Chapter 12
Urban Form and Social Vulnerability in Shanghai: A Comparative Study of Hongkou District Before and After the 1990s Urban Renewal

Carmelo Ignaccolo and Yuqi Zhai

12.1 Introduction

The availability of shops and amenities within walking reach from homes or workplaces has become an essential aspect in achieving vibrant and socially inclusive neighborhoods with high environmental, social, and economic performances (Sevtsuk, 2014). Western cities—especially in Europe—have recently started exploring urban development models in which all city residents can meet most of their needs within a short walk or bicycle ride from their homes. However, such development models are often hampered by the physical legacy of mid-twentieth-century urban transformations such as mono-functional blocks, urban renewal, and suburbanization.

At the end of the twentieth century, the global spread of large-scale shopping centers started transforming traditional retail spaces beyond suburbs, by reaching downtown metropolitan areas. As a result of this spatial shift, shopping malls in city centers started performing as city-wide commercial destinations rather than serving locals living in their immediate adjacency. In other words, these radical transformations of urban morphology altered traditional low-rise mixed-use urban blocks, changing the neighborhood level supply-demand balance. However, while some of these enormous commercial buildings continue to flourish (thanks to high-performing public transit networks or urban highways), others seem to experience an irreversible decline.

In light of the above, this paper focuses on the effects of morphological alteration of commercial blocks in the communities' livelihood of Shanghai's Hongkou

C. Ignaccolo (✉)
Department of Urban Studies and Planning, MIT, Cambridge, MA, USA
e-mail: cameloi@mit.edu

Y. Zhai
College of Architecture and Urban Planning, Tongji University, Shanghai, China

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district. Driven by the rapid urbanization experienced by the city of Shanghai in the 1990s, thousands of traditional low-rise buildings were demolished to make space for large-scale commercial facilities and office towers. Hongkou stands as an emblematic example of such transformation. However, the commercial development enabled by government-led commercial renewal plans did not bring long-term revitalization. As a result of contemporary challenges regarding the regeneration of large-scale urban shopping malls in Shanghai, this research contributes to the theoretical discussions on how distribution patterns of commercial units affect the development of commercial districts. In doing so, this study argues that modernist urban redevelopment models have impoverished the existing network of small local businesses by either homogenizing the commercial offer of a neighborhood or, on an urban morphology standpoint, promoting block-wide shopping malls. These changes in the built environment were mirrored by a paradigmatic shift in the socioeconomic fabric of Hongkou where low-income communities had to succumb to the development pressure along North Sichuan Road, motivated by rising market values (Fig. 12.1).

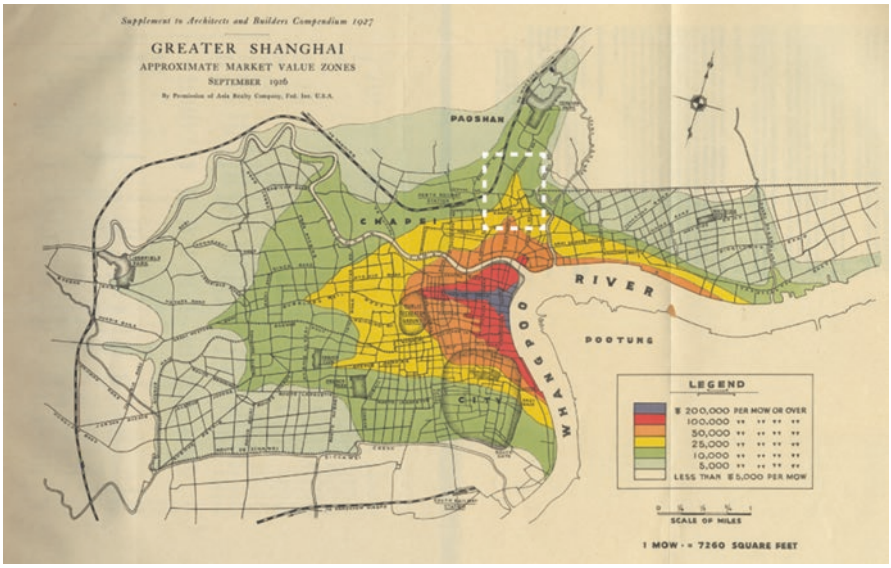

Fig. 12.1 Greater Shanghai—Approximate land value zones (Asia Realty Company, Fed. Inc. USA)—September 1926—Copyright@Virtual Cities Project (Institut d'Asie Orientale). The authors have drawn a white box to identify the central part of Hongkou district

12.2 Literature Review on Distribution Patterns of Commercial Activities

Scholars have widely studied the spatial distribution patterns of commercial activities and how shopping behaviors depend on space. In 1935, Christaller postulated the central place theory and established two fundamental concepts in terms of access range and threshold demand: "the range is defined as the maximum distance consumers are willing to travel for goods; and the threshold of a good implies the minimum amount of demand that must exist in an area for a store to be economically viable (Craig et al., 1984)." Stahl, for example, indicates that retailers tend to position their stores "as closely as possible to the consumers demanding their commodity bundle" (Stahl, 1987). In a perfectly uniform market under the central place theory, the sellers will be equidistant from neighboring stores and serve an equally sized hexagonal market area (Fig. 12.2) (Craig et al., 1984). Thus, centrality theory promotes a microeconomic approach to the analysis of retail locations. Early application of the centrality theory includes the comprehensive research of Isard (1956), Stahl (1987), Vandell and Carter (1993), and Eppli and Benjamin (1994). These scholars investigated the spatial factors determining the location of retail stores under a simplified theoretical condition rather than complex urban conditions. Also, Huff (1963), O'Kelly (1981), Achabal et al. (1982), and Craig et al. (1984) explored different mathematical models to predict potential store locations. However, studying retail environments often requires a more in-depth socio-economic, cognitive and cultural understanding than geometric rules that lack human behavioral considerations.

