

#89.

The Marvellous Ordinary

A temporal enquiry into the socio-spatial morphology of alleyway housing in Taiping South Road area, Nanjing c.1930s/c.2020s

Yichang Sun

Space Syntax Laboratory, The Bartlett School of Architecture, UCL; yichang.sun@ucl.ac.uk

Laura Vaughan

Space Syntax Laboratory, The Bartlett School of Architecture, UCL; l.vaughan@ucl.ac.uk

ABSTRACT

Building upon the concept of co-presence, this paper – which forms part of a larger research study into Nanjing, China – seeks to explore whether and to what extent the mixing of use patterns and people’s everyday activities within Nanjing’s historical alleyways are shaped and influenced by their configurational settings and typomorphological patterns. Focused on the north section of Taiping South Road area, two alleyway cases representing different historical periods, serve as pivotal examples of spatial continuity spanning the early twentieth century to the present. Using publicly accessed footway maps of c.1930s and c.2020s, on-site surveys and observations, and ethnographic research, our analysis explores the diachronic configurational settings and synchronic typomorphological patterns of the alleyways at a finely-grained micro level. We find that the alleyways, considered within their local context, have varying combinations of street network, building typomorphology, and micro-morphological attributes. The findings suggest that these elements contribute to the patterns of co-presence, mixed-use patterns and people’s activities, not only within the alleyways but also in the various third places situated around them. We argue that the studied cases may play a vital role in shaping and maintaining urban diversity and sustainability (on environmental, economic, and social-cultural dimensions), particularly at the local and neighbourhood levels. It is further proposed that the micro social-spatial morphological approach, coupled with historical studies through space syntax, alongside the description and empirical studies of the alleyway cases, enhance our understanding of the everyday meshing of co-presence and micro-rituals, which further promotes a rethinking of the evolving meaning of the third domain in a rapidly changing urban context.

KEYWORDS

Alleyways; Urban housing; Nanjing, China; Typomorphology; public-private interaction

1 INTRODUCTION

Alleyways, as a critical part of urban form, linking public and private realms and facilitating the transition between the street and the domestic milieu, have received insufficient attention in recent space syntax and urban morphology studies. Embedded within the urban fabric and local culture, alleyways exhibit distinctive spatial and social characteristics in various contexts (Alawadi, Khanal and Abdelfattah, 2023). This distinctiveness is evident in the multitude of terms and dialects employed by individuals to describe alleyways; for example, a linguistic study of naming in the UK has found 9 geographically varied terms

(<https://www.ourdialects.uk/maps/walkway/>) with myriad more found in an informal subsequent discussion on Twitter (cite blog post by the author). In Asian cities, compared with the Anglo-Saxon context where they are primarily local linking routes, alleyways tend to be more closely associated with small-scale social and economic activities, serving as a vital part of everyday urban life (Imai, 2013, 2017; Gibert-Flutre and Imai, 2020). This difference in land use diversity suggests that different spatial cultures lead to ostensibly similar configurational types having different movement economy patterns.

In an important enquiry into spatial configuration and land use diversity, Penn and colleagues (2007) proposed that urban diversity extends beyond a mere mix of uses and people; it encompasses the structured interplay of “not only the physical material and spatial properties of urban form, but also the socio-economic and cultural properties of the communities that inhabit and use the city as their behaviours affect sensory perceptions in urban space (pp .219)”. They emphasize the need to consider a temporal dimension and individual experiences to comprehend how diversity emerges and is perceived. Subsequent research, building on this perspective, explores how – at least in the Anglophone world – street networks, building types, and micro-morphological attributes contribute to the continuity of co-presence, support new activities, and promote adaptability and diversity in local centres of activity, high streets (Vaughan *et al.*, 2015; Törmä, Griffiths and Vaughan, 2017) and housing (Palaiologou and Vaughan, 2012, 2014).

Building upon the scholarship above, this paper, as a part of ongoing research into the socio-spatial evolution of Nanjing, China, seeks to carry out a finely-grained analysis of the diachronic spatial configurational and micro level social-spatial morphology of alleyways within their surrounding clusters in the heart of the city. Through on-site surveys and observations, it also

seeks to investigate whether, and to what extent, the social-economic activities and domestic patterns within the historical alleyways are shaped by and interrelated with their spatial configurational and typomorphological patterns. Two alleyway cases are studied, within their local context. The cases are sited within the northern section of the Taiping South Road area (TPS, a continuously thriving commercial street since the early twentieth century). The two cases represent different historical periods and were sampled to serve as emblematic cases of the spatial continuity of many of the alleys that can still be found in the inner city of Nanjing.

The enquiry employs a space syntax approach in its initial phase to explore the continuity and transformation of the configurational settings of the selected alleyways within their surrounding area over the past century. Then, the study delves into the typomorphological characteristics, use types, and people's activities at a micro level. Throughout the research process, a comparative perspective is maintained among the alleyways, their adjacent streets, and their surrounding streets, namely the streets immediately adjacent to them (see full explanation in the methods section). In the concluding section, spatial configurational settings are further compared with the micro social-spatial characteristics between the two alleyway cases.

2 THEORY

A central idea in early space syntax theory is that the spatial form of cities probabilistically shapes a "field of possible encounter and co-presence" (Hillier (1989. p. 11) that is an essential, latent feature. It exists, Hanson (2000) subsequently argued, as "a pre-condition for face-to-face human social interaction" (ibid., p.120). Thus, it is believed that one of the social functions of towns and cities is to structure co-presence among diverse groups of people on various urban scales. Within the case study of an inner London neighbourhood's transformation from street-based housing to housing 'estates', Hanson specifically highlights that housing morphology plays a critical role in the field of co-presence, influencing the way in which people "either blend together or fail to encounter one another" (ibid.).

A series of studies have shown the critical role that urban form, mainly focused on the spatial configuration of street layouts, plays in terms of co-presence. Vaughan and Hiller (2007) addressed how cities accommodate the demands made by different activities for patterns of movement and co-presence; a pattern that is primarily a result of self-organising processes, highlighting the essential role of spatial configuration in forming patterns of integration and segregation, namely configurational inequalities. Based on this study, the vital role of urban form in co-presence in public space and social segregation has been further examined elsewhere in Europe (Legeby 2013; Legeby, Berghauser Pont, and Marcus 2015). The latter

paper in particular highlights how co-absence – the phenomenon whereby spatial segregated areas – can limit opportunities of mixing due to the low number of people coupled with little socio-economic diversity.

Taking the street and “street-based housing” as one composed unit, the following studies further assert that street configuration and building morphology together play essential roles in the patterns of encounters and co-presence, with urban diversity generated and impacted by both the diachronic urban changing process and the synchronic structure of everyday city (Palaiologou, 2015; Palaiologou, Griffiths and Vaughan, 2016). Correspondingly, theoretical studies have discussed the potential within space syntax to examine how co-presence is related to social science – as Durkheim named social morphology – in a socio-spatial framework (Marcus, 2015). According to recent research, a theoretical ground between space syntax and Durkheim’s micro-sociological branch of this theoretical domain has been reassessed, extending the application of space syntax in the studies of micro socio-morphology, highlighting the agency of both human and space in generating dense urban co-presence (Suonperä Liebst and Griffiths, 2020).

While there is a substantial body of research focusing on co-presence and urban form, fewer studies have addressed the intricate relationship between alleyways and housing typomorphologies within complex urban settings, particularly through a temporal-social-spatial description – though the work of Thai, Stevens and Rogers (2018, 2020) should be highlighted for its delineation of spatial configuration and urban form at this scale of analysis, in their case to study home-based businesses Hanoi, Vietnam. Based on the above studies, this research aims to delve into spatial configuration, typomorphology, and their roles in facilitating encounters and co-presence within the dynamic inner-city alleyways of Nanjing in two key periods: c.1930s/c.2020s. Built upon the established theoretical connections between space syntax and micro socio-morphology (ibid.), the study further investigates the nuanced interplay between spatial morphology and social morphology at a fine-grained micro level.

3 METHODOLOGY AND DATA SOURCES

3.1 Mapping the publicly accessed footways

In order to establish a representative sample of all alleyways in the study area, Taiping South Road area (TPS), two maps were drawn of a wider contextual area to capture the full detail of the area’s publicly accessible footways. The process involved synthesizing cartographic sources from c.1930s and c.2020s respectively. The contemporary footway map of c.2020 was reconstructed based on Nanjing Planning Bureau’s city map, Baidu Map, and Gaode Map. This procedure involved an exhaustive examination of the streetscape using Baidu Street View – a

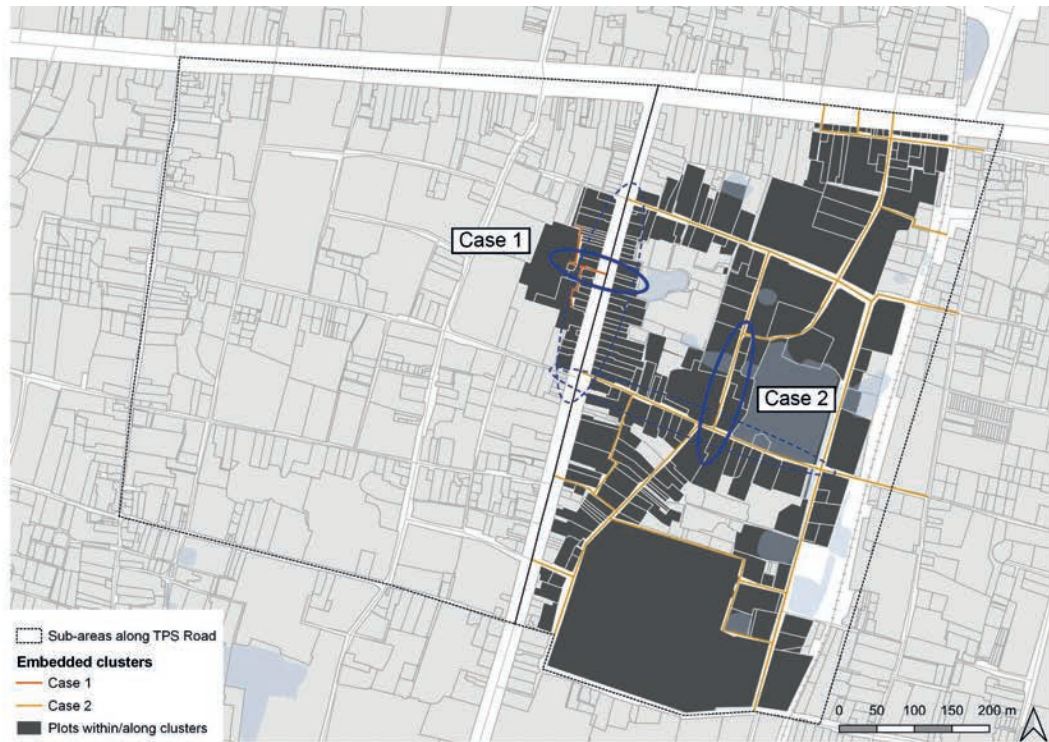
technology featured in Baidu Maps enabling users to interactively view panoramic imagery along various streets within Chinese cities. Taking walking as a vital method (Pierce and Lawhon, 2015), additional on-site fieldwork encompassed manual cartography and the utilization of GPS as a reference to track the author’s movement routes within the spaces that can be publicly accessed in the city. This comprehensive fieldwork was initially carried out in 2021 and then continued into the summer of 2023, which further refines the footway map, specifically delineating those accessible to the public.

The historical footway map of c.1930s, on the other hand, is reconstructed based on the cadastral map series surveyed during 1930-1936 (Repository from Ministry of the Interior and Academia Sinica). It should be noted that compared with the map of 2020s, which is created by investigating spaces between the massing of buildings, the footway of 1930s is mapped through measuring the void spaces between building plots. This difference in methods means that morphological and configurational indicators are not comparable between the periods, so rather than using absolute numbers, the *proportion* of the count and its *rate of change* are used for comparing the two periods.

