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AN OPTIMISED DESIGN METHOD IN THE HISTORIC BEIJING DASHILAN DISTRICT. A CASE STUDY OF INTERIOR DESIGN IN PUBLIC STREET BASEN ON A DIVERSE POPULATION MOBILITY

Metropolitan development involves the protection and re-development of the city. Beijing has started focusing on developing human-centred space as an ancient and modern city. *Dashilar* is a historical and cultural block located close to Beijing Central, and it belongs to a critical part of the 25 historical reserves in Beijing city. With a unique urban spatial and humanistic character, *Dashilar* has a long history of public space construction development on the needs of its residents and tourists. This paper studied the current situation and spatial features of four types of public space in *Dashilar*: street, lane, courtyard and residential houses types. This paper concludes with strategies for advanced interior design in historical public narrow street in *Dashilar* Hutongs, Beijing.

Keywords: People-oriented space, public space in historical blocks, population diversity

1. INTRODUCTION

As one of the eight ancient capital cities, Beijing is known for its long historical and cultural heritage. In particular, the intertwined Hutongs represent the old lifestyle in the ancient city of Beijing [Guo 2018]. With the rapid increase of the population, a large number of other forms of buildings have been added to the traditional

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Hutongs and Courtyards [Jia 2007]. Consequently, the public space in the Hutongs is taken by the diverse and shared living conditions. Thus, Dashilan block, one of the 25 critical historical protection areas in Beijing, has developed its unique characteristics because of its special spatial and humanistic backgrounds. However, under development, its public space has also become a concern with the diversity of the population.

The Beijing Urban Master Plan (2016-2035) includes the guidelines of “restorative construction”. It identifies the regulations relating to urban repair work to improve the quality of the environment and life quality [Nian 2009]. Additionally, people start to pay attention to the deterioration of their living environment in an ancient city. Thus, there is a need to protect the historical blocks and redevelop the public space environment of Hutongs for the improvement of living conditions.

As one of Beijing’s 33 historical and cultural inherit reserves, Darshilar retains the modern urban street styles as well as the essence of traditional ancient Beijing cultures [Zhao 2010]. Therefore, the Darshilan district faces significant problems common to other historical districts. Many experts and scholars have launched the “Dashilan Redevelopment Plan” and “Dashilan Navigating Programs” to suit people’s needs and lifestyles better. In particular, the activation of the people-oriented public space in the historical district has attracted further discussion in the Redevelopment Plan. Further, these redevelopments will provide important references for other historical districts’ development across different cities. Thus, this paper will investigate the people-oriented public space in historical blocks to offer a refresher overview and practical application of the theoretical studies of people diversity and its impact on developing a people-oriented living environment in historical blocks.

2. CASE STUDY OF DASHILAR

This paper uses the case study of the redevelopment of the Dashilan block. Its current public space environment will be analysed by studying the residents’ behaviour patterns, space needs from the visitors and tourists to propose advanced strategies for redeveloping public spaces. Additionally, the needs of diverse people will be integrated into the redevelopment, with the ultimate goal of achieving a sense of community belonging. The diverse people in this study will include the local residents, tenants, merchants, and other tourists in Dashilar, and public spaces are among streets, courtyards, Hutongs, buildings and other public spaces. Moreover, people’s various activities are to be investigated for the purpose of space activation.

2.1. Dashilar geographic information

Dashilar is located on the most prominent historical and cultural zone of the west side of Beijing Central (see Fig. 1). The total area of Dashilar is approximately 1.26 square kilometres. It is located in the central business area of the capital city. Moreover, it is one of the historic and cultural districts in ancient Beijing. Dashilar represents Beijing's historical and cultural memory with a unique street-living lifestyle and has its own special spatial and humanistic characteristics. However, it also has many living problems because of its unique living conditions.