The centrality theory, in general, stimulated many empirical experiments on towns and market centers (Craig et al., 1984; Dacey, 1964). For example, Hillier has addressed morphological studies in city environments based on centrality theory through space syntax research (Hillier, 1996; Hillier and Hanson, 1984). His work

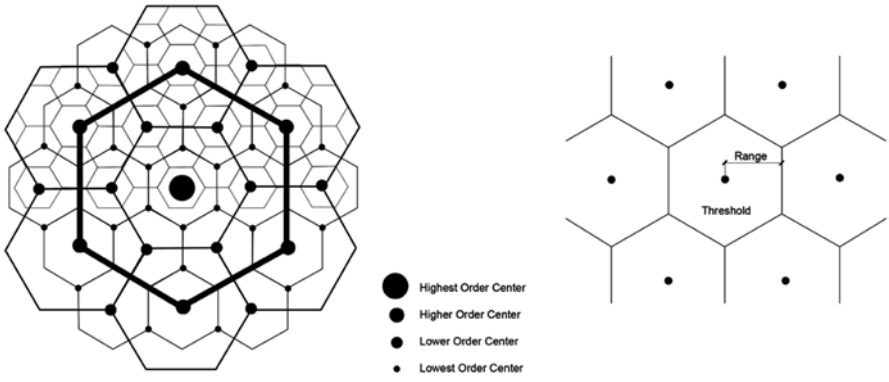

Fig. 12.2 Left: Overlapping variable-size market areas for different types of goods. Right: Identical market areas for identical goods according to the Central Place Theory. Image redrawn based on Walter Christaller's central place theory. Author YUQI ZHAI

focuses on the notions of visibility and integration within the physical structure of the built environment. Waldfogel, Meltzer, and Schuetz have conducted other applications of central place theory. More specifically, they started testing how location directly affects patronage and revenues of retail establishments and, therefore, how it constitutes an essential part of a retailer's production function (Meltzer & Schuetz, 2012; Waldfogel, 2008). Recently, several studies have focused on further examinations of the centrality theory through a detailed analysis of spatial distribution patterns of commercial activities in dense urban contexts. For instance, in 2017, Piovani demonstrated how in London, the locations of well-known retail clusters significantly correlate with the location of road intersections, which in turn attract retail activity (Piovani et al., 2017). Although the application of central place theory on commercial patterns has been studied for more than 80 years, measuring how morphological and typological transformations of commercial units affects the development of specific commercial districts is still unclear.

Centrality can guarantee easy accessibility from both immediate surroundings and more distant locations (Porta et al., 2009). Thus, a central place tends to attract more customers and has a more significant potential to evolve into a social catalyst (Sevtsuk, 2014). In other words, centrality provides an essential base for discussing commercial growth patterns. Central locations in urban areas can sustain higher densities of retail and services, and they are also crucial factors for supporting the formation and vitality of urban "nodes" (Newman & Kenworthy, 1999).

Both traditional and modern commerce nodes are vital elements to form a vibrant neighborhood. However, different retail patterns attract different groups of consumers. For example, while conventional retail facilities (such as grocery shops, cafes, convenience stores) attract customers from all socioeconomic groups, commerce center (such as shopping malls) primarily relies on a high-status clientele (Thomas and Bromley, 2000). Specifically, because of the paucity and unpredictability of financial resources, as well as the lack of refrigerators or privately owned transportation means which mitigates against bulk purchases, low-income groups purchase small quantities frequently, and they rely more on small neighborhood shops (Bromley, 1998; Grompone, 1985; Samiee, 1993). Therefore, the erasure of traditional commerce patterns affects the social stability of low-income communities, making them more vulnerable to displacement.

In this perspective, the evolution of retail spaces implies significant mutations in the social fabric. By comparing the spatial distribution of commercial units, this study scrutinizes the difference between the commercial units established by the local community in the early twentieth century and the more recent ones brought by the top-down governmental regeneration plan executed in the 1990s.

12.3 Historical Context of Commercial Activities in Hongkou District

12.3.1 The Development of Commercial Activities in Hongkou District

In the 1920s, North Sichuan Road in Hongkou district hosted the vast majority of family-run commercial businesses in Shanghai. Given the commercial history of this neighborhood, investigating the spatial transition of commercial units in North Sichuan Road is crucial to understand how large-scale commercial retail has changed the spatial structure of this formerly traditional area (Fig. 12.3).

In the eighteenth century, the Hongkou district used to be a suburb of Shanghai's old town. Later, in the 1900s, along with constructing the bridge over Suzhou Creek and the Woosung Railway, Sichuan Road became the most significant connection between the northern and southern banks of Suzhou Creek. During the 1920s, the north end of Sichuan Road became the third-largest street in Shanghai (after Nanjing Road and Huaihai Road). Japanese expatriates moved into the area and opened factories near the Suzhou river around the south end of Sichuan Road. Thanks to the convenient transportation accessibility provided by Sichuan Road, an increasing number of shops and inhabitants gathered in its north end. In 1940, the number of Japanese stores around North Sichuan Road increased by 823%: from the 65 stores registered in 1938 to 600 stores, accounting for nearly 90% of the total number of shops in the district (Penhui, 2008). Because of this rapid commercial development

Fig. 12.3 Hongkou district in Shanghai. Author CARMELO IGNACCOLO

driven mainly by Japanese developers, North Sichuan Road was then named "Little Tokyo," and it was also recognized as a commercial district by the local planning authorities.

Following the establishment of the People's Republic of China (1949), retail stores, theaters, teahouses, new grocery shops, and fresh food markets were plugged into the traditional urban morphology to meet residents' daily needs. Initially, most of these new shops were built along Sichuan Road. However, in the following years, they started spreading within those minor streets intersecting Sichuan Road, acting as pivotal nodes for community interaction along residential streets.

