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Achieve a balance between publicness and commercialisation

--- Space for public street life in South Luogu Lane Block, Beijing, China

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Finn en balans mellan offentlighet och kommersialisering

--Plats för offentligt gatuliv i Södra Loungu Lane Block, Beijing China

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Abstract

English

China is now seeking for more sustainable and healthy urban development and pays much attention to better quality of urban life in the process of new-type urbanization. Beijing, as the capital and economic centre in China, plays a leading role in practices for vital and diverse urban life in the existing urban space, especially Hutong redevelopment. A lot of problems and challenges emerge in this process, such as over commercialization of public space, gentrification, and exclusion of original inhabitants. Based on a combination of western public life study and Chinese practises, this thesis tries to figure out the problems and spatial role of Hutong in the process of regenerating thriving public street life in South Luogu Lane Block in Beijing. To find proper solutions for these problems, the thesis looks into Gehl's public life theory, Hillier's space syntax and practices from Project for Public Spaces. With the placemaking strategy, the thesis aims to find a way to achieve a balance between publicness and commercialization in Hutong redevelopment and create good public street space for commercial activities and everyday life in South Luogu Lane Block.

Swedish

China söker nu mer hållbar och hälsosam stadsutveckling och anstränger sig för att skapa bättre kvalitet på stadsliv i processen av ny-typ urbanisering. Beijing (Peking??), som huvudstad och den ekonomiska centralen i Kina, spelar en ledande roll i att införa praktiker för vitala och skiftande stadsliv i den existerande stadsrum, speciellt ombyggnaden i Hutong. Många problem och utmaningar kommer fram i denna process, såsom kommersialisering av offentlig mark, gentrification och uteslutning av de ursprungliga medborgare. Baserad på en combination studier om offentligt liv i väst och kinesisk praxis, försöker den här uppsatsen ta reda på vilka problem som finns i Hutong och dess spatiala roll i processen av återskapandet av blomstrande gatuliv i South Luogu Lane Block i Peking. För att hitta passande lösningar för dessa problem, ser denna uppsats till Gehls teori om offentligt liv,

Hillers plats syntax och metoder från Projekt för O

offentliga platser. Med strategin av *placemaking*, är målsättningen att hitta ett sätt att uppnå balans mellan offentlighet och kommersialisering i Hutong nyutveckling och skapa god offentlig gatuplats för kommersiella aktiviteter och vardagsliv I South Luogu Lane Block.

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Finally, I want to thank Kyle Farrell, Jiamin Zheng (郑嘉敏), Ivannia, Katja, Gardiner for their careful proofreading and revision of my thesis. They read part of my thesis and made very useful comments for writing and language improvements. Besides, I would like to thank my family and friends, who gave me much accompany and encouragement on my way of academic career.

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Chapter 1 Introduction

As a traditional concept for living and neighbourhood interaction in a human scale, Hutong is not only a culture heritage to Beijing, but also the whole world. It represents the Chinese idea of vital neighbourhood and good life. There are a lot of Hutong redevelopment projects in Beijing currently, but a lot emphasize on new courtyard house design or commercialization for tourism development. The public space and street space for social interaction and neighbourhood life is a missing aspect in this process. With rapid urban development and economic growth, citizens and municipality in Beijing turn their attention to urban life quality improvement, to which diverse public space make great contributions. It is very essential to create public space in Hutong neighbourhood and revive traditional Hutong street life in the Hutong redevelopment.

1.1 Background

1.1.1 Demand of Human Dimension

When the People's Republic of China was established in 1949, there were only 10.64% of the whole population, 57.6 million residents, living in cities (NBSPRC, 2015). In the last decades, China witnessed an exciting picture of rapid urbanization: 400 new cities in the nation (Ren, 2013). At the same time, urban population is increasing rapidly from 1949 until now and in 2010 urban population ratio firstly exceeded rural population ratio in the nation (See Fig.1.1). 129 cities' population were over 1 million and another 110 cities had residents between half million and 1 million in 2010 (Ren, 2013). In 2013, the urbanization ratio has reached 53.73% in China, which is about 730 million urban residents (NBSPRC, 2015). Although China is still in the stage of rapid urbanization, the past development mode is unable to deal with existing problems and meet new challenges, such as industry upgrade, sustainable environment and equal society (SCPRC, 2014). As more and more people move to cities, increasing attention has been turned into better urban services and high-qualified urban life as the driving force rather than the previous industrialization for healthy economic growth, urban development and social progress. It is time to make a new approach to achieve a society of moderate prosperity. The need of transition from rapid urbanization to healthy and sustainable urban development has

never been so urgent.

Under this background, in December 2012, the concept of "New-style Urbanization" was put forward for a qualified urbanization in The Central Economic Work Conference. In 2014, the State Council of People's Republic of China published the National New-type Urbanization Planning (2014-2020), which demonstrated the importance of people's urbanization and citizenization for a sustainable, healthy, green, effective and low-carbon China. In the Asia-Pacific Econmic Cooperation CEO Submit 2014, President Xi Jinping first systematically clarified his idea of "New Normal" to stimulate comprehensively sustainable economic, social and urban development in China. As reflection of these two demands, it is important to transfer from Physical Expansion to Built-up Area Improvement in the area of urban planning and design. The human dimension is always missing in the process of urbanization and traditional planning in China. However, there are two obvious emphases in the demand of New-style Urbanization and New Normal urban planning: one is improving urban space regeneration, and the other is increasing the life quality of citizens. Thus, the abundant public life and good public space has become a new indicator to evaluate the urban civility and human urbanism in many cities.

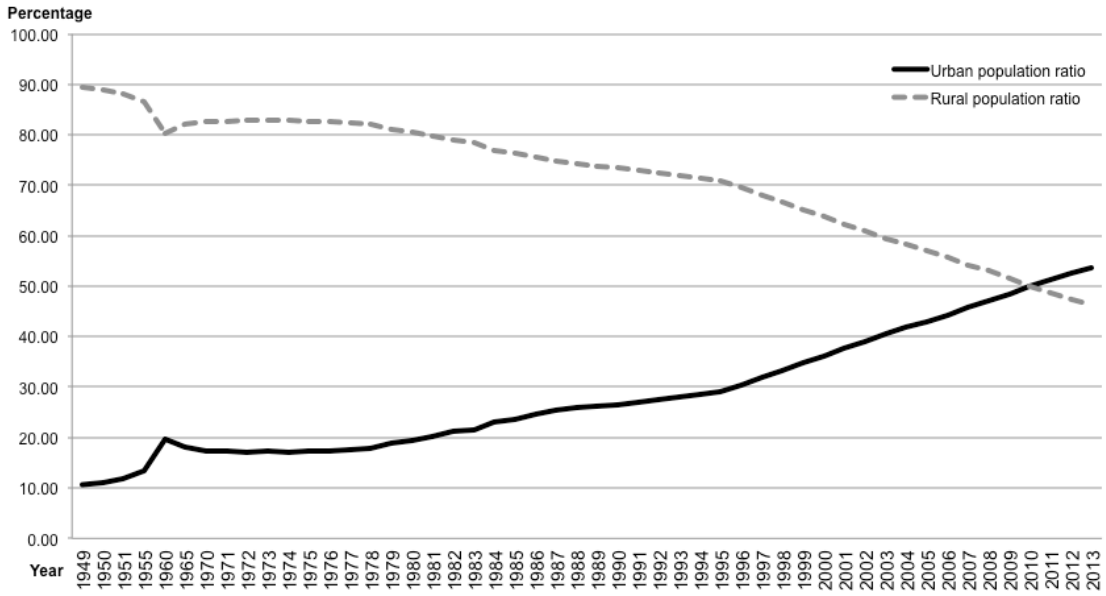


Figure 1.1 Urban population shares in the national population 1949-2013

Source: China Statistical Yearbook 2014

1.1.2 Public Space in China

There is an absent culture of public space appropriation in China. Recently, there are numerous news and heated discussions about the Guangchangwu (public square dancing), which leads to huge contradictions between residents nearby and these square dancers because of the noises and disturbance produced. Except for a weak awareness of publicness, another essential reason is that the city lacks a diversity of usable public space for different public activities. Yang (2006) illustrated that the dilemma of public space in China is due to its poor environmental quality, the separation from citizens' everyday life, the disjunction of public activities, and an ignorance of users' real demands. On the other hand, compared with typical western interpretations, public space is defined in a different way in the context of China. In the Western norms, public space is usually connected with civic society, democracy, citizen participation, the right to the city and other similar concepts (Hassenpflug, 2010). In Hassenpflug's (2010) observation, public space in China refers mainly to open space, especially open urban space, which could be categorized into three types: noble space (e.g. Tian An Men Square), commercial space, neighbourhood or community space.

Commercialization is often described as a common driving force to bring lively urban life in Hassenpflug's (2010) explanation of public space in China. In most cases, attractive public space in Chinese cities is considered as commercial places with retail stores, shopping malls, supermarkets, and street vendors. Xintiandi, a popular commercial place in Shanghai, is a typical typology of commercial facilities sharing public space within surrounding closed neighbourhoods. Commerce changed previous dilapidated neighbourhood into a vital and colourful urban space. However, commercialization contributes to the fragmentation of pubic space and limited public activities in these places. Under this situation, the public space that belongs to citizens is intruded or occupied by other developers. As a result, people hardly know what public space is and where their right to public space applies.

In this sense, community space is closer to western public space. In China, Xiaoqu is the most common housing compounds, which are planned and designed as gated communities with physical walls, fences, and gates to mark its boundaries (Hassenpflug, 2010; Ren, 2013). It creates quiet and friendly courtyards and green space for neighbourhood socializing and activities. "Exclusion is a key word in the

text of the contemporary Chinese cities" (Hassenpflug, 2010, p.48). Although the gate is left open all the time in most cases, these community space are still semi-public space, hardly accessible to everyone. However, the neighbourhood pedestrian streets are open to city streets and publicly accessible. In the evening, the central public space and streets become a popular and lively theatre of colourful city life and activities for nearby residents in these communities, because these places are more interesting to see other people and much enjoyable for walking (Hassenpflug, 2010; Ren, 2013). In the old time, neighbourhood streets had a mix of repair workshops, food stalls, diverse stores, newspaper stands, and restaurants with people talking, walking and working. Now some neighbourhood streets are either too commercialized or too empty. Street life is missing in the neighbourhood, which indicates a deficiency in public space for everyday life and activities in China.

1.1.3 Beijing Old City Regeneration

As the capital of culture, economy and politics in China, Great Beijing Area has a population of 21.516 million and 86% are urban population at the end of 2014 (Deng, 2014). The old Beijing city is a great heritage and represents a unique image of traditional culture, everyday life and architecture. Hutong in the Beijing Old City represents traditional housing neighbourhood and street life in China. Recently, a lot of efforts have been made to preserve the old urban texture and improve urban life quality, urban regeneration and sustainable development. In Beijing Master Plan (2004 - 2020), two primary principles are urban public life quality improvement and Old Beijing City protection and renewal. In 2011, Beijing proposed its Conservation Plan for Historical and cultural city of Beijing (2011-2015), which not only emphasized the culture protection and physical conservation, but also the integration and redevelopment of existing spaces. This was the first time to make a comprehensive plan for Old City conservation and many following detail plans were based on this plan.

The municipality implemented a range of actions to boost better urban public space in a more human scale, including residential environment, urban green space, community space, streets, and civic squares. As the typical and traditional residential neighbourhood system in Beijing, Hutong describes a vivid picture of old Beijing

physical space and lively life style, which attracts a large number of visitors to explore and residents to live in. Recently, many planners, designers, architects, officers and organizations have made creative projects to revive these Hutong space and culture. There are many successful stories, but also a lot of problems emerge in this process, like gentrification, commodification of public space, commercialization. This study will make a further discussion on the problem of commercialization in these redevelopment projects.

1.2 Research Aim, Questions and Importance

1.2.1 Research Aim

Traditional Hutong neighbourhoods are a significant part of Beijing Old City's historical and cultural preservation. It displays a traditional way of urban life in its well-connected public space, especially its street space. Hutong street system provides huge potential for diverse everyday life and activities. They are the places for slow traffic, shopping, standing, walking, meeting, talking, playing, and social interaction. For a long time, Beijing Municipality has made numerous efforts in urban planning and design projects to conserve traditional Hutong neighbourhoods and regenerate its vital Hutong life.

However, due to Hutong's unique landscape and culture, commerce and shopping have been viewed as the driving force to rejuvenate the area. As a result, a lot of Hutong space has been transformed into semi-commercial space. Besides, most active space in Hutong is mainly designed to attract tourism and consumption, while original residents are excluded from their everyday street space. In a recent implementation evaluation report of Beijing Historical and Cultural City Protection Regulation, Shichahai and South Luogu Lane (the research area in this study) failed to be selected as the National Historical and Cultural Area (Li & Zhao, 2015). Shichahai and South Luogu Lane were previously traditional Hutong courtyard housing neighbourhoods, but now these memorable places contain too many commercial elements after redevelopment. Commercial Hutong streets are now full of visitors and tourists. There is no space for everyday street life and neighbourhood activities for local residents.

This reflects a common and urgent problem in the current Hutong renewal projects: over commercialization for tourism development and inadequate pubic space for social interaction and neighbourhood life. This is not real Hutong life. Therefore, this research aims to find a way to achieve a balance between publicness and commercialization in Hutong redevelopment process. It is essential to design space for public street life and everyday neighbourhood activities. The international experience and practices on public life study and street life initiations can be helpful to revive Hutong street life for a diversity of users.

1.2.2 Research Question

Thus, the main research question is that in the Hutong redevelopment projects, how can urban planners and designers achieve a balance between commercial space for tourists and public space for everyday life of local residents?

To answer this question, there are three small aspects for detailed exploration:

1. What are the main problems and challenges in the current Hutong renewal?
2. From the aspects of urban form and morphology, what is the role of Hutong and how does it spatially manifest itself?
3. In terms of place-making activities in Hutong, how can the approach of placemaking (Jan Gehl and PPS) be applied in the Hutong renewal to achieve a balance between commercial space and everyday life space?

1.2.3 Research Importance

This thesis chooses South Luogu Lane Block, one of the three most representative Hutong typology areas, for research and analysis. It is one of the 25 Historical and Cultural Area in Beijing and is preserved as a complete Hutong Neighbourhood block. Since 1990, several renewal projects oriented by the municipality have been implemented at different times, which changed its landscape and produced some common problems. There are a large number of literature, researches and projects about redevelopment and protection of Hutong. Most of them deal with tourism development, courtyard housing protection and Hutong morphology, but few researches discuss everyday street life and Hutong public space in the renewal process.

Thus this study will be a start of an elementary exploration on this topic. The result of study in South Luogu Lane Block can represent common problems emerging in the Hutong redevelopment projects and offer some ideas and thoughts to create vital public street life in other places.

1.3 Delimitations and Limitations

Actors are the driving forces in the redevelopment projects. However this thesis will only do a simple actor analysis, listing the involved actors in several completed Hutong redevelopment projects. More efforts will be spent on the spatial and morphological aspect, that is, how the physical environment and elements can contribute to public street life in Hutong neighbourhood in the process of urban planning and design. The role and relationship of different actors in the Hutong renewal can be another interesting topic for further research later when this thesis is finished.

In terms of data collection, Google map is an alternative tool to collect geographical and location data for research when a proper and accurate map is not available (Sridhar et al, 2011; Akanbi & Agunbiade, 2013; Guo, 2013; Preston & Wilson, 2014). Considering the research site is in China, where the Google map is banned, this research will not use Google Map. Instead, Baidu Map will be an alternative, which will be illustrated more in the methodology part.

Due to time limitation and visa extension problem, the site observation part is done by the author's colleague, Rushi Tan, a master student who is studying urban planning and design in Nanjing University in China. The evaluation of public space quality of South Luogu Lane and Ju'er Hutong is made based on Tan's observation and discussion between her and the author. This evaluation represents personal spatial experiences from two professional urban planners, which will not be able to reflect accurate quality of public space in South Luogu Lane. A better way is to invite local residents, tourists and professional urban planners to make their evaluation respectively and then get a more comprehensive result of public space quality. This method will be applied in future studies focused mainly on public quality in South

Luogu Lane.

1.4 Disposition

This thesis is divided into seven parts to elaborate findings from various literatures and an empirical study of South Luogu Lane Block. Chapter 1 introduces the background of public space development in China and illustrates the research aim and research questions. Also it is important to explain the delimitations and limitations of this thesis. In Chapter 2, it makes a review of Hutong history and development in Beijing Old City from Ming Dynasty to nowadays, especially Hutong spatial pattern and its public street life. In addition, it summarizes existing problems and challenges in the Hutong redevelopment from literature, which will partly answer the first sub research question. Chapter 3 analyses theories and previous studies on public life and street life from both China and West, which follows an evaluation of different factors mentioned in these theories. This helps to identify important indicators relevant to street life space assessment in Hutong. Chapter 4 describes the research methodology in this study, which illustrates methods for data collection, quantitative analysis and statistics analysis for South Luogu Lane Block.

In Chapter 5, an empirical study of South Luogu Lane Block is made to find out the spatial role of Hutong to support public street life and other specific problems in the block redevelopment. This chapter tries to figure out a proper answer to the first and second sub research questions. Then chapter 6 aims to answer the third research question. It gives a summary of the empirical study, and introduces successful placemaking practices in the Strøget in Copenhagen and New Road Project in Brighton. Besides, it puts forward some thoughts on the way to apply placemaking to transform Hutong street space in South Luogu Lane Block. Finally, Chapter 7 gives some recommendations on redevelopment policies and strategies, and small urban design projects to create more public space in South Luogu Lane Block.

Chapter 2 History and Challenges of Hutong Development in Beijing

With a history of more than 800 years, Beijing Old City has an area of 62.5 km^2 (Zhu, 2013). Existing Hutong network shapes the land use structure of Beijing Old City. Hutong is the context and stage of Beijing's history and culture, and is the place for everyday life of its residents as well. Its name came from Mongolian and was first used in Yuan Dynasty (1271 - 1368) to name streets. The amount of Hutong reached almost 1000 in the Qing Dynasty and was over 1330 in 1949 (Zhu, 2013). But due to the urban construction and renewal projects in Beijing, a large number of Hutong are disappearing rapidly in recent decades (See Fig. 2.1).

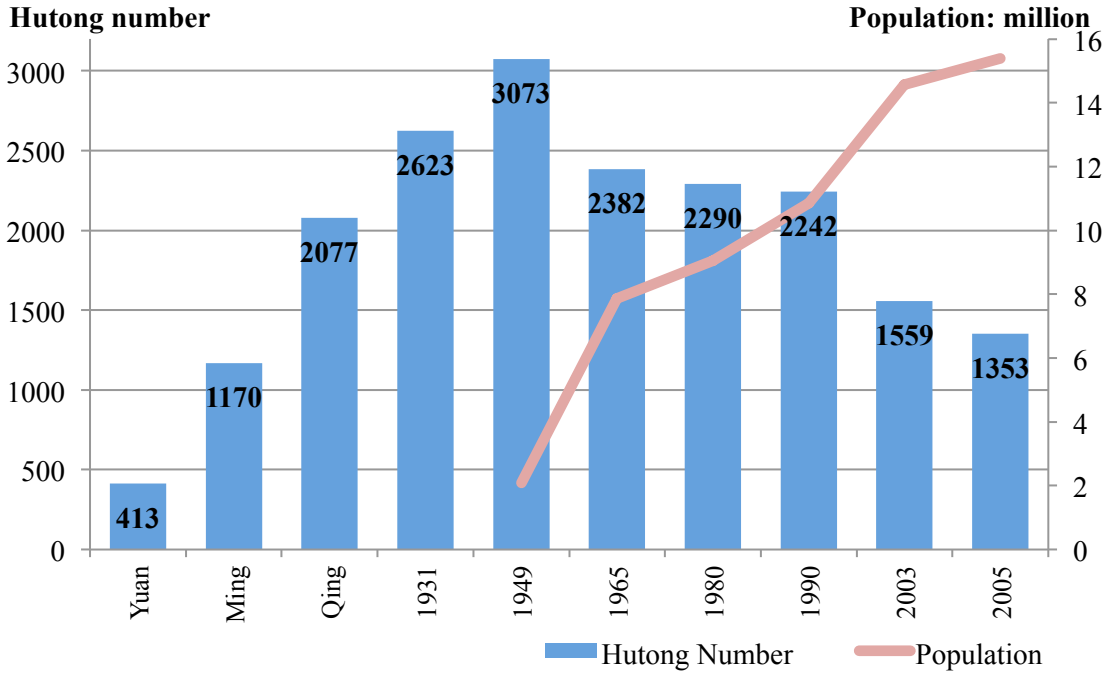


Figure 2.1 The Hutong number in the Beijing Old City and population development in Beijing City

Source: Li, N. et al., 2006; Zhu, 2013

2.1 Hutong before the People's Republic of China (1271 - 1949)

2.1.1 Hutong in Yuan, Ming, Qing Dynasty

The construction of Beijing Old City is based on the spatial pattern and urban form of

Yuandadu (Beijing city in Yuan Dynasty) (See Fig. 2.2). In Yuan Dynasty, the avenues were the main roads and these roads created residential blocks called “Fang” (See Fig. 2.3). In the blocks, there were several west-to-east small alleys, which were called Hutong, for the carriages and pedestrians traffic. In the regulation at that time, the width of avenue was 37.2 meters, street 18.6 meters and Hutong 9.3 meters (Wu, 1999; Li, et al., 2006; Zhu, 2013). Thus, Hutong, street and avenue shaped an integrated street network of Yuandadu (See Fig. 2.2).

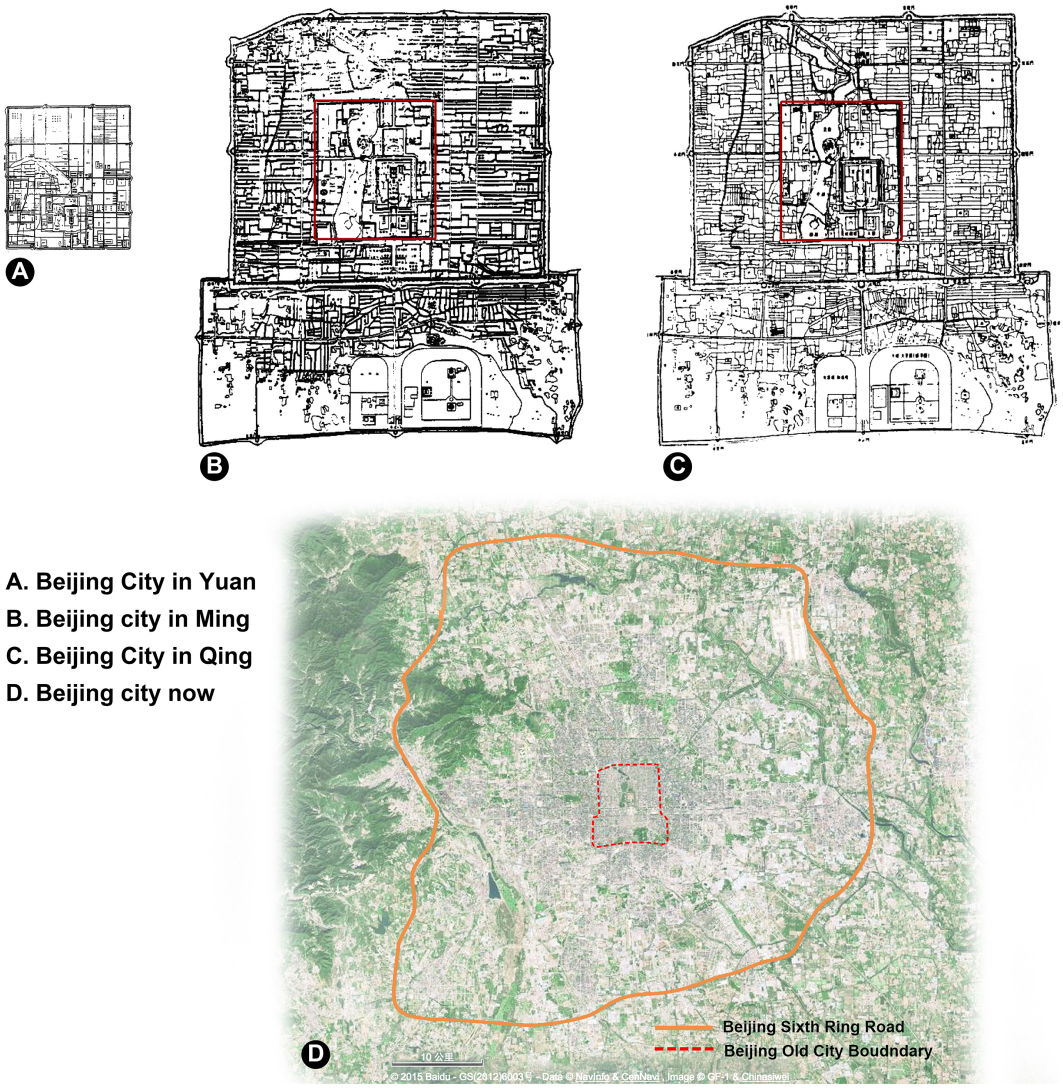


Figure 2.2 City layout of Beijing in Yuan, Ming, Qing Dynasty and now

Source: Map A, B, C from Hou, 1998, Fig. 27-8, Fig. 31-2, Fig. 41-2 cited in Wu, 1999; Map D from Baidu Map (map.baidu.com)

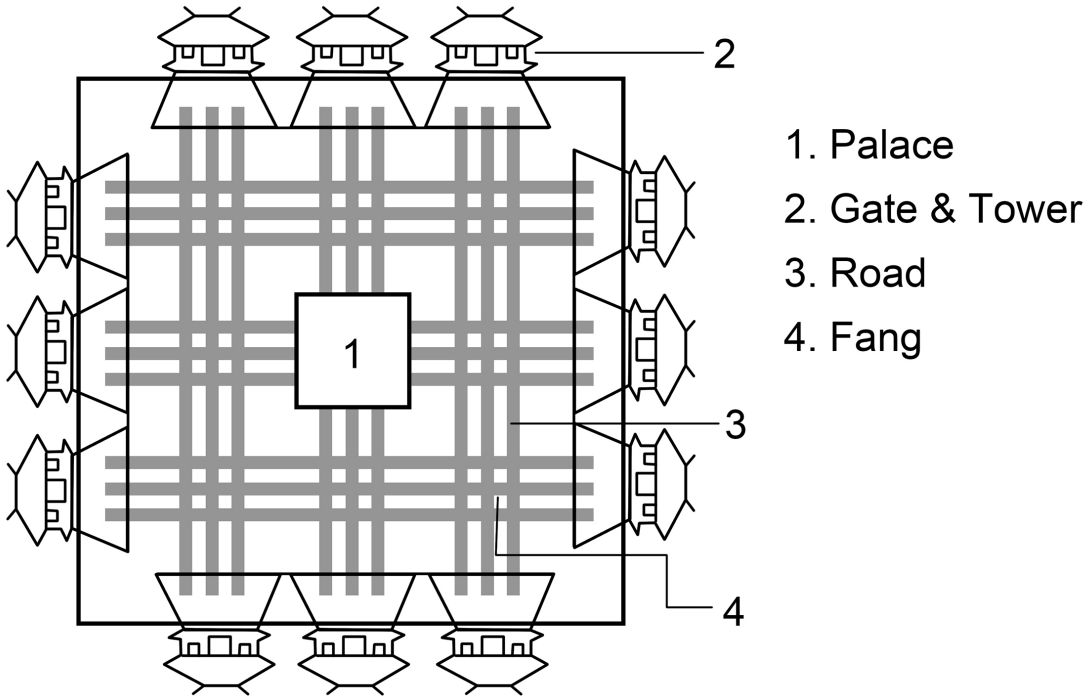


Figure 2.3 Residential block “Fang” in the Yuan Dynasty

In Ming (1368 - 1644) and Qing (1636 - 1912) Dynasty, Yuan’s street network was preserved and developed (See Fig. 2.2). Most streets ran from north to south and from west to east, which displayed a grid pattern. At this time, each Fang was divided into several long strips. West-to-east Hutongs arranged neatly with equal interval of 77 meters. The number of Hutong increased from time to time: 29 in Yuan Dynasty, 459 in Ming Dynasty and 978 in Qing Dynasty (Li, et al., 2006; Zhu, 2013, See Fig. 2.1). The increasing Hutong changed the square residential blocks into linear streets with two-floor house walls (Zhu, 2013). Besides, the regulation was not so strict in the width for new constructed Hutong. Consequently, Hutong with different widths and slant Hutong appeared in some places. In terms of the Hutong pattern, the main types are herringbone, long grid, circle, dendritic and polyline shapes (See Fig. 2.4).

