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TRIUMPH OF PEDESTRIAN:

Empirical study on the morphology of shops in Beijing's central city area in 2005-2015

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ABSTRACT

In the last decade on-line shopping had great impact on Chinese people's every day life. How this transformation may influence the spatial distribution or types of shops in the real urban space is a major question. By comparing the morphology of shops in 2005 with 2015 based on detail field work survey in 94 urban blocks inside the 2nd ring road of Beijing, the data suggest that in the last decade the total number of shops on the street increased rather than decreased. At neighbourhood scale, this paper focuses on three case areas: Dongsi, Xisi, and Lama temple to study the changes of different types and the detail distribution of these shops. The result shows that with the development of information technologies the emerging shops are mostly service-based economies such as restaurants and pubs, or retails but more oriented to local people and tourists. Furthermore, the city-scale shops on the super grids retains its vitality. They also tend to penetrate into the local streets inside the urban block. On the other hand, the morphology of local shops is affected by the visibility from super grid and the syntactical connection of these streets in its local surroundings.

KEYWORDS

Morphology of shops, pedestrian, information technology, Space Syntax.

1. INTRODUCTION

Shopping behaviour in China has been changed profoundly based the rapid development of information technologies. Benefiting from relatively cheap delivery cost and tax-free policy, online shopping has become an indispensable part in Chinese people's daily life. However, it is also accused to play a negative role on the shops in real urban space.

Even before the spread of internet and smart phones, there were debates among scholars back to 1990s on the impact of informational technologies. At the beginning some scholars believed that they will make the geological space irrelevant (Graham, 1998). However, later empirical studies in the beginning of 20th century suggests that the informational technology may have a two-fold impact: on the one hand it may help the decentralization of certain economic sectors such as manufacture into suburbs or smaller towns. On the other hand, it also requires higher

level of concentration of other type of sectors such as management and advanced services Saskia Sassen's research on global cities is one example (Sassen,2001).

In China, recent researches also focus on this transformation (Liu & Zhen, 2004). Prof. LuZi's research on the online group-buying behaviour in Shijiazhuang (provincial capital of Hebei) suggests that the online business rely on even higher degree of spatial concentrations in real urban space (Lu et al, 2013). However, in his research the centre of concentration is defined by distribution of shops based on the metrical distance rather than an urban structure which could explain the underlying spatial logic between movement and urban economies.

For space syntax researches, the influence of urban structure on the spatial distribution of shopping functions is a well-studied issue for decades (Hillier et al, 1996, 1999, Siksna, 1997, Scoppa & Peponis,2015). Recent development of information technologies has brought vast open data resources. Using Baidu Point Of Interest (POI) data, Yang Tao has studied the spatial distribution of various types of urban functions in Beijing's metropolitan area. His research not only illustrates different types of functions depends on different scales of accessibility, but also discovered more detail properties such as cost or style of restaurants have different spatial pattern (Yang, 2015). Other than providing vast yet detailed location data of shops, the new information technology could also render the use of these shops visible. Using number of reviews and check-in data, Yao Shen's study in Tianjin also demonstrate the value of space syntax model in analysing the spatial distribution of different types of shops (Shen and Karimi, 2016) .

For morphological research on the changes of shops, because these new data sets is only available from 2010s, and the resolution and accuracy of early data set is poor. It is very hard to compare data from different periods. There is a lack of morphological study based on detailed and consistent data of shops for one city.

In 2005-2008, the author did a detailed survey on the distribution of shops on each the street inside the third ring of Beijing. From 2013 to 2015, we did another survey in the same area using street view map and fieldwork. Considering 2005 to 2015 is a period that on-line shopping has a dramatic booming development, this comparative study should be able to show clearly the impact of new information technologies. Meanwhile, although the road network at large metropolitan scale and the metro system has been developed in last decade, Beijing's central area road network has not changed too much. Therefore choosing the central area of Beijing as a case could study the morphology of shops in a relatively stable spatial condition.

The main research question of this paper is: what is the morphological logic for different types of shops in the central area of Beijing in the last decade? To answer this question, this research is divided into two parts based on the scales: at city scale, a statistical analysis will be presented to illustrate the changing number of shops on the super grid and inside each super blocks. The preliminary result shows that the total number of shops inside the 2nd ring road are increasing instead of decreasing. Furthermore, the majority of emerging shops are located inside the super block rather than on the super girds. At local scale, three case areas are selected for more detailed analysis, based on Baidu street view map, the new shops are divided into 30 types according to the commodities or service they provide. For each case the distribution of shops is analysed based on an integrated index of accessibility and visibility from super grid (space for vehicle) and the local street pattern (space for pedestrian).

2. DATA AND MODEL

This research focuses on the urban area inside Beijing's 2nd ring road. The main data set is the location and number of shops in 2005-2008 and 2013-2015. The data collected between 2005 and 2008 is based on fieldwork mapping of all shops on each streets inside the 3rd ring road. The area covered 160 square kilometres. These shops were classified into three types initially according to the types of commodities or services. Metropolitan scale shops are those wholesale centres of specific commodities, shopping malls, hobby shops, etc. Local scale shops are those local food markets, street venders, clubs (Qipaishi), grocery stores, etc. All other

shops are classified as middle scale shops. For the clarity and convenience of this research, the metropolitan and middle scale shops are all re-classified as city-scale shops.