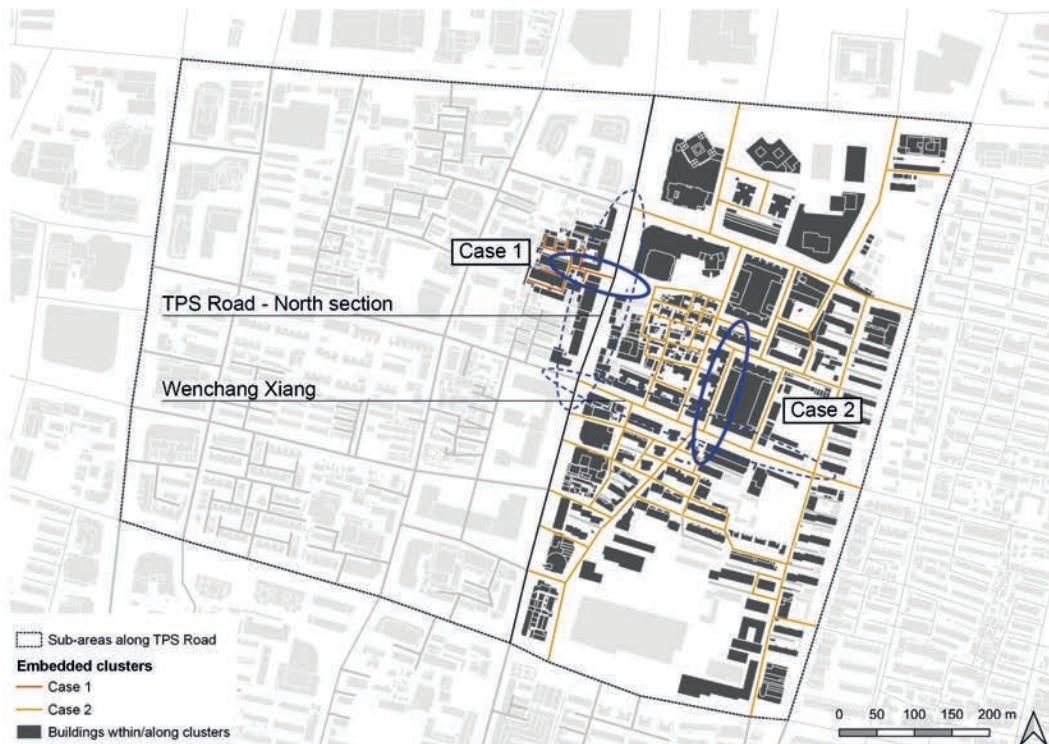
Considering various factors including footway width, configurational pattern, morphological characteristics, topological settings, and temporal continuity (namely, checking whether an alley existing today existed as well in the 1930s and vice versa), four cases of alleyways with continuity were chosen from the publicly accessible footway map. The sampling was stratified to capture examples from the different sections of TPS area – two in the north, one in the mid, and one in the south. This paper focuses on a comparative analysis of two alleyway cases located within the north section of the TPS area (Table 1). Figure 1 presents the two alleyway cases, their adjacent streets, and their surrounding streets within the map of c.1930s and c.2020s, with the plots/buildings on both sides highlighted in black. Here, the term "surrounding streets" refers to all the pathways connecting bounding streets of one sub-area to the corresponding alleyway case.

Table 1 Spatial and morphological attributes for two alleyway cases in the north section of TPS area (red texts indicate alleyways in a cluster/along with older buildings).

TPS area	Alleyways with continuity	Pattern	Older building(s)	Topological steps (axial turnings) from the bounding street
North section	Case 1	Clustered	Yes	1
	Case 2	Alone	No	2



c.1930s



c.2020s

Figure 1 Mapping Case 1 and Case 2 Alleyway, their adjacent streets, and surrounding streets within the publicly accessed footway map c.1930s and c.2020s.

3.2 On-site surveys on typomorphology and use types

Following the spatial configurational analysis based on the reconstructed publicly accessed footway maps, the comparative analysis of the alleyways and their adjacent streets was developed along the lines of typomorphological studies. The latter includes the on-site survey, integrated with historical archival research, on building typologies, the construction periods, and the height of the buildings (using the number of floors as a metric). With a particular focus on building types with residential uses (Firley and Stahl, 2010), building typologies in TPS area are specifically categorised into nine types: 1) detached house, 2) villa, 3) terraced house, 4) semi-detached house (denoting buildings sharing a common wall with neighbouring ones), 5) courtyard house, 6) apartment housing, 7) collective housing (specifically referring to those with shared facilities like kitchens and bathrooms), 8) additional buildings (such as bike sheds and guard houses), and 9) others (i.e., office buildings, shopping malls).

Subsequently, the investigation moves on to examine the land use types by classifying each of the building entrances along the pathways. Given the limited resolution of most Points of Interest (POI) and land use data at the local community level, the data collection of uses here involved on-site observations as part of the field survey. Specifically, the use of entrances along pathways is classified into sixteen categories: 1) accommodation, 2) cafés, 3) restaurants, 4) fresh food store, distribution and premises, 5) medical and health care services, 6) shops, 7) education, 8) recreation and leisure, 9) enterprises, 10) daily services, 11) local government, 12) public facilities, 13) residence, 14) banks, 15) offices, and 16) general commercial. Taking the length of the pathway into consideration, two additional comparisons are made regarding entrance density and use type diversity.

3.3 On-site observations on people's movement flows and activities

Following the on-site survey on static typomorphology and use type, the observations of people's daily movement and dynamic activities comprise two main parts: one is junction observation, and one is people following. Situated at the intersections of each alleyway and its adjacent street, junction observation seeks to record and compare the quantity and percentage of people's three types of movement (*From* – moving from the alleyway into the surrounding streets, *Pass* – moving past the alleyway without entering it, and *To* – entering the alleyway) across five periods encompassing weekdays (WDY) and weekends (WKD). Each period includes five minutes of observation and two rounds per case:

- 1) Morning rush-hour (8:00-10:00)
- 2) Late morning (10:00-12:00)

- 3) Lunch time (12:00-14:00)
- 4) Mid-afternoon (14:00-16:00)
- 5) Evening rush-hour (16:00-18:00)

With a specific focus on people’s activities within the alleyways, namely for people with the *To* movement, the people following observations select ten individuals randomly, alternating men and women, tracing their movement from the chosen junction into the area for the same five time periods as above per entry point in weekdays and weekends. Pedestrian trajectories were recorded until their departure from the observation alleyway or stopped to carry out any activity extending beyond a duration of two minutes. Based on the movement traces, people’s activities are further classified into seven types in Table 2. It should be noted that Type A and B are excluded from Case 1 as it is a one-end alleyway.

Ethnographic observations and interviews with local shop owners and residents are further adopted to investigate and understand the spatial cultures and people’s daily practices within and beyond the alleyway, using the work of Suzanne Hall as a guide (Hall, 2012).

Table 2 Seven types of people's activities within alleyways based on the people following from junctions.

Type	Description	Actions in a temporal dimension
A	Pass through the alleyways without a stop	Through
B	Stop along some shops (or other areas) and then pass onwards to another exit;	Through with stop
C	Stop along some shops (or other areas) and then return from (or to somewhere close to) the same entrance;	In then out
D	Stop along some areas (planting, bench etc.), talking with someone/sitting or standing independently (for more than 5 mins).	In, stay outside
E	Stop along some shops (or other areas) and then enter a residential building, presumably to go home/work/deliver food etc.	In, stop, enter
F	Enter a building (mostly a residential building), presumably to go home/work etc. (for residents and shop owners)	In, enter residence
G	Enter a shop (or other areas) and stay for more than 5 mins. (For customers (i.e. in restaurants and reading clubs) and staff like cleaners)	In, enter non-residence

4 SPATIAL CONFIGURATION C.1930S/C.2020S

Before delving into the spatial configuration, our initial approach involved quantifying the total count and length of publicly accessed pathway segments to trace the transformation of the street layout from c.1930s to c.2020s. As depicted in Table 3, there is a marked reduction in both the total count (-15.7%) and length (-12.4%) for Case 1 Alleyway and its surrounding streets,

notwithstanding an augmentation in their respective lengths (+10.4m and +199.5m). This decline assumes particular significance when juxtaposed with the relatively stable proportion observed in the surrounding streets within the designated sub-area, exhibiting marginal changes in total count (-1.6%) and total length (+1.0%).

Table 3 Comparing the proportion of alleyway Case 1 and Case 2 within their surrounding streets, and that of these streets situated within the corresponding sub-areas along TPS Road, taking the measure of total count and total length of footway segment c.1930s and c.2020s (blue texts indicate a greater *increase* and the red text show a greater *decrease*).

Spatial measures		c.1930s		c.2020s		Change	
		Case 1	Case 2	Case 1	Case 2	Case 1	Case 2
Alleyway case	Total count	3	1	3	1	-	-
	Total length/m	61.7	156.5	72.0	138.9	+10.4	-17.6
Surrounding streets	Total count	9	62	17	142	+8	+80
	Total length/m	203.3	4326.4	402.8	6800.3	+199.5	+2473.9
Sub-area	Total count	95	113	215	172	+120	+59
	Total length/m	6501.7	6236.4	9777.7	8188.7	+3276.0	+1952.3
Proportion	Alleyway within its surrounding streets _Total count	33.3%	1.6%	17.6%	0.7%	-15.7%	-0.9%
	Alleyway within its surrounding streets _Total length	30.3%	3.6%	17.9%	2.0%	-12.4%	-1.6%
	Surrounding streets within the sub-area _Total count	9.5%	54.9%	7.9%	82.6%	-1.6%	+27.7%
	Surrounding streets within the sub-area _Total length	3.1%	69.4%	4.1%	83.0%	+1.0%	+13.7%

This decrease can be elucidated by the transformation in the plot pattern and corresponding properties within the residential neighbourhood. Specifically, the neighbourhood underwent a transition from a residential land in c.1930s to an assemblage of smaller plots featuring intricate properties within the contemporary city (Sun and Bao, 2021). The pathways situated between buildings within these plots, previously unrecorded in the cadastral map of the 1930s, have accordingly become discernible and accessible in the map of the c.2020s.

In contrast, Case 2 Alleyway, despite its diminished length (-17.6m) from c.1930s to c.2020s, demonstrates a relatively consistent proportion of its total count and length embedded within the surrounding streets, exhibiting minimal changes (Total count: -0.9%, and Total length: -1.6%). The proportion of surrounding streets within the sub-area, on the other hand, undergoes a substantial increase in both total count (+27.7%) and length (+13.7%). This transformation is

mainly attributed to the large-scale resettlement housing initiative during 1985-1994, resulting in the establishment of a more densely configured urban grid within this sub-area (See the street views of Case 1 and Case 2 in Figure 5 and Figure 11 below).

Moving on now to investigate the spatial configuration of these two alleyway cases within their surrounding streets. Using measures of Segment Angular Integration and Choice, Figure 2 reveals that Case 1 Alleyway consistently maintains lower integration and choice values at local scale (radius 400m), with one exception of 400m Choice, where it exhibits a relatively higher value in the map of c.1930s. At city level (in radius 2400m), Case 1 Alleyway demonstrates higher integration and choice values in the map of c.2020s. In contrast, Case 2 Alleyway exhibits lower integration and choice values at both local and global scales in the map of c.1930s, whereas in c.2020 map, it displays higher integration and choice values at local level, with higher integration and relatively lower choice values at city level.

Table 4 further explored the configurational settings of the alleyway cases through comparing their average integration and choice values with those of their adjacent streets and the surrounding streets across scales and time periods. Given the clustered pattern of the surrounding streets, in which Case 1 Alleyway is situated, featuring one end connecting to TPS Road, it is unsurprising to observe a consistent higher integration and choice values across scales for Case 1 Alleyway in comparison to the surrounding streets over the past decade. Intriguingly, Case 1 Alleyway manifests a higher choice value than its adjacent street – specifically, the north section of TPS Road – at radius 400m and 800m in the map of the 2020s, indicating its role as a local centre for through-movement within the contemporary city.

In contrast, Case 2 Alleyway, when compared with its surrounding streets, sustains higher integration values over time at radius 400m, along with higher integration at radius 800m in c.1930s. It is noteworthy that Case 2 Alleyway exhibits higher integration values than its surrounding streets at radius 2400m but lower values within the broader city context in c.2020s. These findings illuminate the configurational settings of Case 2 Alleyway, with a persistent higher integration at local level over the past decade and relatively higher integration at a broader neighbourhood level within the contemporary city.