Streets have been used as a popular place of open market for trade among citizens since Song Dynasty (960-1279). Linear space was very adaptive to various volumes of traffic and pedestrian flows; therefore it was easier for businessman to trade and citizens to shop (Zhu, 2013). In Ming and Qing Dynasty, commercial activities always happened in the streets and streets were the closest public space for residents’ everyday life.

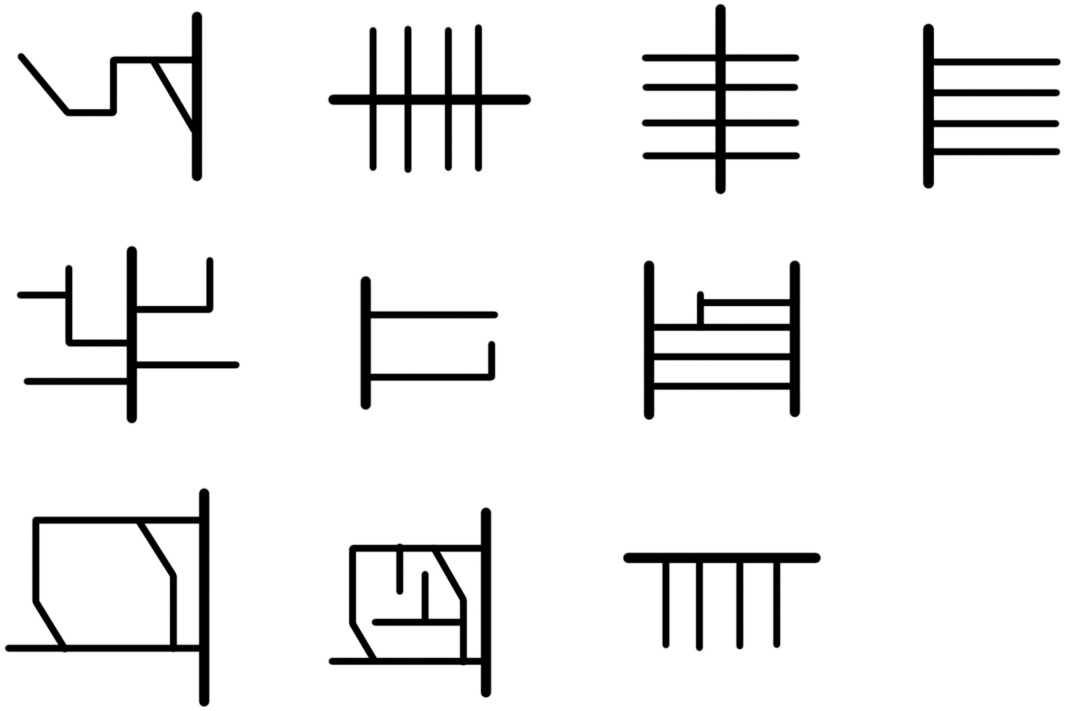


Figure 2.4 Hutong neighborhood typology in the Beijing Old City

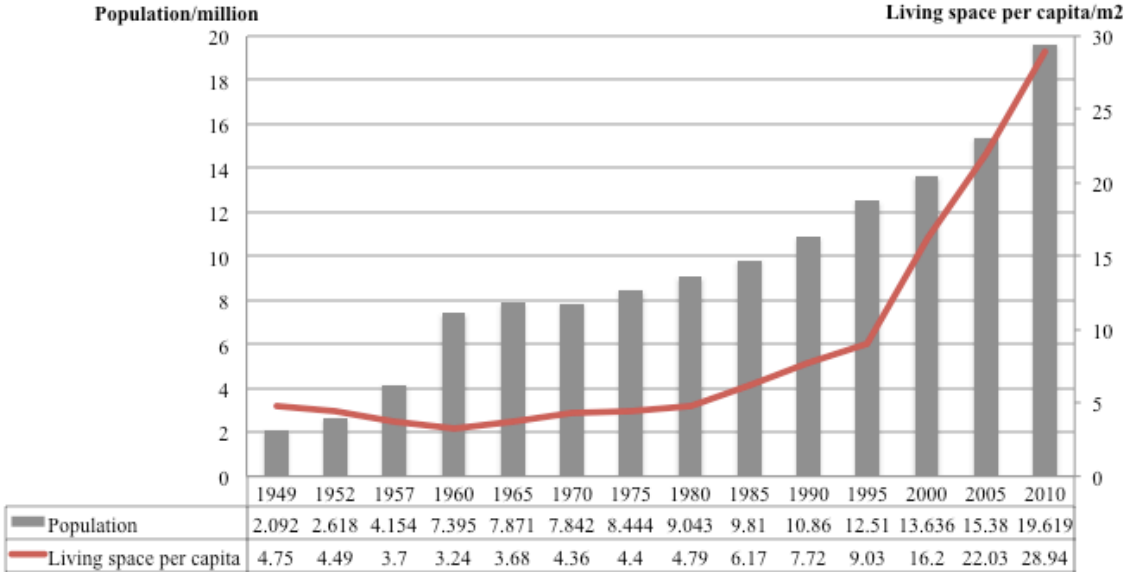
2.1.2 Hutong in the Republic of China Period (1912 - 1949)

In the Republic of China period, the whole country was under unrest and wars, thus urban policies changed quickly. However, with introduction of new ideas and concepts, public space in the Beijing City grew and developed gradually. The Forbidden City was open to the public and citizens were equal to choose where to live. Many new roads and streets were built under new construction, which mitigated rising traffic. The street system changed gradually from the previous grid pattern into radial grid pattern.

Due to the increasing population density, the number of Hutong and street also increased from 2077 in the Qing Dynasty to 3582 at this time (Zhu, 2013). As a result, the width of Hutong was narrowed and many branches were added. A lot of poor people moved in and living space became smaller and smaller. In this time, life quality was very low, while street market was developed greatly. Many shops and services were concentrated in these street markets. But, public space was very limited in this period.

2.2 Hutong in the Urban Renewal Period (1949 – 1990s)

When the People's Republic of China was established in 1949, Beijing Municipality chose to build the capital on the old center of Beijing, which caused several problems and challenges for urban development until now. Redeveloping the Old City, in fact, destroyed a large number of the best existed urban places and space, and also led to increasing dilapidated houses due to poor maintenance and incomplete conservation policies (Wu, 1999). At this time, during the process of capital construction, more and more people moved in. But the city had a large housing shortage and poor quality of residential environment (See Fig. 2.5).



	1949	1952	1957	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010
Population	2.092	2.618	4.154	7.395	7.871	7.842	8.444	9.043	9.81	10.86	12.51	13.636	15.38	19.619
Living space per capita	4.75	4.49	3.7	3.24	3.68	4.36	4.4	4.79	6.17	7.72	9.03	16.2	22.03	28.94

Figure 2.5 Population and living space per capita in Beijing City (1949 - 2010)
Source: Ruiren (a), 2012; Beijing Statistical Yearbook 2014; Beijing Statistical Information Net (http://www.bjstats.gov.cn)

In the 1970s, direct removal was adopted in many Hutong neighborhood areas to create space for new multi-story housings. In the Command Economy period (1949 - 1978), housing was regarded as welfare of work units. Thus, Work unit Danwei or Xiaoqu, the closed neighborhoods, were built in original sites. As a second solution, the government advocated residents to rebuild their Siheyuan (Courtyard house in Hutong) or add more living space, which made Siheyuan become a large messy and crowded courtyard accommodating four to eight families (Liu, 2003; Macasek, 2010; Zhu, 2013). This resulted in a discontinuity of street pattern and a disappearance of

traditional Hutong habitat environment that is preserved from Ming and Qing dynasty.

"Open and Reform Policy" was put forward in 1978, announcing that China entered a new era of market economy. Then it was a proper time to start derelict Hutong housing rehabilitation in the Old City. In 1987, the municipality put forward several initial renewal experiment projects, such as Ju'er Hutong, Xiaohoucang, and Dongnanyuan, to find out proper methods for Hutong neighborhood renovation and urban fabric preservation (Zhu, 2013). Ren (2013) demonstrates that urban planning in China is dominated by administrative orders from local governments largely and involves little public participation for a long time. At the beginning, most rehabilitation projects were oriented mainly by city municipality, district municipality or other governmental departments (See Table 2.1). In the 1990s, due to the pressure of profits and successful experiences of commercial development, developers, investment corporations and other actors started to get involved in these projects and some land were sold for commercial or business use (See Table 2.1).

Table 2.1 Actors involved in rehabilitation projects in the renewal time

Renewal Project	Actor
Qingnian Lake Xiaoqu Redevelopment Project, East City District, Bejing (1974-1981)	East City District Municipality, Construction Company (Government contract)
Ju'er Hutong Rehabilitation Project, East City District, Beijing (1987-1993)	Beijing City Municipality, East City District Municipality, East City District Property Management Office, East City Development Company, The World Bank, Neighborhood Committees as a housing cooperation, Architecture and Urban Planning research team from Tsinghua University
Xiaohoucang Renewal Porject, West City District, Beijing (1987-1991)	Deputy Mayor of West City District, West City District Municipality, West City District Property Management Office, Beijing Institute of Architectural Design, Construction Team for West City District Property Management department, West City

	District No.3 Construction Company, Experts of urban planning, architectural design and management, China Construction Bank
Debao Xiaoqu Redevelopment Project (First stage), West City District, Beijing (1990 – 1994)	Beijing City Municipality, West City District Municipality, West City District Property Management Office Debao Xinyuan Xiaoqu: Beijing Institute of Architectural Design & Urban Planning, West City Construction and Development Company Debao Comprehensive Hall: Beijing Mingfeng Real Estate Development Company Debao Hotel: Ministry of Finance of the People's Republic of China, China Economic Development, Trust and Investment Corporation, Beijing Debao Real Estate Development Company

Source: Huang, 1991; Wu, 1999; Ruiren (b), 2012; Liu, 2013

Although these practices improved building quality and provided more living space, some new Xiaoqu destroyed the urban fabric of Beijing Old City to a large extent and it was hard to see the traditional landscape of Beijing Old City. In 1990, the Beijing municipality published 25 Historical and Cultural Preservation Area and carried out a series of plannings and researches for Hutong conservation and rehabilitation. Professor Liangyong Wu proposed his "Original regeneration" concept as a way to protect old urban landscape and solve social, economic and living problems in the old city at the same time. Later, the Municipal Urban Planning department and Cultural Heritage Department established Conservation Plan of 25 Historical and Cultural Area in the Beijing Old City in 2001, Beijing Forbidden City Conservation Plan in 2003, and Beijing Famous Historical and Cultural City Conservation Plan in 2004. However, outside the 25 areas, new urban development and constructions still destroyed a lot of valuable historical and cultural places. Another problem is that these urban renewal projects transformed traditional landscape of Hutong: only 430 Huotongs have been protected its traditional pattern, 52% (685 Hutong) were partly maintained, and 15% were totally rebuilt and hardly to see the old memories (Zhu, 2013). The public space in Hutong is also shrinking gradually. People started to use new squares, new parks and new commercial space as their new pubic space.

2.3 Hutong in the Current Age: Problems and Challenges

The current Beijing Old City is a mix of traditional landscape and modern architectures. As a global city, high-rise commerce, office and apartment buildings can be seen everywhere in the city. After 1990s, a number of Xiaoqu were built in the south in order to offer better living environment. As a result, a number of historical Hutong neighborhoods have been demolished. Hutong, an essential heritage to complete traditional Beijing landscape, is disappearing at a faster speed than expected. The number of Huotong was 3073 in 1949, 2242 in1990, and only 1353 in 2005 (Li, et al., 2006, see Fig. 2.1). Looking at the Beijing City images in Google Map, Hutong are incoherent, fragmented and distinct: in the northern part, Hutong are wide and neat; in the southern part, Hutong are narrow and messy; in the eastern part, Hutong are more even; and in the western part, Hutong are in disorder. Besides, the function of Hutong is also changing gradually. For a long time, Hutong has been a mix of living, commercial and social uses, like ventilation, light, fire prevention, trades, markets, festivals, culture and traffic (Zhu, 2013). But now, Hutong are in most cases only for passing traffic, and some Hutong are widened to create accessible public space for residents and visitors.

In 2002, the Beijing Master Plann 2004-2020 (BMCDR, 2002) pointed out the importance of cultural tourism in Beijing Famous Historical and Cultural City conservation:

> *"The City Function - Beijing is […] the world famous old capital and modernized international city, internationally well-known culture and tourism center, and international tourism service center in China. Beijing should protect its historical and cultural landscape, create harmonious urban environment with a mix of traditional culture and modern civilization, and take advantage of tourism to stimulate economic growth." (BMCDR, 2002, p.2)*
>
> *"Urban space development strategy - Urban space development and spatial structure should adapt to historical and culture conservation. East City District will be important traditional culture tourism area and top national commerce center, while West City District will become traditional*

landscape tourism area and top national commerce center." (BMCDR, 2002, p.6)

"Historical and cultural city conservation – redevelopment should adopt small scale and gradually organic renewal method, promote cultural and tourism industry as a way to revive old city and reduce real estate development. The aspects for old city conservation are the original grid street and Hutong network, traditional Hutong-Siheyuan architecture form, height control, architecture color and feature control, and old famous trees." (BMCDR, 2002, p.7)

"Immediate construction plan (2004-2010) – The city should strengthen old city conservation and integration, explore new ways for old city conservation and organic renewal, and improve culture and tourism industry to adapt to the old city urban fabric." (BMCDR, 2002, p.15)

From 2000, the municipality launched a number of Hutong conservation and redevelopment projects, for example, Nanchizi (2001-2003), Dashilan (2004-ongoing), Shichahai (2013-2017), South Luogu Lane (2005-ongoing). There were some similar problems emerging during and after these projects, such as demolishing original buildings and later rebuilding modern replicas, highly intense real estate development, too much commercial development for tourism, exclusion of original residents and gentrification (Wang, 2003; Wang, 2012). Ren (2013) expresses that the Chinese cities usually reinvent the historical buildings and neighborhoods as centers of finance, media and cultural industry, because in their eyes, these preservation zones not only have historical value, but also contain more commercial value.

The Hutong block replica is an interesting phenomenon in these redevelopments. In Redevelopment Projects of Nanchizi and Xianmen, the original small, narrow but good courtyard houses were demolished in some parts, instead, real estate developers rebuilt several bigger and grand "fake" courtyard houses on the original sites (Wang, 2003; Guo, 2014). Original residents cannot afford these houses, thus these new constructed courtyard houses are built for the wealth and upper class. The previous various and vital Hutong neighborhood disappeared, while new and wide streets were

created (Wang, 2012). It is hard to integrate these modern building replicas with traditional Hutong landscape to retain Hutong culture and memories. Another problem is the application of commerce and tourism. Some Hutong areas are over commercialized, like South Luogu Lane Block, which is a large residential block in the past. The redevelopment turned these quiet lanes in the city center into popular tourist hotspots with bars, modern clothing shops, cafes, restaurants, hotels and gift stores (Macasek, 2010). The physical characteristics are still there, like grey bricks and architectures, but the old Beijing culture and everyday life is missing here. In Macasek's (2010) research, South Luogu Lane Block now is just a popular shopping district for foreigners and upper-middle class Chinese. Original residents are rarely willing to live in the Hutong, since it is too commercial, too westernized and lacks elements of old Beijing life (Macasek, 2010).

Besides, exclusion of original residents is always the result of these redevelopment projects. What are missing are not only these people, but also the Hutong culture and life they represent. In the past, Xianyukou Hutong area had about 140 time-honored brand snack restaurants and stores managed by local residents (Wang, 2012; Guo, 2014). Due to the redevelopment planning and local residents' moving out, this area became Taiwan Business District and Taiwan Snack Street now. The early vital small commercial areas and attractive small street business culture were no longer to be seen. Beijing Master Plan 2004-2020 (BMCDR, 2002) emphasized that redevelopment projects in the Old City Historical and Cultural Preservation Zones should try to keep original residents and encourage them to return to live. The diversity of neighborhood contributes to a thriving urban space, and original residents are an indispensable part of traditional Hutong landscape and everyday life. However, previous redevelopment projects failed to achieve this, which caused a lot of discussions, researches and studies in the public and academic area. Some current renewal actions and projects are trying to avoid this dilemma.

Chapter 3 Theory and Previous Study

There are a lot of problems and challenges emerging in the process of seeking more sustainable and healthier urban development in China. In the academic area, public space and its everyday life still lacks deep exploration and wide research. It is difficult to solve all these problems only with dependency on Chinese experiences and practices. Internationally, there are a number of other cities abroad faced with same challenges and dilemma currently or in the past. Western countries, especially traditional European cities, share the similar trajectory of urbanism and now are at leading position to achieve sustainable urban development. In many western cities, the high quality of public life is a significant factor and a primary principle to build healthy, sustainable and lively urban environment. To achieve this goal, they made numerous interesting and helpful projects. A lot of researchers produced a diversity of useful theories on public life, public space and urban space redevelopment. All of these will enlighten Chinese urban planners and designers to find a balanced way for sustainable urbanism, and contribute to better Hutong redevelopment and vital public space in China. Figure 3.1 shows the theories and previous studies that are made further exploration in this thesis.

Figure 3.1 Selected theories and previous studies in this thesis

3.1 Liangyong Wu - Urban Organic Renewal Theory

As the professor at the School of Architecture in Tsinghua University, Liangyong Wu made many researches and studies on Hutong renewal in Beijing. City is a living organism instead of a static artifact. New development and redevelopment should fit to the existing urban fabric rather than destroying it. Organic renewal is trying to preserve valuable urban fabric and at the same time adapt it to modern life (Wu, 1999). This does not mean a complete preservation of everything. In the regeneration process, useful and relevant elements will survive and continue to make its function, while those that are no longer suitable will be eliminated. Organic renewal is a sustainable strategy in the redevelopment of Beijing Old City (See Table 3.1).

Table 3.1 Main Principles of organic renewal

A suitable development scale	• Break down a highly complex problem into simpler parts and adopt a suitable strategy for each one • Start rehabilitation from a small area for each part • Expand the scale until it is self-suitable at the small scale
Humane design	• Maintain urban fabric and hierarchy of access at different scales in Hutong neighborhood • A new prototype of Courtyard house with improve living quality and traditional neighborhood interaction space • Clear distinction between private and common space • Interrelation between interior and exterior • Natural beauty in a human-made environment • Residents' sense of identity and belong to a culture
Coordination of present and future needs	• Conserve historical and culture value, urban fabric • Regenerate the local economy at a grassroots and raise general living standard

Source: from Wu, 1999

There are no fixed modes for organic renewal, which depends on different areas, various specific conditions, expected goals and diverse methods. In Wu's practices and researches, a lot of efforts are made on the area of housing rehabilitation in Hutong redevelopment. Wu firstly applied organic renewal concept in the Ju'er

Hutong Rehabilitation Project in Beijing. In this redevelopment project, housing is an important component of urban fabric and shapes the form of public space and everyday interaction in the neighborhood. Wu tries to figure out a better way for new courtyard house design, which can meet increasing housing demand and keep traditional Hutong living environment. In this project, the whole process has four phases. But due to rising land price in the site, the rehabilitation project stopped in 1993 and fails to finish the forth phrase. There are a number of lessons and challenges on design, construction and management of Hutong redevelopment projects. It is hard to widen the lanes in Hutong to deal with increasing traffic. Developers want to build high buildings to make more profits, while Huotng redevelopment projects usually aim to conserve traditional courtyard houses. There are also some obstacles of planning permission and real estate management. The planning and design of dwellings is not only a matter of housing for urban residents, but also a very complex work for community development and even an essential element to build coherent and pleasant urban space for living, working and playing (Wu, 1999). For future study, Wu (1999) expresses that urban planners and designers should make more efforts on good infrastructure, culture conservation, and community participation in these redevelopments.

3.2 William Whyte & Project for Public Space (PPS)

In 1971, Whyte started his pioneering research titled The Street Life Project. In this project, he implemented a series of observational studies of human activities and social life in the small public space, sometimes with the help of a time-lapse camera. The Social Life of Small Urban Spaces (Whyte, 1980) illustrates vividly the reasons why some places are more attractive to people and others are not. In his observation of a plaza usage, “other people” is the main attraction for people to enter a public space for sitting, meeting, talking, walking and standing. One important conclusion of his observation is that people like to stay in the main pedestrian flow and stand in the middle of the traffic stream (Whyte, 1980).

3.2.1 Basic Elements for A Good Public Spaces

There are diverse elements to stimulate people to use the public space and achieve a lively public life (See Table 3.2). First is the quality and amount of sitting space (Whyte, 1980). Whyte (1980) states that fixed benches are not good for sitting and social interaction in the public space since the social distance is always changing. Secondly, sun, wind, trees and water will also influence the spatial experience and usage. Easy access to sun, trees and water will encourage people to use the space. Last but not least, food is always an easy, good and convenient way to seed a place with activities. However, the most attractive and interesting element of a good public space is other people. They stay in or move in the main pedestrian flow, sit in the mainstream, stand in the mainstream, and ever usually stop to talk in the middle of the traffic stream (Whyte, 1980).

Table 3.2 Basic elements for a good public space

Quality of sitting space	The amount of sitting space: maximize the sittabiltity of inherent feature by making ledges or other flat surfaces Sitting height: 17 inches near the optimum Steps and corners: make steps at least 11 inches deep and no higher than 7.5 inches Mobile benches and not fixed seats
Sun, wind, trees and water	Protect the access to sun and offer shade Warmth and good weather Make water accessible and touchable, such as waterfalls, sluiceways, tranquil pools, water tunnels, meandering brooks, fountains
Food	Snack bars, open cafes, and vendors
Other people	Users like to observe what other do and stay in the mainstream.

Source: from Whyte, 1980

3.2.2 The Importance of Streets and Small Spaces

Whyte emphasizes a lot on the characteristics of streets for public space and social life. Streets contains various factors to become a successful public space: the activities on the corner, retailing in streets like stores, windows with displays, street signs,

people moving in and out, connected plazas or open space (Whyte, 1980). In his study, the indoor space is put forward as a beneficial part for public space, since these spaces have amicable sitting space, food, retailing shops and toilets. But equal "access" is the problem to make these spaces real public space for everyone since some are privatized. Whyte (1980) proposes that these internal spaces should be well connected with streets; provide access to the public and visible from the streets and surroundings.

Whyte is in high praise of small spaces and its tremendous effect on public life. "The walk-through function of a space is greatly enhanced if something is going on within it" (Whyte, 1980). These small attractions could be a beautiful sculpture, musicians, entertainers, real performances, festivals, and crowded people. All these will make a strong social effect, attract people to gather in a place, build a bridge between people and encourage strangers to talk with each other.

3.2.3 Project for Public Space (PPS)

Based on Whyte's work, Projects for Public Space (PPS) was founded in 1975 in America. It is a non-profit organization aiming to help people to build vital public spaces and stronger communities (PPS (a), n.d.). As a collaborative process, placemaking encourages people to shape public realm in a way to maximize its shared values, and inspires residents to collectively reimagine and reinvent public space as the community heart (PPS(a), n.d). Community revitalization and neighborhood participation are essential to placemaing process. In this way, placemaking projects are community-driven, dynamic and sociable. Now placemaking grows into an international movement and advocates developers and planners to respect and pay attention to such kind of grassroots involvement (PPS(a), n.d).

In their website (http://www.pps.org), there are a large number of successful projects around the world to introduce and share their experience and practice in the communities, streets and other public spaces. These projects try to transform an underused space into to lively and attractive public space through the place-making strategies. Street & Transit is an important topic in the resource section, which introduces a lot of useful practices and projects aiming to create lively street life around the world. Perdestrianisation of the Strøget in Copenhagen of Danmark and

the New Road Project in Brighton of the United Kingdom is two of these projects and recommended as successful examples of street space transformation. A lot of good and interesting placemaking activities are made in the Strøget to create diverse public space and vital street life. These are useful experience for other cities to start street perdestrianisation and small urban street projects. Besides, as a reference to solve the mixed-traffic problem in the street redevelopment, the New Road Project puts forward the concept of "share street surface" for street design and traffic management in the neighborhood.

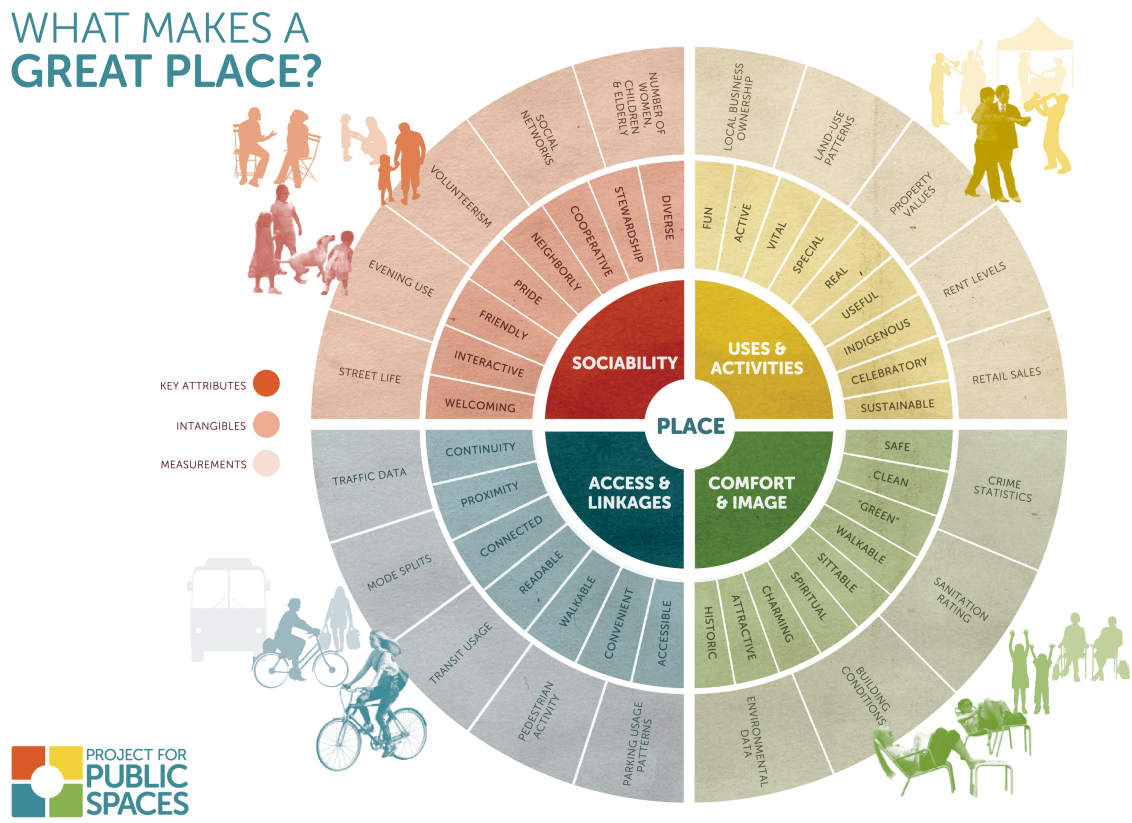


Figure 3.2 PPS's indicators for "what makes a great places"

Source: from http://www.pps.org/reference/grplacefeat/

Table 3.3 Eleven Principles and 10 Strategies for Placemaking

11 Principles for Creating Great Community Places	10 Strategies for Transforming Cities and Public Spaces through Placemaking
• The community is the expert • Create a place, not a design • Look for partners	• Improve streets as places • Create squares and parks as multi-use destinations • Build local economic through markets

• You can see a lot just by observing • Have a vision • Start with the petunias: lighter, quicker, cheaper • Triangulate • They always say "IT CAN'T BE DONE" • Form supports function • Money is not the issue • You are never finished	• Design buildings to support places • Link a public health agenda to a public space agenda • Reinvent community planning • Utilize the POWER OF 10+ • Create a comprehensive public space agenda • Start small and experiment, using a "LIGHTER, QUICKER, CHEAPER" approach • Restructure government to support public spaces

Source: from Project for Public Spaces (PPS), http://www.pps.org

Sociability, uses and activities, comfort and image, and access and linkages are four key attributes of a successful public space (PPS (b), n.d, see Fig. 3.1). Also, PPS puts forwards eleven principles of placemaking to help community revitalization and ten strategies for transforming cities and public space through placemaking (PPS (c), n.d; PPS (d), n.d; See Table 3.3). "Lighter, Quicker, Cheaper" is an important strategy and principle to start and test small changes and experiments of space transformation. The Power of 10+ concept helps to evaluate and facilitate placemaking at different city scale. The idea behind this concept is that places start to thrive when users find a range of reasons (10+) to go there, such as sitting, meeting, playing, art, music, exhibitions, food (PPS (d), n.d). The book *How to Turn a Place Around*, produced by PPS, uses thirty years experience to help and guide everyone to create successful public space.