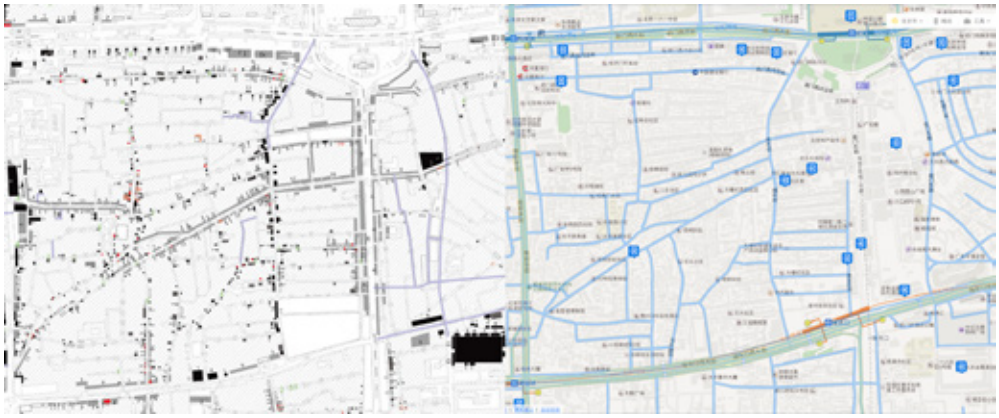

Figure 1 - the date of shop distribution from fieldwork (left) and baidu street view (right).

Between 2013 and 2015, our team did another round of survey in the same area using the Baidu street view map and fieldwork. With the help of street view, the detail types of shops could be recorded to compare with the old data.

Figure 1 shows the combined data based on fieldwork and the street view map. Constraint by the accessibility of car used by Baidu Company to take photos, there are always some streets which could not be reached. This paper will demonstrate that the changes inside those 'invisible' streets are also interesting research subject because it could reveal the spatial expansion of shops in last decades.

On this stage the main research area is within the 2nd ring road. To give enough buffer zone, the spatial model covers all streets extracted from Baidu OSM (highest resolution which includes minor streets inside the neighbourhoods) within 5th ring. To weight the regional scale movement the model also includes satellite towns such as Changping, Shunyi, Mentougou, etc.

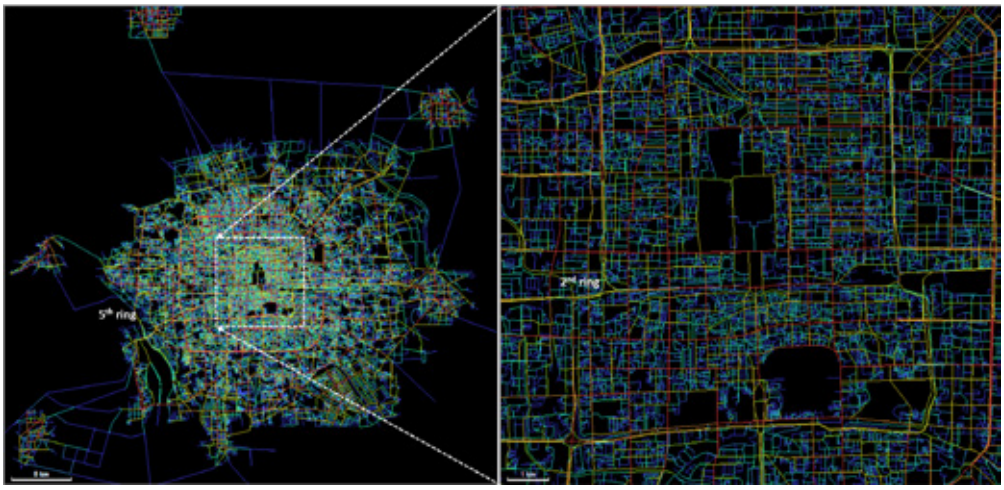

Figure 2 - the range and resolution of space syntax model used in this research.

These towns are connected with Beijing city by simplified highways (see figure 2). The model of 2015 and 2005 are constructed in the same range and resolutions.

3. CITY-SCALE ANALYSIS

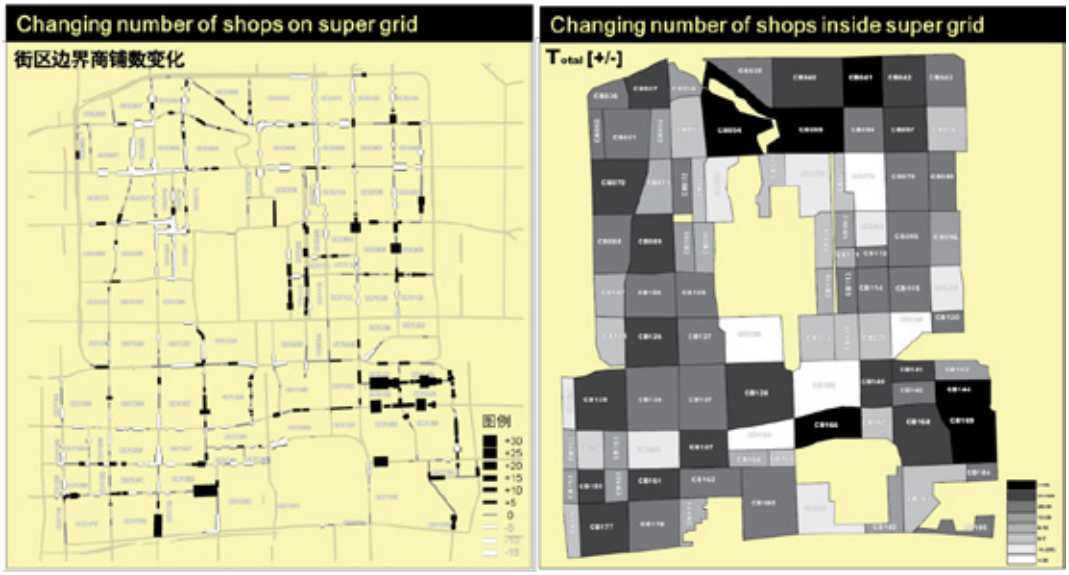

Figure 3 - changing number of shops on the super grid (left) and inside the super block (right)

Based on the author's previous research on the spatial pattern of local centres, the urban area inside the 2nd ring road could be divided into 94 super blocks based on multiple factors ranging from the width of the road, the number of bus lines and syntactical values [11].