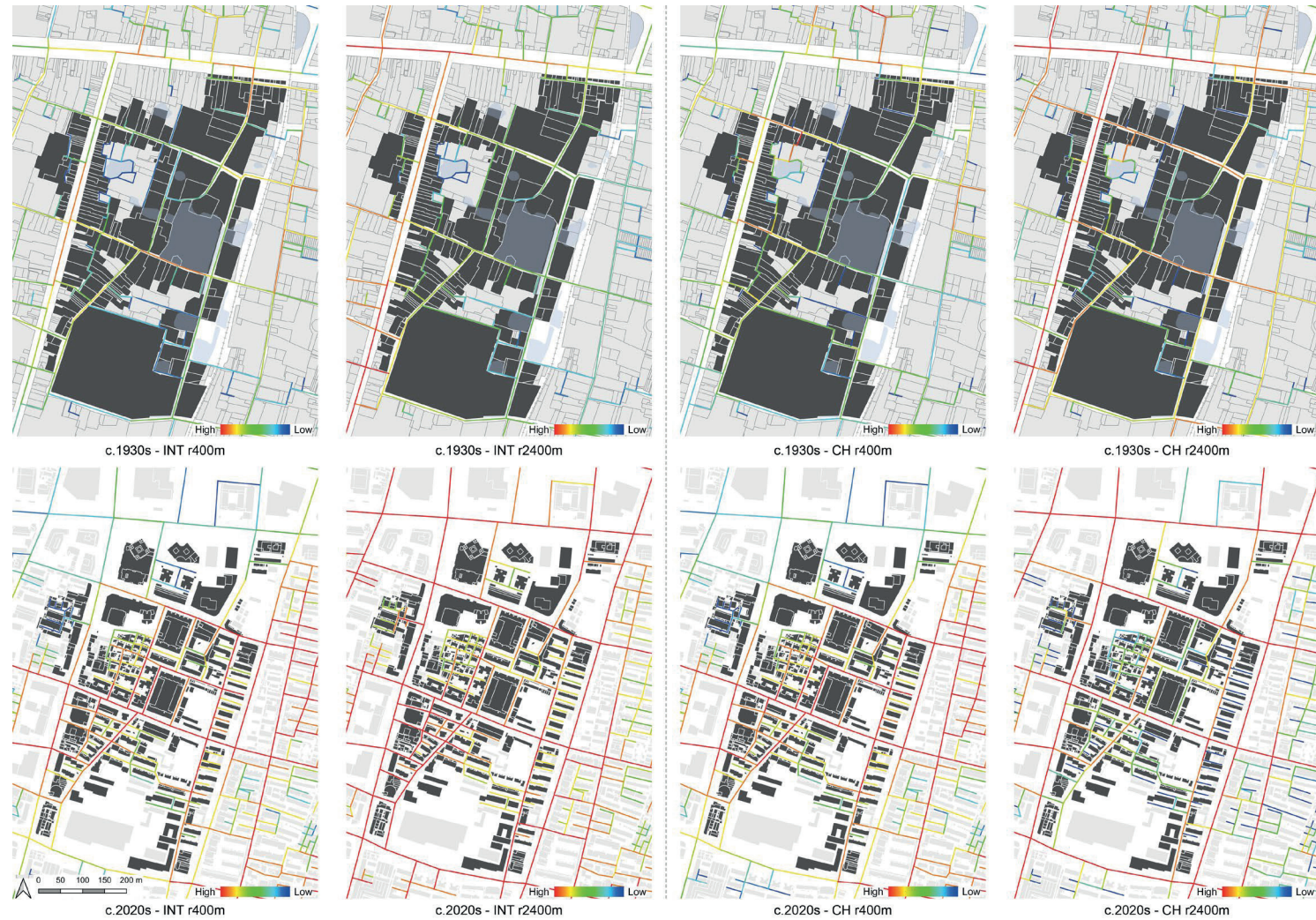


Figure 2 Case 1, Case 2 and their surrounding streets at local and city scale radius c. 1930s and c. 2020s: Segment angular (left) Integration, (right) Choice.

The Marvellous Ordinary: A temporal enquiry into the socio-spatial Morphology of alleyway housing in Taiping South Road area, Nanjing c.1930s/c.2020s

Table 4 Comparing Case 1 and Case 2 Alleyway with their adjacent streets and surrounding streets, taking the measure of average integration and choice values through segment angular analysis across the scale (in radius 400m, 800m, 1200m, 2400m, 4000m and n) and time, c.1930s and c.2020s (blue texts signify higher values than those of respective surrounding streets, with bold further highlighting higher values than the adjacent street).

Case	Time period	Pathway(s)	INT r400	INT r800	INT r1200	INT r2400	INT r4000	INT n	CH r400	CH r800	CH r1200	CH r2400	CH r4000	CH n
Case 1	c.1930s	Case 1 Alleyway	21.6	71.6	126.6	396.7	829.2	1096.9	251.0	1522.3	2843.3	11123.0	26828.0	38759.3
		TPS Road - North section	34.9	103.2	173.6	524.2	1047.1	1333.1	376.5	5206.5	17132.5	126227.0	724281.0	3641620.0
		Surrounding streets	14.2	53.0	95.4	311.3	671.7	907.7	136.1	819.2	1539.7	6028.4	14585.7	21148.4
	c.2020s	Case 1 Alleyway	27.3	111.9	238.8	855.1	1514.5	1904.0	589.3	7757.7	19081.0	78158.3	158759.0	218451.0
		TPS Road - North section	51.5	175.2	345.4	1174.9	1982.6	2425.6	411.0	6424.0	20994.5	216589.0	1151340.0	4164120.0
		Surrounding streets	16.1	74.7	167.1	631.7	1159.7	1494.2	162.8	2012.3	4945.9	20296.4	41285.4	56929.6
Case 2	c.1930s	Case 2 Alleyway	29.4	78.8	131.0	325.6	655.9	963.2	127.0	2177.0	2910.0	4317.0	4671.0	2493.0
		Wenchang Xiang	38.5	94.0	159.5	410.4	818.6	1090.5	345.9	3454.3	11537.3	51029.7	160307.0	371523.0
		Surrounding streets	28.2	78.4	133.8	357.1	730.8	996.0	234.2	2243.1	6112.1	25879.8	75586.1	127225.0
	c.2020s	Case 2 Alleyway	64.7	153.7	271.0	734.5	1320.1	1708.3	483.0	2086.0	6570.0	15299.0	27879.0	23819.0
		Wenchang Xiang	97.1	235.6	387.1	992.1	1669.8	2116.1	1671.9	19353.6	67389.0	226721.0	523795.0	653985.0
		Surrounding streets	57.1	156.0	273.6	732.5	1346.1	1736.7	691.8	5068.7	13202.5	48664.8	109258.0	145914.0

5 MICRO SOCIAL-SPATIAL MORPHOLOGY

Bearing in mind the continuity and transformation of the spatial configurational settings of the alleyway cases within their surrounding streets, the following section delves into the social-spatial morphology of the two alleyway cases at a micro level, through investigations of typomorphology, use types, and people's daily activities. Based on the site survey and observations, we ask whether, and to what extent, the spatial and social arrangements within the alleyways resemble or differ from those of the streets in comparison (particularly, their adjacent streets).

5.1 Analysis of Case 1: TPS Road No.76 Alleyway

Situated in the northern part of TPS area, TPS No.76 Alleyway (*Xiang*) serves as a direct link connecting a residential complex established in 1930s to TPS Road. Comparing the aerial photograph of 1929 with the cadastral map of c.1930s, we can see that the land embedded within the block was previously used for agricultural production before its transformation into a residential complex. This transformation was carried out through land leasing and development by two private estate developers, *Jian Ji* and *Fu Ji*, whose collaboration led to the initial naming of the complex as *Jianfu Li*. This exemplifies a common approach to small-sale land development in Nanjing during the early twentieth century, wherein land and property ownership were initially separated (Hu, 2018). With this residential complex further designated as an unmovable historic site at Qinhuai District in 2019, representing historical traces and building types during Republican period, Case 1 Alleyway consistently serves as the only pathway linking the historic residential settlement to the city's main street – TPS Road.

Typomorphology

Prior to examining the typomorphology of buildings along Case 1 Alleyway and its adjacent street, it is noteworthy that the historic residential complex situated at the western end of the alleyway consists of four detached houses to the north, two collective housing units to the south (with the northern one being of the corridor type, and the southern building being of the unit type), and additional buildings positioned between the collective buildings and along the periphery of the residential area. Shifting the focus to Case 1 Alleyway itself, five distinct building types are identified. These include one detached house and one apartment building on the northern side, as well as one courtyard house, one semi-detached house, and a recently renovated café building on the southern side. In contrast, the northern section of TPS Road, as the adjacent street to Case 1 Alleyway, exhibits a more limited array of building typologies.

Specifically, it encompasses only two types – apartment housing and others – as shown in the upper portion of Figure 3.

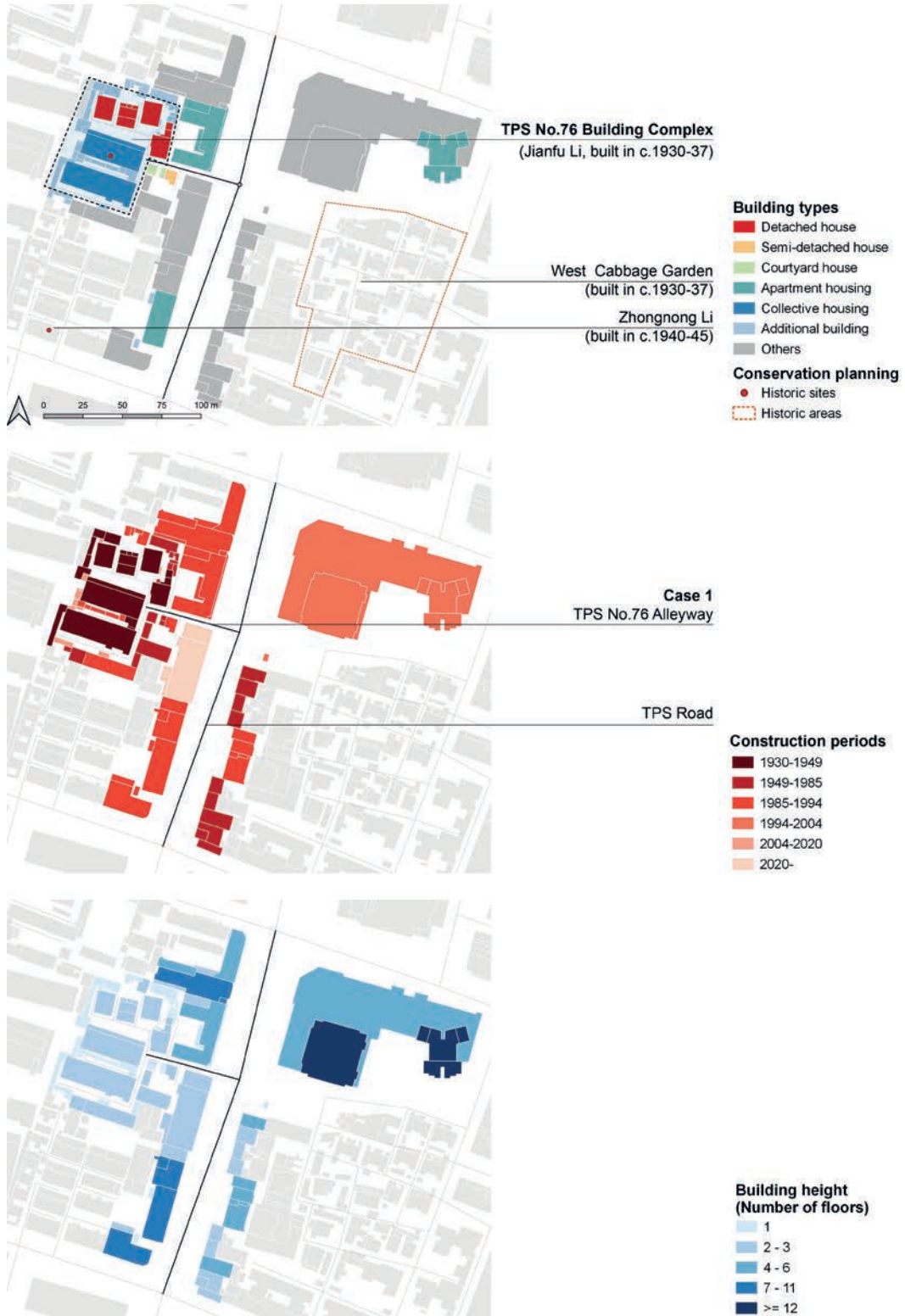


Figure 3 Typomorphology of Case 1 Alleyway, its adjacent street, and its surroundings: 1) building types, 2) construction periods, and 3) building height (number of floors).