3.3 Jan Gehl and Public Life Study

Jan Gehl and Gehl Architects address global urbanism trends with a people-focused design approach to create beneficial relationship between high-quality public life and built environment Gehl Architects, n.d.). When observing pedestrian behaviors in the traditional European cities, Gehl adds "a dimension that interviews with people about the reason for their being in the city" (Gehl & Savarre, 2013). Based on this, Gehl made a series of public life surveys and researches in Copenhagen, especially the

Strøget district, at different times. The pedestrainization of Strøget in 1962 indicates a major change in the approach of creating urban life in Copenhagen and also becomes a popular and useful strategy to create good urban life for other cities. The research on the Strøget district offers a solid foundation and abundant evidence for Gehl's public life theory and international practices to improve the quality of urban life and public space. In Life Between Buildings (1987), Gehl (1987) states that to encourage a vibrant public life, the design of public space should provide a compact, comfortable and human-scaled environment and create an open but connected relationship between architecture and space.

3.3.1 Public Life Study methods

Gehl and Savarre (2013) create a series of methods and tools for public life study in the book *How to Study Public Life*. It is very important to understand the questions "who are in the public space, what are offered in these space and where are the people in the space". According to his practice and projects, Gehl (2013) states that it is very helpful to choose a good weather day for observation and suggests several useful tools：counting, mapping, tracing, tracking, looking for traces, photographing, keeping a diary, test walks (pp.22-35). Among these tools, photographing is a useful tool in public life study to describe the interaction between urban form and life, and document the site character fast for later analysis (Gehl, 2013, p.31). Gehl (2013) also made a categorization of activities in public space into necessary and optional activities and for each category there are three types of activities that are walking, standing and sitting (p.16). In his opinion, social activity plays a significant role to support public space as a meeting place. Using these tools, Gehl has made a lot of public life study in different cities, such as Copenhagen, Istanbul, Seattle, Sydney, Moscow, Chongqing, Malmö. His public life study in the the Strøget district in Copenhagen is a good example for researchers and planners to design a procedure for public life survey, choose appropriate tools and methods and create small projects to revive vital urban life and public space. Based on these projects and researches, Gehl (2010) puts forwards five planning principles and four traffic-planning principles (see Table 3.4) to improve the quality of city space. Besides, Gehl also establishes twelve quality criteria for the pedestrian landscape (see Table 3.5).

Table 3.4 Five Planning Principles and Four Traffic Planning Principles

Five Planning Principles	Four Traffic Planning Principles
• Carefully locate different urban functions to ensure shorter distance • Integrate various functions to ensure versatility, wealth of experience, social sustainability and a feeling of security • Design inviting and safe city space for pedestrian and bicycle traffic • Open up the edges between the city and buildings to connect life inside buildings and outside in city space • Invite longer stays in city spaces	• Traffic integration on the fast-moving traffic • Traffic separation system • Traffic integration on the slow-moving traffic • The pedestrian city with the transition from fast to slow-moving traffic occurring at the city limits or edge of residential area

Source: from Cities for People, Gehl, 2010, p.232, p.234

Table 3.5 Twelve quality criteria for the pedestrian landscape

Protection		
Protection against traffic and accidents – feeling safe • Pedestrians protection • Eliminating fear of traffic	Protection against crime and violence – feeling secure • Lively public realm • Eyes on the street • Overlapping functions day and night • Good lighting	Protection against unpleasant sensory experiences • Wind • Rain/snow • Cold/heat • Pollution • Dust, noise, glare
Comfort		
Opportunities for walk • Room for walking • No obstacles • Good surfaces • Accessibility for everyone • Interesting facades	Opportunities for paly and exercises • Invitation for creativity, exercise and physical activity, • By day and night • In summer and winter	Opportunities to sit • Zones for sitting • Utilizing advantages: view, sun, people • Good places to sit • Benches for resting

Opportunities to see • Reasonable viewing distances • Unhindered sightlines • Interesting views • Lighting (when dark)	Opportunities to talk and listen • Low noise levels • Street furniture that provides "talkscapes"	Opportunities to stand/stay • Attractive Edge for standing/staying • Supports for standing
Delight		
Scale • Buildings and spaces designed to human scale	Opportunities to enjoy the positive aspects of climate • Sun/shade • Heat/coolness • Breeze	Positive sensory experiences • Good design and detailing • Good materials • Fine views • Trees, plants, water

Source: from Cities for People, Gehl, 2010, p.239

3.3.2 Elements for A Lively Urban Space

As cases from Venice, Melbourne and New York show, a diversity of elements will help to increase pedestrians and lively public space: dense city structure, short walking distances, high degree of mixed use, active ground floor, charming architecture, distinguished squares, river, benches (Gehl, 2010). It is the inviting and meaningful places that matter for the liveliness experience in the city. The presence of people and activities in the public space will spontaneously inspire and attract other people to enter the space. Gehl (2010) demonstrates that not only the number of users, but also the length of staying activities will reflect the quality of urban space. For example, 89% of street life is staying activities. Ground floor design is another attraction for street life experience, such as façade, display window, and materials.

3.3.3 The City at Eye Level

With the wide use of car, the space for pedestrian and everyday life in the streets is shrinking and narrowed. The human dimension is still not paid wide attention to in the field of urban planning and design in most cases. The European city experiences, like Copenhagen, Amsterdam, indicates that a city could be more lively, safe and

sustainable if more people are invited to walk, bike and stay in the city space. Gehl says it is a basic human right to offer good city quality at eye level. The traditional cities grew with everyday activities over time, a result that the city was built on a scale adaptable to the senses and human experience (Gehl. 2010).

Distance plays a considerable role in senses and scale, two elementary themes for movement space and experience space, like streets and squares (See Table 3.3.3). From Gehl's study (2010), a distance of less than 10 meter will make the space experience more interesting and let users use all their sense. Gehl (2010) summarizes four distinct communication distances: intimate distance, personal distance, social distance, and public distance (See Table 3.6). Generally, space in small scale will contribute to an exciting, intense and inviting city.

If looking at city at eye level, urban planning and design will have to look into different aspects and details. However, this is the scale for everyday city space and ordinary human activities. Gehl (2010) made huge efforts on the public space at eye level and suggests several strategies to improve space experience for walking, meeting, staying and bicycling at this scale (Table 3.7).

Table 3.6 Distance for different senses and scales

100 m	See people in motion
35 m	Read facial expression and hear speech and song for a great sense and feeling
25 m	Decode emotions and facial expression
10 m	Make space experience more interesting and use all sense
>3.7 m	Public distance
1.2 – 3.7 m	Social distance
45cm – 1.2 m	Personal distance
0 – 45cm	Intimate distance

Source: from Cities for People, Gehl, 2010

Table 3.7 Strategies for the city at eye level

Good city for walking	Good city for staying
• Street widths of 3,5,8 or 10 meters can	• Magical square size: 40×80m

easily handle pedestrian streams of between 2400 and 7800 people per hour • Walking speed factors: route quality, crowd strength, age and mobility of pedestrian, space design, weather • 500 meters is a common acceptable walking distance • Space for pedestrian traffic • Waiting time at the street intersections • Walking psychology: avoid "tiring length perspective" and divide the routes into different segments • Street pattern, space design and ground floor façade design with rich detail • Staircase psychology: divide the clime into shorter segments	• Good and friendly edge placement: walls, corners, columns, niches, urban furniture • Special attraction: water, trees, flowers, fine space, good architecture, art • A good view of the life and people at the site • Comfortable seating: city benches, freestanding chairs and café chairs, pedestals, steps, stones, bollards, monuments, fountains, flower pots pedestals • Sidewalk cafes
Good city for meeting	**Good city for bicycling**
• A good view with visual contact between the inside and outside • 60 decibels (dB) as upper background noise level for hearing and talking • Urban furniture for meetings: grouping of benches, moveable chairs	• Integrated transport thinking • Safe bicycle network • Bicycle paths • Collective bicycle system

Source: from Cities for People, Gehl, 2010

3.4 Bill Hillier – Space Syntax Theory

The order of space decides the special relationship between functions and human behavior (Hillier, 1984, 1996). Hillier, in his book, The Social Logic of Space (1984), presents space syntax as a tool for architects to test the social effect of their designs, for example, to calculate the number of people walking down a given street. Most use of urban space or even informal use is movement related, and land uses and building

density will follow the movement in the grid network (Hillier, 1996). Hillier (1984) states "urban life is the product of the global order of the system, and of the presence of strangers as well as inhabitants" (p.24). In Hillier's description, the street system is the stage for everyday life and transactions, which creates a dense system defining public space by buildings and their entrances.

Space syntax sees the urban space system as different components with different connecting relationships. Hillier (1984) states that there are two basic elements to make up every human trip: an origin-destination pair, and the space passed on the way from an origin space to a destination space. Based on this, Hillier (1984) developed the axial map and convex map (See Table 3.8) to describe these space components, and creates an innovative mathematical method to quantify the people density in certain spatial form. Two terms are mentioned to describe the accessibility of a place: depth and integration (See Table 3.8). A place with lower depth and higher integration is more accessible and attracts more human movements. In the axial map, each line is considered as a node and is connected with other intersected lines. In this way, the integration in an axial map measures the average number of steps that start with each line to all other lines (Hillier, 1984; Turner, 2004).

In his book Space is the machine (1996), Hiller puts forward the concept of "Configuration" (See Table 3.8). Every space can have an "integration" value, which indicates the number of movements passing down each line (street). Their research shows that the movement pattern in urban areas can be predicted by integration distribution in an axial map of the street grid system. The global integration tells the general structure of the area and how a visitor interpret its space, while local integration helps research to explore details of the local movement in small-scale space and movement pattern of local residents. It is also demonstrated that the pedestrian densities in a street segment could be "best predicted by calculating integration for the system of lines up to three lines away from each line (radius – 3 integration)" (Hillier, 1996, p.160). However, the integration in axial map expresses the topological distance between different spaces, not the actual physical distance. Later, segment analysis is introduced in space syntax, which breaks axial lines down into segregated short street segments between junctions and takes the metric distance into account (Turner, 2004). With the development of advanced computer program,

the mathematical method, space syntax is demonstrated as an effective method in the research of relationship between urban form and human activity. Nowadays, the program Depthmap makes these complex calculations and analysis much easier.

Table 3.8 Definition and explanation of terms used in space syntax

Name	Definition/Explanation
Axial map	An axial map is consisted of straight lines, which pass through each convex space, and makes all axial links (Hiller, 1984)。
Convex map	A convex map will be the least set of fattest spaces that covers the system (Hiller, 1984).
Depth	Depth means the number of steps each space is away from the nearest building entrances (Hiller, 1984).
Integration	Integration measures the average number of depth from one node to all other nodes in the system (up to a certain radius and given a definition of distance) and corresponds to mathematical closeness. It is to-movement and represents the potential attractiveness of a certain space for people movements (Hiller, 1984; Hillier, Yang & Turner, 2012, p.156). Global integration is calculated based on the whole system. Local integration is calculated within certain defined radius.
Choice	Choice calculates "the quantity of movements that passes through each spatial element on shortest or simplest trips between all pairs of spatial elements in s system (up to a certain radius and given a definition of distance)" (Hillier, Yang & Turner, 2012, p.156). It is through-movement and equals to mathematical betweeness (Hiller, 1984).
Axial analysis	Axial analysis is the calculation of integration and choice with different defined distance based on the axial map.
Segment analysis	Segment analysis is the calculation of integration and choice based on segment map. The distance in this analysis can be measured by metric, topological, angular or segment length.
Configuration	It is defined as "a set of different relations in which each is determined by its relation to all the other" (Hillier, 1996).

Source: from Hiller, 1984; Turner, 2004; Hillier, Yang & Turner, 2012

Besides, economic and social activities, especially the top-down functioning, affect the shaping of urban space. Hillier (2009) argues the urban network shapes movement, and also shapes land use pattern over time. Commercial activities seek locations with rich movement in the network, while residents prefer to stay at movement-poor space (Hillier, 2009). This is a dual and self-organizing process. Different demand and feedback impact movements, which contribute to connected centers and sub-centers in the network of residential space. The movement demand will mediate the relation between space and activities, which will shape certain space, and new pattern activities will find a way to fit into and probably modify slightly the existing urban pattern (Hillier, 2009).

3.5 Street Life Theory

People always live on streets and streets serve many distinct functions: living, access, traffic, air, light, services, goods exchange and business. Street is movement and the place to develop sociability (Jacobs, 1993). Good urban streets are great public places to invite leisurely safe walking. Allan B. Jacobs and Appleyeard both call for the return of life to street.

The wide use of cars causes traffic noise and pollution, which changes the street image and exclude pedestrians to use streets. Although neighboring is a primary function of street blocks and a valued quality of urban life (Appleyard, 1981), lively life is some kind disappearing in the streets of neighborhood. Street should be a “place” for communal life rather than a “channel” and encourage street activities (Appleyard, 1981). In the book Livable Streets, Appleyard (1981) explored ways to reduce or slow down the traffic in order to allow life in the street. He suggests the practice of “Woonerf ” and the concept of “shared space” to use and introduces a ranges of traffic-control devices, like different traffic signs (stop, speed limit, no entry), street bumps, raised crosswalks, platform intersections, entrances gates and narrowing streets.

In the book Great Streets (1993), Allan Jacobs observed and studied a number of great

and lively streets in different cities around the world, from which he concluded with the essential factors for streets to obtain lively and inviting life, like community interaction, physical amenity and memory (See Table 3.9). Besides, another inquiry is to design the street space for people on foot (Jacobs, 1993). This is a scale that people could read other's facial expression and where public socializing and community daily life happen. A sense of human scale could be achieved through the scale of buildings, specifically, a building height of three stories (approximately 9 meters) and width of 11 meters, with a street width of 22 meters (Jacobs, 1993).

Table 3.9 Essential factors for a great street

Sense of Community	Encourage community participation and interaction
Accessibility to all	Easy to find and get to
Diverse activities	A desirable place to stay, live, play, work and spend time
Physically comfortable and safe	Section, corner, traffic, width, direction, tree, lane, sidewalk, height, façade, window, door, balcony, shade, location, size, a sense of scale, commercial use, furniture and local shop
Rememberable	Leave strong and positive impressions
Street space for people on foot	Curbs and sidewalks: separate pedestrians from traffic Trees: create safe and comfortable walking environment A sense of human scale Other elements: visual complexity to attract eye, windows and doors for a sense of transparency, diverse buildings, streetlights, special paving, benches, fountains, store logos

3.6 Analysis of Literature Matrix

Previous public life and street life study provide useful guide and enlightenment for Hutong redevelopment practices in Beijing. Wu introduces an exemplary planning process and design principles for organic renewal in Hutong area. According to Jacobs and Appleyard's study, traffic reduction and pedestrianization are necessary requirements to create space for street life. PPS and Gehl provide numerous practices and experiences on strategies and methods for public space transformation and public

life survey. Hillier's space syntax tries to figure out the pedestrian movement pattern in the urban space system in the aspect of morphology. From Wu, Gehl and PPS's work, the thriving of Hutong street life needs proper urban planning policies, urban design strategies and small-scale projects.

However, urban design is a complicate process of shaping the environment and quality for urban life, which involves politicians, a wide range of stakeholders in the area, and a diversity of experts, researchers and professionals (CABE, 2003). It will be really meaningful and helpful to integrate these theories in a more systematic way for urban redevelopment policy formulation and small-scale project initiations. The Councillor's Guide to Urban Design (CABE, 2003) puts forward an effective and implemental framework of common qualities for urban planners and designers to think about designing a successful place. Table 3.10 shows the seven qualities and exacts indicators for vital Hutong street life, while Table 3.11 is the selected aspect of urban form relative to Hutong life study.

Based on seven qualities and six urban form aspects, an evaluation of previous literature and study is made to see which elements are frequently used in these theories. According to result of Table 3.12, essential factors for Hutong street life study are character, quality of public realm, ease of movement, diversity, density and mix, façade and interface, and streetscape and landscape, which interrelate with each other to create vital public street life. Considering common problems in Hutong redevelopment, diversity, density and mix has direct connection with land use pattern. The empirical study of public street life study in South Luogu Lane Block will explore more detail in character (distinctive landscape, demography), ease of movement (parking, traffic condition, pedestrian accessibility), land use (commercial activities, diversity, spatial distribution), quality of public realm (street activities), streetscape (street scale, street furniture, façade rhythm).

In our case, South Luogu Lane Block is partly pedestrianized and allows slow traffic to pass the neighborhood, which provides great potential to recall vital public street life. In this way, this study will apply Gehl's methods to investigate and evaluate the current public life in South Luogu Lane and Ju'er Hutong, and use space syntax to measure pedestrian movement morphologically. For traffic management, Gehl put

forward useful principles and Appleyard suggests good methods. PPS offers excellent transformation strategies and practices to regenerate public street life, while Wu's theory helps to set a vision of Hutong life and apply these strategies in the content of South Luogu Lane Block.

Table 3.10 Seven qualities of making a place successful

1 Character	**2 Continuity and enclosure**
Sense of place and history • Distinctive landscape • Natural features • Locally distinctive buildings • Streets and street pattern • Skylines and roofscapes • Building materials • Local culture and traditions	Clarity of form • Streets, footpaths and open spaces overlooked by buildings • Clear distinction between public and private space • Enclosing streets and other spaces by buildings and trees • No leftover spaces unused and uncared for
3 Quality of the public realm	**4 Ease of movement**
Sense of well-being and amenity • A feeling of safety and security • Carefully detailed with integrated public art • Well-designed lighting and street furniture • Attractive and robust planting	Connectivity and permeability • Accessible public transport • Roads, footpaths and public spaces connected into well-used routes • A choice of safe, high quality routes
5 Legibility	**6 Adaptability**
Ease of understanding • Landmarks and focal points • Views • Clear and easily navigable routes	Variety and mixed uses • A mix of compatible uses and tenures • Diverse communities and cultures

• Lighting • Works of art and crafts	• Variety of architectural styles • Biodiversity
7 Diversity	
Ease of change Flexible uses Possibilities for gradual change Areas adaptable to a variety of present and future uses	

Source: from CABE, 2003, p.5

Table 3.11 Selected Aspects of form for Hutong life study

Urban Grain	**Density and Mix**
• The pattern and scale of streets • The rhythm of building frontages along the street as a reflection of the plot subdivision	• The intensity of activity relative to place's accessibility • The place's vitality relative to the range and proximity of uses
Height and massing	**Façade and Interface**
• The size of parts of a building and its details, particularly in relation to the size of a person • The impact on views, vistas and skylines	• The rhythm, pattern and harmony of its openings relative to its enclosure • The nature of the setback, boundary treatment and its frontage condition at street level • The architectural expression of its entrances, corners, roofscape
Details and Materials	**Streetscape and Landscape**
• The art, craftsmanship, and building detail adaptable to local context • The texture, color, pattern, durability and treatment of its materials • The lighting, signage and treatment of shopfronts, entrances and building security	• Paving, planting and street furniture • The integration of public art, lighting, signing and waymarkers • The treatment of parks, play areas, natural features and recreation areas • Consideration of long term management and maintenance issues

Source: from CABE, 2003, p.7

Table 3.12 Analysis of literature matrix

	Wu	PPS	Gehl	Hillier	Jacobs	Appleyard
Character	✔	✔			✔	
Continuity and enclosure		✔				
Quality of public realm	✔	✔	✔		✔	✔
Ease of movement	✔	✔	✔	✔	✔	✔
Legibility		✔		✔		
Adaptability		✔				
Diversity	✔	✔	✔		✔	
Urban grid	✔			✔		
Density and mix	✔	✔	✔		✔	
Height and massing			✔		✔	
Façade and interface		✔	✔		✔	
Details and materials			✔		✔	
Streetscape and landscape	✔	✔	✔		✔	

Chapter 4 Research Methodology

4.1 Research Framework

This research will adopt both quantitative data analysis and qualitative methods due to complexity and different aspects of the research question. The qualitative methods help to establish a complete understanding of Hutong history, problems and challenges in the redevelopment process, to form an elementary picture of traditional street life in Hutong neighborhoods and to apply western experience and practice to Hutong renewal through diverse literature, books, documents, videos and observation. On the other hand, quantitative data is used to describe findings of the empirical study in a more precise way and make it easier for comparison. Quantitative analysis helps to understand Hutong's spatial role in supporting a diversity of activities and everyday life from the mathematic aspect. The main methods used in this research include literature review, observation, space syntax, and statistics analysis. Fig 4.1 shows how the different methods are used to answer the three research questions.

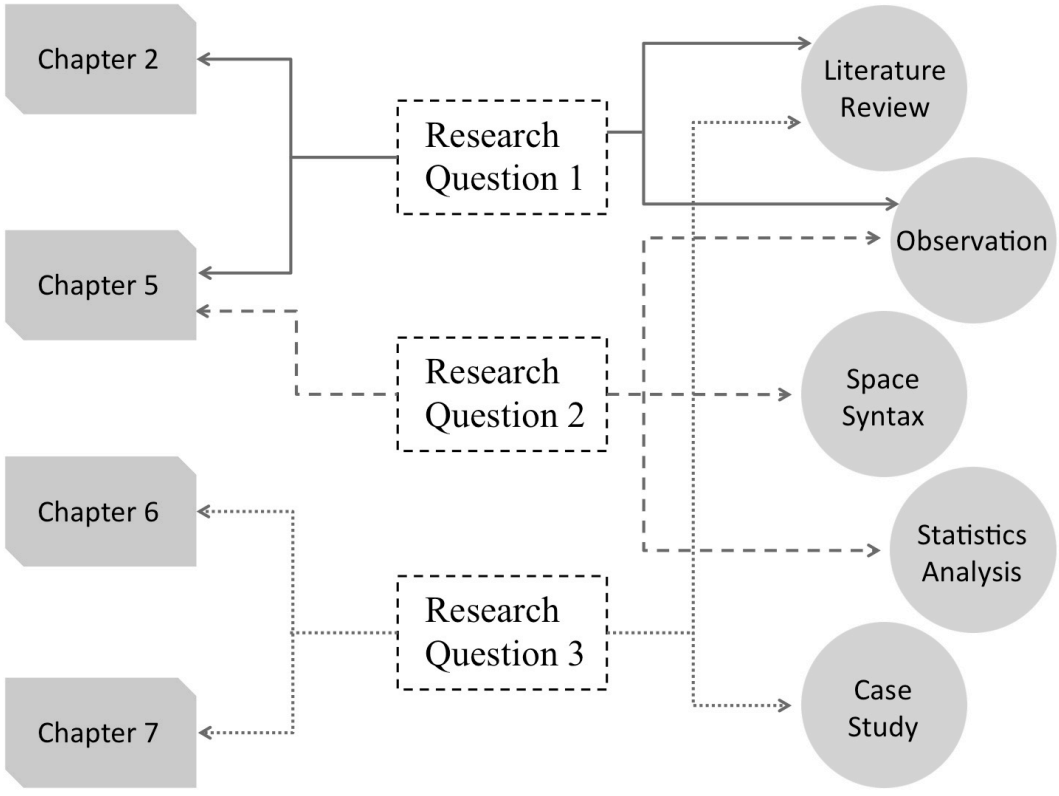


Figure 4.1 The methods used in different research questions

According to the discussion in the last section of chapter 3, the empirical study will

analyze four aspects of South Luogu Lane Block, that are character, ease of movement, commercial activities, quality of public Hutong space, and streetscape. Physically, the vitality of public street space depends on the quality of public space and streetscape in the observation. A diversity of land use makes contributions to various street activities. These analyses will help to find out the problems in South Luogu Lande Block and demonstrate Hutong's spatial role in supporting various street activities and life. This study will try to figure out proper ways to apply placemaking approach to stimulate the above four aspects in lively Hutong life.

4.2 Research Area

With an area of 84 ha, South Luogu Lane Block is located in the Jiaodaokou Jiedao (Sub-district), which is at the east side of Beijing Central Axis (See Fig 4.2). It has four neighborhood communities: Ju'er, South Luogu Lane, Fuxiang, and Gulou Yuan Community (JSO, n.d.). With more than 740 years' history, it is the only completely preserved Hutong residential block left in China and one of the 25 Beijing Old City Historical and Cultural Preservation Zones. South Luogu Lane Block is the area for this research in general, while South Luogu Lane and Ju'er Hutong are the two specific streets for Hutong space and life study in detail (See Fig. 4.3). The two selected streets present distinctive spatial features in the redevelopment process: South Luogu Lane has been transformed into commercial space, while Ju'er Hutong is still a living neighborhood with moderate commerce and business. Geographically, they are connected with each other. Before redevelopment, the two hutong were similar to each other in the street. However, after the redevelopment, street activities and Hutong life is distinct in the two Hutong. This research makes a comparative study of the two Hutong to figure out the reasons behind that distinction.

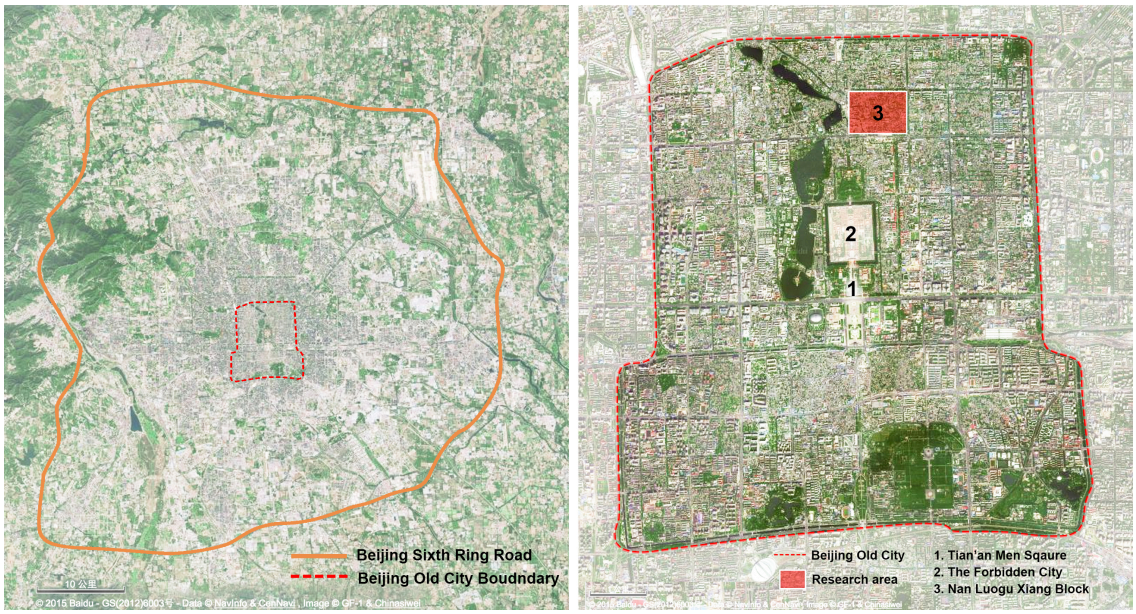


Figure 4.2 Location of research area

Source: Satellite map from Baidu Map, 2015 (http://map.baidu.com), edited by the author

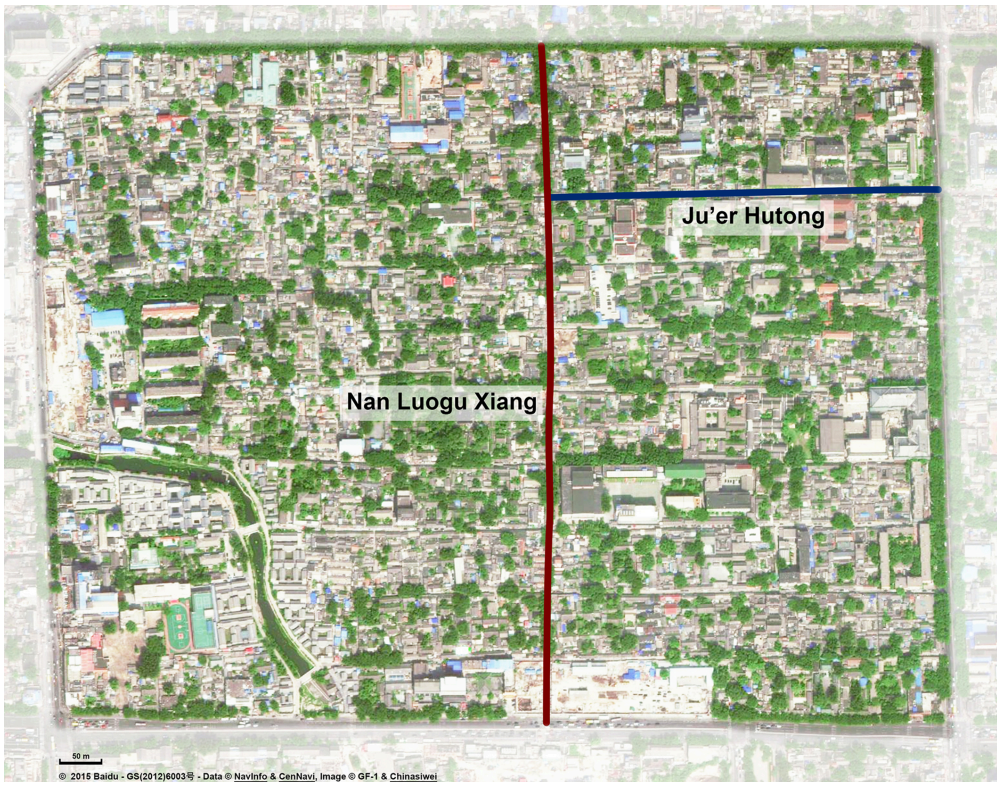


Figure 4.3 Selected Hutong in this study

Source: Satellite map from Baidu Map, 2015 (http://map.baidu.com), edited by the author

In the early stage of redevelopment projects, commercialization is applied in this

process to make the block a successful tourism hotspot, which caused a series of problems. As a result, these projects transformed the Hutong living space into pure commercial space in some parts, which to some extent removed its traditional Hutong life, neighborhood culture and street activities. However, at the same time, this block originally created many elements for colorful Hutong neighborhood life in the past and possesses much potential space to revive its vital street life after proper redevelopment. In 2015, Beijing Mayor Guo stressed that the redevelopment of South Luogu Lane should avoid the real estate oriented renewal model, maintain the traditional landscape and culture, improve living environment and keep original residents (Wang, 2015). This is an interesting and paradoxical area with both increasing demand of keeping the "old" and the pressure of making profits and introducing the "new". The study of this area will help to find some answers for the research questions and also explore widely and deeply in this topic.