Figure 3 shows changing number of shops on the super grid and inside the super block in between 2005 and 2015. Comparing the data between these two years, on the super grid there are 2558 new shops opened and 1257 shops closed. Inside the super block there are 5143 shops opened and 2267 shops closed. Both number indicates that despite of the booming on-line economy in the inner city of Beijing there is a clear growth of shops in real urban space in the last decade. This statistical result also indicates that the changing number of shops inside the super block plays a more important role than those on the super grid. It accounts for 68.86% of total increase. Even considering the total street length of super grid itself (18.706km) and the local streets inside super block (38.175km). The growth of shops inside the super block still outnumber that on the super grid.

When focusing on the changing number of shops inside the super block, there are only 13 out 94 super blocks have less shops in 2013-2015 comparing with 10 years ago. Among these 13 blocks, Qianmen (CB139), National Opera Center (CB128), Tiantannanli (CB181) have less shops because of the urban redevelopment process. After excluding the impact of redevelopment, there are only 10.6% of the super blocks has decreasing shops in the last decade. On the other hands, there are also some areas that has substantially higher number of new shops opened in the last decade. The Huashi area (CB141-144) and Xizhaosi area (CB169) are such examples because of the housing redevelopment projects. Figure 4 shows the dramatic changes in the last ten years. This area proved to have great resilience under this impact and the shops and street life quickly recovered.

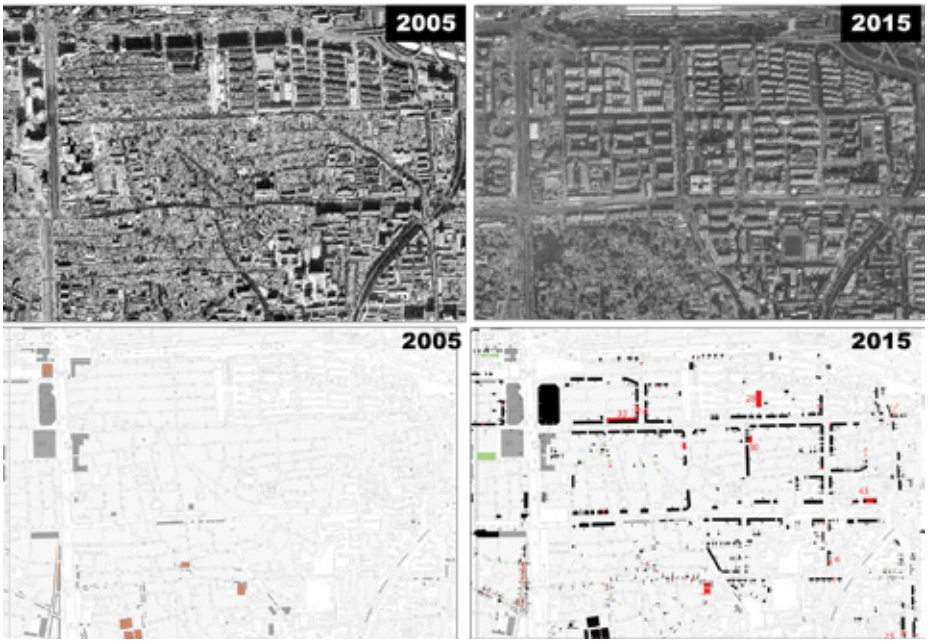

Figure 4 - housing redevelopment and the subsequent shopping revitalization in Huashi and Xizhaosi area between 2005 and 2015 (black and red boxes are new shops opened in the last decade

Is there a general spatial pattern for this change? In figure 5 the left image shows the metrical distance from super grid. The blue color indicates longer distance. From the statistics most new shops and closed shops are located 0-300 away from the super grid. However, because average size of super grid is 500-600 meters by 500-600 meters, so this result does not show a clear logic. The image on the right shows the topological distance from the super grid. One topological step means 90 degree of angular change between two streets. Considering the fact that small angular changes are hard to be sensed by moving people, a threshold is set on 13.5 degree which is 0.15 steps. According to the results, shops located on the super grid directly (<0.15 step from the super grid) accounts for more than one third of the new shops and closed shops. The street connected to the super grid (0.15-1.15 step) accounts for almost 50% of the changes. This result suggests that although the super grid support higher flow volume, the growth pattern of shops inside the super block does not affected by distance from the super grid but rather by angular turns. It is not suffered from distance decay but rather topological decay.

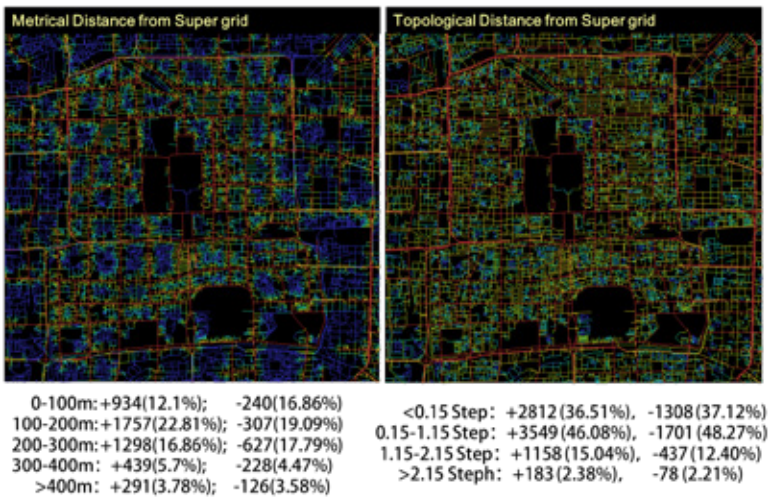

Figure 5 - Changing number of shops based on metrical distance (left) and topological distance (right) from the super grid.