In the 1980s, just after China's economic reform, Hongkou district attracted various retail businesses in the commercial district of North Sichuan Road. The existing neighborhood shops remained in the original locations, while some medium-sized malls sprouted up in street intersections. These changes were part of a district-wide commercial plan that supported several large-scale commercial developments, including seventh Department Store, International Commercial Shopping Mall, Yuandong Household Electrical Appliances, Kaifu Commercial Building, Hongkou Mall, Duolun Commercial Building, Fashion Commercial, Fudu Mall, Hongye Commercial, the eighth Huaqiao Store, Boyang Store, Dongbao Mall and dozens of merchants stores, such as Hong Kong Hair Salon, Dechang Suit Store, Vienna Leather Shoes, Guangmao Roast Duck and Delicious Tobacco. In contrast to western countries, automobiles were not very popular in Shanghai during the 1980s; therefore, large-scale commercial hubs on both sides of North Sichuan Road generated a pedestrian-friendly shopping area that responded to the local community's needs.

In the 1990s, however, new large-scale commercial typologies replaced entire traditional neighborhood blocks. Residents could not afford to relocate within the same neighborhood where newly constructed condos with two-bedroom apartments were out of their price range. For the vast majority of Hongkou residents, there was no other option but relocating to the city's outskirts, leaving behind their original social networks and small-sized housing units (Wu, 2004). As a result, many residents were forced to move out of their neighborhoods and relocate to the city's outskirts. At the same time, thousands of migrants from Chinese extra-metropolitan areas became the new residents of Hongkou district. Most of them lived in the inexpensive shared accommodation units of traditional *lilong* houses. However, despite the spatial proximity to low-income communities, the newly built commercial centers chose a business model oriented towards luxury brands to gain city-wide commercial popularity. This business format disregarded the daily needs of Hongkou's new residents who could not afford high-end products. Thus, these shopping malls relied on high-income consumers across the city. In other words, urban transformations in Hongkou district triggered major socioeconomic shifts: local residents had to relocate to the outskirts of Shanghai, and low-income migrant workers moved to some poorly maintained residential buildings. Newcomers, while initially benefiting from the availability of low-skilled jobs in the newly developed malls (such as cleaning and cooking services), have remained with no access to walking-distance street commerce they could potentially afford.

Among the follow-on effects of these neighborhood changes, large-scale shopping malls brought a rapid increase in the real estate land value (11 billion RMB in 1994, 12.72 billion RMB in 1995, and 13.65 billion RMB in 1996). This steep increase made Hongkou district the second most profitable commercial district in the Shanghai downtown area after the Nanjing Street district. North Sichuan Road, for example, has an average daily flow of approximately 900,000 people, and together with Nanjing Road, Huaihai Road, Jinling Road, and Yuyuan Shopping Mall, it forms a Shanghai-level commercial center, commonly known as "The Four Streets" (Desvaux et al., 2002). Even in the early 2000s, along with the continuous construction of large-scale shopping malls, the development of North Sichuan Road Shopping Center has shown positive financial results, especially in terms of the rapid growth of retail sales.

In 2006, however, the North Sichuan Road commercial district witnessed a substantial decline in its business performance. Scholars have argued that there were mainly two reasons for this sudden decline: first, two mega-commercial centers (Daning International in Jingan district and Wujiaochang in Yangpu district) became the major shopping destinations for high-income customers for the entire city of Shanghai; second, more medium-sized community shopping malls opened in the periphery of the city. Consequently, the increasing residential community in the outskirt of Shanghai stopped going to North Sichuan Road for their daily shopping. Under these business circumstances, the 1990s commercial facilities in Hongkou did not maintain their customer attractiveness. Without entertainment facilities and local residents' demand, the now so-called "old-fashioned 1990s retail malls" in Hongkou district fell into decline. Nowadays, compared to other large-scale commercial centers, the North Sichuan Road shopping options are not as well regarded as those located in other commercial districts of Shanghai.

12.3.2 A Comparison of Commercial Patterns in Hongkou District before and after the '90s

The traditional commercial units of North Sichuan Road were mostly small-scale shops arranged according to a linear layout. Maps of business licenses in 1937 reveal the location of small offices, restaurants, and retail stores. Furthermore, it is utterly apparent that most of them were located along the streets, and some of them were even in the inner part of residential blocks. Most of these small shops were managed by individuals and enterprises from Hongkou district. Thanks to a tight connection between the sellers and the clients, stores kept having a profitable business throughout the mid-twentieth century.

The 1980s improvement strategy of commercial units maintained the location of the original store network and supported the construction of medium-sized malls as a strategic upgrade of the traditional commercial network (Table 12.1). In general, the sellable goods and the distribution of commercial facilities along the streets

Table 12.1 Comparison of commercial units between 1940 and 1980

Attributes	1940	1980
Business form	Retail facing the street	Shopping mall
Business owner	Private retail and enterprises	Large real estate development company
Spatial layout	Linear along the street	Multistory large-scale building
Operation model	Individual or enterprises operation	Subletting mode
Business content	Retail, service	Retail, service, entertainment
Property management rights	Individual or enterprises	Managed by the developer
Funding sources	Individual or state-owned properties	Quoted company (finance)

Source: Table redrawn based on *Table 1.1* in Penhui (2008). *The Effect of Shopping Center on Society Network of North Sichuan Road*. Tongji University; College of Architecture and Urban planning, master thesis

were generally appreciated by the local community: North Sichuan Road was unquestionably the most popular commercial street in Shanghai around the 1940s and during the 1980s.

However, by the early 1990s, due to the inability of commercial facilities to meet the needs of recently urbanized consumer groups and the competition of modern commercial districts (such as the neighboring Xujiahui), the commercial district of North Sichuan Road gradually started losing its economic vibrancy. The commercial facilities from the early twenty-first century were usually designed as city-block-wide shopping malls and operated under a unified management framework guided by foreign corporations or companies outside the Shanghai region. Because of the corporate-driven development, early twenty-first-century shopping malls targeted a very wealthy clientele in search of famous fashion brands, cinemas, and gourmet restaurants. In general, commercial facilities from the 1990s did not trigger a long-term improvement of the commercial attractiveness of the neighborhood. Instead, they generated a mid-scale commercial typology that is now in search of a new identity.