4.3 Data Collection

4.3.1 Baidu Map

Baidu Map, regarded as "Chinese Google Map", is the largest map service website in China. China has no access to Google Map, thus the Google Map of Beijing is not updated and not precise enough for geo-data collection in this thesis. In this way, Baidu Map is used to create the base-map and satellite image map of South Luogu Lane. The base-map of South Luogu Lane contains the different configuration of roads, streets, buildings, green area, open space, river, and point description information indicating the site name and land use type. Satellite image map is used to complement the missing information in the base-map, such as missing building, tree location.

The next is to build a GIS database in ArcGIS (a spatial data analysis program). Based on these two maps, AutoCAD is used to draw the new map of South Luogu Lane with different layers: roads, Hutong and Buildings. Then this CAD file is imported to ArcGIS and processed to create a GIS database of South Luogu Lane Block. According to the *Code for Classification of Urban Land Use and Planning*

Standards of Development Land ("*The Code*" in short), the land use in South Luogu Lane is classified into Residential (R), Administration and Public Services (A), Commercial and Business Facilities (B), and Municipal Utilities (U). In this way, each building is given the corresponding land use code and community code. This data is helpful for land use patter analysis.

Besides, Baidu Map also offers a real time layer indicating traffic flow changes in different segments of roads and streets through the time. In this layer, the traffic condition of the segments is presented in four colors (dark red, red, orange and green), which represent heavily congested, congested, slow, and free. These traffic images in a period can reflect a general traffic condition in a certain area. From 21 July to 27 July 2015, screen shot of Baidu Traffic Flow Map was taken at 0:00, 3:00, 6:00, 9:00, 12:00, 15:00, 18:00, and 21:00 at the Beijing Time. Then overlaying these seven Baidu Traffic Flow maps at a certain time in 7 days produces average traffic flow at a certain time. The final representation of traffic condition is 8 average traffic condition map at 8 time points.

4.3.2 Statistical Yearbook, Literature and Documents

Other data for analysis, like demography data, tourism development data, and urban development data are from Beijing Statistical Yearbook 2014, The Outline of Beijing Tourism Statistics, Tabulation on the Population Census of Beijing Municipality; from some websites of Beijing East City District Statics Bureau, Beijing East City District Tourism Development Committee, Beijing Jiaodaokou Community, Beijing Planning Committee; and also some previous research literature.

4.3.3 Government Websites

A variety of governmental bureaus, departments and offices publish essential statistics, documents and analysis on their website. In terms of commercial and business activities in South Luogu Lane Block, Beijing Administration for Industry and Commerce has established a website (http://qyxy.baic.gov.cn) where the public can search and inquire for information of registered Enterprises and Individual Industrial and Commercial Household. In the searching service, if one puts in the address, name or legal representatives of registered Enterprises and Individual Industrial and

Commercial Household, the website will then display a list of relative Enterprises and Individual Industrial and Commercial Household, which contain information of their registered license number, name, address, place type, commercial service range, time, valid date, and legal representative.

This thesis collected and arranged the register Enterprises and Individual Industrial and Commercial Household in South Luogu Lane and Ju'er Hutong, by putting in search key words of "South Luogu Lane" and "Ju'er Hutong". According to the above collected information, each entity is designated different business and commerce type according to the commercial and business facility land-use category in *The Code*. Besides, each registered place type is marked with Business Place, Business Operation Place and Residence. The Table 4.1 and Table 4.2 explain more detail about each item of land-use code and registered place type.

Table 4.1 Item explanations of land-use code in this study

Code	Name	Content
B11	Retail commerce	Stores, shopping mall, supermarket and market for retail sale
B13	Catering business	Restaurant, cafeteria, bar, snack bar, cafe
B14	Hotel business	Hotel, hostel, guesthouse, service apartment, holiday village
B22	Art & media business	Cultural and art organization, production of video and movie, advertising, media
B29	Other business facility	Expertise service and consulting for trade, design and other industries
B32	Health & Sport commerce	Commercial places for gymnastics, golf and other sports
B9	Other service business	Other services such as training, private clinics, maintenance service

Source: from The Code, 2011

Table 4.2 Item explanations of registered place type

Register type	Description
Business Place	Places where the business and commercial services

	happen
Business Operation Place	Places where the business and commercial services is operation
Residence	Address of enterprise legal representative in the registration (it can be the business place or business operation place, but it can be a residence without any business or commercial activities)

4.4 Research Methods and Data Analysis

4.4.1 Literature Review

Literature review is both useful for both designers and researchers. The aim of Literature reviews is to gain familiarity with the previous research and study in the fields of public life, street life, and urban morphology. Groat & Wang (2002) state that the literature can be explored in active ways to identify topics of inquiry, to focus the topic inquiry, understand the makeup of the research question, understand an idea's genetic roots (history, literature evolution, family tree), and understand the current conceptual landscape.

Literature review is used in the following aspects in this thesis. Firstly, previous studies of Hutong redevelopment give the study the historical background and make the exploration of problems and challenges more efficient. Secondly, literatures from Chinese renewal theory, western public life researches and street life studies offer many useful data, methods, models and guidelines for statistics analysis and South Luogu Lane Hutong space and life study. Finally, literature about place-making practices enlightens the discussion on active Hutong space for everyday life in the urban planning and design of redevelopment projects. They are the foundation to make the final recommendations. In this thesis, the main literature part is the theories and researches from Liangyong Wu, William H. Whyte, Jan Gehl, Bill Hillier, Donald Appleyard, and Allen W. Jacobs.

4.4.2 Observation

People are involved in public space and public life in a more active way in

observations rather than in answers from questionnaires and interviews (Gehl, 2013). Observations of users' activities and behaviors in public space help to understand how the space is used by different users, which has been demonstrated a lot in the works of Gehl, Whyte and Jacobs A.. In this study, photographing is the main tool to record the different street activities in the observation of South Luogu Lane and Ju'er Hutong. According to Gehl's categorization of activity (2013, p.16), Figure 4.4 shows the activities for photograph recording in the observation of South Luogu Lane and Ju'er Hutong. If these activities are observed in the sites, observer will use camera to take photos to record for later analysis. The observer made notes of the photo number, the place where the photo was taken, and the activity category in the photo.

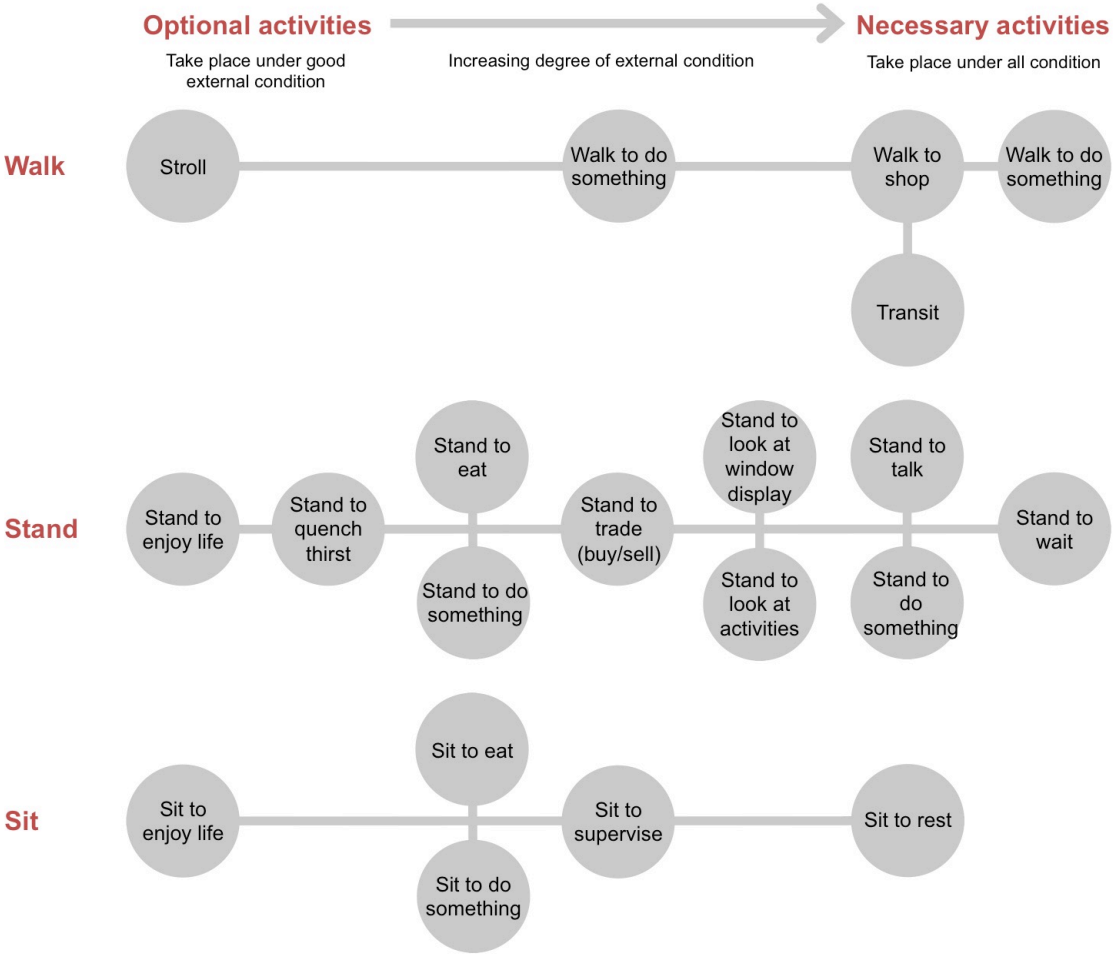


Figure 4.4 Categorization of activities for observation in South Luogu Lane and Ju'er Hutong

Source: diagram adapted from Jan Gehl's categorization of activities (2013), p.16

The site observation was taken in two streets, South Luogu Lane and Ju'er Hutong, between 10:00 to 12:00 and between 14:30 to 17:30 in 23 May in 2015, by my

colleague Tan. The weather is nice, sunny and comfortable at that day. The observer took a walk along the whole South Luogu Lane and Ju'er Hutong at a relatively slow speed. In this process, she took pictures of different street activities observed and the streetscape, and also wrote down necessary notes about traffic and pedestrian flows. An interview was made with her to get her description of spatial experience in these two Hutong. Based on Gehl's twelve qualities of public space, an evaluation of public space quality is made in the South Luogu Lane and Ju'er Hutong through the observation result by Tan and the author. Different elements of street activities, façade and furniture are exacted from photos and categorized for analysis of streetscape and street interface.

4.4.3 Case Study

The method of case study is to capture the complexity of a single case (Johansson, 2007). Huotng is a very complexity object and contains a diversity of different issues. In this way, Naturalistic Generation is the modes of generalization and reasoning, which is comparing a problem situation with already knowledge cases to get conclusions (Johansson, 2007). According to this mode, this study chooses two different kinds of Hutong to present the Hutong street life in South Luogu Lane Block for further exploration. Then, to find the possible solutions for South Luogu Lane Block, Strøget in Copenhagen and New Road project in Brighton are studied to summarize their successful practices to revive lively street life (See Fig. 4.5, Fig. 4.6). The following are the reasons for the choice of these two places.

The inner city area of Copenhagen is famous for its vital urban life, well-connected bicycle lanes, charming pedestrian landscape and green lifestyle. Strøget is one of European longest pedestrian streets and the main pedestrian street in Copenhagen. Strøget used to be a heavily traffic street with little public life. However, after pedestrianization, it proves to be a huge success as a pedestrian street for commercial activities and diverse urban life. Many cities are following this "Copenhagening" to create good public space in the city center. The remarkable pedestrian network in the Strøget district provides valuable experiences and examples in how to reclaim urban space form traffic. The study of placemaking activities in the the Strøget district is helpful for this research to make proper recommendations to start street

pedestrianization and street transformation projects.

Figure 4.5 Strøget in Copenhagen
Source:
http://www.visitdenmark.se/sites/default/files/vdk_images/Attractions-Activities-interest-accommodation-people-geo/Geography-places/Copenhagen/copenhagen-urban-life-stroget.jpg

As a great success, the New Road Project in Brighton was selected as an exemplar project of Urban Design Compendium by CABE and won awards from the Civic Trust, the National Transport Award for Urban Design, the Landscape Institute and the British Stone Federation (Oakden, 2014). It used the “shared space” concept to create street space for diverse activities and moderate cars. The practices from this project give an example of mixed traffic management and street design for public space transformation.

Figure 4.6 New Road Project in Brighton, United Kingdom
Source:
http://gehlarchitects.com/wp-content/uploads/2014/03/Brighton_NewRoad_2_Credit_GehlArchitects_Highres.jpg

4.4.4 Space Syntax

Depthmap is the computer program primarily used to perform visibility analysis of architectural and urban system, and the original thoughts behind Depthmap is Benedikt's isovist analysis and Hillier & Hanson's space syntax (Turner A., 2004). Each analysis always starts firstly to produce a graph to represent these components and their relationships, and then uses this graph for graph theoretical measures (Turner, 2004). This study applies the depthmapX developed by UCL (University College London) for analysis process, and uses axial map and segment map as graphic representations to describe Hutong space system.

Firstly, the base-map of South Luogu Lane is imported into AutoCAD to draw an axial line map of the main roads and Hutong. The principle for drawing is to use the fewest and longest line to express the spatial form. The second step is to import the DXF file into depthmap and then to 'convert' it to an axial map for later analysis.

Considering the block scale and Hutong length's impact on movement, angular

segment analysis by metric distance is adopted in this study to measure the integration and choice of Hutong system in South Luogu Lane Block. The different setting of radius measures in Depthmap allows researchers to explore the local structure more in detail (Hillier, 2009). The space syntax analysis of Gulangyu demonstrates that outsider visitors tend to navigate streets with high global integration, while local residents prefer to choose streets of high local integration (Li, Y. et al., 2015). In this way, the high global integration indicates the accessibility of a place, and local integration (the highest 10% particularly) determines the vitality and attractiveness of space (Li, Y. et al., 2015). In this study, the local integration is calculated in defined radius of 150 meters and the global integration is measured in radius of 1500 meters. Global integration is defined in the distance of whole system. Then comparisons will be made between global integration and local integration, global choice and integration choice, global integration and Baidu Heatmap, global choice and Baidu Traffic condition layer, to form a better understanding of Hutong morphology and its role in space.

4.4.5 Statistical Analysis

Descriptive statistics is applied in the analysis of demography, Hutong morphology and movement, and land use and commercial activities. In demography analysis, resident component structure will reveal from the calculation and comparison of population distribution and percentage based on different variables. This analysis is represented in pie chart. In the Hutong morphology and movement part, comparative analysis is made on the mean, maximum and minimum of variables. Histogram and scatter plot graph are used to describe the distribution of numerical data and compare between different intervals of variables, like Hutong connectivity, Hutong segment analysis. The land use and commercial activities also adopt the above statistics methods. Besides, cross analysis is applied in the analysis of registration data of commercial site location. The two variables for this analysis are location space type and location land use type. This experiment tries to find out the relation between land use and spatial form and its influence on commercial activities and street life.

Chapter 5 Empirical study -- South Luogu Lane Block

5.1 Introduction of South Luogu Lane Block

5.1.1 South Luogu Lane Block Character

South Luogu Lane Block, the same as the old Zhaohui-Jigong "Fang" (Block) in Yuan Dynasty, is a valuable example of Yuan Dynasty urban street layout (Wu, 1999). In 1982, the whole block was designated as a "Traditional Courtyard Housing Preservation Zone". Besides, with an advantageous location in the Beijing Old City, South Luogu Lane Block is close to shopping centers, diverse services, parks, cultural and recreational facilities, and many tourism hotspots. In the past, a lot of rich and upper class lived in the South Luogu Lane Block in Ming and Qing Dynasty due to its close location to the Forbidden City. Therefore, there are a large number of preserved former residences of celebrities, private gardens, mansions and temples, most of which are open to the pubic now. Among these culture heritages, five are at municipal preservation level and twelve are on the district level conservation list.

In 2006, Urban Planning and Design Center in Beijing University made *South Luogu Lane Block Conservation and Development Plan (2006-2020)* and *Jiaodaoukou Sub-district Community Development Plan (2006-2020)*. These plans put forward cultural creative industry, cultural tourism and modern commercial service industry as the leading industries for the redevelopment of South Luogu Lane Block. After a series of redevelopment projects, the block now becomes a popular tourism hotspot in Beijing, which is a "must-do" in the old city tour and attracts a large number of visitors from China and abroad every year.

The main street, South Luogu Lane, has been transformed into to a purely commercial street with creative stores, cultural shops, retail stores, restaurants, cafes and other commercial services. Ju'er Hutong is a residential Hutong with some commercial services. It got its name in Ming Dynasty and belonged to Zhaohui Fang in Ming Dynasty. No.3 and No. 5 yards in the Ju'er Hutong are former mansions of scholar Rong Lu, grand minister of state in Qing Dynasty, which have been one of the East City District Cultural Relics Preservation Units. Besides, Ju'er Hutong Rehabilitation Project is a residential renewal project held by the Architect Liangyong Wu. This project won the UN Habitat Scroll of Honor Award.

5.1.2 Demographic Characteristics

South Luogu Lane Block contains four communities, which totally have 10868 households, and 28977 residents (Jiaodoukou Sub-district Office, see Fig.5.1). Due to the rising land value and economic growth, many local residents rent out their Hutong House to make profits. After redevelopment, some original residents cannot afford high living cost there. They have to sell their houses and then relocate to more affordable areas. As a result, the number of original residents is decreasing in the recent years. Now the residents there are a mix of original residents, migrants and foreigners.

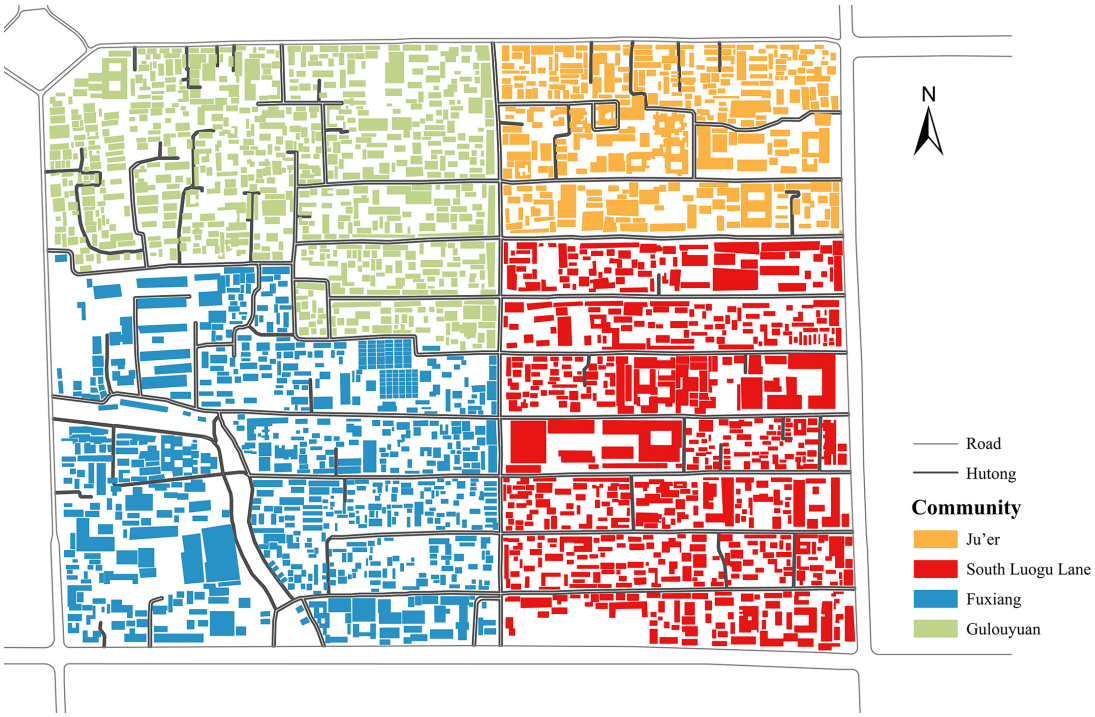


Figure 5.1 Four communities in South Luogu Lane Block

Resident statistics of Jiaodaokou Sub-district shows 19% of current residents living in this area are migrants, who are not originally living in Beijing (See Fig. 5.2). Sun's study (2008) in Ju'er Community reveals similar demographic tendency in this block. Original residents are moving out due to various reasons. In Ju'er Community, 52% of the houses are rented out, 20% houses are second-hand houses, and 28% of the inhabitants are original residents (See Fig. 5.2). Courtyard houses have unique living environment, distinct architectural characteristics and profound cultural and historical value, which attract both people outside the block and even foreigners to experience

the traditional neighborhood. In Ju'er Community, 16% of the residents are from abroad. In terms of age, 44% of the residents are young people and 25% are middle-aged people. These analyses indicate tendencies that original inhabitants are moving out and residents living in the block become younger.

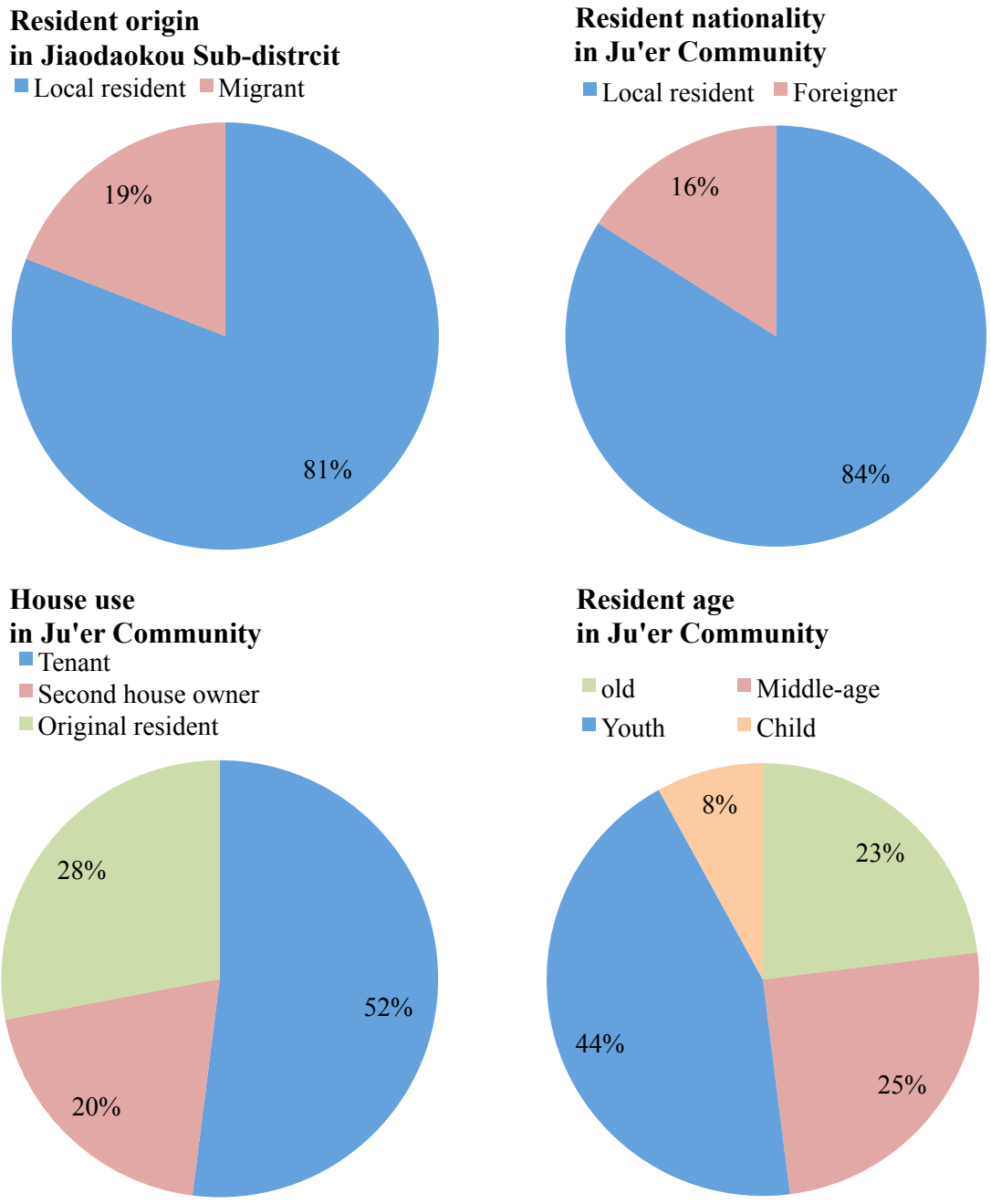


Figure 5.2 Demographic analyses in Jiaodaoukou Sub-district and Ju'er Hutong

Source: Sun, 2008; Pang & Shen, 2012

5.2 Hutong Morphology and Movement

5.2.1 A Hierarchical Hutong Network

South Luogu Lane Block presents a classic north-to-south fishbone pattern, which is 1060 meters wide from west to east and 820 meters from north to south (Wu, 1999; Zhu, 2013). There is an apparent street hierarchy in the Hutong neighborhood in the Black-White map of South Luogu Lane Block (See Fig. 5.3). It has a central north-south street, called South Luogu Lane, and seventeen west-east Hutong connected to the central street (eight Hutong in the western side and nine Hutong in the eastern side) (See Fig. 5.4). These Hutong arrange neatly with interval distance between 70 meters and 80 meters. The central Hutong, South Luogu Lane, is the widest (8 meters) and longest (786 meters) Hutong (Li & Zhang, 2009), which is connected with all the second level Hutong. The second level Hutong all run straightly from west to east, with a width between 5 meters and 7 meters (Li et al., 2006). The central Hutong and second level Hutong divide the whole block into several strip-like sub-blocks as the living units (See Fig. 5.3). In these sub-blocks and between these second Hutong are small and narrow Hutong, which consist the third level. These snaky small Hutong are mainly for pedestrian movement and connect sub-block boundary with buildings.