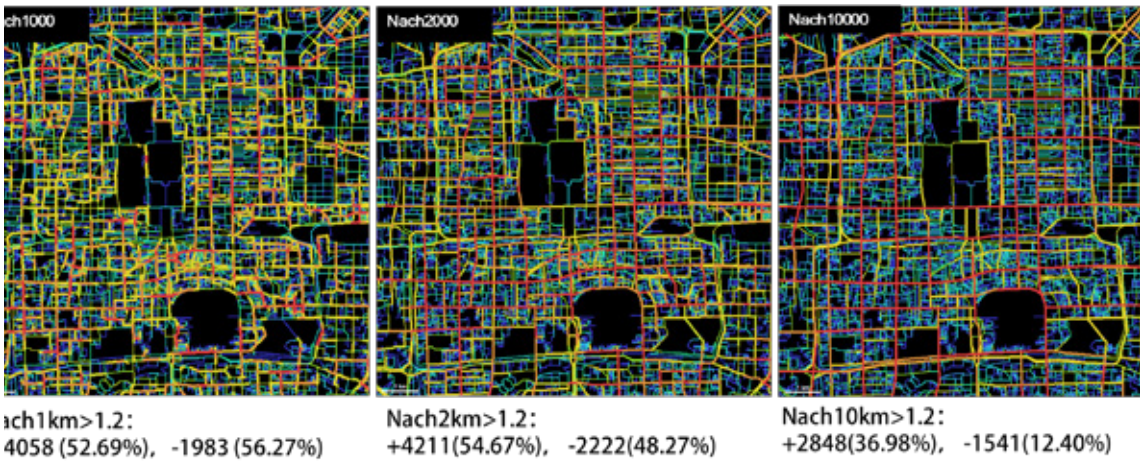

Figure 6 - different scales of NACH analysis and their relationships with the emerged (+) and disappeared (-) shops.

To sum up, this preliminary analysis reveals a general pattern of changes happened in the last decade: most changing shops are located inside the super block on those street directly visible from the super grid (about 1 step). Although on this stage it is too early to state that the on-line shopping can have positive influence on the shops in real space, it is clear that in the central area of Beijing the shops are still expanding in the last decade when the virtual economy is booming.

Is there any difference between city-scale shops and local-scale shops inside the super block? Figure 6 shows the numbers of city-scale and local-scale shops emerged in the last decade within each of these 94 super blocks. As a result, Nanluoguxiang (CB055), Lama temple (CB041), Xizhaosi(CB169) and southeast corner of Huashi(CB144) have more than 100 city-scale shops emerged. Qianmen-dashila(CB138), Xizhaosi(CB168 and CB169), southwest corner of Xuanwumen(CB136) and Xintaicang(CB057) have large number of local-scale shops emerged. There is little correlation between the increase of city-scale and local scale shops inside the super blocks (R square value 0.0684). This result indicates that the changing pattern of city and local scale shops might follows very different spatial logics. In later part of this paper we will explore this detail in three selected cases.

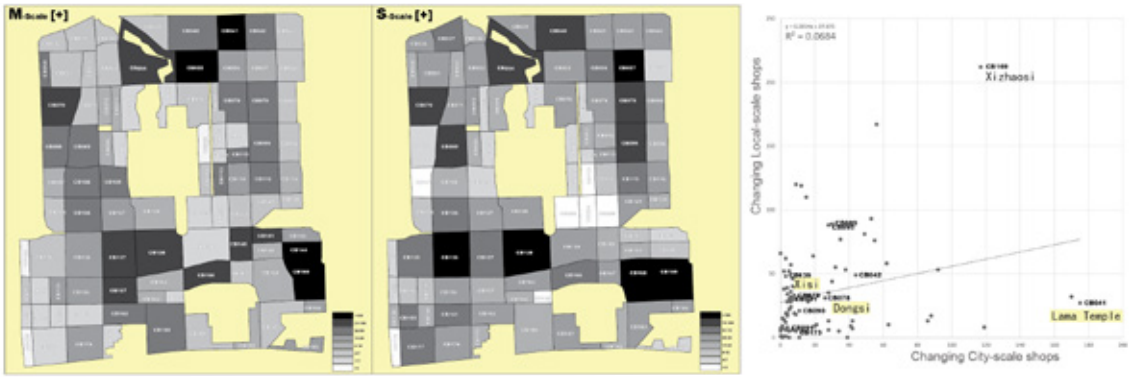

Figure 7 - changing number of city-scale (left) and local-scale (middle) shops inside 94 super blocks.

From the scatterplot in figure 7, three case areas are highlighted: Lama temple (CB041,CB042) is an area with booming commercial functions (City-scale shops plays a leading role); Xisi (CB071,CB072,CB073,CB089,CB090,CB091) is an relatively stable area; Dongsi(CB078, CB094) is an area suffering declining from 1990s. Xizhaosi area (CB169) is also a remarkable cases which local shops play a leading role. However, as mentioned before this area benefited a lot from the massive housing redevelopment so it is not a representative case. In the next part of the analysis these three cases will be further studied.

Before zooming into these three cases, it is necessary to look at how city scale movement network changed during these ten years. This may show if the changing number of shops of each three cases in general could be explained by the change in spatial structure.