12.4 Methods

12.4.1 Case Studies along Sichuan Road in Hongkou District

This research uses two blocks in Hongkou district as selected case studies where to compare (1) the urban morphology and (2) the distribution of commercial facilities before and after the 1990s urban renewal (Fig. 12.4). More specifically, the selected blocks are located in the southern part of Hongkou district: the first block (A) is enclosed by Sichuan Road and Duolun Road; the second block (B) is bounded by

Fig. 12.4 Left: Hongkou district. Right: selected blocks for case study analysis in Shanghai. Author CARMELO IGNACCOLO

Qiujiang Road, Zhongzhou Road, and North Sichuan Road. Regardless of their mutual proximity (1.13 km) and their similar dimensions (0.97 sq^2 for block A and 0.88 sq^2 for block B), the two blocks experienced opposite urban transformations during the urban renewal.

Block A has almost entirely kept its original urban morphology made of low-rise *lilong*: rows of two-story housing units are still located in the core of the blocks (E-W orientation). Their neighboring housing units have the same typology but different orientation (N-S). In general, the block is divided into three different areas: the northern part facing Sichuan Road comprises 5–7 floors residential buildings with commercial units on the ground floor. The central region has kept its original *lilong* urban configuration. The southern part, instead, has undergone some changes in its building typology: the tabula rasa of small-scale housing units and vacant lots offered precious development space for large commercial buildings both facing Sichuan Road and the southern part of Duolun Road. The large east-west plot on the southern side of the block used to host offices and printing machines for a newspaper company. While in 1937 this plot was mostly vacant except for the newspaper company building, it experienced an intensive infill development process during the 1990s. Three six-story condos occupy the eastern and western edges of the plot, hiding the southern part of residential low-rise houses (Fig. 12.5).

Differently from Block A, Block B experienced a radical transformation of its building types and urban form. In the late 1990s, a curvilinear shape tower with commercial facilities on the ground floor was built at the intersection of Sichuan Road and Qiujiang Road (Fig. 12.6). By 2018, the rest of the block, which used to

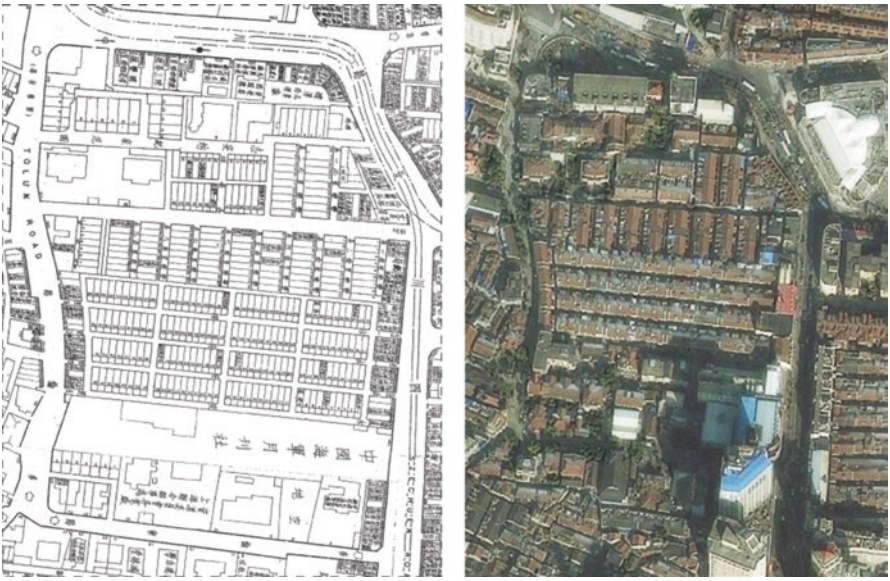

Fig. 12.5 Left: 1937 Shanghai map of Block A. Right: 2018 satellite imagery of Block A. Author CARMELO IGNACCOLO

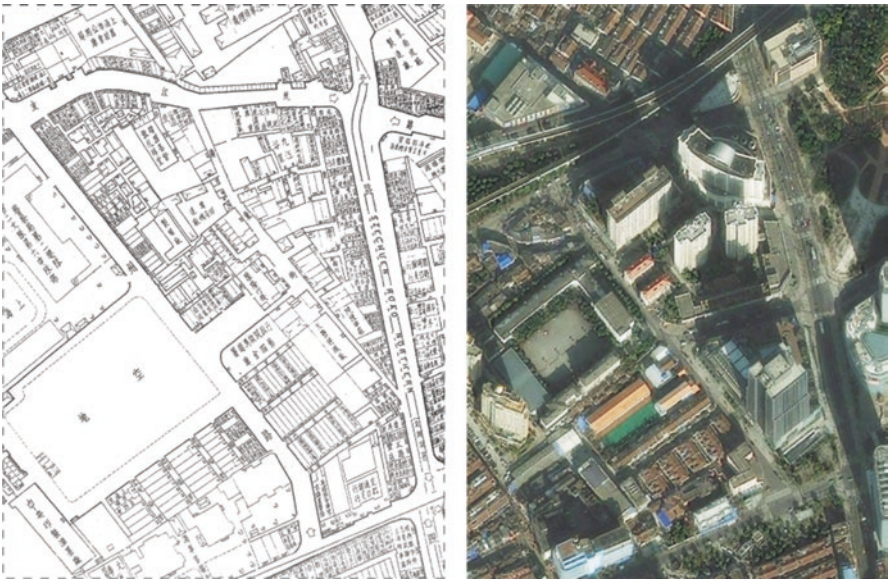

Fig. 12.6 Left: 1937 Shanghai map of Block B. Right: 2018 satellite imagery of Block B. Author CARMELO IGNACCOLO

encompass two-story small mixed-use typologies, was erased in favor of the 35-floor One Prime Tower built in 2010 and the shopping mall located at the footsteps of the tower. The northern part of the block hosts a gated residential compound of two 20-floor towers. In addition to an overall change in the building typology, the block has experienced a severe street design transformation. Since 2009, the newly built Hengshui Road has divided the block into two distinct areas: the northern part with a much more defined residential character and the southern part with a predominant mixed-use character. Because of the different development outcomes, these blocks are ideal case studies to unpack the evolution of commercial units' types and their distribution patterns in relation to changes in urban form.