South Luogu Lane starts from Gulou East Street in the north and ends at Di'anmen East Street. Ju'er Hutong is a west-east running Hutong, starting from Jiaodaokou South Street in the west and ending at South Luogu Lane in the east. Ju'er Hutong is 438 meters long in total and 6 meters wide (Li & Zhang, 2009). South Luogu Lane allows vehicle passing at certain time periods and prohibits parking in the street, while Ju'er Hutong allows vehicles, bikes and pedestrians to pass through and park.

5.3 Black-White map of South Luogu Lane Block

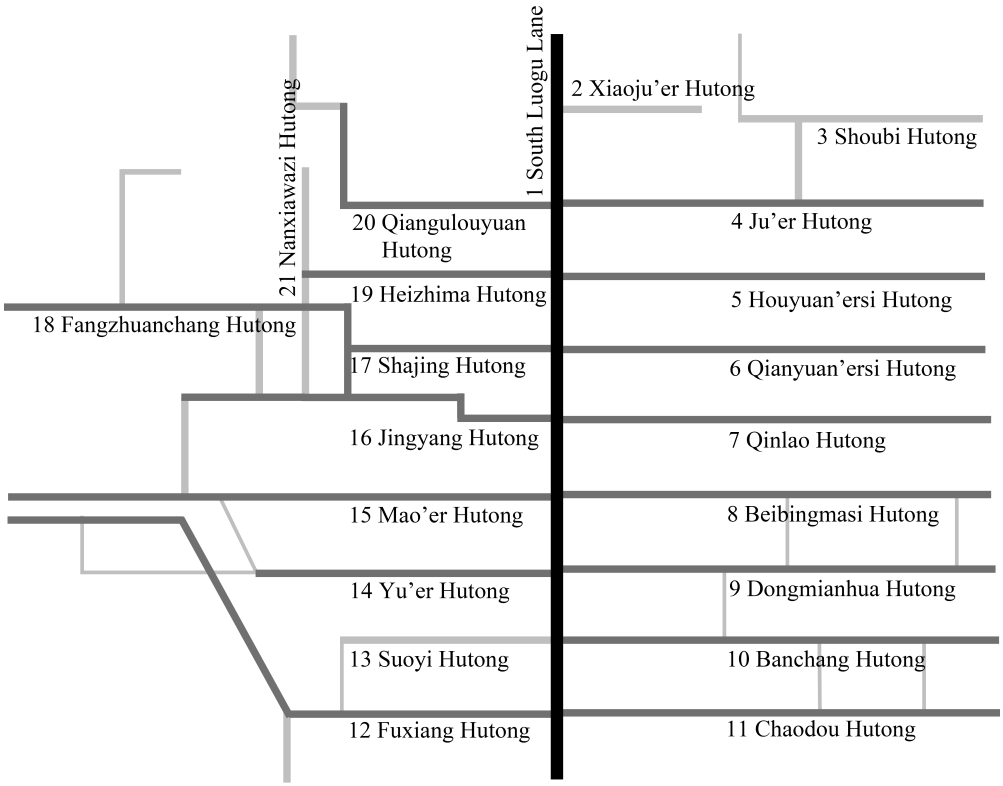


Figure 5.4 A hierarchical Hutong network in South Luogu Lane Block

5.2.2 Hutong Traffic Facilities and Condition

According to Appleyard (1981) and Jacobs (1993), accessibility of a street for its users is an essential factor for a good street and diverse street life. As a hot tourist-visiting place, South Luogu Lane Block has convenient access to public transportation. Two metro lines, Line 6 and Line 8, run across this block with a metro station at Diwai Street in the west and a metro station at Di'anmen Street in the south (See Fig. 5.5). Totally, 8 bus stations are arranged on its surrounding urban roads with an interval of 500 meters approximately and offer a diverse choice of bus lines (See Fig. 5.5). In this way, for the outside visitors, they have easy, quick and various ways to arrive at South Luogu Lane Block by public transportation; while for local residents, they have a diversity of travel choices to reach other parts of the city. There is a huge deficiency in parking space inside the block. The only two small parking places are in the Ju'er Community and for private use of its relative buildings (See Fig. 5.5).

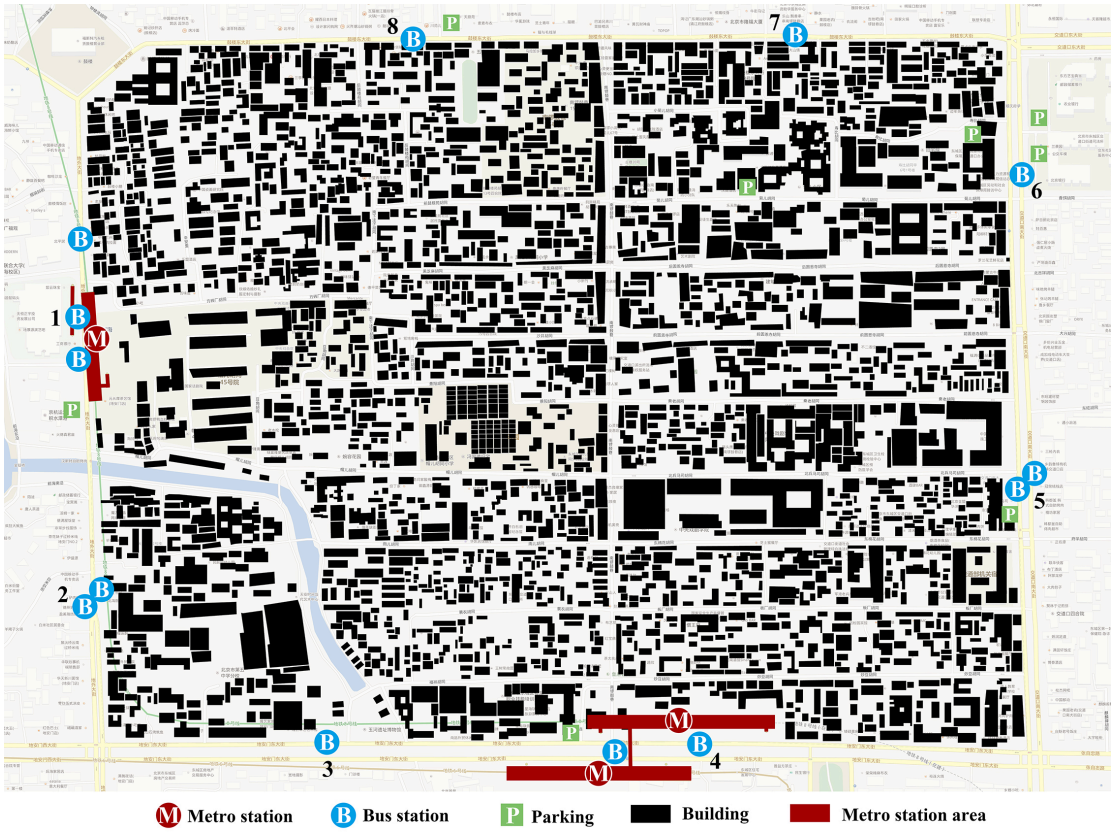


Figure 5.5 Traffic facilities in South Luogu Lane Block

According to Lu and Cui's (2010) study, only 1.9 % of the residents and tourists use private cars as travel mode, and a large number of residents and tourists choose a greener travel mode, like walking, bicycling (See Table 5.1). Their study (2010)

indicates there are two traffic peaks in the block, which are morning peak from 7 to 9 and evening peak from 17 to 20. The following are two small peaks at around 10 and 14, which are busy time for tourists to shop and visit the South Luogu Lane (Lu and Cui, 2010).

Table 5.1 Travel modes of residents and tourists in South Luogu Lane Block

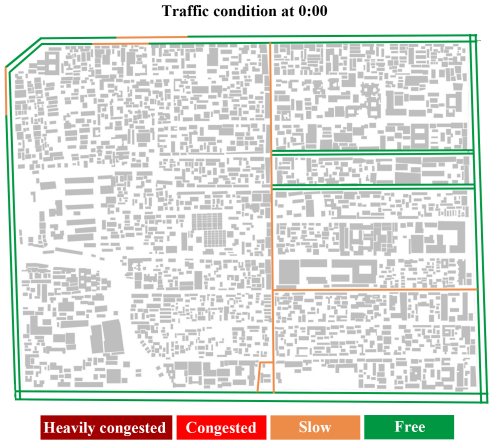
Foot	Bicycle	Electric bicycle	Bus	Taxi	Car	Others
10.6%	13.5%	6.9%	37.5%	29.3%	1.9%	0.3%

Source: data from Lu and Cui, 2010

Figure 5.6 interprets different traffic condition of the block during the day. In the block, there are only four Hutong producing large traffic, which are South Luogu Lane, Houyuan'ensi Hutong, Qianyuan'ensi Hutong and Dongmianhua Hutong. South Luogu Lane is almost congested or with slow movement during the whole day, even the midnight. Little traffic is produced in the west block part (Fuxiang Community and Gulouyuan Community). For the east block part (Ju'er Community and South Luogu Lane Community), the traffic peak comes from noon and lasts until nine o'clock at night. However, although these Hutong allow vehicle traffic, a small number of cars are seen in the observation of South Luogu Lane and Ju'er Hutong. Most of these cars belong to the residents living in this block. South Luogu Lane is full of tourists during the daytime. When there are cars in this street, congestions happen and last for half or one hour due to the slow and crowded pedestrian movement. Ju'er Hutong is more car-friendly since fewer tourists will visit this Hutong. Thus, the congestion in this block is mainly the result of the conflict between local residents' vehicles and outside tourists' movement.

However, a great street is good public space inviting leisurely safe walking (Appleyard, 1981; Jacobs, 1993). In the observation, several bikes parked randomly in the South Luogu Lane. In Ju'er Hutong, cars usually park on both sides of the street, and residents put their bicycles in a disorderly way in the Hutong space. Appleyard (1981) states that streets are places for neighborhood life rather than "channel" for traffic. Jacobs (1993) emphasizes that the design of street should provide space for people on foot. Although part of the block is pedestrianized and traffic is slow and small in the block, these random parking of cars and bikes occupies a lot of street

space. As a result, it fails to create an inviting and attractive street environment for pedestrian movement and a diversity of neighborhood street activities.



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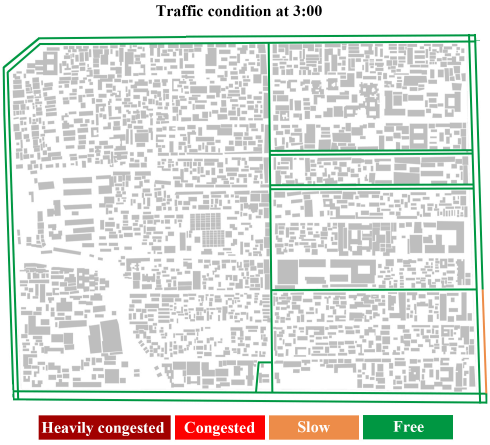

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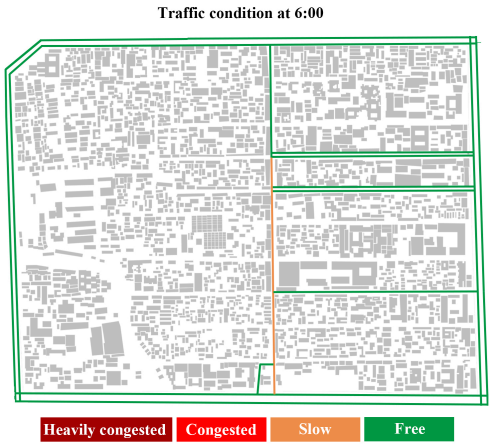

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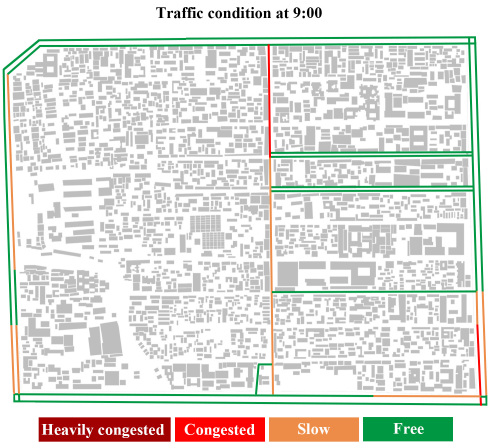

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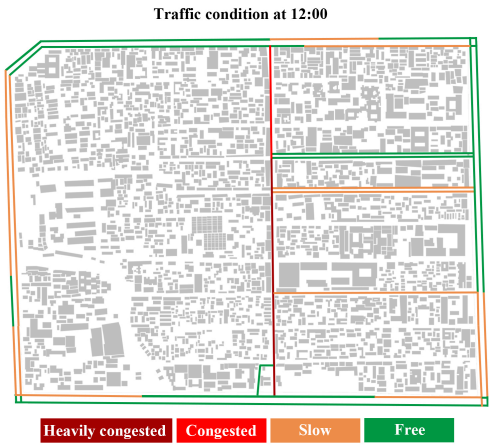

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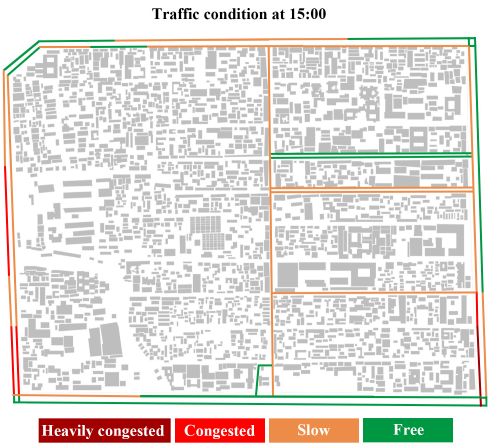

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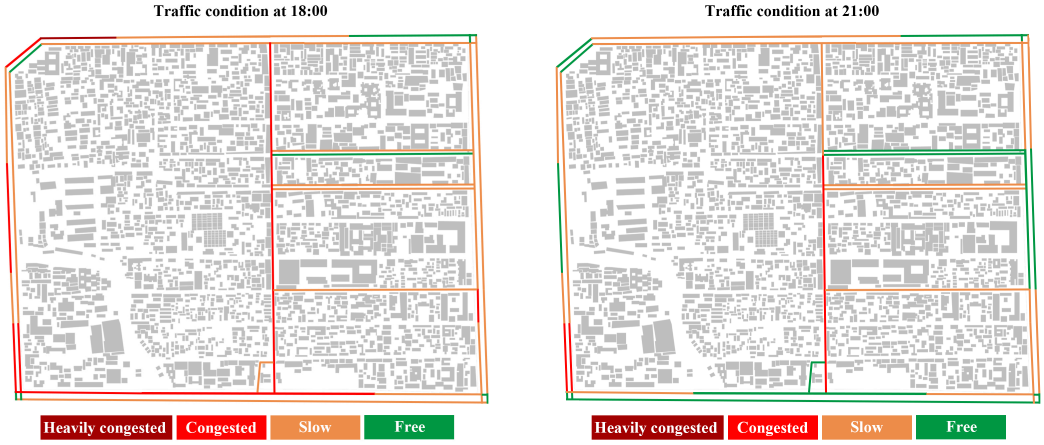


18:00 21:00

Figure 5.6 Traffic condition in South Luogu Lane in different time

Source: data from Traffic congestion in Baidu Map

5.2.3 Hutong Accessibility

According to Hillier's theory, global integration graph shows the accessibility of each Hutong when outsider visitors navigate the whole block. In Figure 5.7 (left), more red color indicates a higher accessibility and more pedestrian movement in that street, which means more people choosing this Hutong as their destination. The result of Figure 5.7 (left) displays South Luogu Lane is the most accessible Hutong in the whole Hutong system. The block edge streets are also highly accessible since they serve as the bridge between the block neighborhood and outside urban spaces, while the second level Hutong also have high accessibility, which connect the residential blocks with South Luogu Lane (See Fig. 5.7 (Left)). The small hutong inside the sub-blocks are not so accessible and are movement-poor area. The global integration pattern corresponds to the Hutong hierarchy of the South Luogu Lane Block to a large extent. Previous researches demonstrate outsider visitors tend to move to places with high global integration (Hillier, 1984; Hillier, 1996; Turner, 2004; Hillier, Yang & Turner, 2012). In this way, tourists are more likely to gather in or move to the Hutong with high integration value. Figure 5.7 (right) is Baidu Heatmap, which expresses the crowded degree of pedestrian flow in the South Luogu Lane Block. The place with more red color indicates there is more pedestrian movement. The Baidu Heatmap shows a large number of people stay or move in the edge streets of South Luogu Lane Block (Diwai Street in the west and Di'anmen East Street) and the central South

Luogu Lane in the block. There is a subway station both in Di'anmen East Street and in Diwai Street respectively. Therefore, most people who want to visit South Luogu Lane Block will definitely arrive at these two stations and then move to the South Luogu Lane. The result from Baidu Heatmap confirms that the Hutong with high integration attract more pedestrian movements.

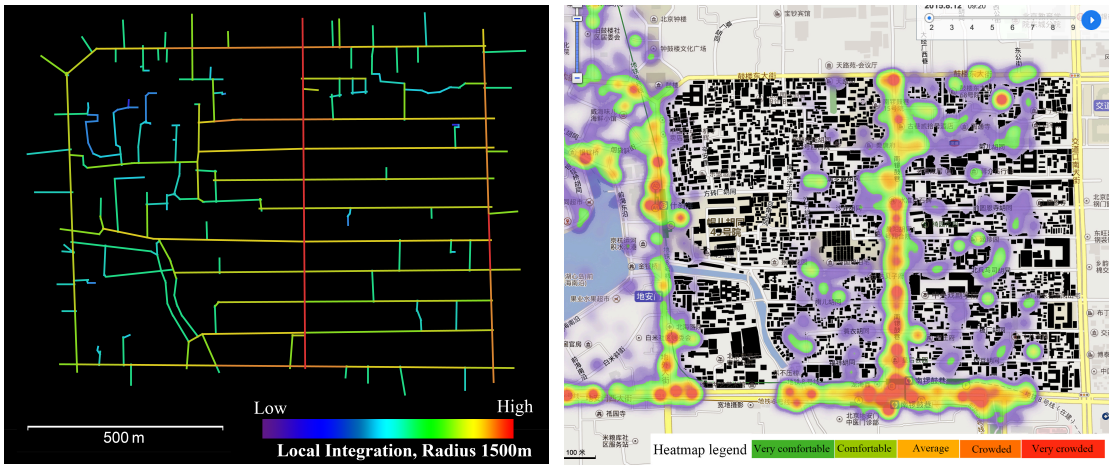
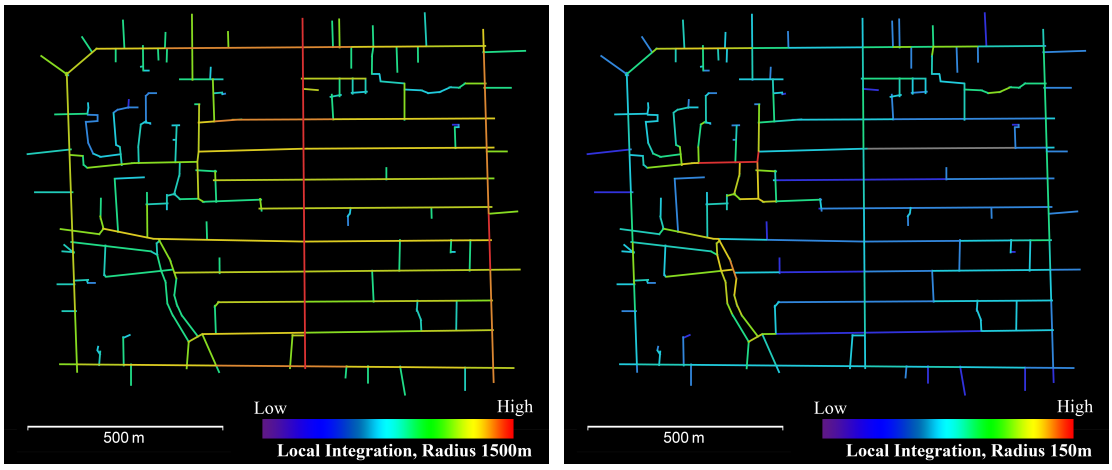


Figure 5.7 Left: Global Integration of South Luogu Lane Block, Right: Baidu Heatmap of pedestrian flow density

Source: Baidu Heatmap (http://map.baidu.com/heatmap/index/index/), accessed 9:20, 12 August 2015

Local integration shows how local residents use the Hutong space in the South Luogu Lane Block. When compared with global integration pattern, accessibility of Hutong is quite different in terms of local integration pattern (See Fig. 5.8 (right)). Local residents navigate and use Hutong in a different way from visitors. For them, street with high local integration is more attractive and accessible for neighborhood activities. At the local level, South Luogu Lane is not the core area and most accessible for neighborhood activities. Instead, there are two emerging sub-centers with high local integration value in the west part of the block. If planners and designers aim to revive neighborhood life in the block, it is good start to design good public street space and provide a diversity of cultural events and neighborhood services in these two places in order to regenerate vital street life in the community.



Global integration			Local integration		
Average	Minimum	Maximum	Average	Minimum	Maximum
148.387	70.6336	239.607	16.0741	4.096	41.3113

Figure 5.8 Left: Global Integration of South Luogu Lane Block, Right: Local Integration of South Luogu Lane Block, Radius 150 meters

Source: data from Depthmap

Figure 5.9 demonstrates that the land use pattern of South Luogu Lane Block inherently follows the logic of its Hutong morphology. This confirms Hillier's (1984) explanation that space with distinctive integration in the urban system satisfies diverse demands of movement and various activities. Commercial activities require high accessibility and rich movement for lively interaction with the pedestrians. Thus these activities are likely to happen in highly accessible space, which are the space with high global integration value in the system. South Luogu Lane now has been shaped into a popular tourism hotspot, and diverse commercial activities are intended to serve for outside visitors in a large degree rather than local inhabitants. Spatially, commercial uses tend to concentrate in the space with high global integration, which is the South Luogu Lane in this case. Residential area is located in the area with low global integration (See Fig. 5.9), because local inhabitants prefer a quiet space for living, which is moderately accessible and not disturbed by large amount of movements.

As a result, Hutong system consists of streets and lanes with different accessibility, which means these Hutong space supports distinct activities with various demands of movement. It is not a monotonous and homogeneous urban space. Instead, Hutong

shape the neighborhood space into a hierarchical system with several community centers for various functions.

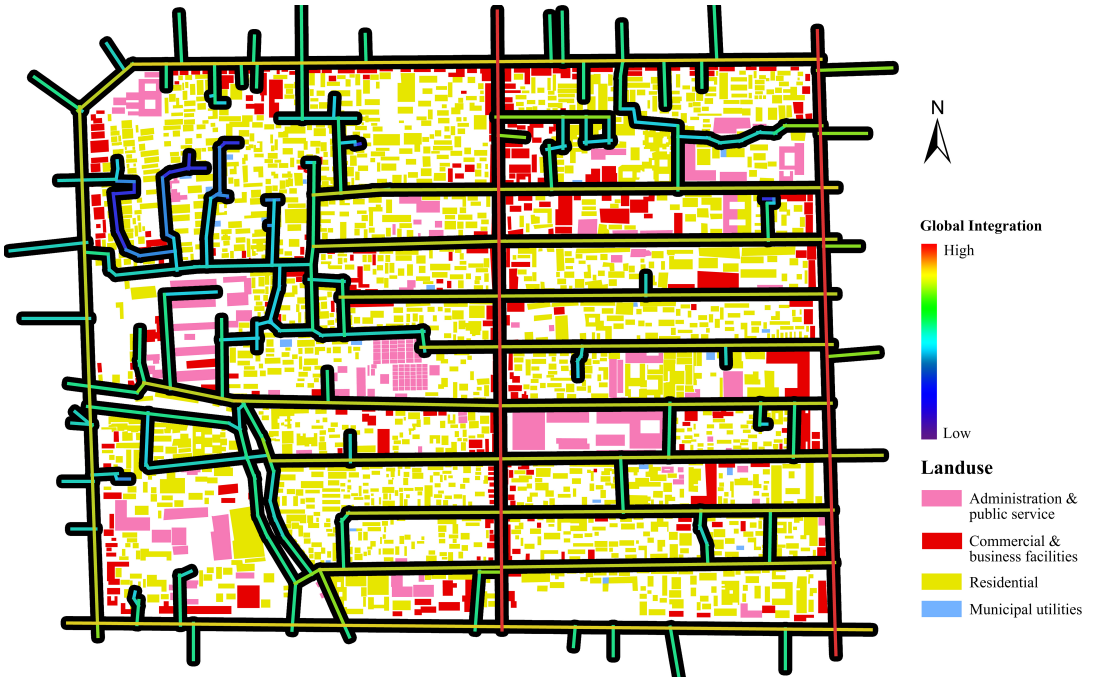


Figure 5.9 Global integration and land use patter in South Luogu Lane Block

5.2.4 Hutong Connectivity

Street connectivity and length are two additional indicators to understand the spatial form of Hutong network. Connectivity measures the number of the other streets that are connected with the selected street.

The axial lines represent the topological distance of Hutong system (Hillier, 1984). Outside visitors are not familiar with Hutong space and network. Consequently, they will choose axial Hutong to travel through the block and select the shortest path with fewest turns. This is the way that outsider visitors navigate in the South Luogu Lane Block. According to the calculation of axial lines in Depthmap, the average connectivity of Hutong network is 2.55, with a maximum of 19 and minimum of 1 (See Table 5.2). Looking at Figure 5.10, 84 axial Hutong, about 50%, are connected with two other axial Hutong, 49 axial Hutong have a connectivity of 1, and only 9 Hutong have more than six connections with other Hutong. The average Hutong length is 106 meters (See Table 5.2). This means in most cases, there is a diversity of route choices with fewer turns when outside visitors are deciding their walking path to a destination in the block.

Table 5.2 Connection and length of axial line and segment line in the South Luogu Lane Block

	Connectivity			Length: meter			Number
	Avg	Min	Max	Avg	Min	Max	
Axial line	2.55	1.00	19.00	106.92	5.71	1168.04	188.00
Segment line	4.44	3.00	10.00	31.91	0.03	385.86	630.00

*Avg – average, Min – Minimum, Max – Maximum

Source: data from Depthmap

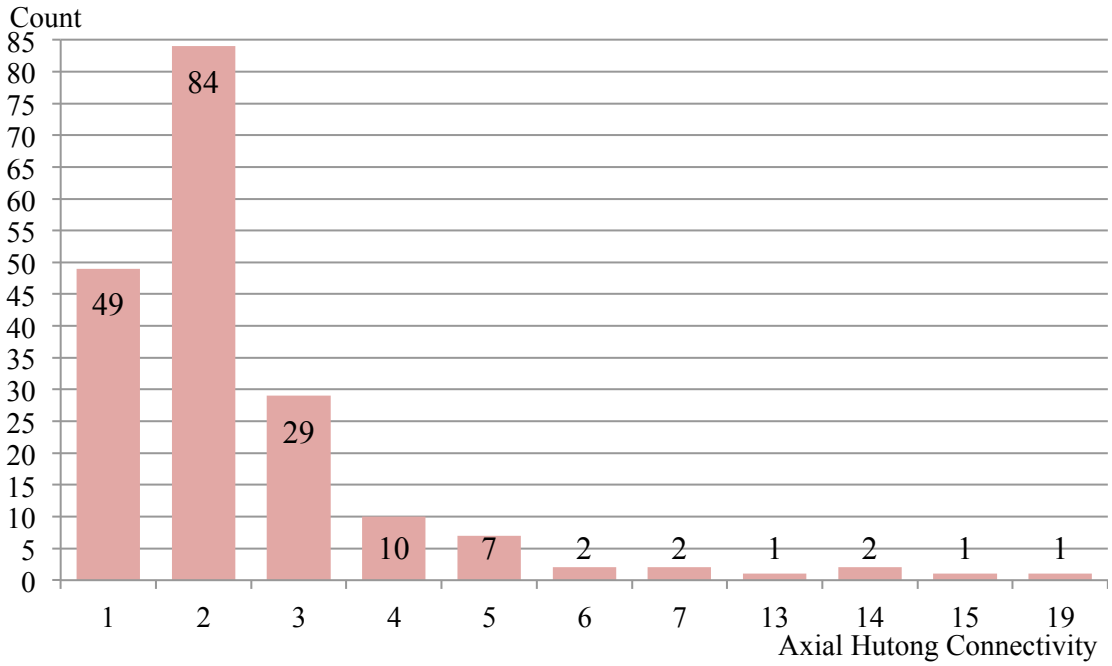


Figure 5.10 Axial Hutong connectivity in South Luogu Lane Block

Source: data from Depthmap

However, local inhabitants decide their walking trips in the South Luogu Lane Block in a different way. Physically, a straight long Hutong is divided into different Hutong segments by intersections and junctions. These segments present a local Hutong spatial form pattern at a smaller scale. Local residents don't care about the number of turns on their way and usually choose the shortest metrical path to get to their destinations. Since they are familiar with Hutong segments, inhabitants in the block plan their shortest routes from rich combination of different Hutong segments. There are 630 Hutong segments in the block, with an average length of 31 meters, a minimum of 0.03 meter and a maximum of 385.86 meters (See Table 5.2). The Hutong segments are much shorter than axial Hutong in average. The average

connectivity of Hutong segments is 4.44, higher than that in the axial Hutong network (See Table 5.2). The range pattern of segment connectivity shows 335 Hutong segments are linked with other three Hutong segments and 222 segments have a connectivity of 6 (See Fig. 5.11). Consequently, a more connected Hutong segment network at the local level offers many selections of combining different Hutong segments for local inhabitants to decide their shortest routes in the block.