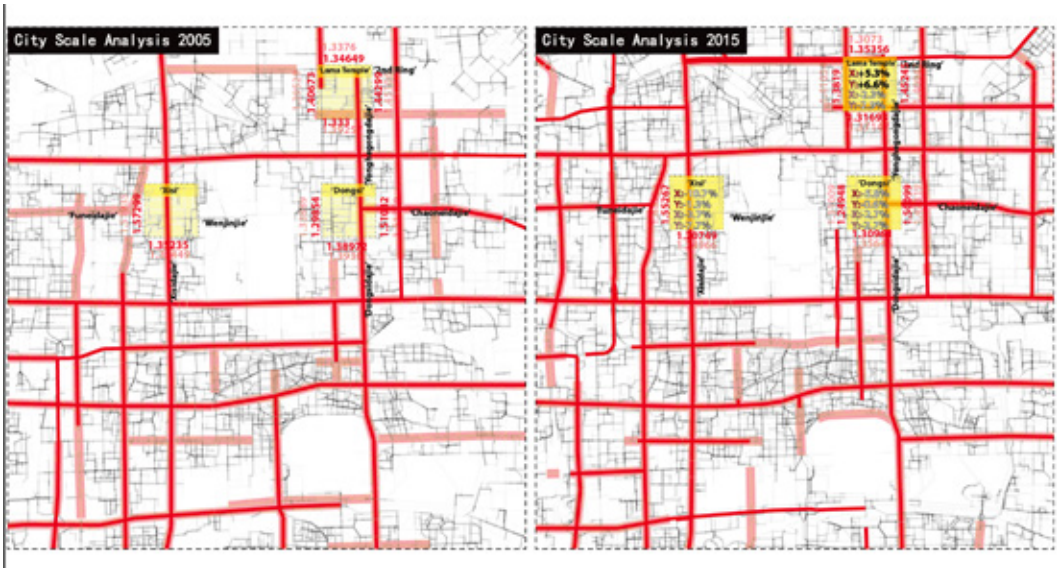

Figure 8 - comparative study of the main road structures (Top 5% NACH R50km and NACH R10km values) in Beijing between 2005 and 2015 in three case areas (highlighted in yellow).

In figure 8, the top 5% of the street segments with high NACH R50km values are presented as red thin lines, top 5% NACH R10km is presented as thick pink lines. These two values indicate the through movement potential of 50km and 10km radii respectively for vehicles. The former could be understood as the regional or metropolitan scale connection. The later could be understood as the city scale connection. The NACH R1km which illustrates the distribution of local movement within 1km radius. It is shown as grayscale lines in the background, the darker the higher value. This value could be understood as the local movement potential for pedestrians. Comparing the morphology of large scale urban movement networks, there is a clear tendency that it evolves towards a more regular orthogonal super grid pattern. In these 10 years, although there is seemingly little changes in the central city of Beijing, some minor interventions on the road network (connecting the dead-ended streets, extending the main roads, etc.) still can affect the large scale structure to some extent. As a result, the city-scale centre becomes more integrated which could possibly explain the increase number of shops for most super blocks. However, the through-movement potential for main individual main streets may decrease because a regular grid structure can provide more options. For example, the main streets in Dongsi, Xisi and Lama temple area are also decreasing in NACH R10km. But when we look at the NACH R50km, due to the extension of airport highway to the 2nd ring in southwest direction, Lama temple areashows a clear increase: 5.3% for the roads running east-west, 6.6% for the roads running south-north. Xisi area retains its commercial vitality because the north-south main road (Xisidajie) remains relatively stable (-1.3%), although the east-west main road (Wenjinjie) drops dramatically (-10.7%). Dongsi area continues to decline because it has decrease NACH values in both two directions of the main roads, -5.9% in north-south, -8.6% in east-west. Future study will be focusing on analyse more case areas, but on this stage the city (or regional/metropolitan) scale connection of super blocks could explain the changing number of shops to certain extent.

Except for the road structure, another change in movement network is the development of metro system (see figure 9). In 2005 Beijing has opened three metro lines: Line 1, Line 2, and Line 13. Metro line 5 is opened in 2007. Line 4 is opened in 2009. Line 6 is opened in 2013. For our three cases, Lama temple is on line 2. And later became an interchange station of Line 5 and 2.

Dongsi is a station on Line 5 and later became an interchange station of Line 5 and Line 6. Xisi is a station on Line 4. According to the entry/exit data of metro stations in 2014, the average number of daily passengers coming in and out of Lama temple station is 51710, Dongsi is 38383, Xisi is 22949. Clearly, Lama temple benefits most from the metro system developed in the last decade.

Figure 9 - the passenger data of Beijing Metro system in 2014. Black lines were opened before 2005. Red lines were opened after 2005. The size of circle stands for the exit/entry data of stations. The thickness of lines stands for the volume of flow between two stations

4. LOCAL-SCALE ANALYSIS

4.1 DONGSI CASE

This part of the research will compare the changing number and types of shops in three case areas. Because the data in 2005 do not have detail classification of types, this research can only include detail types for those shops emerged in 2015. Unfortunately for those shops changed its types or upgrade from local-scale to city-scale is omitted. It means this research only focuses on those changes from residential or other land uses into commercial land use or vice versa. In fact, commercial functions in city are very vibrant, in one or two years they may change from retails to restaurants. Furthermore, a street with large number of shops that are changing their types of business can be a sign of either processes, increasing commercial opportunities or declining. Therefore, changing land uses which is a slower process can represent the commercial vitality in a stable way.

Let us start with a declining case, Dongsi area. Figure 10 shows the case of Dongsi which suffered a contiguous declining since 1990s. Dongsi used to be one of the most popular shopping centre in the last century. However, due to the rapid urban development, the importance of Chaofudajie (east-west main road) as city-scale movement network were substituted by Changandajie and PingAndajie gradually. As mentioned in early part of this paper, the main roads in both directions are reduced substantially in the last decade. In fact, Dongsi is top one declining case inside the 2nd ring road after excluding the influence of redevelopment project in other areas such as Qianmen. Even though, in figure 10 one still can see some street segments in this area have new shops.

In the bar chart in figure 10, 30 types of shops are listed. For the total 155 new shops, 85 of them are retails and 70 are service based shops. The major type is fashion (dressing) store. In the last 20 years fashion is the main shopping attraction of Dongsi area although it is kept declining.