Examining the construction periods of buildings along Case 1 Alleyway reveals a chronological progression from the inner to the outer area of the block, extending from west to east (see the mid part of Figure 3). Commencing with the oldest ones – the detached house dating back to 1930s – the subsequent time periods include 1949-1985, marked by the construction of the courtyard house on the southern side. The semi-detached house, sharing a wall with the courtyard house, and the apartment building along both the alleyway and the street were constructed during 1985-1994. A more recent addition is a café and restaurant building, constructed around c.2020s, replacing the earlier shophouses built between 1949 and 1985. It is noteworthy that this type of small-scale shophouse represents the oldest building type still present on the north section of TPS Road. Following this period, most shophouses along this street were progressively replaced by other building types serving official and commercial uses, along with apartment buildings.

The investigation on building height, as assessed by the number of floors (see the bottom part of Figure 3), further reveals a relatively lower building height along Case 1 Alleyway with an average of 2 floors and a maximum of 6 floors. In contrast, its adjoining street manifests a higher average building height of 5 floors, with one high-rise building on the north reaching a maximum of 27 floors.

In summary, the typomorphology of Case 1 Alleyway, when juxtaposed with its adjacent street, is characterized by diverse residential building types, inclusive of older buildings spanning a greater temporal range, and notably, a lower building height.

Use Type

Building upon the spatial morphological analysis, the subsequent study explores the social dimension by comparing the usage patterns within Case 1 Alleyway and its adjoining street. Figure 4 presents the spatial distribution, based on the map of building height, and the composition of uses types of entrances along both pathways. Considering the length of each pathway, the initial investigation on the entrance density, namely the count of entrances per metre, indicates that Case 1 Alleyway exhibits a slightly lower density of entrances (0.10) in comparison to the north section of TPS Road (0.11).

In contrast to the nine use types identified in the northern section of TPS Road, Case 1 Alleyway, with a total of seven entrances, exhibits a lesser diversity, comprising three use types in total— one for shops, four for residences, and two for offices. Notably, entrances leading to residential buildings constitute the majority at 57%, while the one entrance for a shop represents the

smallest proportion at 14%. Conversely, along its adjacent street, shops account for the highest proportion of use types at 50%, while only two entrances, constituting 6%, are designated for residence.

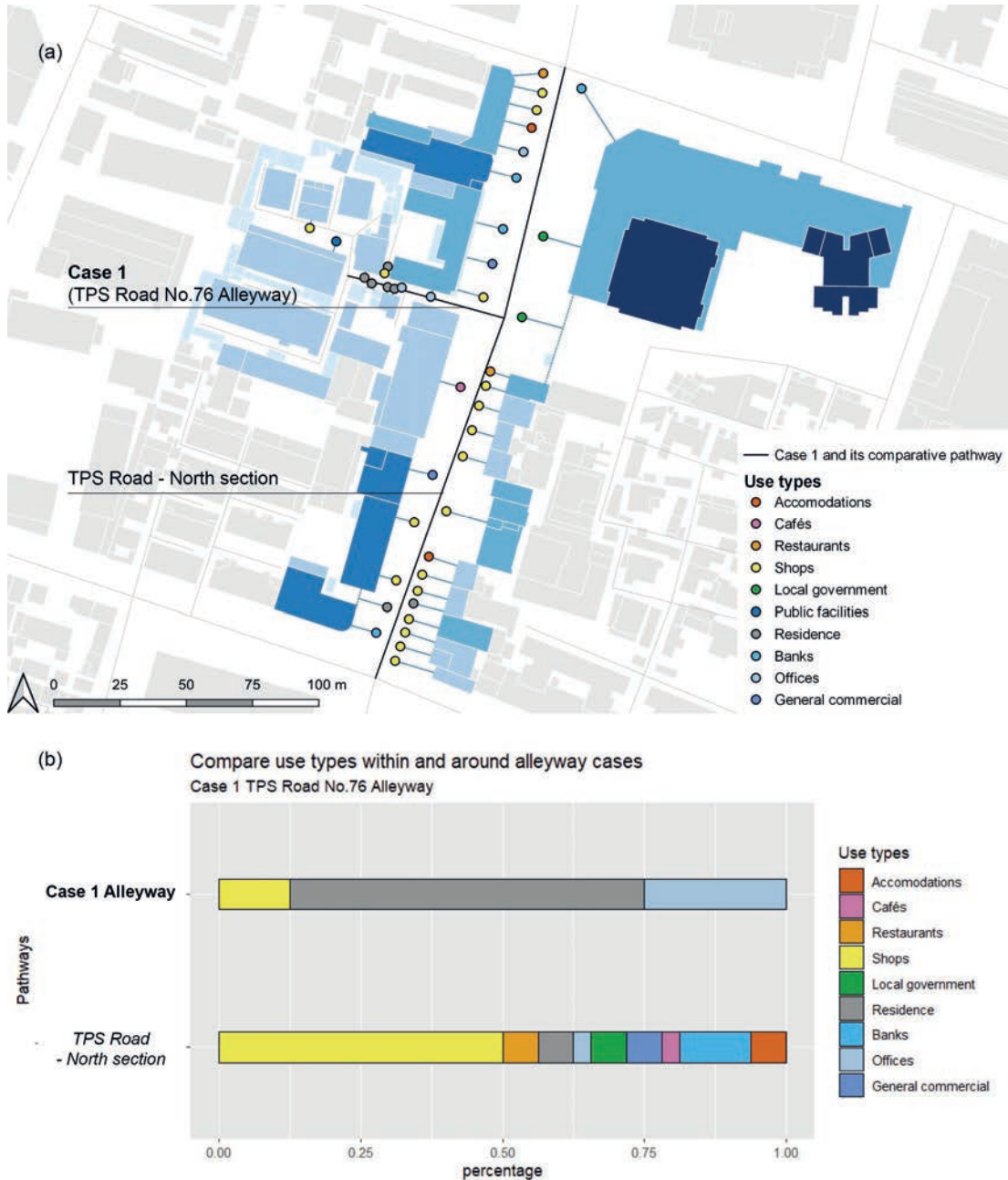


Figure 4 Comparing use type within Case 1 Alleyway and its adjacent street – the north section of TPS Road: (a) the spatial distribution of use types of entrances, based on the map of building height, and (b) the use type composition within each pathway.

It is noteworthy to highlight that among the sixteen shops along the north section of TPS Road, a considerable majority, twelve shops, sell jewellery or gold, 75% of the total. This underscores

the enduring commercial tradition of jewellery-making and trading in the northern part of TPS Road since the 1970s-80s, a period when it was referred to as Golden Jewellery Street. For instance, Paoqing Jewellery, a renowned silversmithing house with a history of over 200 years in Nanjing, has its main store situated along this street. Moreover, the only shop within Case 1 Alleyway is a gold jewellery-making studio (*Dajindian*), providing a cost-effective alternative for bespoke jewellery. Its entrance is visible from the main street, though situated within the alley, making the most of its adjacency to the main Road (Figure 5).



Figure 5 Two jewellery shops: (a) Paoqing Jewellery, located along the north section of TPS Road, and (b) Chengbao Dajindian (a gold jewellery-making studio) situated along Case 1 Alleyway, with a visible entrance and shop sign from TPS Road.

People's activities

Turning now to the on-site observation of people's daily activities. Figure 6 – (a) and (b), in conjunction with Table 5, present a comparative analysis of the quantity and percentage of three movement types recorded at the junction of Case 1 Alleyway and TPS Road across five periods during weekdays and weekends. It is evident that during the evening rush hour (16:00-18:00), the overall traffic volumes are consistently higher than in other time periods during both weekdays (WDY5) and weekends (WKD5). The predominant movement type is *Pass*, denoting individuals merely pasting the junction without entering/leaving the alleyway, and this movement constitutes more than 80% of the total recorded, significantly surpassing the proportion of other movement types across all observed periods. With closer comparisons of *To* and *From* movement, an intriguing pattern emerges. Specifically, during the morning rush hour (8:00-10:00) on both weekdays and weekends, the proportion of individuals moving towards the alleyway (*To*) exceeds those departing from the alleyway (*From*). This trend is also discernible during late morning on weekdays (WDY2) and mid-afternoon on weekends (WKD4).

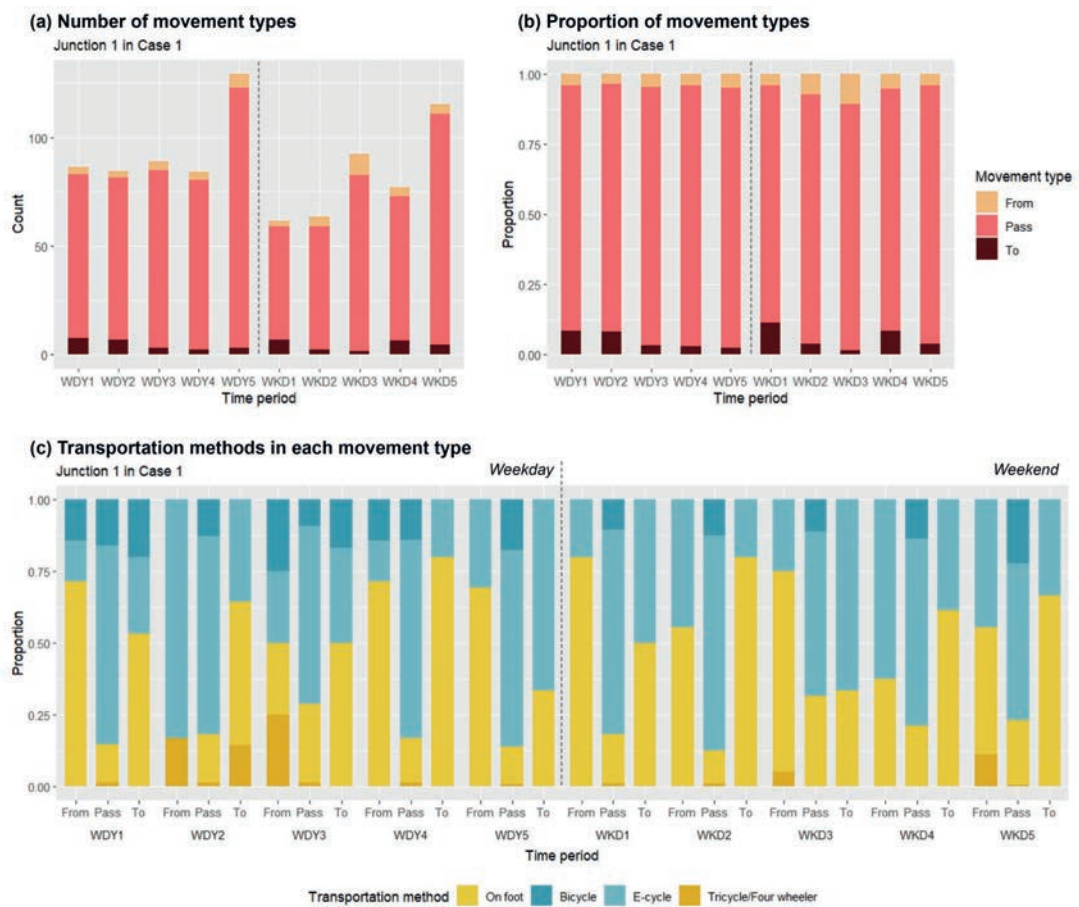


Figure 6 Junction observation of people's movement in Case 1 Alleyway during weekday and weekend: a, b) Number and proportion of movement types, and c) Proportion of transportation methods, including on foot, bicycle, e-bicycle, and tricycle/four-wheeler (n=100, 100 people observed in total for this junction, ten people following for each time period).