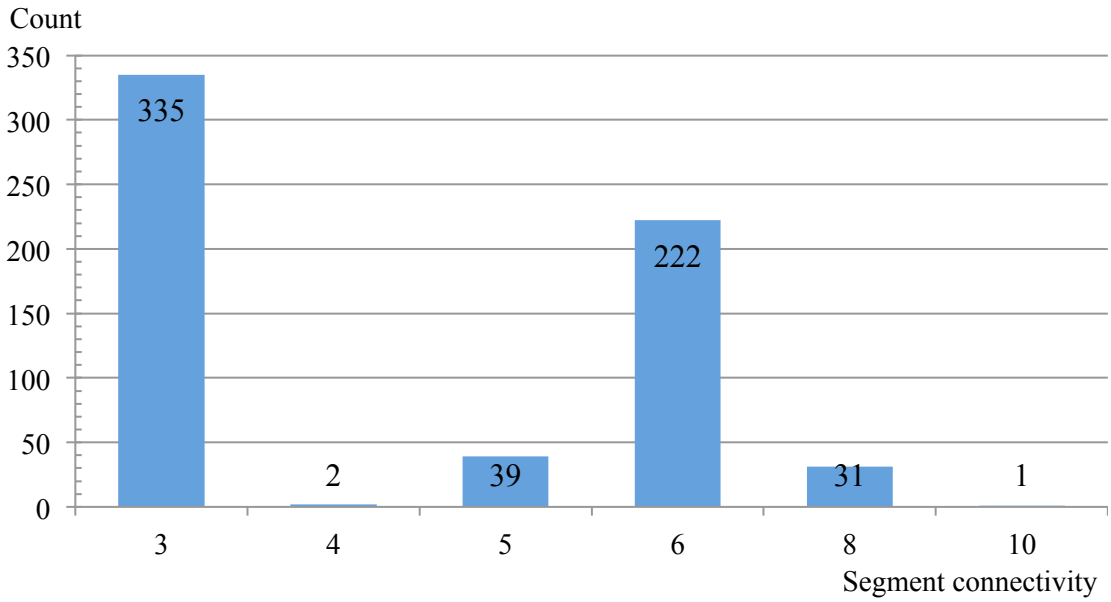


Figure 5.11 Segment line connectivity in South Luogu Lane Block
Source: data from Depthmap

In terms of segment length, 272 segments are with a length of less than 5 meters, 484 segments are less than 50 meters, and 609 segments are shorter than 150 meters (See Fig. 5.12). Consequently, numerous distinct Hutong segments created by intersections and junctions contribute to rich and vital street interfaces. Whyte (1980), Gehl (2010) and Jacobs (1993) demonstrate the importance of active ground floor and interesting street facades to support various street activities and attract pedestrian movement. In this way, these street interfaces have various connectivity and accessibility, and have potential to support a diversity of activities with different demands of movement patterns and street forms. From the opinion of Gehl (2010), a distance of 10 meters makes spatial experience more interesting and encourages people to use all senses. 323 Hutong segments are less than 10 meters long, which take up about 51% of the whole Hutong segments. These interfaces become attractions on the routes and can create a good rhythm of street pattern. This presents that when people are walking in

these Hutong segments, they are likely to get an interesting spatial experience within this distance. All these help to make an attractive ground floor and street facades for diverse street life.

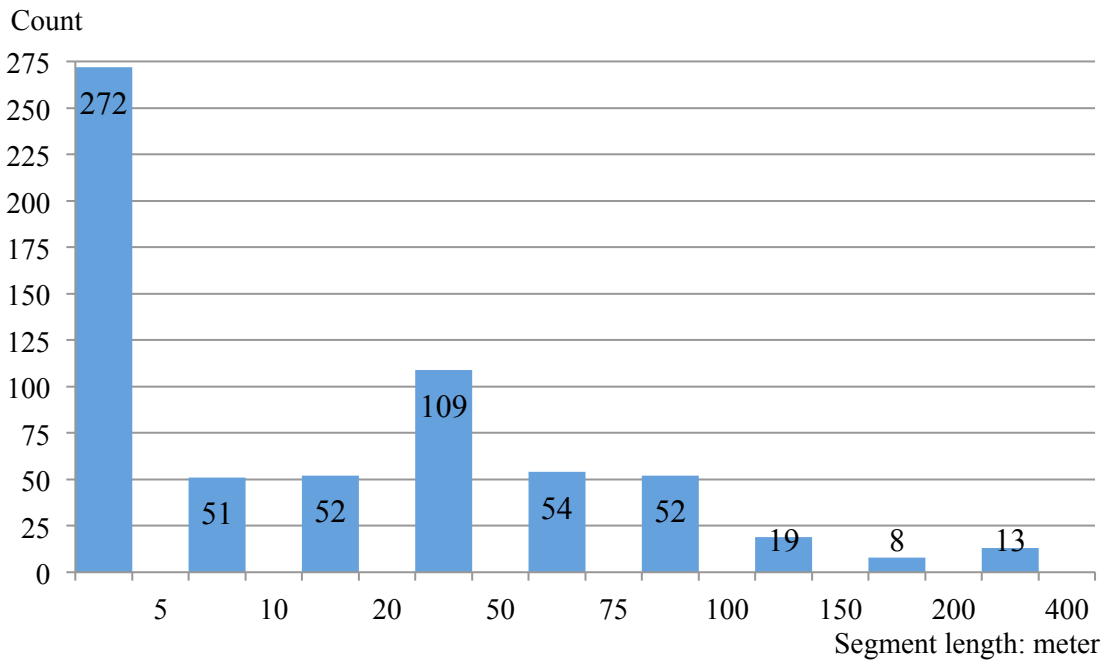


Figure 5.12 Segment length range in the South Luogu Lane Block

Source: data from Depthmap

In conclusion, from the perspective of spatial form, Hutong provide abundant potential space to support different activities and movements meeting different demands of its space users. Its Hutong network creates a number of segments with diverse accessibility and connectivity, and many street interfaces with various lengths at different scales. Both outside visitors and local residents are able to find proper space and choose routes according to their demands.

5.3 Land Use and Commercial Activities

From the above description, Hutong morphology and form spatially decide the movement pattern, which will attract appropriate land use and activities to agglomerate and develop. According to Jacobs's theory (1993), diverse activities help to create good places to stay, live, play, work and spend time. Land use patter affects ground floor plan, and a good and attractive ground floor helps to revive public life

and create diverse activities (Gehl, 2010). In this case, land use types along streets play an important and direct role in regenerating a diversity of street activities, while the land use pattern somehow affects the kinds of street activities in a general way.

5.3.1 Block Land Use

There are mainly four land-use types in the block, which are Residential (R, 22.2ha), Commercial and business facilities (B, 6.38ha), Administration and public service (A, 4.99ha) and Municipal utilities (U, 0.21ha) (data from geometry calculation in ArcGIS). Residential area is the largest land use type, which accounts for 65.72% (See Fig. 5.13, Fig. 5.14). Commercial and Business Facilities is the second (18.88%) and Administration and Public Services is the third (14.78%) (See Fig. 5.14).

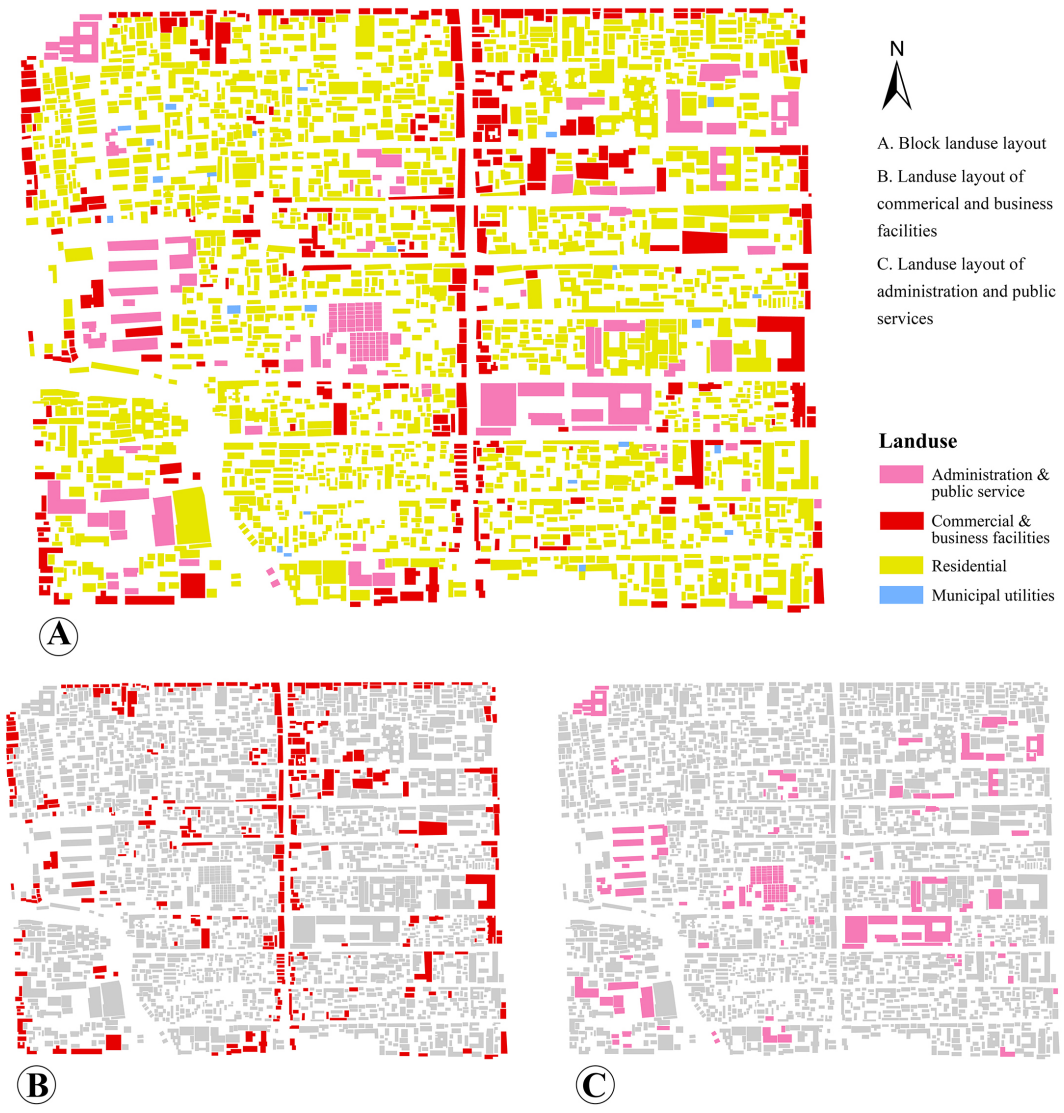
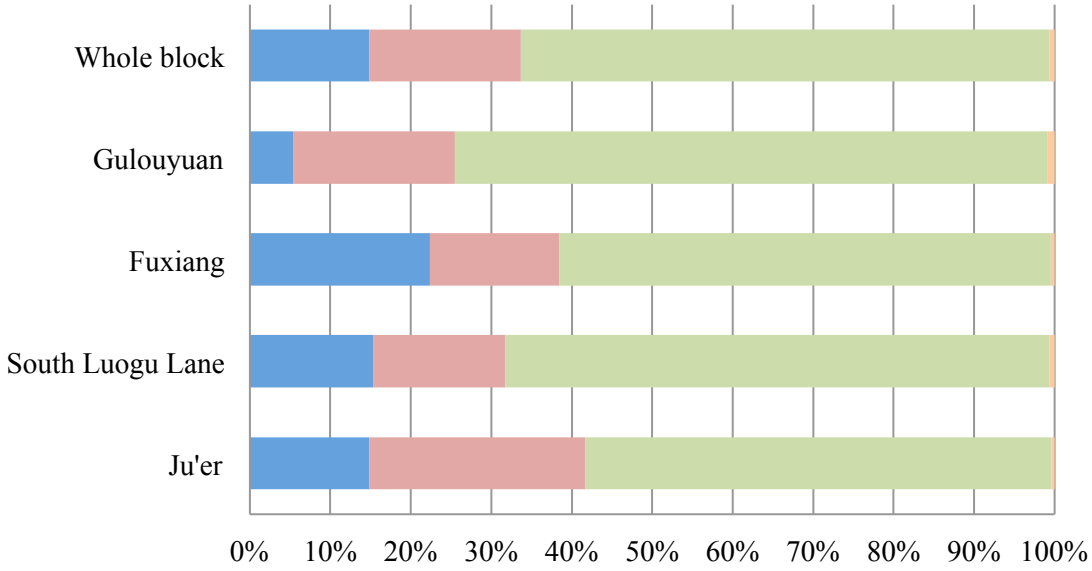


Figure 5.13 Land-use layouts in South Luogu Lane



	Ju'er	South Luogu Lane	Fuxiang	Gulouyuan	Whole block
A	14.82	15.34	22.39	5.44	14.78
B	26.91	16.40	16.09	20.04	18.88
R	57.88	67.64	61.03	73.64	65.72
U	0.40	0.61	0.50	0.89	0.61

Figure 5.14 Ground floor land-use structure in the communities

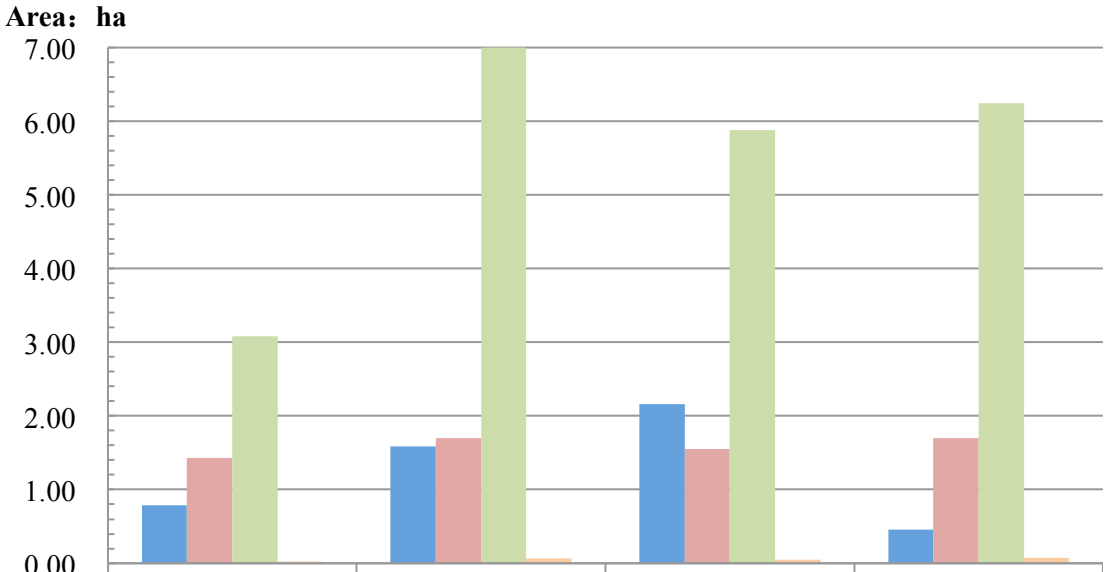
Source: data from geometry calculation in ArcGIS

5.3.2 Community Land Use

Ju'er Community, South Luogu Lane Community and Gulouyuan Community share similar land use structure with the block. However, in Fuxiang Community, Administration and Public Services, with a total area of 2.16 ha, takes up 22.39%, which is the highest in the block, while Commercial and Business Facilities (1.55ha) is only 16.09% of the whole community land use area (See Fig. 5.14, Fig. 5.15). Thus, Fuxiang Community has the highest land use density of Administration and Public Services, that is 801.34 m^2/ha (calculated from data in Fig. 5.15).

For Commercial and Business Facilities land use, Ju'er Community has the highest percentage, 26.91% (See Fig. 5.14). But for its area size, it is only 1.43 ha, the lowest among four communities (See Fig. 5.15), which means Ju'er Community has the highest Commercial and Business land use density, about 1200 m^2/ha (calculated from data in Fig. 5.15). South Luogu Lane Community has the largest commercial

and business area, that is 1.7 ha, but its density is 668.43 m^2/ha, which is approximately half of the value of Ju'er Hutong (calculated from data in Fig. 5.15).



	Ju'er	South Luogu Lane	Fuxiang	Gulouyuan
A	0.79	1.59	2.16	0.46
B	1.43	1.70	1.55	1.70
R	3.08	7.00	5.88	6.25
U	0.02	0.06	0.05	0.08

Figure 5.15 Different ground floor land-use areas in the communities

Source: data from geometry calculation in ArcGIS

5.3.3 Commercial and Business Activities along South Luogu Lane and Ju'er Hutong

From Gehl (2010) and Whyte's (1980) experience in public life study, other people are the biggest attraction and reason for people to stay longer in the urban space. In our case, distinctive commercial and business services in South Luogu Lane are the main feature to stimulate people to spend time in the space. These services make a lot of "other people" showing up in the Hutong, which encourages more pedestrian movement and activities in the street. The previous analysis indicates that the commercial land use area in these two communities is close to each other in size (Ju'er Huotng, Community, 1.43ha; South Luogu Lane Community, 1.7ha, see Fig. 5.15). However, in the observation, the pedestrian volume in South Luogu Lane was much larger than that in Ju'er Hutong, even though they are graphically connected

with each other. South Luogu Lane was lively or even too crowded with groups of people, especially tourists, while it was relatively enjoyable and comfortable to walk in Ju'er Hutong. There are some inherent reasons behind such distinction.

One possible factor for this distinction is the distribution of different land use along both Hutong. South Luogu Lane is concentrated on commercial and business facilities nearly in the whole street (See Fig. 5.13). There is less residential and other land use. Instead, Ju'er Hutong has a balanced mix of commercial and business facilities, residential area, and administration and public services (See Fig. 5.13). Commercial and business services tend to stimulate more movement and street space uses. As a result, the users in Ju'er Hutong are a mix of neighborhood inhabitants and visitors, while South Luogu Lane attracts more visitors and consumers. In terms of commercial and business activities, there are 194 registered commercial entities in South Luogu Lane and 103 in Ju'er Hutong (See Table 5.3). In terms of total number, commercial entities in South Luogu Lane is twice of that in Ju'er Hutong. Nevertheless, considering the length of Hutong, the number of commercial entities in every 100 meters is 24.7 commercial entities in South Luogu Lane and 23.5 commercial entities in Ju'er Hutong. Both Hutong have similar density of commercial entities along the street. So there are other factors for this difference in pedestrian movement and activity intensity.

The second factor is the sort of commercial and business activities, which make contributes to the intensity of street activities and usage. The primary commercial activities in South Luogu Lane are retail and catering, which takes up 57% and 25% respectively of the whole entities (See Fig. 5.16). However, Ju'er Hutong only has 22% retail entities and 8% catering entities (See Fig. 5.16). In the aspect of number, South Luogu Lane has 111 retail entities and 48 catering entities, while Ju'er Hutong owns 23 retail entities and 8 catering entities, which are largely far behind South Luogu Lane (See Table 5.3). Whyte (1980) is in high praise of food as an easy and useful triangulator to feed the space with activity and enliven social interaction. From the observation, retail and catering activities responds to various demands from a diversity of people, which creates large potential to inspire interactions between street activities and pedestrians. In this case, South Luogu Lane takes its significant advantage in retail and catering services, thus is more likely to stimulate a number of

street activities, pedestrian movement and street uses. However, the dominating commercial service in Ju'er Hutong is expertise and consulting services, which provide professional service for certain groups of people. These people come to the space mainly for the services and are possibly not interested in using street space for public life. Thus, street life in Ju'er Hutong is not as diverse and intense as that in South Luogu Lane.

Table 5.3 Cross analysis of commercial activity and commercial space in South Luogu Lane and Ju'er Hutong

South Luogu Lane								
	B11	B13	B14	B22	B29	B32	B9	Total
BOS	66	28	0	3	3	0	2	102
BP	9	2	0	1	1	0	0	13
R	36	18	3	11	10	1	0	79
Total	111	48	3	15	14	1	2	194

Ju'er Hutong								
	B11	B13	B14	B22	B29	B32	B9	Total
BOS	11	6	0	0	2	0	0	19
BP	2	0	1	0	3	0	1	7
R	10	2	3	15	44	0	3	77
Total	23	8	4	15	49	0	4	103

* Commerce and business registration type: BOS – Business operation site, BP – Business place, R – Residence; Commerce and business activity: B11 – Retail commerce, B13 – Catering business, B14 – Hotel business, B22 – Art & media business, B29 – Other business facility, B32 – Health & sport commerce, B9 – Other service business

source： data from Beijing Administration for Industry and Commerce (http://qyxy.baic.gov.cn)

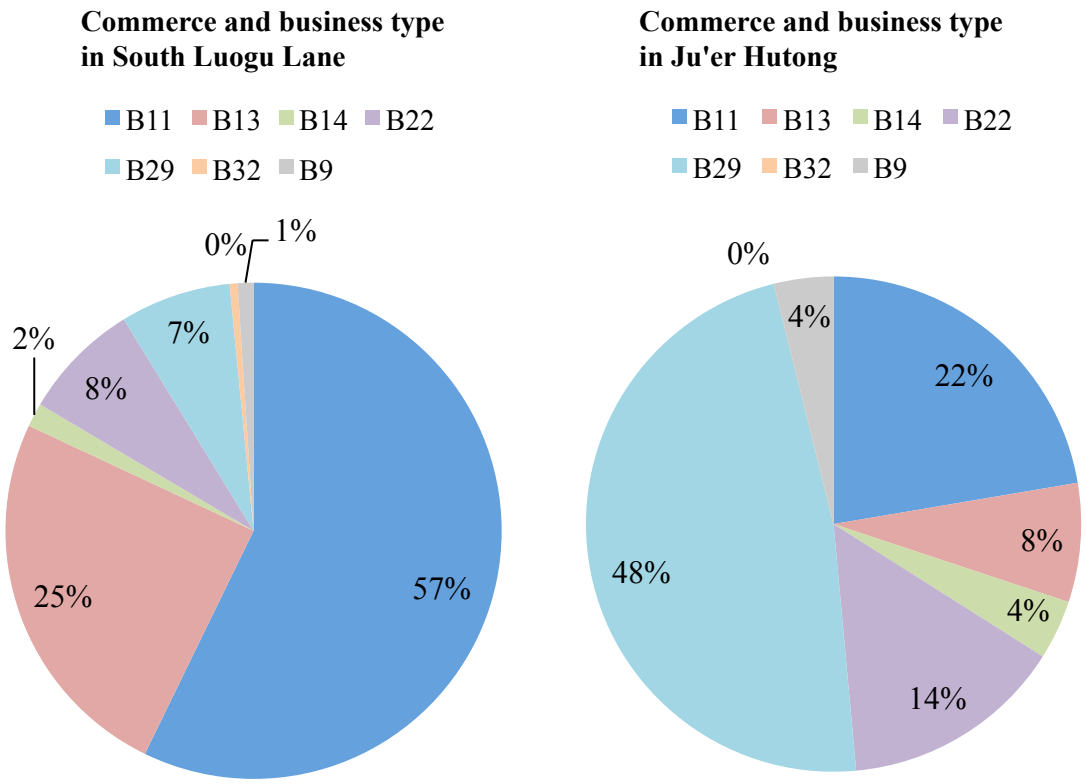


Figure 5.16 Commerce and business activity proportion in South Luogu Lane and Ju'er Hutong

Source: data from Beijing Administration for Industry and Commerce (http://qyxy.baic.gov.cn)

A third factor is the location of commercial and business space. Gehl's study (2010) delineates that almost half of the activities in and around semi-private outdoor space happen more often in the front of ground floor units (See Fig. 5.17). On the ground floor, different services and activities are more accessible to people. In South Luogu Lane, 52% of commercial entity addresses are registered as business operation site and 7% are as business place (See Fig. 5.18). However, 75% of entities are addressed in residence in Ju'er Hutong. Registered business operation sites and business place are the place where commercial activities directly emerge, while registered residence may not be the direct place for commercial activities. There are 77 residence registration items, among which 44 are not on the ground floor. In South Luogu lane, registration residences are mainly on the ground floor. Under this consideration, compared with Ju'er Hutong, South Luogu Lane has more attractive and interactive commercial space on the ground floor for people. This distinction has been reflected

in the observation of street activities in the next section of this chapter.

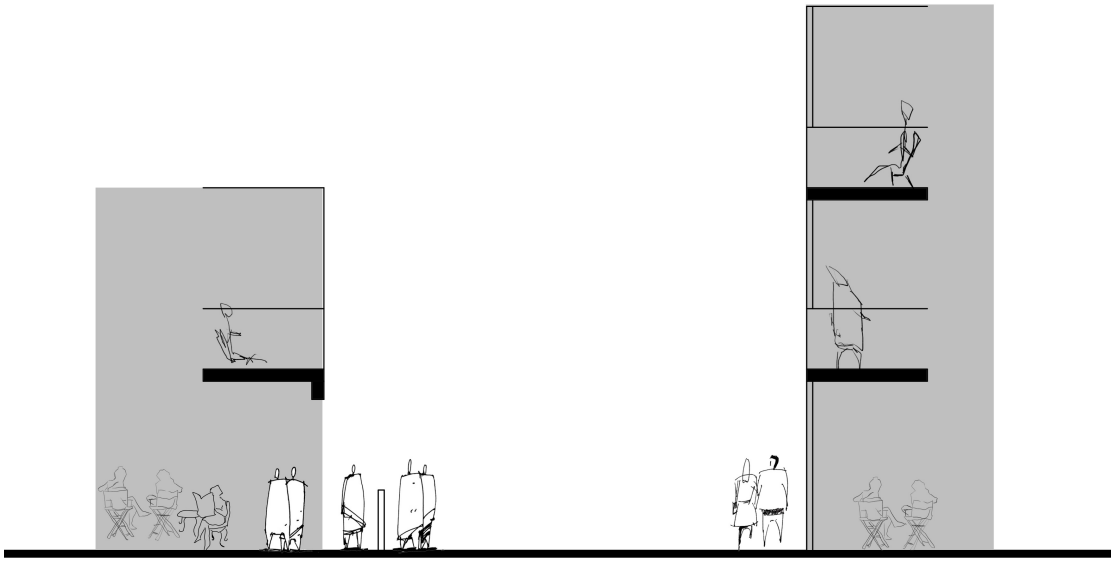


Figure 5.17 Social interaction in ground floor

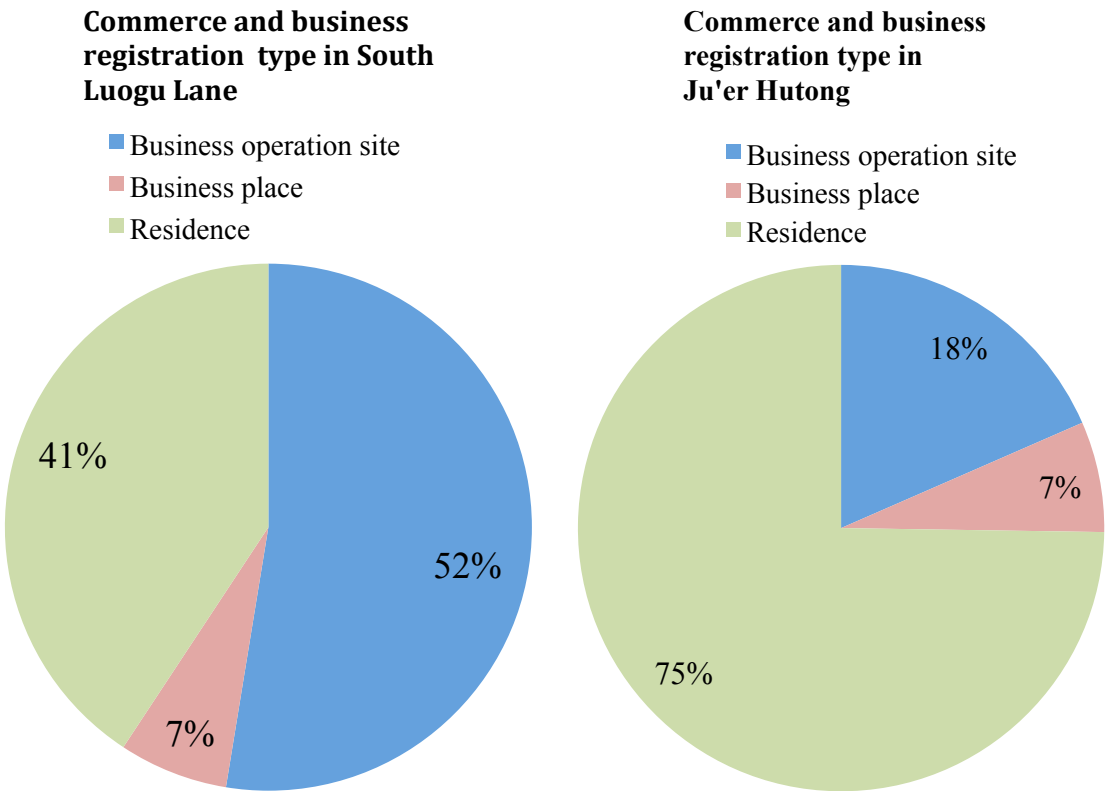


Figure 5.18 Commerce and business registration type proportion in South Luogu Lane and Ju'er Hutong

Source: data from Beijing Administration for Industry and Commerce (http://qyxy.baic.gov.cn)

5.4 Street Open Space and Street Life

5.4.1 Street Activities

The observation of Ju'er Hutong was made between 10:00 – 12:00 and the observation in South Luogu Lane was made between 14:30 – 17:30 in 23 May in 2015. The activities in South Luogu Lane and Ju'er Hutong can roughly be categorized into two sorts, in other words, tourism activities and neighborhood activities.