The second and third type are the restaurant and local groceries respectively. In general, the retail-based shops still account for 55% of the total number of new shops, 10% more than that of the service-based shops.

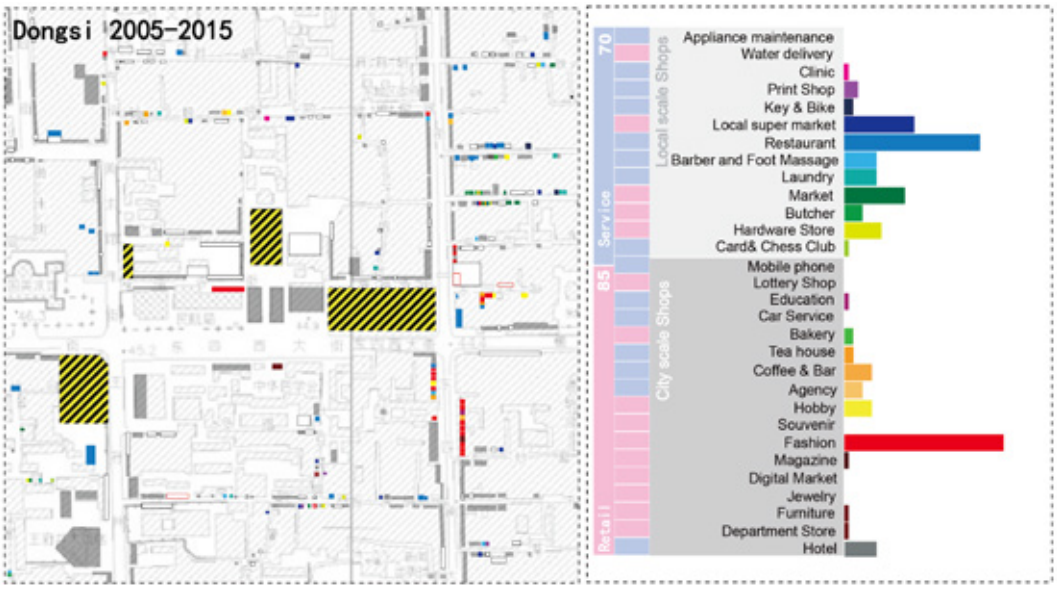

Figure 10 - the detail types of shops emerged from 2005 to 2015 in Dongsi area.

This research is focusing more on the distribution pattern of those shops rather than the statistical fact. The map on the left side of figure 11 shows changing types of shops (city and local) on this spatial context. The purple arrows and numbers stand for the location and number of new city-scale shops. The blue arrows and numbers stand for the location and number of new local-scale shops. The white number with black edge shows the decreased number of shops. The thickness of purple line stands for the value of NACH R50km. The grayscale lines stands for the value of NACH R1km. From this map, a general spatial pattern could be described as: 1,most city-scale shops tends to penetrate into the local street from the super grid. The only growth on the super grid itself located in the intermediate space of metro station. 2, the local shops also tends to emerge on where the local street meet with the super grid. Additionally, some local shops tens to emerge deep inside the super block when these streets are of high NACH R1000 value.

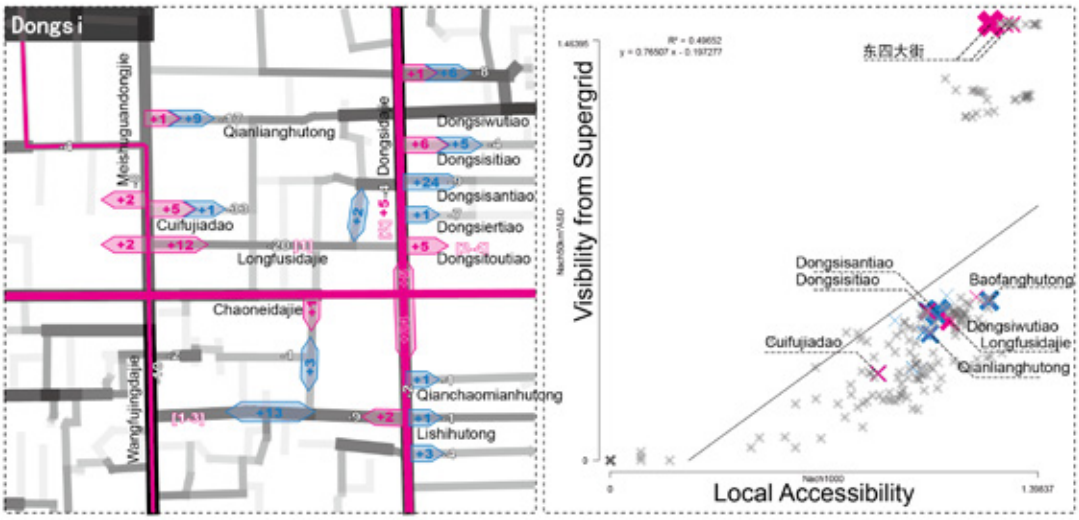

Figure 11 - spatial analysis on the distribution of emerging shops in Dongsi

This pattern observed could also be visualised in a scatter plot which shows the visibility and accessibility of super grid in Y-axis and local accessibility in X-axis. Local Accessibility is measured directly using NACH R1000 value. Visibility and accessibility value is an integrated measurement of the value of NACH R50km on the super grid multiply with the angular depth (plus one) from super grid. By definition this index value could be understood as measuring the permeability of the area. In this scatter plot each crossing stands for each street segments in map. The thickness of lines in crossing stands for the number of shops emerged. The colour stands for the types of shops (city or local scale). As the result shows most streets with more increased number of shops a grouped on the middle-right area. The top-right area are the super grid segments. This result mean that most of this street segments with increased number of shops are of high local accessibility and very easily visible from the super grid. Cuifujiadao is an exception in this case because the west end of Longfusidajie is controlled by gate which only allows pedestrian to pass. Therefore many people turn to Cuifujiadao as alternative exit of this area.