Table 5 Proportion (and count) of movement types recorded at the junction of Case 1 Alleyway (blue texts present the higher percentage of *To* movement than *From* movement during each period).

Movement Type	WDY1	WDY2	WDY3	WDY4	WDY5	WKD1	WKD2	WKD3	WKD4	WKD5
Pass	87.3% (76)	88.2% (75)	92.1% (82)	92.9% (78)	92.6% (120)	84.6% (52)	89.0% (57)	87.6% (81)	86.4% (67)	92.2% (106)
To	8.7% (8)	8.3% (7)	3.4% (3)	3.0% (3)	2.3% (3)	11.4% (7)	3.9% (3)	1.6% (2)	8.4% (7)	3.9% (5)
From	4% (4)	3.5% (3)	4.5% (4)	4.1% (4)	5.1% (7)	4.0% (3)	7.1% (5)	10.8% (10)	5.2% (4)	3.9% (5)
Total count	(88)	(85)	(89)	(85)	(130)	(62)	(65)	(93)	(78)	(116)

Taking the transportation methods associated with each movement type into account, Figure 6 – (c) further reveals that in contrast to the prevalent use of e-cycles for people's *Pass* movement along TPS Road, the *From* and *To* movements within Case 1 alleyway exhibit a higher proportion of walking throughout the various time periods. This pattern remains consistent,

with the exception of instances including the *From* movement in WDY2 and WKD4, as well as the *To* movement in WDY5 and WKD3, where e-cycles emerge as the predominant mode of transportation. Tricycles and four-wheelers, as convenient transportation methods primarily adopted by individuals with specific spatial and usage requirements, such as street vendors and cleaners, are predominantly observed within the alleyway during *From* and *To* movements.

To further understand the people's daily activities within Case 1 Alleyway, Figure 7 and Table 6 specifically present the proportion and count of five activity types observed across time periods. We can see that people entered the alleyway and then went to the residence (In, enter residence), mainly to go home or head to work, maintains the highest proportion during five periods (WDY1, WDY2, and WDY 3 on weekdays, as well as WKD2 and WKD5 on weekends), with the highest overall proportion of 42%. On the other hand, individuals who came to the alleyway and subsequently returned through the same entrance (In then out) exhibit the highest percentage of activities during another five periods (WDY4, WDY5 on weekdays, and WKD1, WKD3, and WKD4 on weekends), with the second-highest overall proportion of 37%.

Interestingly, it is often observed that individuals entered the alleyway, remaining outside to talk with someone or sitting/standing by themselves across each period on weekdays. Such activities became particularly noticeable during the morning rush hour on weekends (WKD1), reaching the highest proportion of activities, with four out of ten people engaged in. This phenomenon is further contextualized by ethnographic research on site, revealing that this type of activity predominantly occurs around the courtyard house along the southern side of the alleyway. Here, an elderly retired couple has resided for several decades, and their activities, such as sitting on the threshold of the door, keeping an eye on things along the wall opposite their house (such as a pink flower tree, several bird cages, and drying bed sheets and clothing, which interestingly, are not only belong to themselves), and chatting with passers-by, contribute to an extension of their domestic life. They are those whom Jacobs (1961) named "public characters", who are always present, and chat to different people passing by; they know everybody in the neighbourhood, and care about it. The inner courtyard, threshold area, and the space between a small wooden gate and the yellow wall along the alleyway collectively form an enduring locus of everyday encounters within the alleyway neighbourhood.

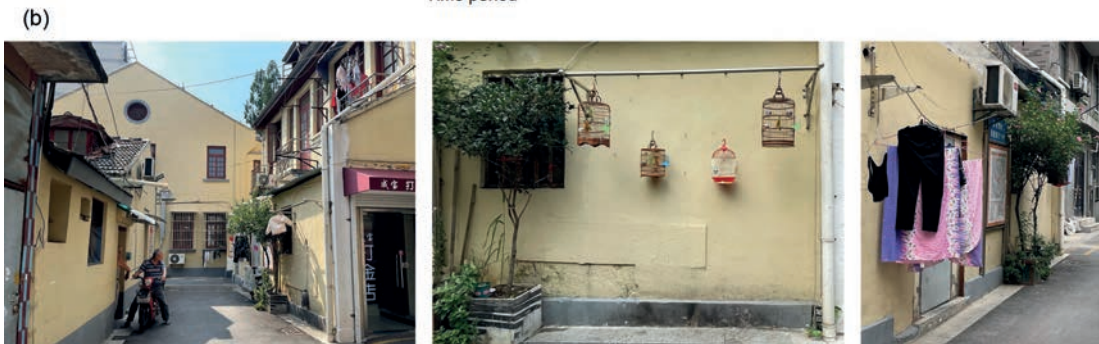
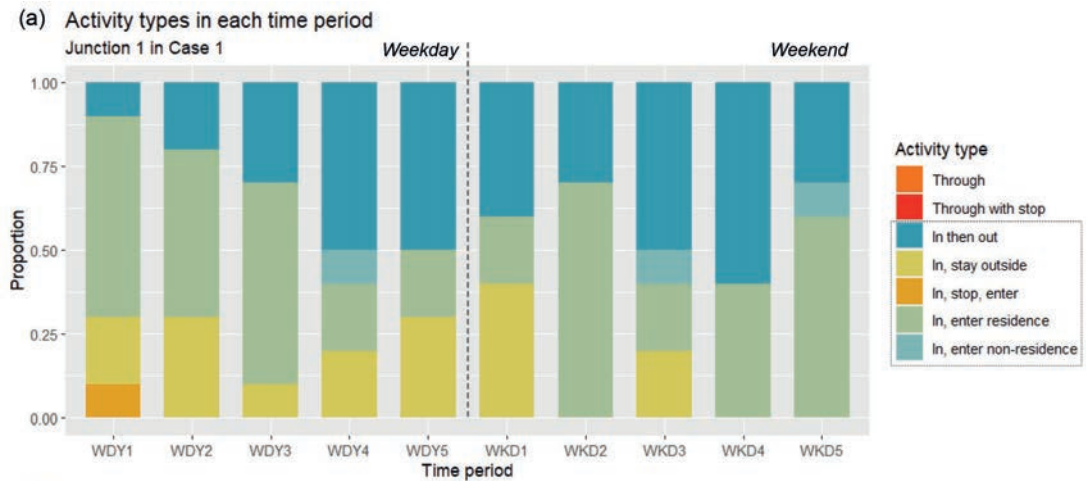


Figure 7 (a) People following from Junction 1 to trace the daily activity pattern within Case 1 Alleyway (n=100 in total, 50 weekdays + 50 weekends); (b) People’s activities of *In, stay outside* the courtyard house along the alleyway, which serves as both an extension of the residents’ domestic life and a communal place for everyday encounters.

Table 6 The number of people observed in various activities in Case 1 Alleyway (**bold** texts present the highest count within each period, and **blue** texts refer to the activity type with the top three proportions in total).

Activity type	WDY 1	WDY 2	WDY 3	WDY 4	WDY 5	WK D1	WK D2	WK D3	WK D4	WK D5	Proportion
In then out	1	2	3	5	5	4	3	5	6	3	37%
In, stay outside	2	3	1	2	3	4	-	2	-	-	17%
In, stop, enter	1	-	-	-	-	-	-	-	-	-	1%
In, enter residence	6	5	6	2	2	2	7	2	4	6	42%
In, enter non-residence	-	-	-	1	-	-	-	1	-	1	3%

5.2 Analysis of Case 2: East Cabbage Garden

Connecting Ke Xiang and Wenchang Xiang, the pathway of present Case 2 Alleyway, formerly designated as Zhenren Miao, featuring water ponds at both sides, was considerably longer in the 1930s (see Table 3 above). Following the large-scale urban resettlement project initiated in

the inner city of Nanjing during 1985-1994, the alleyway and its surroundings underwent a shift and became known as East Cabbage Garden. This place name stems from its geographical location to the east of West Cabbage Garden, which is derived from the historical use for vegetable cultivation of this area prior to its transformation into a residential complex constructed in 1930-37.

Typomorphology

Figure 8 delineates the typomorphological characteristics of Case 2 and its surroundings within the sub-area between Ke Xiang and Wenchang Xiang. Situated amidst several historic sites including Nanjing Museum of the Site of the Lijixiang Comfort Stations to the north and Tung Chuin (Tong Jun) House to the south, East Cabbage Garden area is characterized by its unique blend of commercial and residential uses. Specifically, this is formed by continuous shops and markets on the ground floor, including two two-storey indoor markets (Ke Xiang Market and Suguo Supermarket), alongside apartment buildings, typified by deck-access housing.

Case 2 Alleyway, connecting the mid pathway within East Cabbage Garden to Wenchang Xiang in the south, spans about 140 metres in length and measures 6.5 metres wide. Its western side predominantly comprises fifteen single-story shops linking three seven-storey apartment housing on the ground level (East Cabbage Garden No. 54-55, 56-57, and 58-59). On the eastern side, a distinctive deck-access housing lines the alleyway (East Cabbage Garden No. 60-68, 69-74, 75-83, 84-89 – four seven-storey apartment buildings in the sky). This side features two open staircase entrances leading to the deck and seventeen shops on the ground floor. With this typomorphological analysis in mind, the subsequent investigation moves to examine the use type patterns along Case 2 Alleyway and its comparative pathways.

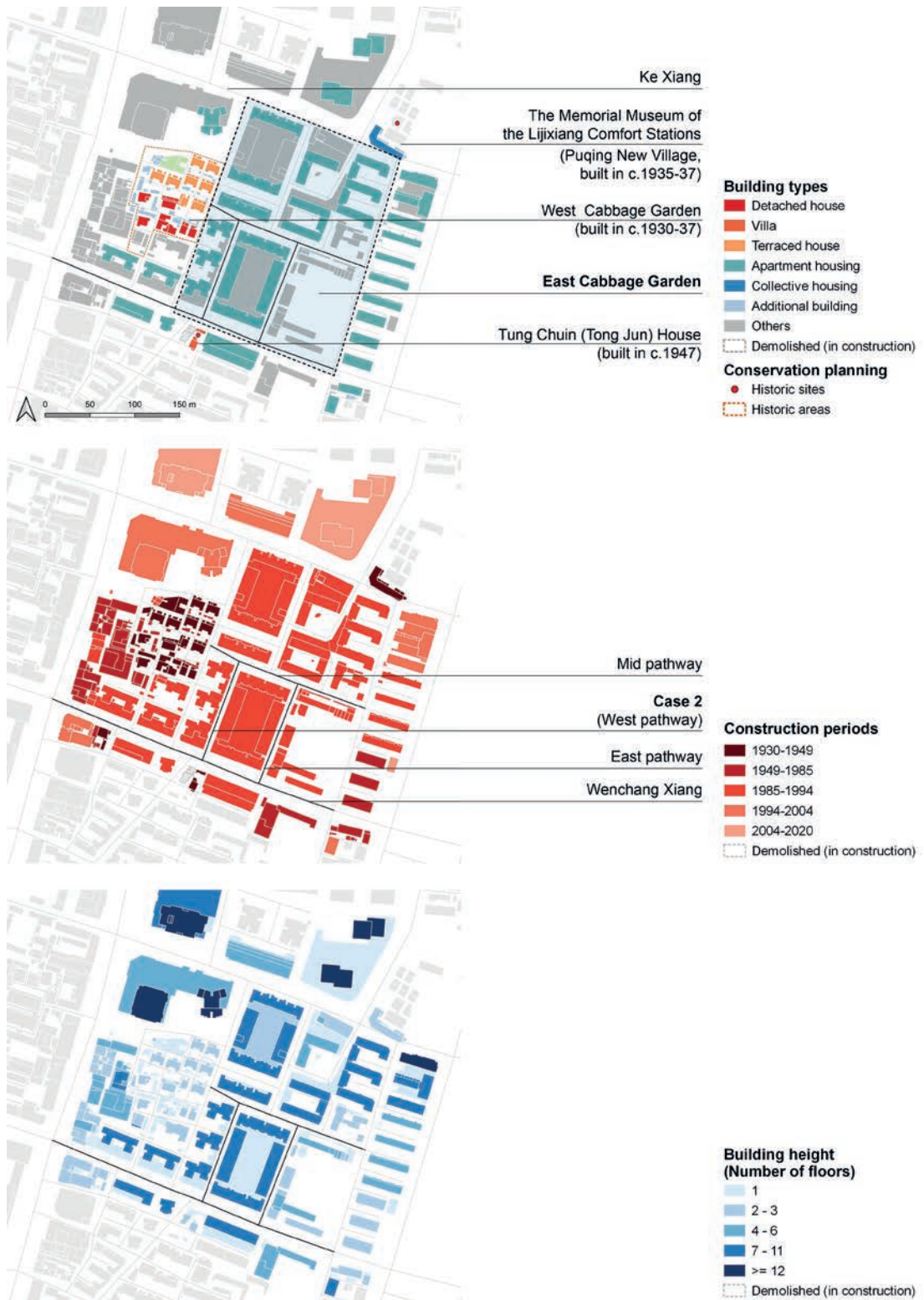


Figure 8 Typomorphology of case 2 and its surroundings within the sub-area between Ke Xiang and Wenchang Xiang: 1) building types, 2) construction periods, and 3) building height (number of floors).