12.4.2 Data Overview

The project employs two novel datasets: the 1937 high-resolution map of business licenses in Hongkou district (Shanghai) and the Gaode Points of Interest (POIs) data extracted through the Gaode API in September 2018. The authors have georeferenced the 1937 map using the UTM 51N projection system in Geographic Information System software (ESRI ArcMap). By detecting and translating Chinese characters contained in some of the 1937-map plots, it was possible to classify commercial units located in Block A and B into eight types (café and teahouse, public service, office, restaurant, clothing store, convenience store, rickshaw and taxi, and craftsmen workshop). Commercial units and their attributes were digitized and converted into georeferenced shapefiles of incident points (Fig. 12.7).

The second dataset contains the 2018 Gaode georeferenced POIs for the Hongkou district. This dataset includes more than 58,000 observations for the Hongkou area. Given the research focus on two specific blocks in Hongkou, the two selected samples contain 372 items in Block A and 532 items in Block B. Gaode data items have several attributes for each commercial unit, such as address, unit type, and customer ratings. In line with the aim of this research, the authors have omitted Gaode points containing attributes about ATMs, entrances to residential units, and parking lots. As a result of this data filtering, Block A and B, respectively, count 268 and 397 commercial units. Taking into consideration the comparative scope of this research on commercial types and their locations, the authors have grouped the 1937 and 2018 data into fourteen categories: café and teahouse, public service, office, restaurant, clothing store, convenience store, book-café and souvenir shops, hotel and entertainment, museum, antique store, jewelry and beauty, tech. and electric appliances, photo studio, and education.

In 1937 Block A encompassed mainly convenience stores (28.7%), restaurants (20.2%), and office spaces (23.4%) (Table 12.2). The block edge along North Sichuan Road used to host more commercial units than the western edge along Duolun Road. This antipodal distribution might be related to lower rates of pedestrian traffic along Duolun Road, which still acts as a minor and narrower infrastructural link compared to still heavily trafficked North Sichuan Road.

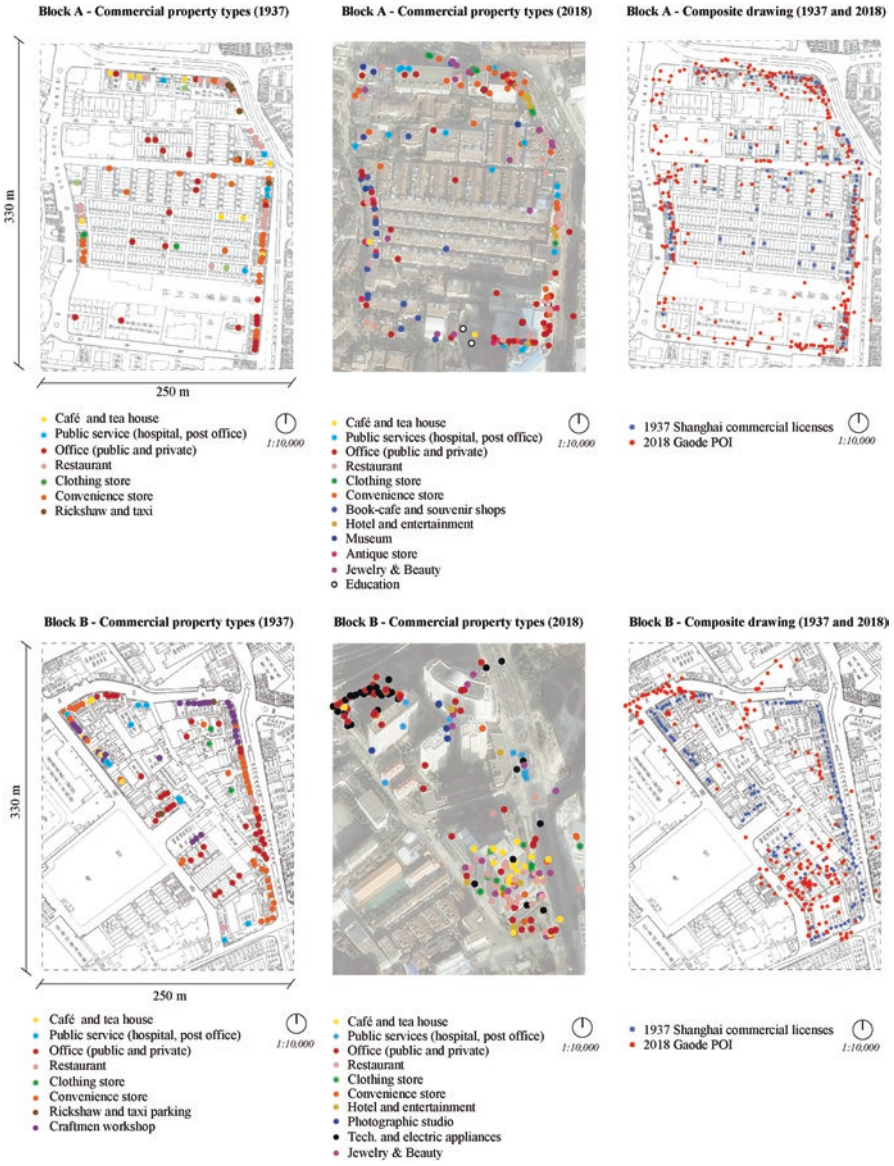

Fig. 12.7 Top-left: commercial property types in Block A (1937); top-center: commercial property types in Block A (2018); top-right: composite drawing with commercial properties (1937, blue; 2018, red); bottom-left: commercial property types in Block B (1937); bottom-center: commercial property types in Block B (2018); bottom-right: composite drawing with commercial properties (1937, blue; 2018, red). Author CARMELO IGNACCOLO

Block B mainly had an industrial character in 1937. Commercial property types at the intersection of North Sichuan Road with Qiujiang Road included carpenters, metal craftsmen, and plumbers (21.26%) (Table 12.3). Similar to Block A, Block B

Table 12.2 Types of commercial units in Block A (1937 and 2018)