4.2 XISI CASE

Xisi is a relative stable case considering the total number of changing shops. However, its balance is achieved by an increase of local-shops and decrease of city-scale shops. This area is known as the wholesale centre of electronic products and jewelleries for tens of years. Figure 12 shows the changing types of shops in Xisi area. Not surprisingly, the leading sector of growth is the local market (Xiaomaibu) and restaurants. For the city-scale retails, a few jewellery stores and digital markets also opened in some local streets connect to Xisidajie (North-South Main Street). While the east-west main street, Fuchengmenneidajie shows a clear sign of declining as a result of dropping NACH values of large value as mentioned before. In general, retails in this area still account for more than 59% of total increased number of shops. Service-based shops account for less than 41%.

Figure 12 - the detail types of emerging shops from 2005 to 2015 in Xisi area.

This distribution of these emerging shops shows a very similar pattern with the case of Dongsi. In most streets shops are emerging on where the local streets meet the super grid, which could be described as a seepage pattern. Dagaibanghotong turns to be an example of concentration of local shops only, which is relative far from the super grid. In the scatter plot, because some street such as Xihuangchenggenbeijie and Fuchengmenneidajie are of very low NACH R50 values. The integrated index of visibility and accessibility from super grid are also substantially lower than normal super grid main street such as Xisidajie. As a result in the scatter plot these 'weak' super grid streets forms a cluster between the majorities at bottom and the ones at top. On these 'weak' super grid streets the new shops emerged mainly on those street segments with relative low local accessibility. It is not a preference but simply because other streets at these level have been already occupied. For most local street inside the super block. The very same pattern with Dongsi appeared again: the streets of high local accessibility and relative high integrated index can support more emerging shops in the last decade.

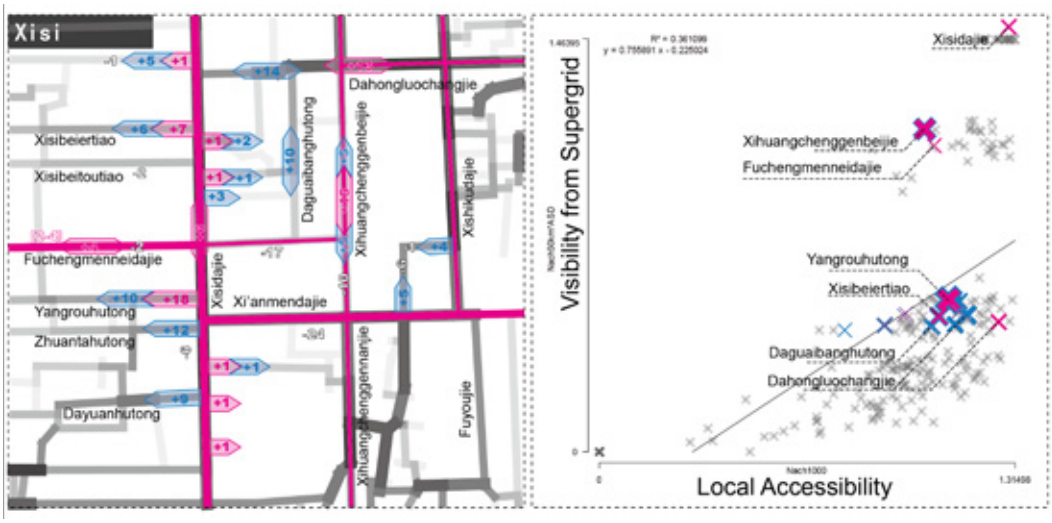

Figure 13 - spatial analysis on the distribution of emerging shops in Xisi

4.3 LAMA TEMPLE CASE

Lama temple is a case which underwent a booming growth of commercial functions in the last decade. The main shopping street nowadays, Wudaoyinghutong, used to have only 5 local shops in 2005 in our first fieldwork. In 2008 a lot of bars and fashion stores already appeared. Now it even become one of the most attractive shopping streets in the inner city of Beijing after the famous case of Nanluoguxiang. In figure 14, 'restaurant' and 'coffee & bar' contribute to the total increase most. Other retail functions such as souvenir and fashion shops, local groceries (shown in dark orange, red, dark blue) play secondary roles. In general, the service-based shops account for more than 59% of the total increase, while the retail-based shops account for less than 41%. Among all three cases, this is the only one that the service-based shops outnumber retail-based shops.

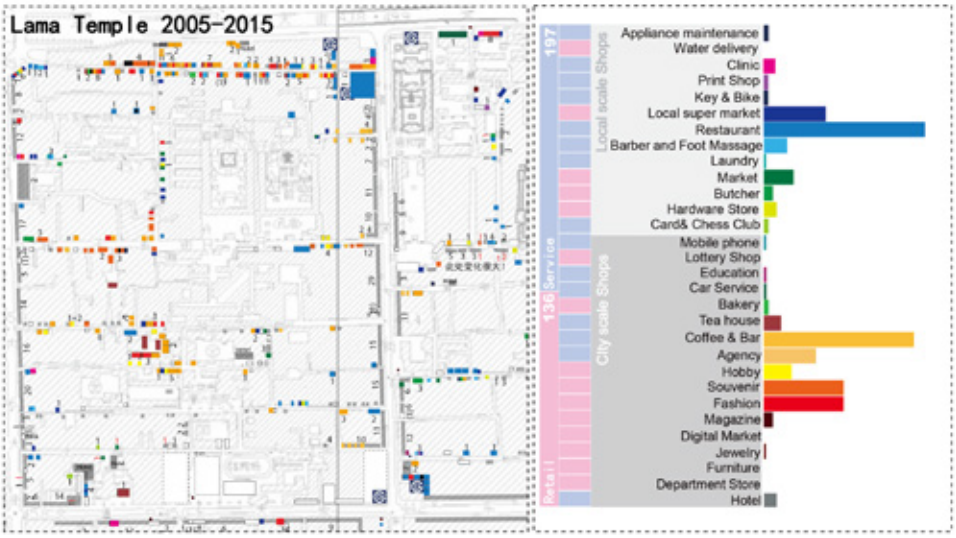

Figure 14 - the detail types of shops emerged from 2005 to 2015 in Lama temple area.