Use Type

Considering the pathways on the other three sides of the deck-access housing for comparison, they consist of Wenchang Xiang to the south, mid pathway to the north, and east pathway along with Nanjing No.3 High School (Wenchang Xiang campus) to the east. Figure 9 specifically shows the spatial distribution and composition of the use types of entrances along these four pathways, encompassing ten use types in total. Segment length weighted density analysis finds that Case 2 Alleyway has the highest density of entrances (0.23) compared with the others (East pathway: 0.14, Mid pathway: 0.16, and Wenchang Xiang: 0.19).

Within Case 2 Alleyway, there exist a total of seven use types (compared to eight in Wenchang Xiang), with two types holding the largest proportion of entrances at 34% each: i) recreation and leisure, and ii) fresh food stores, distribution, and related premises. It is notable that the percentage of entrances used for recreation and leisure activities in Case 2 Alleyway stands significantly higher than the others in comparison. In contrast, it exhibits the lowest proportion of shops and a relatively lower percentage of restaurants (except for the mid pathway, which excludes restaurants altogether). Conversely, its adjacent street to the south, Wenchang Xiang, presents the highest proportion of both shops and restaurants.

For the use of recreation and leisure, Case 2 Alleyway specifically includes six bath and (or) massage shops, alongside two mahjong and poker clubs. Based on the field observation, those massage shops that offer traditional medical treatment like moxibustion (*Ai-jiu*), particularly attract elderly patrons, predominantly women. These are typically frequented in the mornings, which might to follow the knowledge of yin-yang, taking both massage therapy and lessons, and trying to maintain a healthy lifestyle. To some extent, this kind of massage shop along the alleyway serves more than providing leisure experience; it functions as a place for people's regular gatherings, fostering a daily ritual, particularly for elderly people, and moreover, fostering community ties.

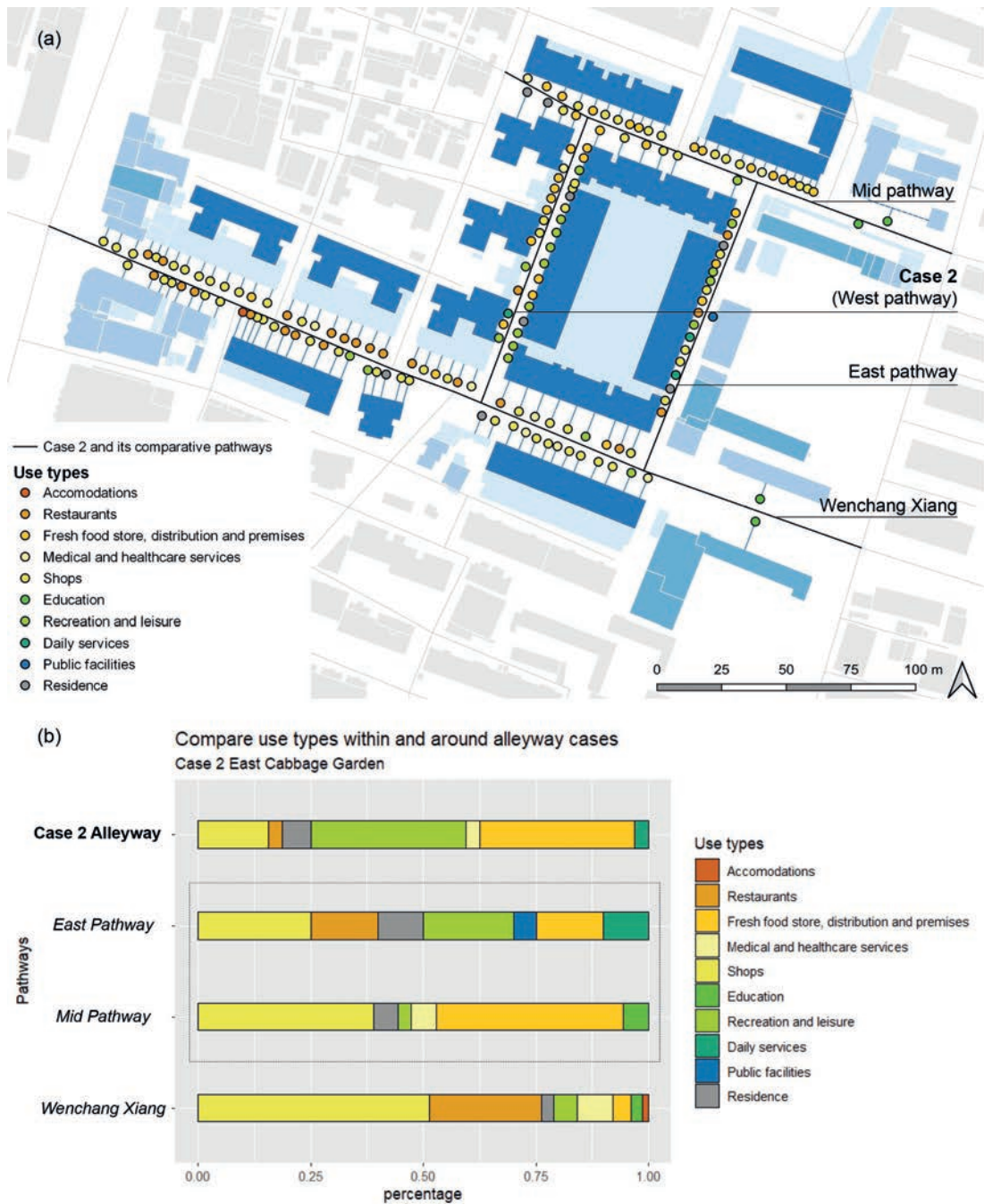


Figure 9 Comparing use type within Case 2 Alleyway and its adjacent street – Wenchang Xiang, along with two pathways surrounding the deck housing (east pathway and mid pathway): (a) the spatial distribution of use types of entrances, based on the map of building height, and (b) the use type composition within each pathway.

On the other hand, it is not surprising to see the higher prevalence of fresh food-related uses in Case 2 Alleyway, slightly below the proportion observed in the mid pathway (at 42%), given its location within the bustling everyday food market of East Cabbage Garden. This area includes three butcher shops, three vegetable shops, two duck shops (reflecting Nanjing's culinary

traditions), two egg shops, one seasonally operated crab shop, one grain and oil shop, and a speciality sesame oil shop.

The mixture of food production, storage, and trade within these shops constitutes an indispensable component of the larger food market network. Take, for instance, the sesame oil shop, a fixture in this area for over two decades, functioning as a fresh oil production studio managed by the shop owner. The owner routinely crafts two sizable pots of sesame oil daily, packaging them into glass bottles. As per his account, while these bottles of sesame oil are often bought by individuals passing by, most sales occur through bulk orders placed by numerous restaurants across the city. Renowned for its high quality, some individuals, after relocating from Nanjing, continue to procure this sesame oil through online shopping and express delivery services.



Figure 10 Views of shops along the alleyway: (a) the street view of the sesame oil shop, (b) the owner's machine for fresh sesame oil making, and (c) the street view of the egg shop with outdoor cooking at the entrance and a resident parking her bicycle along the shop to buy eggs.

Moreover, due to the pivotal role of food in residents' daily lives, the fieldwork diaries indicate that this is a common sight: witnessing residents stopping on their way home, perhaps to purchase items such as eggs and engaging in conversations with acquaintances encountered before going upstairs. Embedded within the market-housing milieu, these food-related shops establish diverse socio-economic linkages at both local and wider levels (Figure 10).

To sum up, Case 2 Alleyway, hosting ten use types along its pathway and nestled within the market, serves a multitude of roles (Figure 11): it provides space for the daily production activities of shop owners, accommodates various additional uses (such as hanging and drying towels used in massage shops, storage of egg boxes at the egg shops, and the presence of cooking stations at the entrance of numerous shops), fosters a network for commercial activities and trade across scales, serves as a meeting point and pathway for residents coming home, and functions as a relatively secure area for children to play, offering high intervisibility (at 69%). Based on these findings, the subsequent analysis further explores the everyday

pattern of people's movement and activities within this alleyway through junction observation and people following from the two ends of the alleyway (Junction 2-1 and 2-2).



Figure 11 The multiple uses of the alleyway: (a) people queuing along the duck shop to buy fresh duck meat, (b) children playing along the pathway, (c) a female shop owner walking towards the dustbin on the south, and (d) towels hanging and drying above the (e-) bicycle parking area.

People's Activities

Figure 12 – (a) and (b), along with Table 7 compare the quantity and percentage of three types of movement (From, Pass, To) recorded at Junctions 2-1 and 2-2 (located at the north and south ends of Case 2 Alleyway) across five periods encompassing weekdays and weekends. It is evident that the overall traffic volume at Junction 2-1, the southern connection to Wenchang Xiang, consistently surpasses that of the northern end linked to the inner mid pathway of East Cabbage Garden throughout the time periods. The proportion of individuals entering and departing Case 2 Alleyway, denoted as *To* and *From* movements respectively, recorded at Junction 2-1 (the northern end of Case 2), consistently maintains a higher percentage compared to the southern end (except during the evening rush-hour on weekends, where the percentage of *To* movement at each end remains almost identical at 16%).