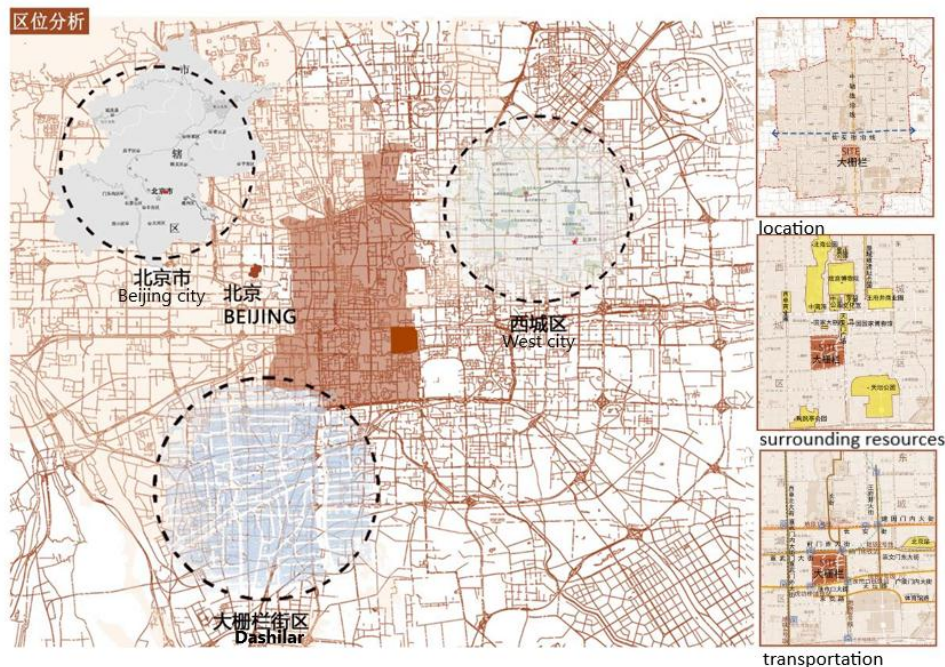


Fig. 1. Dashilar geographic information
(Image source: Author-drawn)

2.2. Public spaces at Dashilar

Although there are many rich architectural designs in Dashilar, the public spaces in the Dashilar block are unevenly distributed, poorly configured and connected. For example, many buildings are poorly maintained and need repairing, and the internal space of the residential buildings is minimal.

Dashilan Streets have a layout of a “slanted street-courtyard” with a shape of a narrow alley. They have a poor traffic environment and very limited parking spaces. There are 111 Hutongs and alleys in the block, totalling 23 kilometres in length. In addition, approximately one-third of the Hutongs have broken ends and bends. Sixty-three per cent of the Hutongs are less than 4 metres wide, which does not meet the fire escapes requirement. In particular, 45% are narrower than 3.5 metres, which do not even meet the one-way driving requirement [Xiong 2021]. However, this dense road network has great potential to create an urban living environment without fast movement requirements.

In terms of public spaces for activity purposes are very limited, and only a tiny proportion of the Dashilan block can be used for activities. There are 11 squares, including four small outdoor sports venues with fitness equipment.

The area of green space is only 1.7 hectares, which counts for 1.4% of the total street area. There are only five parks and green spaces. The existing parks have a traditional landscape with an emphasis on culture. However, with the limited individual spaces, the facilities cannot meet the growing diverse needs of the residents.

Traditional Hutongs and alleys are the main streets at Dashilar, and there are many small or micro public spaces on both sides of the Hutongs. However, currently, most of them are taken by vehicles and a few are occupied by potted plants. Therefore, the space lacks consistency and continuity with no distinctive cultural features. Moreover, the small green spaces do not form an extensive green network for maintenance.

Based upon their different styles and features, the buildings in the street are divided into six categories: cultural inherited buildings, protected buildings, improved buildings, preserved buildings, renovated buildings and refurbished buildings. Among them, cultural inherited buildings and protected and improved buildings take up 65% of the total area. There are also many protected, renovated and refurbished symbolic landmark buildings, including Zhengyi Temple, Kanye Bank, Quanyechang, Qianxiangyi, Beijing Fang, and Wudao Temple.

2.3. Humanistic characteristics

There are a large number of traditional buildings and cultural relics in Dashilar. Dashilar is famous for its unique Hutongs, highly regarded traditional commercial places and the most extensive historical and cultural Beijing flavour district. Moreover, the Dashilan streets are one of the densest areas of Hutong in the ancient city of Beijing. The famous Bada Hutongs are also located in the district.

During the Yuan Dynasty, the southwestern area of Yuandadu was adjacent to the northeastern area of Jinzhongdu. The residents' walk created a number of inclined roads from Zhengyang Gate to Hufang Bridge. Many paved houses were built along these inclined roads, which created a foundation for the Dashilan in-

clined streets. Later during the Ming Dynasty, houses were built along Langfang-toutiao to Sitiao. Since then, the Dashilar block was expanded and the patterns of streets and alleys were established. During the Qing Dynasty, Dashilar was developed into a commercial district in Beijing and became an important import and export gateway. After the 1990s, Dashilar gradually lost its top business reputation because of its landscape deterioration, outdated buildings, limited facilities and low social and economic status. Thus, there is an urgent need to protect and renovate Dashilar in the city of Beijing.