Types	1937 (#)	1980 (%)	2018 (#)	2018 (%)
Café and teahouse	9	9.6	10	0.8
Public service	5	5.3	31	11.9
Office	22	23.40	66	25.4
Restaurant	19	20.20	43	16.5
Clothing store	6	6.40	10	3.8
Convenience store	27	28.70	42	16.2
Rickshaw and taxi	6	6.40	/	/
Antique store	/	/	10	3.8
Book-cafe and souvenir	/	/	19	7.3
Education	/	/	6	2.3
Hotel and entertainment	/	/	8	3.1
Jewelry and Beauty	/	/	18	6.9
Museum	/	/	5	1.9
TOTAL	*94*	–	*268*	–

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Table 12.3 Types of commercial units in Block B (1937 and 2018)

Types	1937 (#)	1980 (%)	2018 (#)	2018 (%)
Café and teahouse	6	4.72	32	8.06
Public service	10	7.87	19	4.79
Office	39	30.71	151	38.04
Restaurant	4	3.15	53	13.35
Clothing store	3	2.36	16	4.03
Convenience store	36	28.35	26	6.55
Rickshaw and taxi	2	1.57	/	/
Craftsmen workshop	27	21.26	/	/
Tech. and electric appliances	/	/	52	13.1
Education	/	/	7	1.76
Hotel and entertainment	/	/	8	2.20
Jewelry and Beauty	/	/	27	6.8
Photo studio	/	/	6	1.51
TOTAL	*127*	–	*397*	–

Authors CARMELO IGNACCOLO and YUQI ZHAI.

had many office spaces (30.71%) and convenience stores (28.35%), but it lacked the network of cafés and teahouses dotting Block A. From a spatial distribution standpoint, office spaces do not seem to rely on being located along heavily trafficked street fronts. Craftsmen workshops and convenience stores, instead, are highly dependent on street front exposure. Figure 12.7 (bottom-left), in fact, shows two clusters of office spaces in the inner part of the block.

12.5 Data Analysis and Results

12.5.1 Data Analysis

This study employs a two-step data analysis process. First, it examines the spatial distribution of commercial units throughout time; second, it investigates whether the typological composition of commercial units has changed in both blocks between 1937 and 2018.

The spatial distribution research borrows the methods from Mitchell (2005) and Anselin (1995), where (1) Point Density analysis is used to determine the density of incident point data and (2) Getis-Ord Gi* index is used to render "hot spots" and "cold spots" of spatial features.

The Point Density tool calculates the density of point features around each output raster cell. Conceptually, a neighborhood is defined around each raster cell center, and the number of points that fall within the neighborhood is totaled and divided by the area of the neighborhood. Borrowing the methodology from Silverman (1986), the neighborhood radius is the shortest of the width or height of the output extent divided by 30. The radius utilized in this study is 8.78 m.

The hot spot analysis was carried out using a fishnet shapefile generated according to the extension of the selected blocks as bounding polygons containing the incident point data of commercial units. The aggregation process resulted in 355 squares (10m edge) weighted by the number of commercial units contained within each square's perimeter. The dimension of the square units was calculated through the ANN method (Average Neighbor Distance): for all of the unique location points excluding locational outliers, the ANN is computed by summing the distance to each feature's nearest neighbor and dividing by the number of features (n).

In regard to shifts in street commerce types, this study calculates percentages of commercial spaces as fractions of the whole sample of commercial units in each block. It then quantifies the percentage change across 80 years by comparing the 1937 typological composition of commercial units to the one of 2018. In doing so, it engages with path-dependence theory on the persistence and change of street commerce clusters. More specifically, it demonstrates that the legacy of pre-development commercial licenses (1937) persists in the spatial and typological arrangements of some commercial units in contemporary Shanghai.

12.5.2 Results

The results of the data analysis show how changes in urban morphology have triggered re-arrangements in the distribution of commercial units from 1937 to 2018. In Block A, where the configuration of the urban block has not changed throughout the last 80 years, the distribution of commercial units is still mainly centered along North Sichuan Road. However, the Point Density analysis reveals how the density

of commercial units has increased in two street intersections: Sichuan Road and Shanyin Road (northwest corner) and Sichuan Road and Duolun Road (southwest corner). These results are in line with the existing literature on commercial units' distribution which expects store owners to locate their businesses at points of maximal demand, such as street intersections (Stahl, 1987). More specifically, on the northeast corner of Block A, the average density of commercial units has almost doubled (154% increase, from 240 shops/ha in 1937 to 618 shops/ha in 2018). In general, no changes in the urban form of Block A have resulted in a higher density of commercial units throughout time with specific peaks in the adjacencies of street intersections (Fig. 12.8).

The comparison between commercial property types in 1937 and 2018 sheds light on the persistent cultural and historic character of Block A. In fact, while in 1937 there had been approximately nine café and teahouses, in 2018, the neighborhood counted ten café and teahouses and 19 book-café and souvenir stores. The original functions of twentieth-century teahouses have been gradually replaced and enhanced by many book-cafés dotting the neighborhood today. However, in terms of shops serving daily needs, this study reveals a steep decrease in convenience stores (−77%). This result seems in line with the literature on amenity-districts where amenities for visitors are often prioritized over residents' needs. The presence of amenities fostering social interactions combined with antique stores and museum spaces has made Duolun Road a prominent cultural district of Shanghai. This transformation started in 1998, when the local government launched a regeneration in order to counter degrading infrastructures and poorly maintained *lilong*—usually occupied by low-income households. The project focused on conserving and restoring historic buildings (such as the Xi Shi Bell-Tower) by turning them into museums, galleries, cafés, or craft shops.