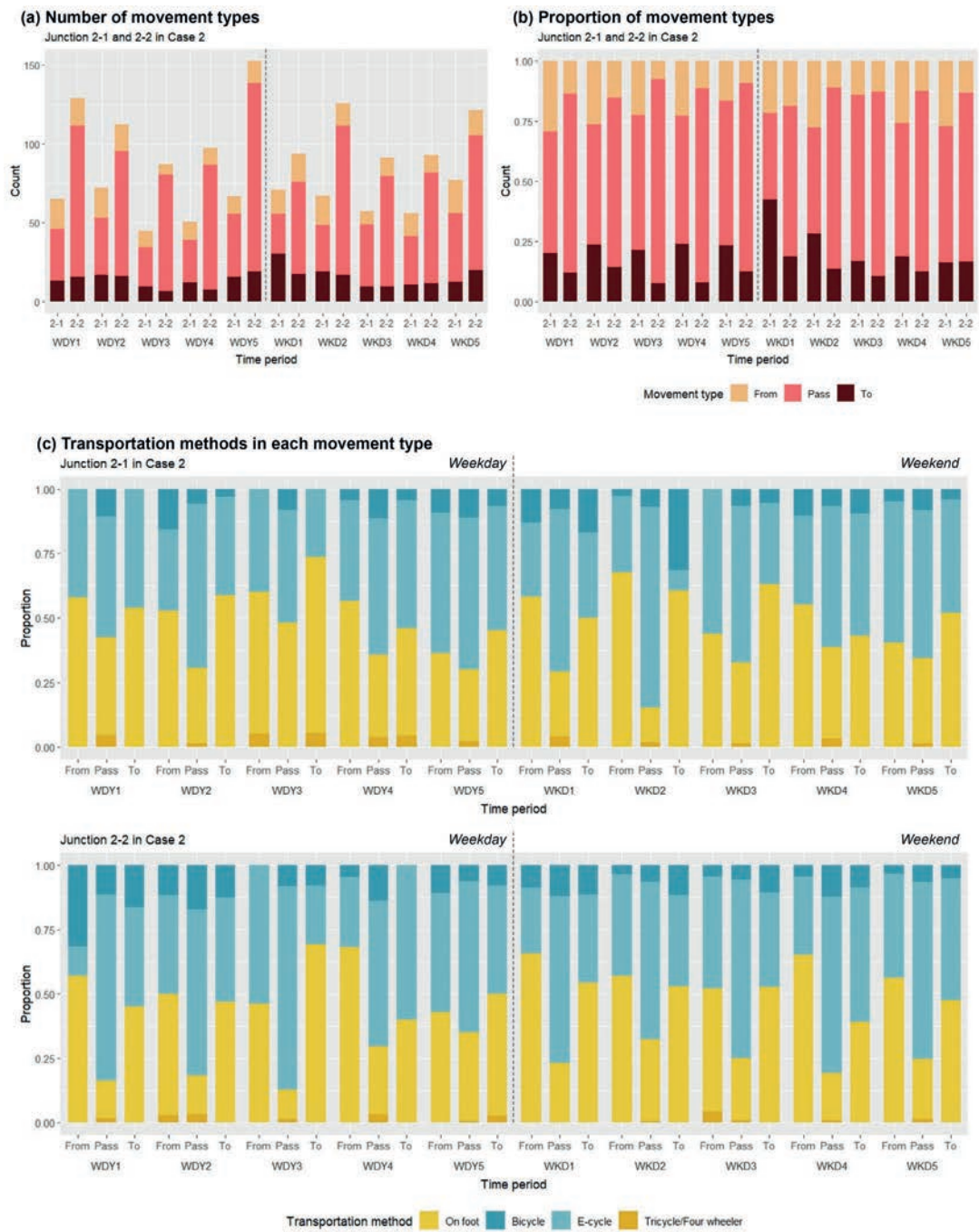


Figure 12 Junction observation of people's movement on Junction 2-1 and 2-2 in Case 2 during weekday and weekend: a, b) Number and proportion of movement types, and c) Proportion of transportation methods (on foot, bicycle, e-bicycle, and tricycle/four-wheeler).

Table 7 Proportion (and count) of movement types recorded at Junction 2-1 and 2-2 of Case 2 Alleyway (blue texts present the higher percentage of *To* movement than *From* movement during each period).

Movement Type	WDY1	WDY2	WDY3	WDY4	WDY5	WKD1	WKD2	WKD3	WKD4	WKD5
Junction 2-1										
Pass	50.8% (33)	50.0% (36)	56.2% (25)	53.5% (27)	33.3% (40)	35.9% (25.5)	44.0% (29.5)	69.3% (39.5)	55.4% (31)	56.5% (43.5)
To	20.0% (13)	23.6% (17)	21.3% (9.5)	23.8% (12)	33.3% (40)	42.3% (30)	28.4% (19)	16.7% (9.5)	18.8% (10.5)	16.2% (12.5)
From	29.2% (19)	26.4% (19)	22.5% (10)	22.8% (11.5)	33.3% (40)	21.8% (15.5)	27.6% (18.5)	14.0% (8)	25.9% (14.5)	27.3% (21)
<i>Total count</i>	(65)	(72)	(44.5)	(50.5)	(120)	(71)	(67)	(57)	(56)	(77)
Junction 2-2										
Pass	74.4% (96)	70.7% (79.5)	85.1% (74)	81.0% (79)	78.4% (120)	62.6% (58.5)	75.3% (94.5)	76.9% (70)	75.3% (70)	70.4% (86)
To	12.0% (15.5)	14.2% (16)	7.5% (6.5)	7.7% (7.5)	12.5% (19)	18.7% (17.5)	13.5% (17)	10.4% (9.5)	12.4% (11.5)	16.5% (20)
From	13.6% (17.5)	15.1% (17)	7.5% (6.5)	11.3% (11)	9.2% (14)	18.7% (17.5)	11.2% (14)	12.6% (11.5)	12.4% (11.5)	13.2% (16)
<i>Total count</i>	(129)	(112.5)	(87)	(97.5)	(153)	(93.5)	(126)	(91)	(93)	(122)

Figure 12, part (c), then delves deeper into the transportation methods adopted by individuals engaging in these three types of movements across time periods. In contrast to the prevalent use of e-cycles for *Pass* movements, the *From* and *To* movements within the alleyway exhibit a higher proportion of walking over the observed time spans. To elaborate specifically on Junction 2-1, except during WKD3, WDY5, and WKD5 for *From* movements, as well as during WDY4, WKD4, and WKD5 for *To* movements, walking remains the predominant mode of transportation for individuals moving towards and departing from the north end of the alleyway. Similarly, pedestrian movement remains predominant for both *To* and *From* activities observed at Junction 2-2 from the south, except for WDY 3 and WDY 5 for *From* movements and the mid-afternoon periods on both weekdays and weekends (WDY4 and WKD4). It is noteworthy that during all the exempted periods, e-cycles remain the primary mode of transportation.

These findings of people's daily movement patterns suggest a close connection between Case 2 Alleyway and the nearby local neighbourhood, given the prevalent preference for individuals to approach and depart from the alleyway on foot. The higher usage of e-cycles during specific periods, on the other hand, indicates its relationship with the broader urban area. The spatial configuration of this alleyway, characterised by higher integration at local and neighbourhood levels, might be one of the factors in shaping this connection, which will be further explored through comparative analysis among the two alleyway cases.

Moving forward to trace people’s specific activities as they enter Case 2 Alleyway from two junctions. Figure 13 and Table 8 present that the most diverse range of activity types is documented during the weekdays’ evening rush hour (WDY5) at Junction 2-2 in the south. This period encompasses all listed activity types except for *In, enter non-residence*. Among the seven activity types in total, people passing through the alleyway without a stop (Through) consistently maintain the highest proportion at both junctions across most time periods.

Two exceptions arise: i) during the weekday's morning rush hour (WDY 1), individuals who stop along some shops (and other areas) and then pass onwards to the south end (Through with stop) rank as the highest proportion within people entering from the north end (Junction 2-1); ii) during the weekend's evening rush hour (WKD5), the proportion of people pausing at various shops (and other areas) and then proceeding to the residential area (*In, stop, enter*) on the deck registers as the highest activity recorded from the north end. Conversely, individuals directly moving towards the residential area hold the highest proportion of recorded activity from the south at Junction 2-2.

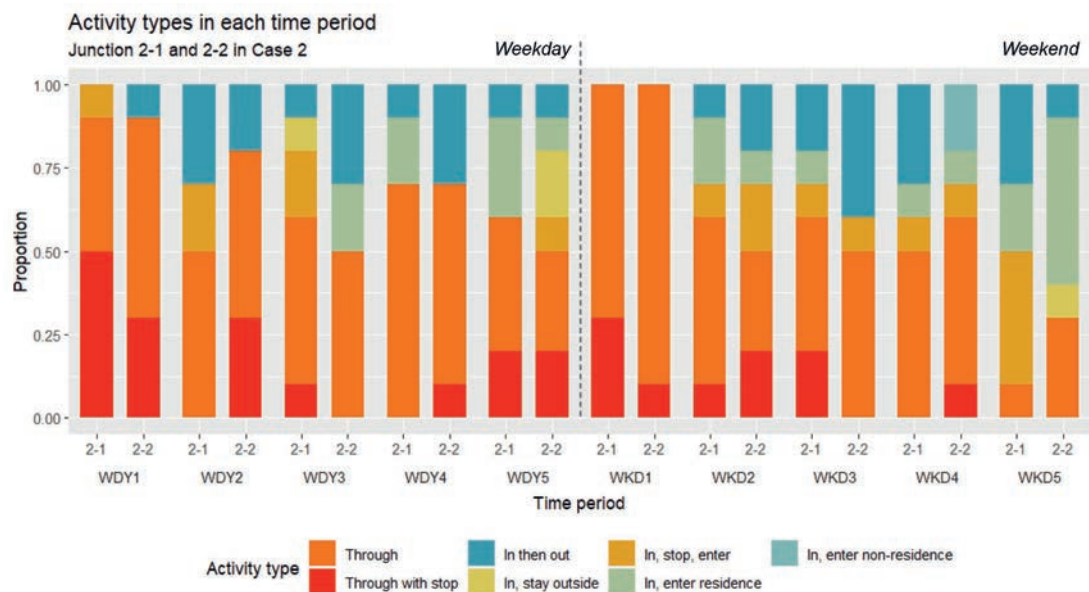


Figure 13 People following from two junctions (2-1 on the north end, and 2-2 on the south end) in Case 2 (n=100 in total per junction, 50 weekdays + 50 weekends).

These detailed observations on people’s daily activities within the alleyway reported here indicate the primary role of Case 2 Alleyway as an ordinary pathway for people passing through. Moreover, the wide array of activity types documented across time periods, with the diversity ranging from two to six types, and the higher proportion of activities associated with shops on the ground level and residences on the deck seem to further support the assumption that the

distinctive blend of commercial and residential uses within this alleyway can generate people’s diverse activities (Vaughan, 2015), which is intricately intertwined with people’s everyday life.

Table 8 The number of people observed in various activities from two junctions (2-1 and 2-2) in Case 2 Alleyway (**bold** texts presents the highest count within each period, **blue** texts refer to the activity type with the top three proportion in each observed junction overall).

Junction observation on activity type	WDY 1	WDY 2	WDY 3	WDY 4	WDY 5	WK D1	WK D2	WK D3	WK D4	WK D5	Proportion
Junction 2-1											
Through	4	5	5	7	4	7	5	4	5	1	47%
Through with stop	5	-	1	-	2	3	1	2	-	-	14%
In then out	-	3	1	1	1	-	1	2	3	3	15%
In, stay outside	-	-	1	-	-	-	-	-	-	-	1%
In, stop, enter	1	2	2	-	-	-	1	1	1	4	12%
In, enter residence	-	-	-	2	3	-	2	1	1	2	11%
In, enter non-residence	-	-	-	-	-	-	-	-	-	-	-
Junction 2-2											
Through	6	5	5	6	3	9	5	5	5	3	52%
Through with stop	3	3	-	1	2	1	-	-	1	-	11%
In then out	1	2	3	3	1	-	4	4	-	1	19%
In, stay outside	-	-	-	-	2	-	-	-	-	1	3%
In, stop, enter	-	-	-	-	1	-	1	1	1	-	4%
In, enter residence	-	-	2	-	1	-	-	-	1	5	9%
In, enter non-residence	-	-	-	-	-	-	-	-	2	-	2%

6 DISCUSSION

Following is a comparison of the results for Case 1 and Case 2 Alleyways (Table 9). We seek to, first, explore the configurational settings of alleyways within their surroundings, the transformation of building types, the entrances – as a micro building level, and how these are related to different patterns of use types and human activities. Second, building on the concept of co-presence, we further inquire into how the alleyways’ embedding within their surroundings shapes opportunities for mixing, both within the alleyways and within key activities, such as informal public gatherings in what Oldenburg (1999) termed as “Third Places”, exemplified by massage shops.

The thriving/success of Case 2 Alleyway, characterized by a more diverse range of use types (7) and a higher percentage of people's movement within it (averaging 35.1%, calculated through

both 'To' and 'From' movements), are apparently shaped and influenced by several factors.

These include:

- a) the higher integrated network than its surroundings at local scale over time and the development of centrality into both local and wider-reaching scales, in line with Hillier's concept of Centrality as a Process (Hillier, 1999) and the significance of multiple scales in centrality (Vaughan *et al.*, 2010);
- b) the building types consisting of apartment housing and continuous ground-floor shops, which were constructed in the same period, providing a homogeneous yet adaptable environment for economic and social activities;
- c) at the micro-building level, the higher density of building entrances along the alleyway (0.23), featuring increased intervisibility (69%) and street constitutedness (88.9%), namely over 75% of entrances facing directly towards the street with front doors.