Figure 2 shows the diverse population in Dashilar [Ren 2016]. The residents include aboriginal Beijing generations, people (visitors) coming from other cities to work in Beijing, and tourists from other cities and countries. These tourists came to Dashilar to check in on cultural and historical sites and experience the collaboration between ancient and modern cultures. In addition, Dashilar attracts many artists to Beijing Design Week. Based on the people's behavioural patterns, people can be divided into three types: local residents, tourists and visitors.



Fig. 2. Population diversity at Dashilar
(Image source Author-drawn)

Although the diversification of the population may impact the continuation of the traditional lifestyle, it brings vitality to Dashilar so that we can redevelop Dashilar from the insiders' perspectives. For example, we can analyse the behavioural patterns of the people and their activity spaces to re-organise and optimise the public spaces in an orderly manner. We developed and administered the surveys among the people, and categorised their public activities, being studying, shopping, tourism, sporting, commuting, and creation. These activities can be summarised from the perspectives of living, communication, culture and entertainment, and educational needs.

3. CURRENT PROBLEMS OF PUBLIC SPACES AT DASHILAR

From Cultural fragmentation perspective, Dashilar has rich historical and cultural resources and many valuable cultural heritages. However, except for the nationally protected units, many other cultural relics have not received their deserved social attention. Meanwhile, it isn't easy to maintain and repair cultural relics be-

cause, currently, many people live and use these places daily. Moreover, Dashilar has a history of being a busy traditional commercial area. However, many traditional businesses are being overtaken by modern businesses and are starting to wither away gradually [Wang 2022].

From Chaotic space perspective, Dashilan streets are mainly residential and commercial areas. In particular, it was found the land area of 65.5 hectares (51.0% of the total street area) is used for residential purposes. Most of the residential buildings are traditional courtyard houses. The spaces are chaotic because a) there is limited internal space in these old houses, b) the ownership of the courtyard space is very complicated, and c) many private buildings were built randomly without official approval. The chaotic space has damaged the lifestyle of the block, increasing the number of grey spaces and reducing public spaces for activities. Additionally, the narrow and tortuous Hutongs themselves make it difficult for Dashilar to be redeveloped to adapt to the traffic of cars and buses, causing significant safety concerns. This spatial disorder disrupts the continuity of public spaces and hinders social and cultural exchange activities between different communities.

From Low community energy perspective, The total resident population of Dashilar is 36,000, and the registered population is 55,000. It shows that Dashilar is a highly populated area, and the proportion of the population transfer is high. Currently, aging has become a serious issue because 32.9% of the population are elders (over 60 years old). There are also approximately 2,000 people with disabilities and more than 1,000 people live on pensions or government support. Most of the residents have low incomes and belong to socially vulnerable groups. These people did not have the enthusiasm and initiative to participate in the construction and redevelopment of the communities.

At the same time, due to historical problems left from the Collectivisation Time, the collective public space has become increasingly disordered. The boundaries between houses and spaces are unclear, and the difference between private and public spaces is confusing. Family-unit residents find conflicts in family privacy and public spaces [Li 2021].

3.1. Optimised strategies for public spaces at Dashilar

Redevelopment for Dashilar shall be integrated with the needs of the diverse groups of the population to achieve high community energy. Therefore, the strategies need to be developed based on analysis of the space needs of residents, tenants, business people and tourists in Dashilar. Strategic planning also needs to consider streets, courtyards and buildings to re-construct spaces and allow various activities that meet the needs of the diverse communities. Moreover, how people can use the space and the surrounding environments needs careful consideration to retain the local community space and reshape the traditional ancient Beijing culture.

3.2. Part-to-whole spatial publicity strategy

From Building empowerment point of view. The important buildings are analysed to redefine the function of the building space. Following the principle of preserving the original appearance of the building, local areas are repaired and maintained. Moreover, the infrastructure is improved, and the landscape is improved. Fun activities are to be designed, such as escape rooms, immersive experiences, intangible cultural heritage workshops, community-shared homestays, and experiential theatres. Distributed in the West Street District and Sanjing District, the vacated buildings are now mainly used as hotels, restaurants and offices, which have little impact on solving internal issues of the block. It is known that the definition of illegal buildings and their complicated construction background is not clear. These buildings need to be integrated and used for service purposes to effectively help more diverse groups of people in the communities (see Fig. 3).