As an extreme case of booming shopping area, the spatial patterns of emerging shops in Lama temple is also appears 'extreme'. Benefited from a directed access to one of the metro exits of Lama temple station in the east end, and a very close distance to Andingmen station in the west end, Wudaoying streets has attracted more than 80 new shops. It even bring opportunities other local street which intersect it directly. Jianchanghutong for instance, has attracted 9 city-scale shops and 4 local-scale shops, but it does not even visible from the outside of the superblock. It is also interesting to compare the superblock on the southwest corner of Lama temple station with the one on the southeast. The latter has clear advantage of tourist attractions. The entrance of Lama temple itself located on Xilouhutong in the southeast area. However, simply because of the complex local street pattern make it difficult to be explored by non-local people, the southeast area benefit far less from the growth although in term of metrical distance they are in same condition to the metro station. So from this case, we can see a topologically shallower local street structure can be better appropriated by pedestrians comparing with the complex ones. The local street structure itself could even create an tourists attractions and compete with existing historical ones when its linkage to the whole city is improved (by both the growing metro system and an highway leading to the airport in this case).

Figure 15 - spatial analysis on the distribution of emerging shops in Lama Temple

In scatter plot, Lama temple case has no increase number of shops on super grid. All developments are happening inside the superblock. Despite of this difference, its growth pattern on the local streets is very similar to the other two cases. The street of high local accessibility and integrated index can attract more shops. But as mentioned before, due to the large amount of people this area attract, more local streets in relative weak spatial conditions can still benefit from the flow of tourists. Jiaodaokoubeisantiao, Jianchanghutong and Xilouhutong are such examples.

4.4 SUMMARY OF THREE CASES

As a summary of these three cases, the service-based shops account for 49% of the total number of new shops opened in the past 10 years. Because Lama temple is one of the extreme cases of growth, Xisi and Dongsi are considered to represent common situation, we could speculate that for most areas the retail-based shops still play a leading role. This result is surprising because with the rapid development of information technologies, we used to believe that service-based shops will take the lead. To certain extent this speculation is still true because when we only focus on all 30 types of shops in three cases, the leading type is the restaurant which accounts for 19.2% of the total number. The second type is the local supermarket (Xiaomaibu) which accounts for 12.3%. Then the following ones are dressing and coffee, 11.2% and 10.6% respectively. So the catering functions in general (restaurant + coffee) account for over 30%. On the other hand, for the retail-based shops, fashion and dressing store still sustains because to buy a dress or shoe still need to try. The local groceries and supermarket, food markets or shops are normally omitted by scholars, but clearly the result shows that these daily retails serving the local people contribute a lot for the growing number of shops in the last decade.

To sum up the spatial patterns in these three cases, there are at least two types of growth patterns: the first is a seepage pattern which could be found in both city- and local-scale shops. It seems most new shops emerged on where the local street meet the higher scale movement network. The second is a local-intensification pattern for local-scale shops. It seems the streets which are well-connected in the neighbourhood but not directly visible from the border of super block could support more local shops than 10 years ago. Furthermore, there is also a third, yet very simple growth pattern. In all of these three cases on the super grid there are places with more emerging shops. These places are directly located nearby the metro stations, it is very limited in 100 meters range the and mostly along the main roads.

5. CONCLUSIONS AND DISCUSSIONS

This paper starts with a 10-year empirical study on the changing number of shops in Beijing. By comparing the changing number of city and local scale shops. The preliminary result suggests that the number of shops in the city centre of Beijing is still increasing despite of the booming development of on-line shopping. Furthermore, this growth happened more on those local streets inside the superblock. The city or higher scale movement network still matter, but they matter through a way that increase the accessibility of particular area (super block) to the whole metropolitan area. The local street pattern decides the spatial pattern of those new shops.

At local scale, the results from three selected cases areas shows that the retail-based function still plays an important role, but the service-based shops may play a leading role in new attraction areas such as Lama temple. For all of the three cases, the contribution of local daily-based retails could not be neglected.

Additionally, except for a simple distance-dependent growth pattern nearby metro station, there are two spatial patterns could be found in this three cases: seepage pattern and local intensification pattern. Generally speaking, both of them could be conceptualized as a dependence on different groups of pedestrians, either coming from a large city or metropolitan area or merely local surroundings. It is eventually a question of how movement beyond local could be interfaced with the local. The development of metro system and evolving structure of super grids in the last decade are all improvement of infrastructures which aims to facilitate travelling over longer distance. Based on the empirical studies on Dutch cities, Read stated that the contemporary cities are operating on a 'biplex' structure between super grid and

local streets. The former could bring an evenly distributed potential but the latter can act as attractors on the ground (Read, 2005,2009). Following this line of thinking, even the development of information technologies might be understood as a kind of 'infrastructure' that facilities the decision process of travelling. Instead of making the geological space irrelevant, all of these infrastructures might lead to re-discover the value of local streets. The preliminary result on 10 years changing pattern of shops in the centre city of Beijing suggests that the local street connectivity at least still matters for the urban vitality in the informational age. Is it a generic phenomenon for other cities? Will the on-going development of both real and virtual infrastructures eventually leads to the triumph of pedestrian? These are interesting questions need to be deal with in future researches.

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