Unlike Block A, Block B has experienced a radical change in its morphology throughout the last 80 years. Because of these extreme changes and, therefore, the impossibility of comparing commercial units on the same street network, this study

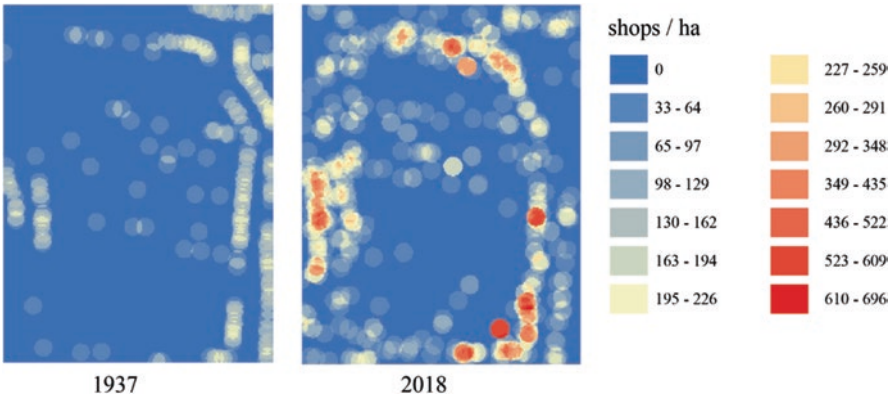

Fig. 12.8 Comparative point density analysis of commercial units between 1937 and 2018 (shops/hectares). Author CARMELO IGNACCOLO

utilizes an optimized hot spot analysis which creates a map of statistically significant hot and cold spots using the Getis-Ord Gi* statistics. The local Getis-Ord Gi* evaluates the spatial dependency effect of the number of commercial units within 10m X 10m polygonal features. It uses a calculation that considers each of the features' values and those of its neighboring ones. As a result of this operation, the hot spot analysis gives a z-score for each feature in the dataset, which can be significantly positive or negative with a minimum confidence level of 90%.

The results show a statistically significant hot spot of commercial units in the southeast corner of the block where the "Shengbang International Plaza" is located (Sichuan Road and Wujin Road). The Gi* index in this area of the block reflects a 90% confidence interval with values comprised between 3.51 and 2.81 (Fig. 12.9). This peak might be a result of changes in both building typology and in block configuration. In fact, this block has two shopping malls: "One Prime" and "Rose Plaza." Rose Plaza is a gated residential community with commercial facilities, and One Prime is a large shopping mall.

From a typological standpoint, the longitudinal comparison of commercial units in 1937 and 2018 reveals interesting results. In 1937, Block B was generally considered an industrial neighborhood rich with craftsmen and industrial makers. This research indicates that part of this industrial legacy has persisted into the contemporary block, despite aggressive urban transformations. In fact, the northwest part of the block facing Qiujina Road and Zhongzhou Road hosts a large mall containing dozens of small electronic stores. Thus, while craftsmanship has transitioned from steel/wood to electric appliances, the neighborhood has maintained—at least in the northwest corner—a maker culture. However, further investigation is required to provide evidence on a plausible ownership nexus between pre-development craftsmen and contemporary electricians and tech experts.

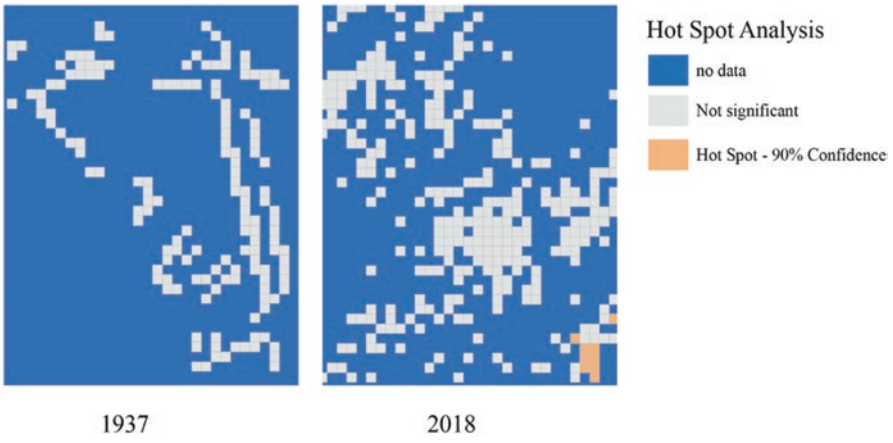

Fig. 12.9 Comparative hot spot analysis of commercial units between 1937 and 2018 in Block B. Author CARMELO IGNACCOLO

12.6 Discussion and Conclusions

Rapid urbanization in Shanghai has contributed to a drastic reconfiguration of the city morphology and to typological changes in residential and commercial units across the city (Whitehand & Gu, 2007). Low-rise traditional buildings were torn down to make space for 20-story condominiums—often developed within gated communities—and small family-run commercial activities were rapidly replaced by shopping malls strategically located at the intersections of heavily congested streets.

Even if the shopping malls constructed in the early-mid 1990s during the government-led urban renewal had a considerably profitable business for around 10 years, they are now experiencing a period of general economic decline. These negative trends are often caused by (1) a mismatch between shops and customers living in the same neighborhood and (2) high competition between the 1990s mall generation and the more glamorous and sophisticated twenty-first-century shopping malls. Within the scope of contributing to the literature debate on commercial streets and to the policy discussion on the future of the Hongkou district, this research has conducted a comparative study of the distribution and types of retail units from 1937 to 2018. This comparison provides empirical evidence of changes in locations and types of retail units; and it contributes to the theoretical debate on the relationship between people's livelihoods and street commerce.

The result of this comparative study is fourfold: first, it demonstrates how certain blocks managed to keep a vibrant streetscape with small shops spatially arranged on a much denser layout than in 1937 (Block A); second, it suggests that large-scale shopping malls have impoverished the formerly vibrant streetscape of Hongkou district by allocating shops into multistory malls; third, this study demonstrates that the legacy of 1937 neighborhood-retail identity tends to persist in the typological arrangements of contemporary Shanghai, despite major urban transformations; fourth, it proves that the rising number of amenities such as museums, book-café, and souvenir stores has come at the expense of local residents living in areas with an ever decreasing amount of convenience stores serving their daily needs (−77%).