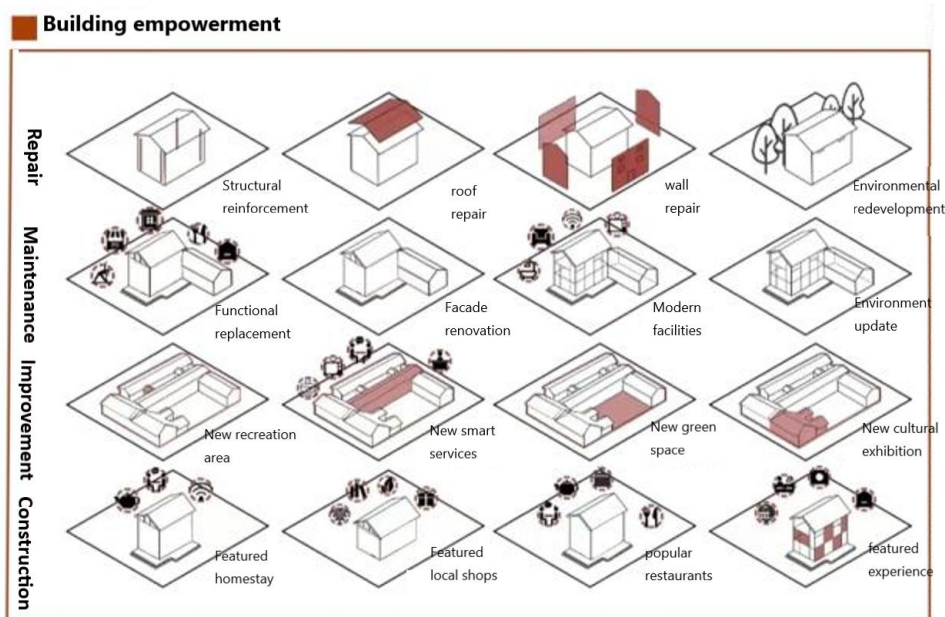


Fig. 3. Strategies for building empowerment
(Image source. Author-drawn)

- Courtyard creation

Illegal buildings are demolished; the texture of buildings is organised, and supplementary functions are created to add a small space with partial subsidence. The modern space will be introduced to the traditional space. Meanwhile, the grey space in the courtyard is revitalised to add business functions. The inner yard space is developed to create a comprehensive courtyard. The courtyard creation can meet

the needs of diverse people at different times to increase the utilisation rates of the courtyard space (see Fig. 4).

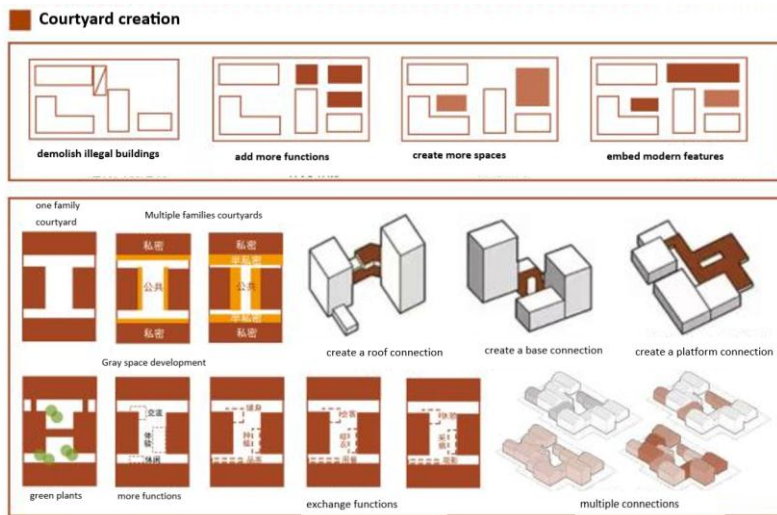


Fig. 4. Strategies for courtyard creation
(Image source. Author-drawn)

