Analysis report on the spatial planning of streets and lanes of Shu Han Street Community

Wu Yue*
Architecture College, Southwest Minzu University, Chengdu 610200, PR China

Abstract. Shu Han Street Community of Jiangxi Street is located in the centre of Wuhou District, Chengdu Province and there are many Tibetan resident agencies in this community. It is also close to Southwest Minzu University, People's Government of Wuhou District, Customs Office, and Temple of Marquis Wu. Shu Han Street Community is richly populated by multiple ethnic groups and other social groups. As a community with a dense flow of people and complex population composition, the spatial planning structure of streets and lanes in residents' lives should be analyzed in great detail. Through measured survey and questionnaire survey, we have collected objective information such as street structure and planning and subjective information such as residents' wishes and expectations. After integrating the information obtained, we used professional knowledge of architecture, ekistics and other subjects to propose an optimization plan for three parts—streets, corners, and micro-landscapes.

1 Introduction

Established in 2001, Shu Han Street Community is situated in the centre of Wuhou District in No. 12 Wuhouci Bystreet, Jingxi Street, Wuhou District, Chengdu Province. It is adjacent to the Wuhou Campus of Southwest Minzu University in the east; near to the People's Government of Wuhou District in the west; close to China Customs Office of Gaoshengqiao in the south; faced to Temple of Marquis Wu, a cultural attraction of the Three Kingdoms, in the north from the distance. The transportation here is convenient and extends in all directions. The area under its jurisdiction is 0.28 square kilometres, and there are 31 courtyards. The community has a total of 6 Party branches of CPC, 14 authority organs, enterprises and public institutions, and 11 Tibetan resident agencies, so here is a multi-ethnic settlement. Because there is a large number of ethnic minorities of its residents, and the surrounding areas include government institutions, universities, and tourist attractions, the population composition of the area is relatively tanglesome, and the corresponding activities of its residents are diverse. However, due to the lack of specialized knowledge of planners at the beginning of the establishment of the community, and with the development of the district even to the city, all aspects of the community revealed loopholes in planning and complexity of management. Therefore, in the present the street space of residents' lives and activities in the community needs to be further optimized.

2 Spatial planning analysis

2.1 Analysis on the transportation streamline

Transportation streamline analysis plays a key role in the construction and optimization process of the traffic port station and transport hub group. The goal of transportation streamline analysis is also very clear, that is to provide technical support for the construction and optimization of the traffic port station and hub, so that its facilities layout will become more reasonable. When conducting transportation streamline analysis in the traffic port station and hub, we need to consider the characteristics of the port station or hub group under the established layout scheme according to the goal of streamline analysis, count the number of various streamlines basing on region, classify streamlines, and analyse the static distribution rule of streamlines.

2.1.1 Street traffic

Shu Han Street Community is surrounded by the main roads of the city on three sides, and the secondary roads of the city are interspersed among them, providing better traffic conditions for residents travel. However, residents in the north part of the community can only enter the main road through the branch road, which is easy to cause traffic congestion. The specific street traffic flow is shown in Figure 1. 

*Corresponding author: 2983933163@qq.com
© The Authors, published by EDP Sciences. This is an open access article distributed under the terms of the Creative Commons Attribution License 4.0 (https://creativecommons.org/licenses/by/4.0/).
2.1.2 Public transport

Shu Han Street Community has advantageous public transportation conditions. Metro stations and bus stations basically cover all residents in the community. There is a Gaoshengqiao subway station in the community, and the subway transportation is expedient. The community is surrounded by a large number of bus stops so the public transportation is convenient. The specific public transportation streamline chart is shown in Figure 2.

Fig. 1. The street transportation streamline of Shu Han Street Community

2.2 Street analysis

2.2.1 Wuhouci Bystreet

Wuhouci Bystreet in Huaxi dam, Wuhou District, Chengdu Province, was built by no developer, with a total of 205 houses. The community property company manages the property for the subdistrict office (neighbourhood committee). After investigation and measured survey calculation, the aspect ratio on the left side is 1:1.6, giving people a sense of oppression, and the right side aspect ratio is 2.71:1, so the sense of closure is not enough. And he left side space is more spacious, while the right side space is more crowded. Street planning optimization should focus on improving residents' intuitive feelings, and reasonably adjust the width of the pavement to alleviate street congestion. The calculation details are shown in Figure 3. The specific problem is shown in Figure 4.