Although the centrality theory has proven itself as a valuable tool for studying urban areas, little work has been done to apply its concepts to historical research on specific traditional districts in China. Moreover, this study employs a big-data research approach on both historical data (1937) and contemporary data on retail units in the city of Shanghai (2018). Thanks to a spatial comparison of commercial patterns recorded in 1937 and 2018 in the North Sichuan Road area, this study sheds light upon the morphological implications connected to the evolution of commercial patterns in downtown Shanghai. Further research could illuminate the current performances of shopping malls and small retail units through Gaode maps reviews and rating data. On a methodological note, a longitudinal model could provide a more granular understanding of businesses' performances throughout the selected 80-year time range.

Learning from the evolution of street commerce patterns is essential to address contemporary challenges related to the profitability of commercial facilities and the

vulnerability of Hongkou's residents. Furthermore, from a policy standpoint, this study could contribute to a policy effort on re-branding the district of Hongkou, especially along Sichuan Road, and make it again attractive to investors and locals. Finally, by avoiding neighborhood-wide relocations of low-income groups and providing vulnerable communities with in situ alternative and affordable housing solutions, this study envisions the future of Hongkou as a socially inclusive and diverse commercial hub for both neighborhood residents and the whole city of Shanghai.

References

Achabal, D. D., Wilpen, L. G., & Mahajan, V. (1982). MULTILOC: a multiple store location decision model. *Journal of Retailing, 58*(2), 5–25.

Anselin, L. (1995). Local indicators of spatial association-LISA. *Geographical Analysis, 27*(2), 93–115. https://doi.org/10.1111/j.1538-4632.1995.tb00338.x

Bromley, R. (1998). Market-place trading and the transformation of retail space in the expanding Latin American City. *Urban Studies, 35*, 1311–1333. https://doi.org/10.1080/0042098984376

Craig, C. S., Ghosh, A., & McLafferty, S. (1984). Models of the retail location process: A review. *Journal of Retailing, 60*(1), 5–36.

Dacey, M. F. (1964). Modified poisson probability law for point pattern: More regular than random. *Annals of the Association of American Geographers, 54*(4), 559–565. https://doi.org/10.1111/j.1467-8306.1964.tb01784.x

Desvaux, G., Li, G., & Fenhirin, J. (2002). Shanghai shopping. (China Research). *The McKinsey Quarterly*, 17+. Gale Academic OneFile.

Eppli, M., & Benjamin, J. (1994). The evolution of shopping center research: A review and analysis. *Journal of Real Estate Research, 9*(1), 5–32. https://doi.org/10.1080/10835547.1994.12090737

Grompone, R. (1985). *Talleristas y Vendedores Ambulantes en Lima*. DESCO, Centro de Estudios y Promocion del Desarrollo.

Hillier, B. (1996). *Space is the machine: A configurational theory of architecture*.

Hillier, B., & Hanson, J. (1984). *The social logic of space*. Cambridge University Press.

Huff, D. L. (1963). A probabilistic analysis of shopping center trade areas. *Land Economics, 39*(1), 81. https://doi.org/10.2307/3144521

Isard, W. (1956). *Location and space-economy: A general theory relating to industrial location, market areas, land use, trade, and urban structure*. M.I.T. Press.

Meltzer, R., & Schuetz, J. (2012). Bodegas or bagel shops? Neighborhood differences in retail and household services. *Economic Development Quarterly, 26*(1), 73–94. https://doi.org/10.1177/0891242411430328

Mitchell, A. (2005). *Spatial measurements & statistics*. ESRI Press.

Newman, P., & Kenworthy, J. R. (1999). *Sustainability and cities: Overcoming automobile dependence*. Island Press.

O'Kelly, M. E. (1981). A model of the demand for retail facilities, incorporating multistop, multipurpose trips. *Geographical Analysis, 13*(2), 134–148. https://doi.org/10.1111/j.1538-4632.1981.tb00721.x

Penhui. (2008). *The Effect of Shopping Center on Society Network of North Sichuan Road.* [Master Degree Thesis]. Tongji University, College of Architecture and Urban planning.

Piovani, D., Molinero, C., & Wilson, A. (2017). Urban retail location: Insights from percolation theory and spatial interaction modeling. *PLoS One, 12*(10), e0185787. https://doi.org/10.1371/journal.pone.0185787

Porta, S., Strano, E., Iacoviello, V., Messora, R., Latora, V., Cardillo, A., Wang, F., & Scellato, S. (2009). Street Centrality and Densities of Retail and Services in Bologna, Italy. *Environment and Planning B: Planning and Design, 36*(3), 450–465. https://doi.org/10.1068/b34098

Samiee, S. (1993). Retailing and channel considerations in developing countries: A review and research propositions. *Journal of Business Research, 27*(2), 103–129. https://doi.org/10.1016/0148-2963(93)90018-K

Sevtsuk, A. (2014). Location and agglomeration: The distribution of retail and food businesses in dense urban environments. *Journal of Planning Education and Research, 34*(4), 374–393. https://doi.org/10.1177/0739456X14550401

Silverman, B. W. (1986). *Density estimation for statistics and data analysis*. Chapman and Hall.

Stahl, K. (1987). Chapter 19 Therories of urban business location. In *Handbook of regional and urban economics* (Vol. 2, pp. 759–820). Elsevier. https://doi.org/10.1016/S1574-0080(87)80005-6

Thomas, C. J., & Bromley, R. D. F. (2000). City-centre revitalisation: Problems of fragmentation and fear in the evening and night-time city. *Urban Studies, 37*(8).

Vandell, K., & Carter, C. (1993). Retail store location and market analysis: A review of the research. *Journal of Real Estate Literature, 2*(2), 13–45. https://doi.org/10.1080/10835547.1994.12090037

Waldfogel, J. (2008). The median voter and the median consumer: Local private goods and population composition. *Journal of Urban Economics, 63*(2), 567–582. https://doi.org/10.1016/j.jue.2007.04.002

Whitehand, J., & Gu, K. (2007). Urban conservation in China: Historical development, current practice and morphological approach. *Town Planning Review, 78*(5), 643–670. https://doi.org/10.3828/tpr.78.5.6

Wu, F. (2004). Residential relocation under market-oriented redevelopment: The process and outcomes in urban China. *Geoforum, 35*(4), 453–470. https://doi.org/10.1016/j.geoforum.2003.10.001