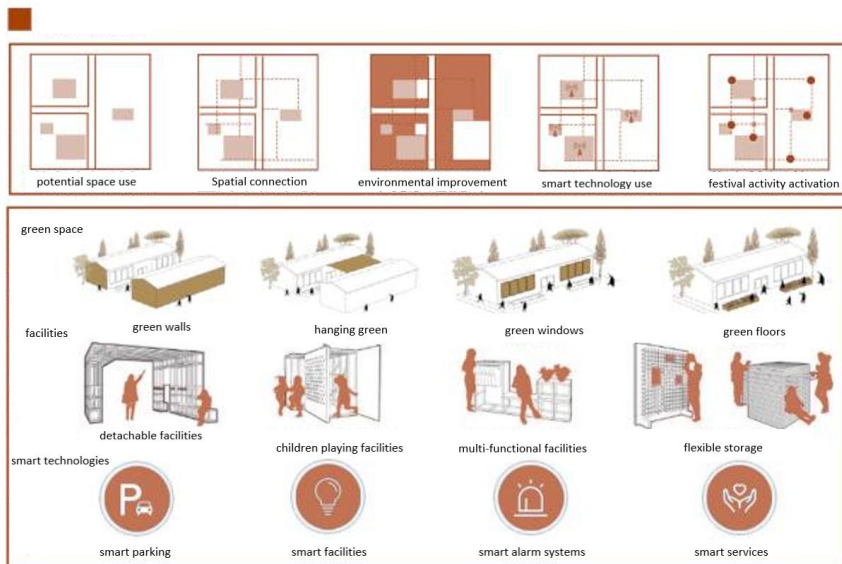


Fig. 5. Strategies for street quality improvement
(Image source. Author-drawn)

- Improve street quality

Potential spaces of Hutongs are analysed to create a spatial connection inside the block. Currently, most streets are east-west, and there are few streets that are from north to south. New north-south streets are developed to create tourist routes and reorganise the street structure to achieve environmental penetration for easy navigation purposes. Additionally, more green creeping plants on the walls, hanging plants from the windows, and trees and other green plants are planted. Moreover, detachable facilities, children's activity facilities, multi-functional recreational facilities and flexible storage are to be developed to implement smart technologies. Smart parking, facilities, safety alarm systems and services are being introduced to people's daily life (see Fig. 5).

- Neighbourhood revitalisation

In order to improve the comfort, safety and accessibility of the pedestrian space, pedestrian space in the block is revitalised to connect community interaction spaces. Dynamic changes in the community spaces are achieved through activities meeting the changing characteristics of the various age groups. Dynamic and static areas are created by connecting different areas of the slow-moving spaces in Dashilar. The continuity, interpenetration and spatial integration of the block space significantly impact the block activation to meet the needs of different aged people to the greatest extent. All the functions are combined and integrated into each other to avoid any idle space and fully activate the gray space in the block (see Fig. 6).