In South Luogu Lane, most of the street activities are tourism relevant activities and consumption behavior. In the peak time, the street is crowded with people and sometimes it is hard to move easefully. According to statistics from East City District Municipality, the daily amount of tourists in South Luogu Lane reached 20,000 in 2013 and the number was between 30,000 and 40,000 at weekends (Wang, 2013). During the holidays of Dragon Festival, up to 100,000 tourists visited South Luogu Lane Block each day in 2013, which was equal to the daily number of visitors in Forbidden City at the same time (Wang, 2013). The dominant activities in South Luogu Lane are walking and standing (See Fig. 5.19). People talk with friends, look at different stores or buildings, or take photos when walking. There are also street venders peddling traditional Beijing snacks or handicrafts. Due to the deficiency of rest space and furniture, people usually stand at the edge of buildings and Hutong to rest, talk or eat snacks. When attracted by interesting stores, people also stand at the entrance space of stores for a looking and talking. There are long queues of people standing to buy food, snacks or beverage in front of several snack bars. Some businessmen put their small chairs and tables at the entrance of their stores, watching and talking with tourists.

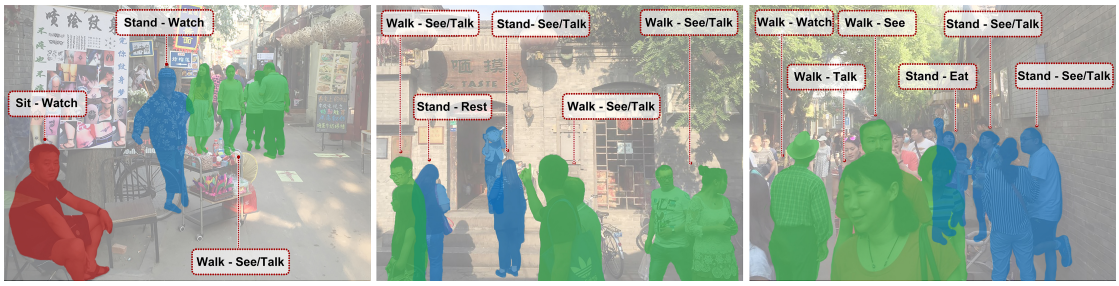


Figure 5.19 Street Activities in South Luogu Lane

The activities in Ju'er Hutong are much more diverse (See Fig. 5.20). The segment connected with South Luogu Lane is similarly occupied with commercial relevant activities. Because of moderate number of tourists, there is some space for tables or chairs at the Hutong corners, building edges or store entrance space. People can sit in the space to watch, eat or interact. The east part of Ju'er Hutong contains a variety of neighborhood activities of local residents. Few tourists are seen at these places. Some old people stand at the door to look at children playing. In the small lanes connected to Ju'er Hutong, children play football or cats, and chase with their friends. Some residents bring their tables and chairs to eat, talk, meet and play with their neighbors. Hutong space in these residential areas becomes neighborhood space for social interaction, meeting and community activities.

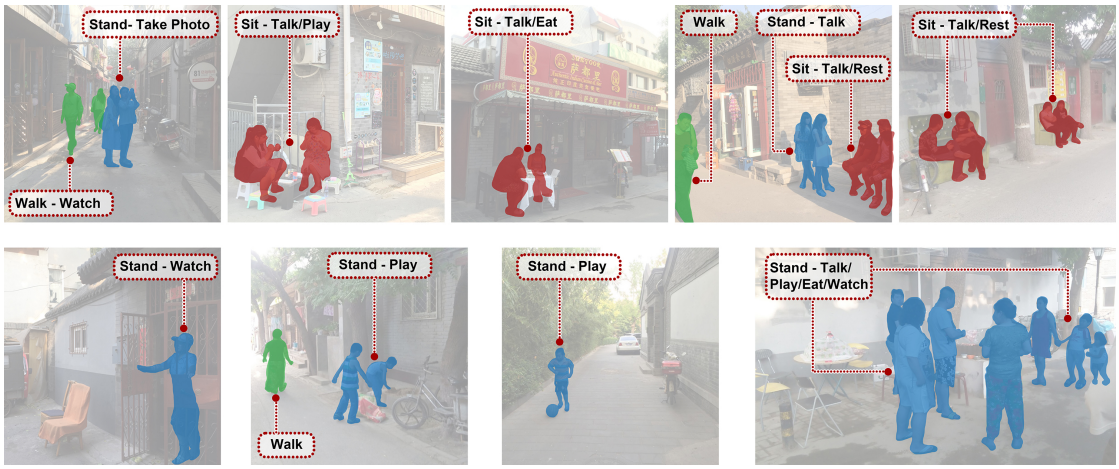


Figure 5.20 Street Activities in Ju'er Hutong

5.4.2 Quality of Public Space

Based on Gehl's Twelve Quality Criteria for the Pedestrian Landscape, the quality

evaluation of public space in South Luogu Lane and Ju'er Hutong are mainly made by Tan and the author. Different values are given to each quality criteria, in which 3 is good quality, 2 represents medium quality and 1 means poor quality. Good quality means there is abundant public space for this activity and a large number of people are engaged in this activity. Poor quality means public space for this kind of activity is scarce and it is hard to see people doing such activities. Medium quality is between good quality and poor quality. Table 5.4 shows the result of evaluation by Tan and the author. This evaluation only represents the spatial experience of Tan and the author, and the evaluation could be improved to get a more comprehensive result in future studies.

Table 5.4 Quality of open public space in South Luogu Lane and Ju'er Hutong

Quality criteria	South Luogu Lane	Ju'er Hutong
Protection against traffic and accidents	3	3
Protection against crime and violence	3	3
Protection against unpleasant sensory experiences	2	2
Opportunities for walk	2	3
Opportunities for play and exercises	1	2
Opportunities to sit	1	2
Opportunities to see	2	2
Opportunities to talk and listen	2	3
Opportunities to stand/stay	1	2
Scale	3	3
Opportunities to enjoy the positive aspects of climate	2	2
Positive sensory experiences	2	2

In the protection aspect, it is safe and secure to walk and live in South Luogu Lane and Ju'er Hutong since a large number of people appear in the street during the day (See Fig. 5.21). Both Hutong are one-way streets with low emergence of private cars during the day. In the observation, few cars ran in the South Luogu Lane and most

cars were just parked in some parts of Ju'er Hutong in the day (See Fig. 5.21). Pedestrians felt free to walk in the street and were not disturbed by vehicles. Because now these two Hutong become popular tourist destinations, the streets are lively and occupied by a lot of people and different activities. Therefore, people feel safe to walk, stand and sit in the street. However, there are also some unpleasant sensory experiences. South Luogu Lane is crowed with people all the time, which results in a lot of noise and trash from tourists. Ju'er Huotng fails to deal with trash problem as well.

Figure 5.21 Street space in South Luogu Lane and Ju'er Hutong

In the comfort aspect, South Luogu Lane and Ju'er Hutong see distinct qualities. Gehl (2010) puts forward some strategies for good public space at eye level in the city, which is illustrated in detail in chapter 3. Good space for walking needs street widths between 3 to10 meters, an acceptable walking distance of 500 meters, space for pedestrian traffic, and fewer staircases (Gehl, 2010). South Luogu Lane is 8 meters wide and 786 meters long, while Ju'er Hutong is 6 meters wide and 438 meters long. There is abundant space for pedestrian movement and no staircase at all. In a general way, both Hutong create good walking environment spatially. Although both Hutong contain several small segments, it is better that a small square or open space is designed in South Luogu Lane as a fixed point in the middle to create an acceptable

walking distance. Besides, Gehl (2010) suggests a distance between 1.2 meters and 3.7 meters as a good social distance. There is usually no proper social distance for pedestrians in South Luogu Lane, since sometimes it is full of people. People do not feel enjoyable and comfortable to walk in South Luogu Lane when it is the peak time of tourists. In other words, Ju'er Hutong provides more opportunity for walking than South Luogu Lane. In addition, without good squares and open space, it is hard for people to find good public space to play and exercise, sit, see, talk and listen, stand and stay in South Luogu Lane and Ju'er Hutong. South Luogu Lane allows talking and listening, and there are numerous interesting stores for seeing. But it is not a good experience because of the scarcity of sitting, standing and staying space. Similarly, Ju'er Hutong lacks well-designed sitting, standing and staying space. Most activities happen on the street, like playing, doing exercises, talking, listening and meeting. Local residents have to bring their benches and chairs out in the street for sitting and meeting.

In the delight aspect, both Hutong have a human scale and the buildings along Hutog create a feeling of street. Trees in South Luogu Lane and Ju'er Hutong make the street space more enjoyable. But during the redevelopment, many trees were destroyed. Both Hutong are very typical straight linear space without enough good design and details, and fine views.

5.4.3 Streetscape

The streetscape in South Luogu Lane and Ju'er Hutong share some similarities, yet are different in some aspects. Due to the limited linear space and large volume of movement in both Hutong, trees and paving have become the main elements to shape the streetscape in South Luogu Lane and Ju'er Hutong (See Fig. 5.22, Fig.5.23). South Luogu Lane is decorated with different kinds of lighting and attractive signage to get tourists' attention. Various and interesting façades of these traditional courtyard houses create unique historical and cultural environment for strolling in South Luogu Lane. Streetscape is similar in the west segment of Ju'er Hutong, the part connected with South Luogu Lane. The east segments obtain more elements of everyday life of local residents.

A good sense of street scale is important to create a fine view of streetscape. Wu

(1999) empathized on Siheyuan-Allay system to create a traditional scale and environment of Hutong life. At least 1:4 height-to-horizontal-distance is likely to offer a sense of street definition when a pedestrian is looking at a 30-degree angle to the street direction (Jacobs, 1993). Both Hutong still keep the Siheyuan-Allay form. The street sections of South Luogu Lane and Ju'er Huong demonstrate a human scale for its space users and diverse street life (See Fig. 5.24). In South Luogu Lane, the buildings on both sides are almost one story or two stories high, while all buildings in Ju'er Hutong are under four stories. The Hutong is not so wide and the buildings are not too tall, which creates a comfortable scale and feeling to walk in the street.

Figure 5.22 Streetscape in South Luogu Lane

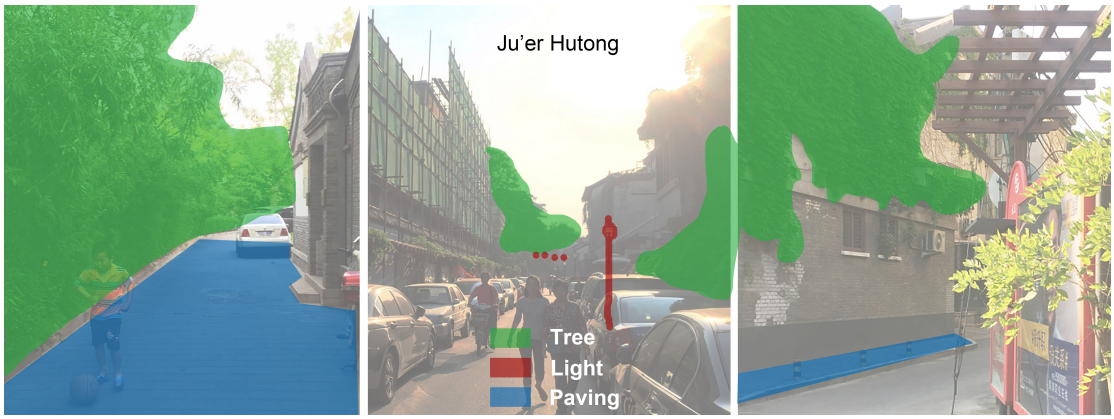


Figure 5.23 Streetscape in Ju'er Hutong

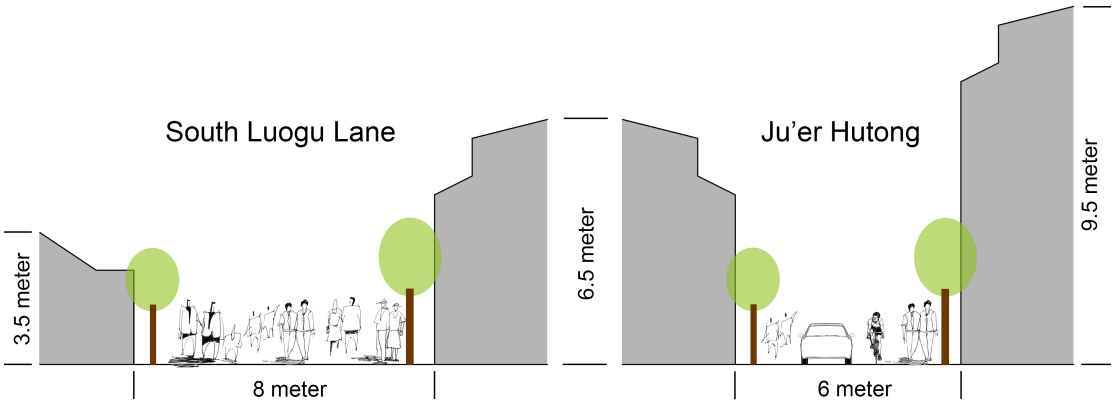


Figure 5.24 Building and street scale in South Luogu Lane and Ju'er Hutong

The Hutong morphology analysis sustains that Hutong network contributes to diverse and distinct street interfaces. The long and straight South Luogu Lane breaks into small Hutong segments at intersections or junctions, which makes a good and varied rhythm of its façade and Hutong interface. Gehl's study (2010) indicates that a thriving commercial street often has a façade length of 5 to 6 meters, other eye-catching options every 100 meters, many narrow units, many doors, proper building density, mixed functions. The average segment length in South Luogu Lane Block is 87 meters. Due to a variety of stores and restaurants, the façade contains many narrow units, doors and diverse characteristics. However, each segment consists of similar repeated commercial services, which creates a monotonous spatial experience in a long walk in South Luogu Lane (See Fig. 5.25). Ju'er Hutong is mixed with commercial services, residential area and cultural heritages, which creates completely different spatial experience and street interfaces in different Hutong segments (See Fig. 5.26).

Figure 5.25 Interface and façade in South Luogu Lane

Figure 5.26 Interface and façade in Ju’er Hutong

Street furniture is hugely inadequate in South Luogu Lane and Ju’er Hutong. South Luogu Lane is full of visitors and very little space is left for rest and street furniture. The street is designed for slow and constant movement rather than long staying in the street. Lingering activities most happen inside these buildings. In the observation, little street furniture was seen in South Luogu Lane. Ju’er Hutong was just a little better. Also playing and exercise facilities are deficient and poor in the residential area (See Fig. 5.27). Almost all street furniture is from local residents, stores or restaurants. Some businessmen put tables and chairs in the street space close to their stores or restaurants. The furniture is only for consumers, not for everyone. Besides, some residents put some unused furniture at the edges of Hutong, and some local residents bring some tables and chairs in the Hutong to have a meeting or talk with their neighbors or friends.

Figure 5.27 Street furniture in Ju’er Hutong

Chapter 6 Discussion

6.1 Summary of Empirical Study

6.1.1 Hutong's Spatial Support for Street Life

From the morphology and land use analysis in the last chapter, Hutong network provides abundant and various space to support a diversity of street activities. Compared with current wide urban roads, Hutong is narrow and comfortable for slow moving traffic such as bicycles, walking and slow-moving vehicles, which creates safe and enjoyable environment for pedestrians. This is an advantageous potential for more street life. The Hutong network builds a hierarchy of streets with distinct accessibility and connectivity, which allows for different movement patterns. As a result, the whole block is not a homogeneous space, but a heterogeneous space with distinct places. Different street users have different requirements of their environment, and mobility and accessibility needs. In the Hutong network, these users seek to find the best location for their activities and life, which will also impact the movement pattern of Hutong network. This is reflected in the analysis of global integration and local integration. The distinct highly accessible area for visitors and local inhabitants inspires urban planners and designers to think about different space for neighborhood activities and tourism services. Due to a higher street density, a long Hutong is divided into different shorter segments. This increases the number of Hutong interfaces in the whole system. These interfaces are soft edges for interaction between interior and exterior spaces, private and public street spaces, as well as house dwellers and street life seekers. In this way, Hutong manifests its spatial role in supporting Hutong life and street activities.

6.1.2 Commerce and Street Life

Commercial services are significant force to bring thriving street life. Shopping and consumption attract people to use the place and offer interesting experiences and products for these people. "Other people" is an important element to initiate street life and make street and public space look good. People like to go to places where there are a number of people there. It is a natural thinking. Attracting people to go to public space is the first step to create vital public life. Commerce and business do an

excellent job in this, which is demonstrated in the redevelopment of South Luogu Lane. A lot of tourists go to South Luogu Lane because they know they can eat traditional Beijing food, find interesting stores, and experience unique Hutong environments. However, commerce only brings people to the street. The next step is to create high-quality public space for these people to interact with the local street life. Public space transforms Hutong space into a vital theatre of urban life and activities. As a result, Hutong will become a staying space for experience and life instead of space only for movement. A proper balance of commercial space and pubic space in Hutong will make huge contributions to lively street life in South Luogu Lane Block. South Luogu Lane Block has succeeded to accomplish the first step, but failed to make the next step.

6.1.3 Sitting Space and Street Life

The amount of spaces offered for sitting has contributed largely to the quality and vitality of public space and public life, as demonstrated in Whyte's study and work. Unlike the western street-square form, Hutong system is simply a linear corridor space without any squares being interesting fixed points in morphology. This is good for movement rather than lingering activities. Consequently, inviting sitting space is deficient and rarely available in Hutong system. Although standing activities make up part of street life, sitting is an effective way to encourage social interactions and street activities, even between strangers, such as meeting, talking, listening and watching. Public sitting space gives huge potential for the revival of various street life and triggers more diverse lingering activities in the street. It attracts people to gather in the space and transforms through space into meeting space and a theater of urban life. In this aspect, South Luogu Lane Block should add more good sitting spaces at its fixed points.

6.1.4 Problems in South Luogu Lane Block

There are several urgent problems in South Luogu Lane Block. Too commercial environment and a deficiency of local identity are two of the biggest complaints from visitors and local residents. It used to be a quiet and lively neighborhood with a variety of small local business. But now the whole South Luogu Lane is full of similar commercial and business activities mainly for tourists. For tourists, they come for the

attraction of traditional Hutong life and culture, but sometimes are disappointed with crowded streets, generic stores similar to other tourist hotspots, and weak experience of Hutong life and culture. For local residents, on one hand, exuberant tourism business and commerce not only brings huge economic benefits to the block, but also increases the cost of living for local residents. On the other hand, increasing tourists also disturb some residents' everyday life and privacy usually in residential areas. In the observation, due to poor wayfinding signage, several courtyard houses put signs at their doors or gates writing "Private space, no visitors" to avoid tourists entering their living space.

Another problem is the shortage of good public space for lingering activities of visitors and local residents. In South Luogu Lane, sitting space is hard to see and find, and there is also little outdoor café space. As a result, people stand to eat, talk, wait, watch and take photos, or just walk through, which can decrease the quality of experience in the public street space. In the more residential area, such as Ju'er Hutong, there is a lack of well-designed public spaces and facilities for neighborhood activities and interactions. Many vehicles and bicycles park randomly in the street, which occupies much space that could alternatively be used for street life and public space.

The number of original residents is decreasing year by year, which is a result of many different factors. Some redevelopment projects exclude original residents since they cannot afford the price of newly constructed houses. Due to increasing land value of South Luogu Lane Block in real estate market, some residents rent their houses for profits. Some residents move out, because the living cost is too high for them on the block, and busy commercial and business activities turn the previous quiet and comfortable neighborhood into an overly noisy and poor living quality residential area. Original residents represent local culture and identity. The decreasing of original residents will contribute to the disappearing of traditional Hutong life.

6.2 Successful Placemaking Practices for Vital Street Life

South Luogu Lane Block is able to revive diverse and vital street life with proper plan

and design in the process of Hutong redevelopment. In order to figure out appropriate strategies and tools to solve the existing problems in this block, the researches and experiences of Strøget in Copenhagen and New Road Project in Brighton can provide food for thoughts.

6.2.1 Strøget in Copenhagen, Denmark

As the capital of Denmark, Copenhagen has an urban population of 1,263,698 and a metropolitan population of 1,992,114 (Wikipedia, n.d). With strong and diverse urban and cultural development, Copenhagen is the cultural, economic and financial center of the country. As the main street going through the Inner City, Strøget is a car-free zone and popular tourist attraction in the center of Copenhagen. It is 1.1 kilometers long running from Kongens Nytorv in the east to Rådhuspladsen (City Hall Square) in the west.

After several temporary trial closure experiments in the 1950s, Strøget was officially pedestrianized in 1964, and a street with buses, lorries and cars was transformed into a pedestrian street, which gave rise to wide public debate "No cars means no customers and no customers means no business," "there is no traditional for outdoor public life in Scandinavia." (Gehl Architects (b), n.d.; PPS (e), n.d). However, later, Strøget proved to become a huge success as a pedestrian street for commercial activities and diverse urban life. Based on this success, the pedestrian network expanded, which made the Strøget district easily accessible on foot. The initial 15,800 square meters pedestrian network of the Strøget has now expanded to about 99,770 square meters (See Fig. 6.1). Now Strøget spreads out a collection of a number of small streets and connected squares in the inner city, which covers the streets Frederiksberggade, Nygade, Vimmelskaftet and Østergade and Nytorv Square, Gammeltorv Square and Amagertorv Square. About 80,000 people walk through a rather narrow street in the Strøget district on any nice summer day and night (Gemzøe, 2001). Because of the pedestrainization of Strøget to a larger extend, the number of people using urban space in Copenhagen center is three times as that in 1962 (PPS (e), n.d).

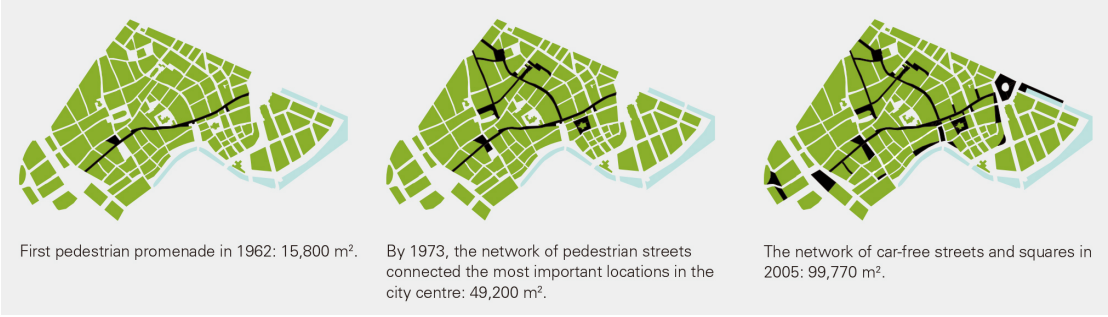


Figure 6.1 The pedestrian network development in the Strøget district in Copenhagen
Source: Public spaces in Copenhagen, Gehl Architects, p3

The revival of public street life and increasing foot traffic proved to be a huge economic benefit for local business in the Strøget (PPS (e), n.d). Strøget, with a diversity of stores from budget-friendly chains to some of the world's most expensive brands, becomes the main popular shopping destination not only for tourists but also for local residents. However, Strøget is also an attractive and popular meeting place for local residents or for just a simple walking route to and from nearby destinations. There are a number of beautiful sights and attractions in the side streets, such as Helligåndskirken, Church of Our Lady behind Gammeltorv Square, the courthouse at Nytorv Square, the Stork Fountain at Amagertorv Square, The Royal Danish Theatre in the beautiful Kongens Nytorv square, and Nyhavn in the other end of Strøget. Cappuccino culture has gained an important role in encouraging long stays in outdoor space. Many outdoor cafes open along streets and put their nice and comfortable tables and chairs in outdoor space, which attracts people to sit for talking, meeting, recreation, watching or just relaxation (See Fig. 6.2). These are good sitting spaces for people to begin their public street life. Besides, the squares provide ample public sitting space for local residents and tourists. Benches are a common type of sitting space on the side streets and in the squares (See Fig. 6.2). Surrounded by fascinating buildings, the Amagertorv Square has an interesting fixed point, the "Stork Fountain" and a new paving with traditional but exuberant pattern created sculptor Bjørn Nørgaard (See Fig. 6.3). The fountain itself becomes a landmark, a favorite gathering place for friends and families, and a vital space for sitting, meeting, talking, watching, recreation or enjoying an afternoon meal.

Figure 6.2 Benches and chair in the Strøget district

Source: http://multimedia.pol.dk/archive/00812/Str_get_50__r_812269a.jpg, https://www.pinterest.com/pin/35536284532214176/

Figure 6.3 Sitting space in Amagertorv Square in the Strøget district

Source: https://c2.staticflickr.com/6/5514/11841284375_368432663f_b.jpg, https://blog.mrandmrssmith.com/2012/01/inside-copenhagen-shopping-design-hotels-denmark/

Street performances and entertainment by acrobats, magicians and musicians are other elements for revival of street life. Multiple public activities happen in the street through the year, such as street performances, parades, public celebrations, and public dancing. In 2014, there were a number of free events linked with Copenhagen's Eurovision Song Contest (PPS (e), n.d.). The Busking Project foundered by Vivian Doumpa and Nick Broad aims to encourage governments to embrace free public art in public space (Broad, 2014). Broad (2014) demonstrates buskers and their performance are a means of triangulation and transformed impersonal space into

creative and interactive space. A group of people created a busking project in Copenhagen, which formed a relatively intimate, supportive and informative community (Broad, 2011). Stroget Street has attracted many professional buskers from all over world, due to its great street performance scene and comfortable public square spaces (see Fig. 6.4, Fig. 6.5). These diverse public arts and interesting performance bring people together, help strangers feel safe and comfortable, and inspire them to interact with each other. These performances and activities are an essential part of public life in the Stroget streets and also help to make street popular meeting places in the city center for tourists and local residents.