Fig. 2. Public transport streamline of Shu Han Street Community

Fig. 3. Abridged general view of Wuhouci Bystreet

Fig. 4. Situation summary of Wuhouci Bystreet
2.2.2 Shu Han Bystreet

Shu Han Street is located in the heart of the community and is a small road. Its aspect ratio of the left and right sides is both 1:1.4, giving people an oppressive feeling. The shops on the ground floor on both sides and street trees extend into the street, compressing the street space. Crosswalks on both sides are narrow, so that congestion is a serious problem. The calculation details are shown in Figure 5, and the specific problems are shown in Figure 6.

![Fig. 5. Abridged general view of Shu Han Street](image1)

The extended ground floor shops and border trees squeezed the passing space.

![Fig. 6. Situation summary of Shu Han Street](image2)

The sidewalk on the other side is only 0.6 meters in width, which is difficult to pass through.

The sidewalks on both sides of the street is rather narrow with no staying space.

2.2.3 Shu Han East Street

Shu Han East Street in Huaxi dam, Wuhou District, Chengdu Province, was built by no developer, with a total of 100 houses. The community property company manages the property for the subdistrict office (neighborhood committee). Shu Han East Street is well planned, with an aspect ratio of 0.77 (0.78) :1 on the left and right sides, giving people a sense of spaciousness. And the two sides of the street are rich in greenery, the ground floor shops are standardly arranged and have land-office business. See Figure 7 for details.

![Fig. 7. Abridged general view of Shu Han East Street](image3)

2.3 Corner space analysis

The street corner space is an important node in the city, because it is widely distributed in the city, and people can further recognize and understand the city through them, which means it have an important impact on the formation of people's overall image of the city. As the starting and turning space of street, the street corner space is an important component of the space node, but it is often considered as an independent element by architects and planners, leading to it not being placed in a larger urban background or even the urban context to be discussed in depth. And insufficient attention is paid to the landscape display effect and connection effect of the street corner space. Therefore, in this paper, how to create high-quality urban commercial street corner space through effective design control means is an important topic to show the characteristics of the community's space.

The corner space is mainly divided into passing-type corner space and stay-type corner space. We selected four representative corner spaces in Shu Han Street Community for analysis, and the specific corner space selection is shown in Figure 8.

![Fig. 8. Corner selection](image4)

2.3.1 Corner A

The corner space size is about 64 square meters. Connecting many communities, this corner is the only way to enter the community, usually there are many residents resting here. Compared to other areas, the stream...
of people here is less because of larger corner space. The stream of people is mainly concentrated in the corner, and the houses on both sides of the main road are relatively scattered, giving people a feeling of spaciousness. The specific corner situation is shown in Figure 9 (the dark part in the figure represents the density of people, and the thicker the dark part, the greater the density of people. The same is true for Figures 10, 11, and 13 below).

![Fig. 9. Corner A](image)

**2.3.2 Corner B**

The corner space is about 211 square meters. And it is the intersection of two roads, The stream of people here is large, and most of them are gathering in the corner space. The space is more open than other areas, and it is used as one of the areas where Tibetan people gather and dance at night. The specific corner situation is shown in Figure 10.

![Fig. 10. Corner B](image)

**Fig. 11. Corner C**

**2.3.3 Corner C**

The corner space size is about 141 square meters. The sidewalk is narrow, and there is no blind road. The stream of people here is large, and a triangular stream of people is formed at the position of merging into the main road, which is very inconvenient to pass. The specific corner situation is shown in Figures 11 and 12.

![Fig. 11. Corner C](image)

**2.3.4 Corner D**

The corner space is about 1135 square meters. It is the connection between the road and the residential area, and there is a lot of landscape here. It is also relatively open, and people often rest here. The stream of people here is large, mainly those who staying in the corner space. The specific corner situation is shown in Figure 13.