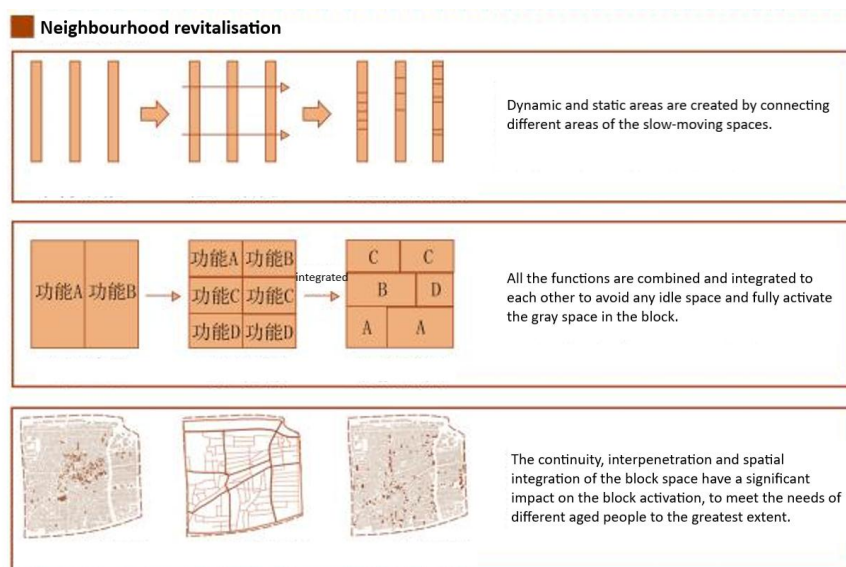


Fig. 6. Strategies for neighbourhood revitalisation
Image source. Author-drawn

3.3. Renewed Energy through using diversity strategies

The diversity strategies should include consideration of people of different ages and the changes in time, space and green landscapes. They also need to involve diverse, immersive experiences for residents, visitors and tourists. For example, different tour routes are designed, and tourists can experience the theatre experience and other designed games along the tour routes. Many cultural distinctive areas are developed in the tour routes. Mini theatres are built for tourists to visit and take pictures. These groups of people can interact with each other to share public spaces. Therefore, public spaces are designed and managed by smart digital technologies. Low-carbon dynamic testing sites, recharging sites, and other convenience facilities are being developed through smart digital technologies. Additionally, residents are involved in the maintenance and management of community facilities. By using these strategies, high energy is built and embedded into Dashilan streets (see Fig. 7).

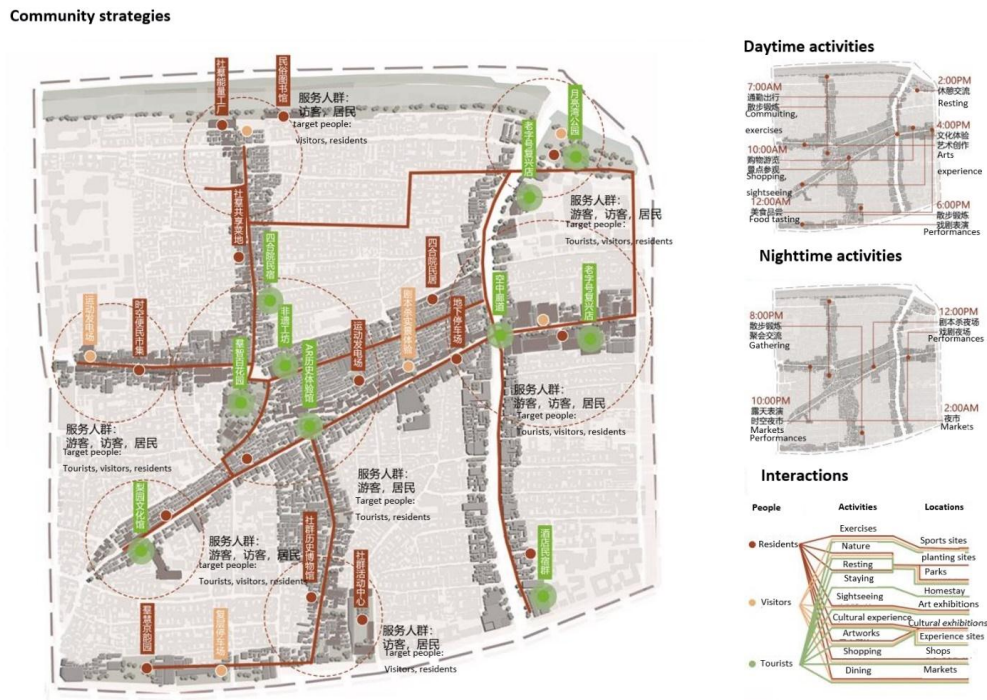


Fig. 7. Community strategies (Image source. Author-drawn)

Scene creation – Strategies of spatial exploration and cultural spirits development

A public space system is constructed involving streets, courtyards and buildings, and a public space activity network is also developed for the activity sites in Dashilar. Big crowd activities sites, such as sports activity power plants, shared vegetable sits, street corner parks, shared homestays, day and night markets, and experience sites, are developed. Buildings should have diverse functions. For example, community activity centres and multi-functional activity rooms are developed to avoid places with only a single function. Multi-level spaces, such as above-ground and underground spaces, shall be used for parking spaces and improve the use rates of small and micro spaces. In addition, immersive experiences should be created for diverse groups of people, such as residents, visitors and tourists. Events planning, such as art festivals and, traditional theatre festivals, cultural and creative festivals, shall involve all the diverse groups of people in Hutong meetings (see Fig. 8). Via these strategies, unique scenes are created to develop cultural spirits and community pride of the people who live and visit Dashilar. Moreover, cultural memory and a win-win sense of belonging will be sensed and shared by the whole community.