Figure 6.4 Buskers in the Strøget streets
Source:
http://busk.co/blog/2013/09/hungarian-break-dancers-stroget-street-copenhagen/

Figure 6.5 Street musicians in the Strøget streets
Source: https://www.pinterest.com/pin/189995678000502531/

6.2.2 New Road Project, Brighton, United Kingdom

New Road Brighton used to be one of the main streets dominated by vehicle traffic in a one-way system through the city center before 2007 (Oakden, 2014). There were theatres and bars on one side and the Pavilion Garden on the other side. It was an important place for visitors and local residents, but the busy cars drove visitors and residents away. In 2007, Brighton & Hove City Council invited Gehl Architects and Landscape Projects to transform this road into high quality urban environment of human scale, and meet the needs of all people, and make a balance between different traffic modes.

Gehl Architects firstly did public life and public space study to find out how residents use public space in the city as pedestrians and also assessed the quality of urban space from the perspective of pedestrians at "eye level". The analysis focused on how residents and visitors spend their time in and around Brighton & Hove (Gehl Architects (c), n.d.). It is very important and useful to talk to people and listen to needs of key users for designing attractive urban space. In this way, the transformation of urban space will be efficient and helpful to create vital public life. The group also tried to make this information and analysis easily accessible to a diversity of stakeholders and actors, such as residents, politicians, city planners, developer, landowners, business associations and other local associations. They proposed several public space programs and new road projects in the city center.

The concept of "shared surface street" was used in new roads to meet different needs of various users. In the shared space, pedestrian movement has the priority and all kerb stones have been removed in order to build inviting walking environment (Gehl Architects (c), n.d.). The pavement defines the streetscape and different movement zones. For example, pedestrian streets were designed with more diverse and fascinating paving ground than vehicle streets to guide pedestrians walking from one street to the next (See Fig. 6.6). This has been very successful to reduce vehicle traffic and increase pedestrian walking. After the opening of this new pedestrian prioritized road, vehicle traffic volume of the street dropped by 93%, while cycling and pedestrian number increased by 22% and 62% respectively (Oakden, 2014; Gehl Architects (d), n.d).

Figure 6.6 Shared surface and pavement in new road, Brighton
Source: http://gehlarchitects.com/wp-content/uploads/2014/03/ga10109.jpg, https://thelandscapedotorg.files.wordpress.com/2014/09/06-newroad-landscape-project-gehl-architects.jpg

Figure 6.7 Sitting space in new road, Brighton
Source: https://thelandscapedotorg.files.wordpress.com/2014/09/new-road-landscapeprojects.jpg

Trees and benches were added on New Road to create comfortable and inviting sitting spaces (See Fig. 6.7). A finely crafted, long continuous wooden bench is located on one side of the street with good tree shade, looking onto the public space. Lingering

activities achieved a massive increase of 600%, and 86% of citizens would like to see more similar public street space like New Road in the city (Gehl Architects (d), n.d). People sit on the benches, watching street activities and children playing, enjoying sun bathing, talking with friends or just having a relaxation (See Fig. 6.7, Fig.6.8). Lighting was also improved and designed well to create welcoming and safe walking environment to attract active street life at night due to numerous theatres near the New Road.

Figure 6.8 Street activities in new road, Brighton

Source:

http://gehlarchitects.com/wp-content/uploads/2014/03/Brighton_NewRoad_3_Credit_GehlArchitects.jpg,

https://thelandscapedotorg.files.wordpress.com/2014/09/children-new-road.jpg

6.3 Enlightenment from Case Study

From both cases, pedestrianization of a street is an essential method to bring and invite exuberant life and various activities back to the street. Pedestrainization creates safe, comfortable and rich street space for pedestrians and activities, which are two necessary factors to regenerate social interaction and public life in the streets. Appleyard's (1981) research demonstrates this a lot and suggests a number of good methods and practices for pedestrianization in his book Livable Streets. However, in some cases, it is not possible to achieve complete pedestrainization in some areas. Thus, the mix of pedestrian traffic and vehicle traffic becomes an inevitable problem in the partly pedestrianized areas. In order to begin pedestrianization, it is useful to

figure out proper methods and strategies for mixed traffic solution and traffic management. The concept of “shared space ”, proposed by Appleyard (1981), is a good way to deal with the mixed traffic problem. Used in the New Road Project, this method was helpful to create inviting environment for walking and at the same time allowed moderate vehicle traffic to pass through. South Luogu Lane Block could also adopt this method to deal with the congestion in some Hutong.

Besides, the success of New Road Project in Brighton demonstrates that the people who use the space define the quality of public space and street life. Before the transformation of space and in the process of design, it is very important and helpful to listen to and talk with main users of the space, and observe and analyze the way they use the space at pedestrians’ eye level. Gehl’s “Pubic Life Public Space” study in various cities offers guidance and examples on how to undertake a public space use demand survey. However, in the Hutong redevelopment of South Luogu Lane Block, pubic life survey is a missing step. The government or developers make most projects, thus, other actors rarely get engaged in. The voices of local residents are hard to be heard and represented in the plan. Thus, Hutong redevelopment should invite more stakeholders and actors to take participation in the planning process and implementation period. A public life survey is a good tool to encourage this participation of diverse actors in the urban planning and design of Hutong redevelopment.

Public space transformation is very complex and cannot accomplish everything right away. Wu (1999) says that it was better to make projects instead of plans for Hutong organic renewal after his research and experiment on Ju’er Hutong rehabilitation. Also Projects for Public Spaces (PPS), suggests that projects start small with experiments and adopt “Lighter, Quicker, Cheaper” approach with short-term improvements (PPS (d), n.d). From the above, successful streets, places to sit, a sidewalk café, a street event, a street performance, a garden, simple pavement, curb removal are simple examples of “Lighter, Quicker, Cheaper” changes to efficiently generate new uses and attractions for places in transition. Small experiments help find out the appropriate way and things necessary for transformation to happen. If one thing does not work, try another. In PPS websites, a lot of these experiments are grassroots community projects, which are the efforts of local inhabitants. However,

there is a scarcity of these small experiments and grassroots community projects in the redevelopment of South Luogu Lane Block.

Chapter 7 Recommendations

7.1 Actors, Interventions and Implementations

7.1.1 Actors

The regeneration of South Luogu Lane Block should encourage a diversity of actors and stakeholders to play an active and positive role in the process of urban policy establishment. According to experiences from previous Hutong redevelopment projects, the main actors include government officers, politicians, urban planners, designers, developers, local residents, and researchers. However, with little engagements of local residents or researchers, the current redevelopment plans and projects were mainly made by the municipality or developers. Different from other urban construction plan, Hutong redevelopment requires significant academic efforts of researchers studying on Hutong history, traditional culture and courtyard housing rehabilitation, as well as great involvements of local inhabitants for community revitalization. These are a big scarcity in the current projects and plans. This research indicates that researchers and professionals could assist government officers, politicians and planners in establishing urban policies and strategies for Hutong redevelopment. Local inhabitants are an essential part of traditional Hutong life and neighborhood identity. Therefore, the voice of local inhabitants should be heard in the urban policy to optimize Hutong renewal projects and revive traditional Hutong life. Besides, grassroots community initiations inspire urban planners and designers to come up with more creative ideas for Hutong redevelopment, which are beneficial to ensure these experiments and interventions going more smoothly.

7.1.2 Experiments and Interventions

Placemaking is the main approach to initiate experiments and interventions in Hutong redevelopment with the application of “Lighter, Quicker, Cheaper” strategy at the community level. These experiments and interventions include urban redevelopment policy, small urban design projects, grassroots community projects, neighborhood experiments and traffic management in Hutong pubic street space. The experiments and interventions are intended to deal with mixed traffic to create inviting walking environment and provide small good public places to generate vital street life.

7.1.3 Implementations

The implementation of South Luogu Lane Block redevelopment is divided into two categories. One is the redevelopment policy and strategy made by government officers and urban planners. The other is the small urban design experiment projects proposed by urban designers and local inhabitants. Based on the analyses and studies in the previous chapters, both municipality and urban planners should take more responsibility to invite local inhabitants and researchers to play an active role in the making and decisions of plans and projects. The recommended urban policies and small experiments in this thesis need cooperation from all the above actors. Citizen dialogue is a good way for local inhabitants and professionals to take an active part in the early stage of redevelopment planning. It is helpful to invite professionals and researchers as consultants in the whole process of Hutong redevelopment plan and Hutong life revitalization. Besides, politicians and urban planners should encourage grassroots community initiations for neighborhood revitalization and Hutong street life revival.

7.2 Redevelopment Policy and Strategy

7.2.1 Diversify Commerce Activities and Invite Local Business

East District Municipality office put forward a new policy in 2014 to adjust commercial activities in South Luogu Lane and invite diverse business activities, such as business clubs, catering and recreation, creative products, and culture and performances. This aims at a balanced and attractive commerce and business structure, that is bars and café (25%), costumes and decoration (25%), creative products and retail (35%), hotel (5%), catering (5%), and others (5%). However, the policy should try to encourage interesting local business and invite small business of local residents. Neighborhood central space should add more everyday life services and small business to meet the demand of local residents.

7.2.2 Design Shared Street Surface and Manage Parking

Pedestrianizing the whole block is not an optimal way for the South Luogu Lane

Block. Hutong network itself creates good environment for slow traffic and pedestrian movement. Different Hutong should have different traffic management strategy. South Luogu Lane has been fully pedestrianized now, and better bicycle parking management should aim to save street space and build more comfortable walking environment. For other more residential Hutong, shared street surface is an appropriate strategy to deal with the pedestrian movement, and bicycle and car traffic generated by local residents. Still, pedestrians have the priority in these residential Hutong. Besides, bicycle-parking management is another strategy to create more enjoyable walking environments for local residents.

7.2.3 Keep Original Residents and Local Culture

Some recent redevelopment projects in South Luogu Lane Block have paid significant attention to keep a certain percentage of original residents to remain and protect valuable traditional Hutong culture. The Municipality could help local residents in the redevelopment area to make a neighborhood redevelopment committee. This committee will represent the voice of local residents in the design of redevelopment projects, discuss appropriate strategies to attract original residents' return, and organize the arrangement of original residents and relative activities.

7.2.4 Create Public Street Space and Encourage Community Participation

The demand of tourists and local residents for public space and public life should be considered equally in the development of South Luogu Lane Block. Space for vital public street life could be a primary strategy when urban planners and designers are making redevelopment plans in South Luogu Lane Block. According to Gehl's public life study (2010), people need to have a stop and a different attraction every 500 meters when walking. Accordingly, a small square will be designed near the middle of South Luogu Lane as the main public space, and small street furniture will be added at Hutong side space to create small public space.

Wu (1999) suggests projects rather than plans for Hutong redevelopment. "Lighter, Quicker, Cheaper" strategy will be applied in the public sitting space design process. Experiments will be made to test small changes and figure out a proper way for space transformation. The plan should encourage local residents and community to make

small grassroots community projects to participate in this process for diverse street life. Besides, public private partnership could be a useful and proper strategy to create meaningful public street space and maintain high quality street environment for different users.

7.3 Small Urban Design Experiment Project

7.3.1 Green Sitting Space Project

Sitting space along streets plays a significant role in creating welcoming and inviting environments for vital pubic life and activities. Trees are essential elements to offer comfortable sitting space and to promote public street life in Hutong neighborhood. People prefer to gather and meet near trees or in the shade of trees in the neighborhoods. Trees and plants could be used to create comfortable and good sitting space when combined with various benches. There are a number of projects and designs about attractive street sitting space (See Fig. 7.1, Fig. 7.2), which could be good examples of Hutong green sitting space design with trees.

7.3.2 Green Bicycle Rack Project

Good design of bicycle racks provides space for bicycle parking and seating space at the same time (See Fig. 7.3). Artists, urban designers, neighborhood committee and local residents are invited in these bicycle rack projects to make experiments and possible transformations.

7.3.3 Exercise Facilities Projects

Small exercise facilities in the neighborhood Hutong will help to create a space for sports, meeting and social interactions. These small facilities could be located at the Hutong side space, existing parking space, and/or green spaces in the neighborhood.

7.3.4 Street Performance Project

Hutong space used to be a theatre for traditional craftsmen and street peddling. The street performance project aims to encourage and invite these craftsmen and street peddlers to give street performances and entertainment related to traditional Hutong

culture, which contributes to reinvent a vital traditional Hutong life and attract people to interact in the public street space. The space for street performance projects could be applied to the small square of the South Luogu Lane.

Figure 7.1 Trees and benches

Source: https://www.pinterest.com/pin/460774605603926039/, https://www.pinterest.com/pin/460774605603925903/

Figure 7.2 Trees and sitting space

Source: https://www.pinterest.com/pin/460774605603926208/, https://www.pinterest.com/pin/460774605603926187/

Figure 7.3 Bicycle rack and sitting space

Source: https://www.pinterest.com/pin/438186238720561781/, https://www.pinterest.com/pin/517562182153565451/

7.4 Limitations

These recommendations still have possible limitations during the implementation. One limitation is that citizen dialogue is still deficient in the Chinese urban planning and design process. Even though researchers and scholars are invited in Hutong redevelopment projects as consultants or planning makers in some cases, citizen participation is still missing in the establishment of Hutong renewal policy and the revitalization of Hutong public street life. The other limitation is unclear implementer for these small urban design experiments and projects. Different actors involved in these projects will have distinctive impact on the result of these interventions and experiments. The implementers could be the municipality, urban planners, developers, neighborhood committee or local inhabitants, which depends on the different projects and plans.

Reference

Akanbi, A. K., & Agunbiade, O. Y., 2013. Integration of a city GIS data with Google Map API and Google Earth API for a web based 3D Geospatial Application. *arXiv preprint arXiv:1312.0130*.

Appleyard, D., Gerson, M. S., & Lintell, M., 1981. *Livable Streets*. Berkely:.University of California Press.

Beijing Municipal Commission of Development & Reform (BMCDR), 2002. *Beijing Master Plan (2004 - 2020)*. [online]
Available at: http://www.bjpc.gov.cn/fzgh_1/csztgh/200710/t195452.htm [Accessed 10 July 2015].

Beijing Municipal Bereau of Statistics & Beijing Investigation Group of National Bureau of Statics of the People's Republic of China, 2015. *Beijing Statistical Yearbook 2014*. Beijing: China Statistics Press.

Broad N., 2011. *Stroget Street, Copenhagen --- The Busking Project Journey*. [online]
Available at: http://busk.co/blog/2011/09/stroget-street-copenhagen/ [Accessed 25 August 2015].

Broad N., 2014. *Busking: Creating a Place one Performer at a Time*. [online]
Available at: http://www.pps.org/blog/busking-creating-a-place-one-performer-at-a-time/ [Accessed 25 August 2015].

Commission for Architecture and Built Environment (CABE), 2003. *The Councilor's Guide to Urban Design*. [online] London: CABE (Published 1 November 2003)
Available at: http://www.designcouncil.org.uk/sites/default/files/asset/document/councillors-guide-to-urban-design.pdf [Accessed 22 July 2015].

Deng, Y., 2014. Beijing Urbanization Ratio. New Beijing Newspaper, [internet] 17 February.

Available at: http://www.chinanews.com/gn/2014/02-17/5842715.shtml [Accessed 1 September]

Gehl Arcitects (a), n.d. *Our approach*. [online] Available at: http://gehlarchitects.com/approach/ [Accessed 15 August 2015].

Gehl Architects (b), n.d. *Public spaces in Copenhagen --- A guide to public spaces in Copenhagen*. [online] Available at: www.akershus.no/file/.../091217_Cph_Guide%20(2).pdf [Accessed 25 August].

Gehl Architects (c), n.d. *Brighton & Hove --- Public Space Public Life*. [online] Available at: http://issuu.com/gehlarchitects/docs/issuu_448_brighton_and_hove_pspl [Accessed 24 August 2015]

Gehl Architects (d), n.d. *Paving the Way for City Change*. [online] Available at: http://gehlarchitects.com/cases/new-road-brighton-uk/ [Accessed 26 August 2015].

Gehl, J. (2010). *Cities for people*. Washington, D.C: Island press.

Gehl, J., & Svarre, B., 2013. *How to study public life*. Translated from Danish by Karen Ann Steenhard. Washington, D.C: Island Press.

Gemzøe, L., 2001. Are Pedestrians Invisible in the Planning Process? Copenhagen as a Case Study. *Proceedings of Australia: Walking the 21st Century*. [online] Available at: http://walk21.com/papers/perth01arepedestriansinvisible.pdf [Accessed 25 August 2015].

Groat, L., & Wang, D., 2002. *Architectural research methods*. New York: John Wiley & Sons.

Guo, X., 2014. *Removal and Redevelopment of Qianmen*. [online] (Updated 30 October 2014) Available at: http://www.21ccom.net/book/story.php?id=11196

[Accessed 6 August 2015].

Guo, Z., 2013. Residential street parking and car ownership: a study of households with off-street parking in the New York City region. *Journal of the American Planning Association*, 79(1), pp. 32-48.

Hassenpflug, D., 2010. *The Urban Code of China*. Translated from German by Mark Kammerbbauer. Basel: Birkhäuser GmbH.

Hillier, B., & Hanson, J., 1984. *The social logic of space*. New York: Cambridge University Press.

Hillier, B., 1996. *Space is the machine: a configurational theory of architecture*. Cambridge (UK): The Press Syndicated of the University of Cambridge.

Hillier B, 2009. Studying cities to learn about minds: some possible implications of space syntax for spatial cognition. *Environment and Planning B: Planning and Design 2012*, (39), pp.12-32.

Hillier B., Yang T., & Turner A., 2012. Normalizing least angle choice in Depthmap and how it opens up new perspectives on the global and local analysis of city space. *Journal of Space Syntax,* 3(2), pp.155-193.

Huang, H., 1991. Experiences and Lessons from Beijing Xiaohoucang Redevelopment Project. *Journal of Architecture*, (7), pp.2-7.

Jacobs, Allan B., 1993. *Great Street*. Cambridge, MA (US): MIT Press.

Jian, S., 2008. *The Research on the Ju'er Hutong Residential Mode*. M.Arch. Wuhan: Wuhan University.

Jiaodaokou Sub-district Office (JSO), n.d. *Introduction of Jiaodaokou*. [online] Available at: http://jdkjd.bjdch.gov.cn/n5687274/n5724008/n5728996/n9934381/9946774.html [Accessed 8 July 2015].

Jing, Y. 2015. Nan Luogu Xiang lost its traditional culture. *Beijing Evening News*,

[internet] 6 August.
Available at:
http://politics.people.com.cn/n/2015/0806/c70731-27422040.html
[Accessed 7 August].

Johansson, R., 2007. On case study methodology. Open house international, 32(3), pp.48-54.

Li, J. & Zhao, X., 2015. Shichahai and Nan Luogu Xiang failed to be national historical and cultural area. *Legal Newspaper*, [internet] 24 July. Available at: http://news.sohu.com/20150724/n417455073.shtml [Accessed 24 July 2015].

Li, N. et al., 2006. *The Investigation and Research Report on present situation of Hutong in Beijing Old City*. [online]
Available at:
http://wenku.baidu.com/view/8f33f71a6bd97f192279e939.html [Accessed 5 August 2015].

Li, T., & Zhang, E. eds., 2009. *Historical Stories of South Luogu Lane*. Beijing：Beijing Press.

Li, Y. et al., 2015. Understanding tourist space at a historic site through space syntax analysis: The case of Gulangyu, China. *Tourism Management*, 52, pp.30-43.

Liu, M., 2003. *Practical Research for the Renovation of the Southern Part of the Beijing Old City --- The Method of Balancing the Cons. and Pros. in Design*. M. Eng. Beijing: Tsinghua University.

Lu, X. & Cui, D., 2010. Traffic Optimization in Urban Historical Block --- A Case Study of South Luogu Lane Block in Beijing. *Journal of Guangzhou Police College*, 20(2), pp.46-48.

Macasek, J. S., 2010. *From Hutong to Hostels: Cultural Tourism and the Process of Commodification in Beijing.* B.Phil. Pittsburgh: University of Pittsburgh.

National Bureau of Statistics of the People's Republic of China (NBSPRC), 2015.

China Statistical Yearbook 2014. Beijing: China Statistics Press.

National Standards of the People's Republic of China --- Code for Classification of Urban Land Use and Planning Standards of Development Land. 2011. SI 2011/GB 50137 – 2011, Beijing: China Architecture & Building Press.

Okaden H., 2014. New Road, Brighton --- A Shared Space. [online] Available at: http://thelandscape.org/2014/09/08/new-road-brighton-a-shared-space/ [Accessed 26 August 2015].

Pang, J. & Shen, Q. eds, 2012. *Tabulation on the Population Census of Beijing Municipality, Town and Sub-district Volumes*. Beijing: China Statistics Press.

Preston, B., & Wilson, M. W., 2014. Practicing GIS as Mixed Method: Affordances and Limitations in an Urban Gardening Study. *Annals of the Association of American Geographers*, 104(3), pp. 510-529.

Project for Public Spaces (PPS) (a), n.d. *What is Placemaking*. [online] Available at: http://www.pps.org/reference/what_is_placemaking/ [Accessed 15 August 2015].

Project for Public Spaces (PPS) (b), n.d. *What Makes a Successful Place*. [online] Available at: http://www.pps.org/reference/grplacefeat/ [Accessed 15 August 2015].

Project for Public spaces (PPS) (c), n.d. *Eleven Principles for Creating Great Community Places*. [online] Available at: http://www.pps.org/reference/11steps/ [Accessed 15 August 2015].

Project for Public spaces (PPS) (d), n.d. *Ten Strategies for Transforming Cities and Public Spaces through Placemaking*. [online] Available at: http://www.pps.org/reference/ten-strategies-for-transforming-cities-through-placemaking-public-spaces/ [Accessed 15

August 2015].

Project for Public Spaces (PPS) (e), n.d. *Strøget*. [online]
Available at: http://www.pps.org/places/streets/stroget/ [Accessed 25 August 2015].

Ren, X., 2013. *Urban China*. Cambridge (UK): Polity Press.

Ruiren (a), 2012. *Population and Living Space Per Capita in Beijing*. [online] (Updated 6 December 2012)
Available at: http://blog.sina.com.cn/s/blog_4aba1d6f010198jv.html [Accessed 5 August 2015].

Ruiren (b), 2012. *Hutong in the Xibeizhimen*. [online] (Updated 17 June 2012)
Available at: http://blog.sina.com.cn/s/blog_4aba1d6f010150yl.html [Accessed 5 August 2015].

Sridhar, R., et al, 2011. Automatic measure of landscape diversity from Google earth imagery using open GIS MapWindow integrating with Mapobject using VB. *Humanities, Science & Engineering Research (SHUSER), 2011 International Symposium on*, IEEE, pp. 144-148.

The State Council of the People's Republic of China (SCPRC), 2014. *National New-type Urbanization Planning (2014-2020)*. [online] (Updated 17 March 2014)
Available at:
http://politics.people.com.cn/n/2014/0317/c1001-24649809.html [Accessed 8 July 2015].

Turner A., 2004. *Depthmap 4 --- A Researcher's Handbook* , Bartlett School of Graduate Studies, UCL, London. [Online] (Updated 15 September 2004)
Available at: http://discovery.ucl.ac.uk/2651/
[Accessed 27 July 2015].

Wang, H., 2012. Demolish the true buildings and rebuild the fake ones in Beijing. *Southern Metropolis Weekly*, [internet] 7 February.
Available at: http://www.nbweekly.com/news/special/201202/28883.aspx

[Accessed 6 August].

Wang, H., 2015. Keeping the old city landscape and improving residents living. *Beijing Daily*, [internet] 19 April.
Available at: http://bjrb.bjd.com.cn/html/2015-04/19/content_272899.htm
[Accessed 24 July 2015].

Wang, Y., 2003. Relook Nanchizi. *Southern Weekly*, [internet] 23 October.
Available at: http://www.southcn.com/weekend/city/200310230051.htm
[Accessed 6 August 2015].

Wang, Z., 2013. Tourist amount reaches 20,000 per day in South Luogu Lane. *Beijing Daily*, [internet] 5 August.
Available at: http://travel.163.com/13/0805/15/95HBP1H400063KE8.html
[Accessed 24 July 2015].

Wikipedia, n.d. *Copenhagen*. [Online]
Available at: https://en.wikipedia.org/wiki/Copenhagen [Accessed 25 August]

Wu, L., 1999. *Rehabilitating the old city of Beijing: a project in the Ju'er Hutong neighbourhood*. Vancouver: UBC press.

Whyte, W. H., 1980. *The Social Life of Small Urban Spaces*. Washington, D.C.: Conservation Foundation

Yang, B., 2006. The Loss and Revivial of Urban Space. *Urban Planning Forum*, (6), pp.9-15.

Zhu, T., 2013. *The publicity of public space in Beijing Old City --- Take Zhuzhonghutong, Qianmachanghutong and Houmachanghutong as examples*. M.Arch. Beijing: Tsinghua University.

Annex 1: General information and data of Four Communities in South Luogu Lane Block

Community	Household	Population	Area/ha	Contained Hutong
Ju'er	2042	6096	11.85	Ju'er Hutong, Xiaoju'er Hutong, Houyuan'ensi Hutong, South Luogu Lane (northern segment)
South Luogu Lane	2843	8491	25.38	Qian Yuan'ensi Hutong, Qinlao Hutong, Bei Bingmasi Hutong, Dong Mianhua Hutong, Banchang Hutong, Chaodou Hutong
Fuxiang	2305	4911	26.90	Mao'er Hutong, Yu'er Hutong, Suoyi Hutong, Fuxiang Hutong, Guaibang Hutong
Gulouyuan	3678	9479	20.16	Jingyang Hutong, Shajing Hutong, Heizhima Hutong, Qiangulouyuan Hutong, Hougulouyuan Hutong, Fangzhuanchang Hutong, Nanxiawazi Hutong,

Source: Jiaodaokou sub-district office website (http://jdkjd.bjdch.gov.cn/n5687274/n5724008/n5728996/n9934381/index.html), area data from geometric calculation in ArcGIS

Annex 2: Hutong section data and traffic condition in South Luogu Lane Block

NO.	Name	Formation Time	Lenghth/ m	Width/ m	Traffic
1	South Luogu Lane	1	786	8	C/B/ P
2	Xiaoju'er Hutong	3	158	3	B/ P
3	Shoubi Hutong	1	360	2	B/ P
4	Ju'er Hutong	1	438	6	C/B/ P
5	Houyuan'ersi Hutong	2	444	6	C/B/ P
6	Qianyuan'ersi Hutong	1	449	6	C/B/ P
7	Qinlao Hutong	1	447	6	B/ P
8	Beibingmasi Hutong	1	446	6	B/ P
9	Dongmianhua Hutong	1	448	6	C/B/ P
10	Banchang Hutong	2	457	6	B/ P
11	Chaodou Hutong	1	463	5	B/ P
12	Fuxiang Hutong	1	225	5	C/B/ P
13	Suoyi Hutong	1	295	3	B/ P
14	Yu'er Hutong	1	343	5	B/ P
15	Mao'er Hutong	2	585	7	C/ B/ P
16	Jingyang Hutong	1	292	5	B/ P
17	Shajing Hutong	1	294	6	B/ P
18	Fangzhuanchang Hutong	1	313	7	C/B/ P
19	Heizhima Hutong	1	265	5	B/ P
20	Qiangulouyuan Hutong	1	261	6	B/ P
21	Nanxiawazi Hutong	2	276	5	B/ P

* Formation period: 1 – Yuan and Ming Dynasty, 2- Qing Dynasty and Republican period, 3 – People's Republic of China period

* Traffic type: C – Car, B – Bike, P - Pedestrian

Note: length and width data from Historical Stories of South Luogu Lane (Li & Zhang, 2009), traffic type from observation at 10:00 – 17:30 in 23 May in 2015 in South Luogu Lane Block

Annex 3: Bus Line inforamtion in South Luogu Lane Block

Bus station		Location	Bus line
1	**Gulou**	Diwai Street	5, 60, 82, 107, 124, 635, N10(I), N10(O), N2
2	**Dianmenwai**	Diwai Street	60, 82, 107, 124, N10(I), N10(O), N2
3	**Di'anmen East**	Di'anmen East Street	3, 13, 42, 60, 118, 612, 701, N21, N3
4	**Luogu Xiang**	Di'anmen East Street	3, 13, 42, 60, 118, 612, N21, N3
5	**Beibingmasi**	Jiaodaokou South Street	104, 108, 113, 127, 612, N18, N34
6	**Jiaodoukou South**	Jiaodaokou South Street	104, 108, 113, 127, 612, T11, N18, N34
7	**Xiaojingchang**	Gulou East Street	107, 124, N10(I), N10(O)
8	**Baochao Hutong**	Gulou East Street	107, 124, 635, N10(I), N10(O)