![Fig. 11. Corner C](image)
3 Space contrastive analysis

3.1 The edge and the centre

The community is located in Huaxi dam, Wuhou District, which can be regarded as the core area of Chengdu Province, with convenient transportation and perfect infrastructure. And the Tibetan people’s inhabitation has provided unique conditions for the dissemination of characteristic culture, the replacement and iteration of social productivity. It is conducive to the living of the Tibetan people, and it is beneficial to the integration of Tibetan culture and Chengdu culture.

But Tibetan people are still on the fringes of mainstream urban culture. The community is close to the hinterland of Wuhou District, which is known as Shuangnan Area, and as a wealthy area in the southwest of Chengdu. Featuring on auditing, law and other industries, Shuangnan Area has had a very vigorous development since the 90s of last century. And this area is rather close to Little Swan Street and West China Medical College of Sichuan University. Caused by the political industry and the sophisticated technology, the cultural blockade to the community culture cannot be ignored.

3.2 Streets and lanes and the square

Based on the analysis above, it can be seen that the street and lane planning in this area is not very good. The square area is too small, and the streets and lanes are too crowded. As shown in Figures 14 and 15. For the Tibetan people, both of the two problems are very serious.

In this multi-ethnic (especially for the Tibetan people) area, the improvement of streets, lanes, and squares should be adapted to different living needs and meet various functional needs. The streets and squares of residential communities are external spaces, it involves public open space, semi-public space, semi-private space and private space in the residential area. The planning should integrate the environment with history and local culture to achieve organic unity with the urban environment. For the Tibetan people, streets and squares should meet their living needs such as gathering, ethnic beliefs, Buddhist life, etc.

4 Conclusion and in-depth optimization

Through the investigation of Shu Han Street Community, we found that the living space that residents in the area are more concerned about mainly refers to the improvement of ethnic characteristics and the improvement of standardized space in the community. Through the analysis, it is concluded that there is indeed a problem with the spatial planning of residents' activities in the community. The main issues are as follows:
- The concrete parameters of the street are not properly planned, affecting the perception of residents.
- Low utilization of corner space.
- Lack of adequate landscape.

In response to the above problems, based on the investigation and analysis of street traffic and street

Fig. 14. The crowded street in the community

Fig. 15. The narrow street and lane in the community

Fig. 16. The narrow street and lane in the community
business formats, we have raised in-depth street renovation plans. On the basis of investigation of the transition corner between streets and lanes, a reasonable utilization and transformation scheme is proposed. In accordance with the measured survey and experience of various micro-landscapes in the community, a more rational transformation and application mode of micro-landscapes is put forward. Here are the suggestions:

- Appropriately adjust the street parameters. Because the buildings on both sides of the street can no longer be changed, it is necessary to change the layout of the street. Clean up the redundant street elements, such as the overextended business supplies by merchants, bulky landscapes, and replace them with much open street space and a large amount of small and chic micro-landscapes.

- The utilization of corner space is a comprehensive issue, which includes many factors such as the community, shops and landscape. To improve the use ratio of corner space, we should concentrate on secondary processing of existing elements in the corner. To equip the outdoor facilities and space signs with multiple functions such as use, identification, and viewing, the setting of them should be combined with building components and outdoor construction conditions.

- To solve the problem of the small area of Shu Han Street community and the small quantity of landscapes, we can’t blindly increase the number of landscapes, which not only is unable to improve the aesthetics of the residents of the community and the beauty of the block, but will intensify the problem of street space congestion mentioned above. What we should do is to properly arrange the landscape composition. People’s viewing activities can be divided into static and dynamic, and the scenery in the landscape and the static viewing space of the scenery often achieve the unity of the part and the whole through the dynamic space connection. Static viewing space is mostly selected in places with relatively concentrated stream of people and wide vision, such as the main entrance of the community, the central green space, the central square, and the intersection of the main roads. There should be good views, frames, and backgrounds, and a place to rest for enjoyment. The dynamic viewing space focuses on the research of the viewing effect produced in the process of residents’ walking and activities, and each scenic spot is connected to form a complete spatial sequence. Besides, we can use elements such as flower stands, steps, bridges, and floor paving to form guidance and spatial changes.

References