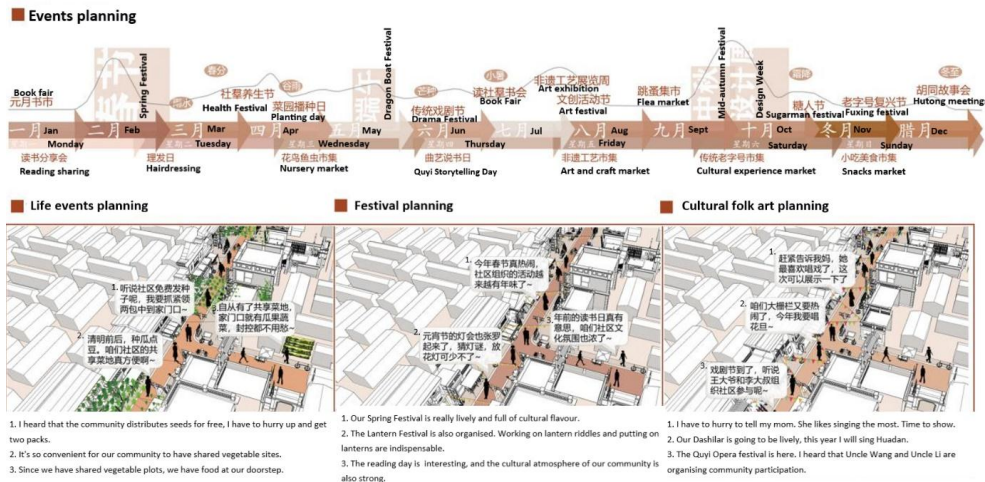


Fig. 8. Events planning (Image source. Author-drawn)

4. CONCLUSION

The protection of redevelopment of historic and cultural districts can take a long and complicated process. The case study of Dashilar shows the renovation of public spaces needs to be carefully considered from the preliminary stages, including

surveys, to a detailed planning and designing stage. Multiple milestones are needed in the process [Jiang 2021].

This paper investigated the public space design in the redevelopment of Dashilan historic streets, focusing on the construction of public space based on the needs of its residents, tourists and visitors. The status quo of the public spaces is analysed, and the characteristics of existing spaces are studied. Based on the investigation results, optimisation strategies are developed to re-establish public spaces in Dashilan Hutongs. This paper also looks into how to create suitable public spaces to meet the financial and emotional needs of the people during the redevelopment and reconstruction stages. It was found that modern technology and pressure from the economy significantly impacted the redesign and redevelopment. Moreover, the reconstruction of historical and cultural areas can also be challenging. The empirical study conducted in this paper can provide references to researching how to redevelop the historical and cultural blocks.

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**METODA OPTYMALNEGO PROJEKTOWANIA W HISTORYCZNEJ
DZIELNICY DASHILAN W PEKINIE. STUDIUM PRZYPADKU NA PODSTAWIE
PROJEKTU ULICY HANDLOWEJ Z UWZGLĘDNIENIEM ZRÓŻNICOWANEJ
MOBILNOŚCI SPOŁECZNEJ**

Streszczenie

Ochrona i rekonstrukcja tkanki miejskiej stanowi część naturalnego rozwoju metropolii. Pekin, będąc miastem o wieloletniej historii, a jednocześnie nowoczesnym, promuje rozwój przestrzenny nakierowany na potrzeby przebywających w nim ludzi. Dzielnica Dashilar stanowi kwartał ulic historycznych, pełniących też ważną funkcję kulturową. Co więcej, stanowi ona kluczową część 25 obszarów objętych w Pekinie ochroną konserwatorską. Dzielnica ta charakteryzuje się niepowtarzalnym układem urbanistycznym i przyciąga szeroką rzeszę odwiedzających. W Dashilar można też zauważyć długoletni proces rozwoju przestrzeni publicznej w odpowiedzi na potrzeby jej mieszkańców i turystów, stąd wiele tu obiektów o wartości historycznej. Niniejszy tekst został poświęcony badaniu obecnej sytuacji i cech charakterystycznych czterech typów przestrzeni publicznej w Dashilar: ulicy, pasa drogowego, podwórza i rodzajów zabudowy mieszkalnej. We wnioskach niniejszej pracy zawarto strategię dotyczące zaawansowanego projektowania historycznych miejsc publicznych na przykładzie wąskiej uliczki Da-shilan Hutongs w Pekinie.

Słowa kluczowe: przestrzeń zorientowana na ludzi, przestrzeń publiczna w historycznych kwartałach, różnorodność populacyjna