The fieldwork sustains the premise that these three factors create an environment conducive to social interaction, both within the residential community and between shopkeepers, residents and people passing through – reminiscent of Jane Jacobs' observations on the uses of pavements for contact, namely how mixed-use streets give rise to changing rhythms of movement and interaction throughout the day (Jacobs, 1961).

On the other hand, Case 1 Alleyway, characterized by a more limited range of use types (3) and a lower percentage of people's movement within the alleyway (10.3%), depicts a different scenario, primarily shaped by the evolution of building types over the past century. The presence of diverse building types (spanning five categories, including four distinct housing types) results in a higher proportion of residential use (57%) and activities for people to come *In, enter residence* (42%). The adaptability of residential buildings, particularly detached houses, facilitates a mixed-use of live/work, exemplified by a home-based jewellery-making studio along the alleyway. With their studio located just one turning away from the main street – TPS Road, renowned for the jewellery industry and retailing in the city since the 1980s, the craftsmen and shop owners maintain close spatial proximity to their industry's wider activities. These residential buildings, featuring distinct types and constructed across various time periods dating back to the 1930s, including listed historic sites, attract more people for exploration and then exit (37%), thus serving as "cultural attractors."

Moreover, the crucial roles played by "third places" and "public characters" within the alleyways cannot be overlooked, as they are intricately linked to the patterns of use types and specific

activities. The elderly couple in Case 1 Alleyway above, who have become informal guardians of the place, intensify the probability of staying within the alley for a chat beyond simply engaging with its formal land uses. Similarly, Case 2 Alleyway features shops like leisure-related massage shops and food-related egg shops that serve as third places for informal gatherings, fostering co-presence and solidarity within the local area, or by providing opportunities for individuals to pause and share information, news, gossip, and mood while purchasing fresh food (with stop, 12.5%), which are integral to people's daily rituals. It is notable that shop owners act as public characters, "keeping an eye" on the alleyway. Lastly, the prevalence of walking (and the relatively slow-paced e-cycles) as the primary mode of transportation within both alleyways further underscores the substantial potential for these spaces to contribute to the three domains highlighted by Hillier (2009): environmental, economic, and socio-cultural forces in cities' sustainability.

Table 9 Comparative analysis on Case 1 and Case 2 Alleyway

Temporal, spatial, social measures			Case 1 Alleyway	Case 2 Alleyway	
Spatial configuration	Pattern		One end; Clustered	Two ends; Alone	
	c.1930s		Higher INT and CH than its <i>surrounding streets</i> across scales	Higher INT than its <i>surrounding streets</i> at radius 400m and 800m	
	c.2020s		Higher INT and CH than its <i>surrounding streets</i> across scales; Higher CH than its <i>adjacent street</i> at radius 400m and 800m	Higher INT than its <i>surrounding streets</i> at radius 400m and 2400m	
Micro socio-spatial morphology	Street level	Total length (with change, m)	72 (+10.4)	138.9 (-17.6)	
		Mean width (m)	5.5	6.5	
	Building level	Residential building types	Five types (Detached house, courtyard house, semi-terraced house, apartment housing, and others)	Two types (Apartment housing and others)	
		Construction periods	Four periods (1930-1949, 1949-1985, 1985-1994, 2020-)	One period (1985-1994)	
		Average building height	Two-storey (1-6 Floors)	Four-storey (1, 7 Floors)	
	Micro-building level (Entrances)	Number of entrances	7	32	
		Density of entrances	0.1	0.23	
		Intervisibility	Low (28.6%; 2 of 7)	High (69%; 22 of 32)	
		Constituted/Un-constituted	Un-constituted (40%, 6 of 15)	Constituted (88.9%, 32 of 36)	
	Use type	Diversity of use type	3	7	
		Use type with the proportion for residential uses & the highest proportion for non-residential uses	Residence (57%) Offices (29%)	Residence (6%) Recreation and leisure (34%) Fresh food store, distribution, and premises (34%)	
	Every-day life	Proportion for 'To' and 'From' alleyway in total		Junction 1: 10%	Junction 2-1 (North): 52% Junction 2-2 (South): 25% Total: 35%
		Main transportation method for 'To' and 'From' alleyway		Walking (55%) E-cycle (36%)	Walking (52%) E-cycle (38%)
		Activities within the alleyways (Top three across the cases)	Through	N/A	50%
			In, enter residence	42%	10%
			In then out	37%	17%
Others			In, stay outside (17%)	Through with stop (13%)	
"Public characters"		The elderly retired couple living in the courtyard house	Shop owners (of the butcher shop, the egg shop, the massage shop...)		

7 CONCLUSIONS

To conclude, this study has formed the initial phase in a planned series of studies taking us around the inner city centre of Nanjing and its transformation over the past century, with a particular focus on the shifting patterns from the public realm to the domestic sphere, and the role of third spaces and places within the urban changing process. Through a temporal enquiry into the socio-spatial morphology of the alleyways, we have sought to, first, shed further light on Hillier and Hanson's theory of co-presence, along with the Collins-Hillier model proposed by Suonperä Liebst and Griffiths (2020) at the fine-grained level of social-spatial morphology, to better understand the everyday complex picture of movement, co-presence and micro-rituals. Second, the comparative analysis, involving different scenarios of the alleyways embedded within their surroundings, reveals the presence of a combination of street network, building types, and micro-morphological attributes that seemingly contribute to the continuity of co-presence within the streets. We have provided evidence for how the spatial context has – over time – shaped and mediated probabilities for the successful mixing of use patterns and people's daily activities, both within the alleyways and within the “great good” third places along the alleyways. The varied public characters, exemplified by residents in Case 1 and shop owners in Case 2, reinforce the role of the alleyways as everyday lifeworlds characterized by dynamic interplays between individuals and their rooted surroundings, grounded in regularity and routine behaviours (Seamon, 2023). With constant flux between ordinary and extraordinary, these alleyways, as integral components of urban fabric, we argue, assume a pivotal role in facilitating efficient movement for pedestrians and micro mobilities, shaping opportunities for mixing, and contributing to both diversity and sustainability. These, in summary, are generated and influenced by the synchronic structure and morphology of the everyday city, as well as the diachronic urban transformation and the daily experiences and practices of individuals within specific spatial cultures.

REFERENCES

- Alawadi, K., Khanal, A. and Abdelfattah, R. S. (2023). 'Typological index of alleyways: mapping the pattern of a forgotten urban form element'. *Journal of Urban Design*. Routledge, 28 (2), pp. 199–224.
- Firley, E. and Stahl, C. (2010). *The Urban Housing Handbook*. 1st edition. Chichester: Wiley.
- Gibert-Flutre, M. and Imai, H. (eds). (2020). *Asian alleyways: an urban vernacular in times of globalization*. Amsterdam: University Press (Asian cities, 15).
- Hall, S. (2012). *City, street and citizen: the measure of the ordinary / Suzanne Hall*. Abingdon [England: Routledge (Routledge advances in ethnography, 9).
- Hanson, J. (2000). 'Urban transformations: a history of design ideas'. *URBAN DESIGN International*, p. 26.

Hillier, B. (1989). 'The architecture of the urban object'. *Ekistics*. Athens Center of Ekistics, 56 (334/335), pp. 5–21.

Hillier, B. (1999). 'Centrality as a process: accounting for attraction inequalities in deformed grids'. *URBAN DESIGN International*, 4 (3), pp. 107–127.

Hillier, B. (2009). 'Spatial sustainability in cities: organic patterns and sustainable forms'. in: *In: Koch, D. and Marcus, L. and Steen, J., (eds.) Proceedings of the 7th International Space Syntax Symposium. (pp. p. 1). Royal Institute of Technology (KTH): Stockholm, Sweden. (2009).*

Hu, Z. (2018). *Research on early-morden housing in Nanjing (1840-1949)*. Ph.D. Southeast University.

Imai, H. (2013). 'The liminal nature of alleyways: Understanding the alleyway roji as a "Boundary" between past and present'. *Cities. (Urban Borderlands)*, 34, pp. 58–66.

Imai, H. (2017). *Tokyo Roji: The Diversity and Versatility of Alleys in a City in Transition*. 1st edition. London ; New York: Routledge.

Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Random House.

Legeby, A. (2013). *Patterns of co-presence: Spatial configuration and social segregation*. PhD Dissertation. KTH Architecture and the Built Environment.

Legeby, A., Berghauer Pont, M. and Marcus, L. (2015). 'Streets for co-presence? Mapping potentials'. in: *The 10th International Space Syntax Symposium*, London: UCL.

Marcus, L. (2015). 'Interaction rituals and co-presence – linking humans to humans in space syntax theory'. in: *10th International Space Syntax Symposium*, London: UCL.

Oldenburg, R. (1999). *The great good place: cafés, coffee shops, bookstores, bars, hair salons, and other hangouts at the heart of a community / Ray Oldenburg*. Cambridge, Mass: Da Capo Press.

Palaiologou, F. and Vaughan, L. (2014). 'The Manhattan row house as an exemplar of urban adaptability: 1874-2011'. in: *New Urban Configurations EAAE/ISUF International Conference*.

Palaiologou, G. (2015). *Between buildings and streets: a study of the micromorphology of the London terrace and the Manhattan row house 1880-2013*. Doctoral. UCL (University College London).

Palaiologou, G., Griffiths, S. and Vaughan, L. (2016). 'Reclaiming the virtual community for spatial cultures: Functional generality and cultural specificity at the interface of building and street'. *Journal of Space Syntax*, 7 (1), pp. 25–54.

Palaiologou, G. and Vaughan, L. (2012). 'URBAN RHYTHMS: historic housing evolution and socio-spatial boundaries | Semantic Scholar'. in: *Proceedings of the 8th International Space Syntax Symposium*, Santiago de Chile: PUC.

Penn, A., Perdikogianni, I. and Motram, C. (2007). 'The generation of diversity: mixed use and urban sustainability'. in Greaves, K. T., Sergio Porta, Ombretta Romice, Mark (ed.) *Urban Sustainability Through Environmental Design: Approaches to Time-People-Place Responsive Urban Spaces*. London: Taylor & Francis.

Pierce, J. and Lawhon, M. (2015). 'Walking as Method: Toward Methodological Forthrightness and Comparability in Urban Geographical Research'. *The Professional Geographer*. Routledge, 67 (4), pp. 655–662.

Seamon, D. (2023). *Phenomenological Perspectives on Place, Lifeworlds, and Lived Emplacement: The Selected Writings of David Seamon*. London: Routledge.

Sun, Y. and Bao, L. (2021). 'Transitional urban morphology and housing typology in a traditional settlement of 20th century, Nanjing'. in *ISUF 2020 Virtual Conference Proceedings*.

Suonperä Liebst, L. and Griffiths, S. (2020). 'Space syntax theory and Durkheim's social morphology: a reassessment'. *Distinktion: Journal of Social Theory*. Routledge, 21 (2), pp. 214–234.

Thai, H. M. H., Stevens, Q. and Rogers, J. (2020). 'The evolution of pathways linking main streets and marketplaces to home-based business locations in Hanoi, Vietnam'. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, pp. 1–27.

Thai, H., Stevens, Q. and Rogers, J. (2018). 'The influence of organic urban morphologies on opportunities for home-based businesses within inner-city districts in Hanoi, Vietnam'. *Journal of Urban Design*, 24, pp. 1–21.

Törmä, I., Griffiths, S. and Vaughan, L. (2017). 'High street changeability: the effect of urban form on demolition, modification and use change in two south London suburbs'. *Urban Morphology*, p. 24.

Vaughan, L. (2015) (ed.). *Suburban Urbanities*. London: UCL Press.

Vaughan, L. and Hiller, B. (2007). 'The City as One Thing'. *Progress in Planning*, 67 (3), pp. 205–230.

Vaughan, L., Jones, C. E., Griffiths, S. and Haklay, M. (Muki). (2010). 'The spatial signature of suburban town centres'. *The Journal of Space Syntax*, 1 (1), pp. 77–91.

Vaughan, L., Törmä, I., Dhanani, A. and Griffiths, S. (2015). 'An ecology of the suburban hedgerow, or: how high streets foster diversity over time'. in *The 10th International Space Syntax Symposium*, London, United Kingdom: Space Syntax Laboratory, The Bartlett School of Architecture, University College London, p. 99:1-99:19.