440

# A comparative study of configuration and morphology of Chinatowns

HA MINH THAI, & QUENTIN STEVENS,

RMIT UNIVERSITY, MELBOURNE, AUSTRALIA

## ABSTRACT

This paper presents a comparative study of Chinatowns using a mixed methodology adapted from space syntax analysis and urban morphological mapping. It examines the Chinatown's spatial configuration, degree of integration to its surrounding context, and morphological characters. As the widespread and distinctive examples of an urban ethnic enclave, Chinatowns provide an optimal opportunity to better understand the concept of an urban 'district' in configurational, morphological, and cultural terms. At the city scale, space syntax is employed to examine the configuration of Chinatowns within their surrounding urban contexts, the connectivity of their streets, and to highlight the socio-economic significance of the district shaped by their spatial conditions. At the neighbourhood level, urban morphological mapping provides a fine grain understanding of this pattern of commercial land use in Chinatowns that links to key morphological characters, such as street and building typologies, distinguishes the district from its surroundings. Detailed mapping of key streets and public spaces capture the micro-scale spatial settings of these places, distributions and visibility of Chinese culturally related built elements in the public realm. It sheds light on the spatial manifestation of ethnicity through architecture, urban design, place-making practices. Findings reveal the diversity of configuration and morphology of Chinatowns, their integration in or segregation from their host cities, reflecting their socio-economic contribution and historical significance of the districts to the development of the wider urban contexts. The paper explores how space syntax, urban morphology, micro-scale mapping and open-source spatial data can be used to systematically examine the multi-scalar configuration and morphology of urban districts.

## KEYWORDS

space syntax, urban morphology, mapping, district, Chinatown

## 1 INTRODUCTION

The paper examines Chinatowns as a spatial unit in the city, a type of urban district (Lynch, 1960) and morphological region (Conzen, 1988). It provides a new multi-scalar, mixed method approach to understand the taxonomy of Chinatowns according to their spatial configurations and morphologies. At the city scale, the paper employs space syntax to reveal the degree of integration of Chinatowns in their host urban contexts, reflecting the roles and impacts of Chinese diaspora in the various cities across different continents. At the neighbourhood scale, it uses urban morphology to capture the relationship between patterns of clusters of Chinese ethnic businesses, physical settings of their neighbourhoods, and spatial manifestations of Chinese identity through establishing and displaying ethnic elements in the public realm.

As a typical example of urban ethnic enclave spontaneously formed by immigrants, Chinatowns can be optimal examples demonstrating the bi-directional relationship between urban form and migrant-dwellers. First, the paper shows the influences of urban settings on dwellers' economic activities through shaping connectivity and movement flows. In turn, it highlights how urban dwellers 'battle' with spatial constraints and take advantage of spatial advantages to conduct their livelihoods, stamp identity, claim citizenship and create 'home away from home' (Lozanovska, 2019, Beynon, 2005). To address this question, this paper employs a mixed methodology adapting space syntax and urban morphology to study urban character and place identity of Chinatowns. This methodology provides a new way to understand Chinatown spatially, suggests an innovative approach to studying and comparing place characters in various urban contexts.

## 2 BRIDGING SPACE SYNTAX AND URBAN MORPHOLOGY

The need for combining space syntax and urban morphology to study the bi-directional relationship between urban form and dwellers' placemaking practices has been highlighted as it will create innovative tools to study the economic significance of built form across scales (Thai et al., 2018, 2020, 2021, Song et al., 2021). The qualitative data gathered through morphological mapping also generate an in-depth understanding of how urban spaces are used and amended by dwellers (Boeing, 2021). While space syntax demonstrates its utility in examining the influences of street networks on the distributions of movement-benefiting economic activities such as retail (Omer and Zafrir-Reuven, 2010, Scoppa and Peponis, 2015), this is mostly done at city level due to availability of statistical data, omitting the impact of neighbourhood scale morphology on such patterns existing along the same street segment (Thai et al., 2021). Space syntax and urban morphology can provide multi-scalar, multi-layered spatial properties of a place, generate a richer understanding of its built form, and the affordances that the built form offers.

This paper demonstrates an application of space syntax in revealing the spatial characters of urban ethnic enclaves in contrast to existing studies which mostly employ historical, demographic, statistic, and ethnographic approaches. It employs angular segment analysis to

study the global and local configuration of streets in the Chinatown, which is how each street segment is connected to all other in the entire network (Rn = global) or within an 800 metres radius (R800m, equivalent to 10-minute walking distance). Global choice map suggests how Chinatowns connect to the surrounding urban centres through vehicular traffic. Local integration map shows the attractiveness of streets in Chinatown to pedestrians within their comfortable walking distance. These two variables allow comparisons of spatial characteristics of various Chinatowns, and between these urban districts with their immediate surroundings.

## 3 DATA AND METHODS

The paper employs a two-stage analysis to study 9 Chinatowns which have been identified and marked in Google Maps.

First, it examines the integration of Chinatown into their host cities. The street networks of Chinatown are mapped within 15 x 15 km areas to ensure most important adjacent urban centres around the focused case studies are captured. Based on the arrangement of the street networks, the case studies are classified from grid to organic network. This paper reports on local integration values (R800m), compares the mean local integration values of all streets in the Chinatown ($I_{Chinatown}$) with mean local integration values (R800m) of all streets in the network ($I_{city}$).

$$\varphi = I_{Chinatown} / I_{city}$$

The higher φ value indicates that streets of Chinatowns are better integrated into the network, suggesting the district keeps an important role in the urban life of its host city.

Second, the paper investigates the clustering of Chinese ethnic businesses utilising data mined from Google Maps and Google Street View. Three types of data are mapped, including: (i) location of Chinese ethnic businesses, recognised by the uses of Chinese characters on the building façade to advertise the goods and services that they offer; (ii) typologies of buildings occupied by these Chinese ethnic businesses; (iii) micro-scale settings of key public spaces, including pavements, street corners, urban squares located within the Chinatown and dominated by Chinese culturally related decorative features.

## 4 RESULTS

Space syntax analysis demonstrates that Chinatowns are integrated into their host city differently, reflecting the evolution of these ‘towns within cities’ and the immigrant policies towards Chinese (Lai, 1988). Despite many Chinatowns were originally ‘bounded’ as an ethnic enclave or formed on the peripheral of the city centres to take advantage of the proximity to the existing economic hubs, some have ‘unbounded’ and been integrated into the city and became part of the city centre (Chau et al., 2016, Anderson et al., 2019). Figure 1 shows a classification of sampled Chinatowns

based on their spatial configuration (integrated to segregated) and morphology (regular grid to organic).

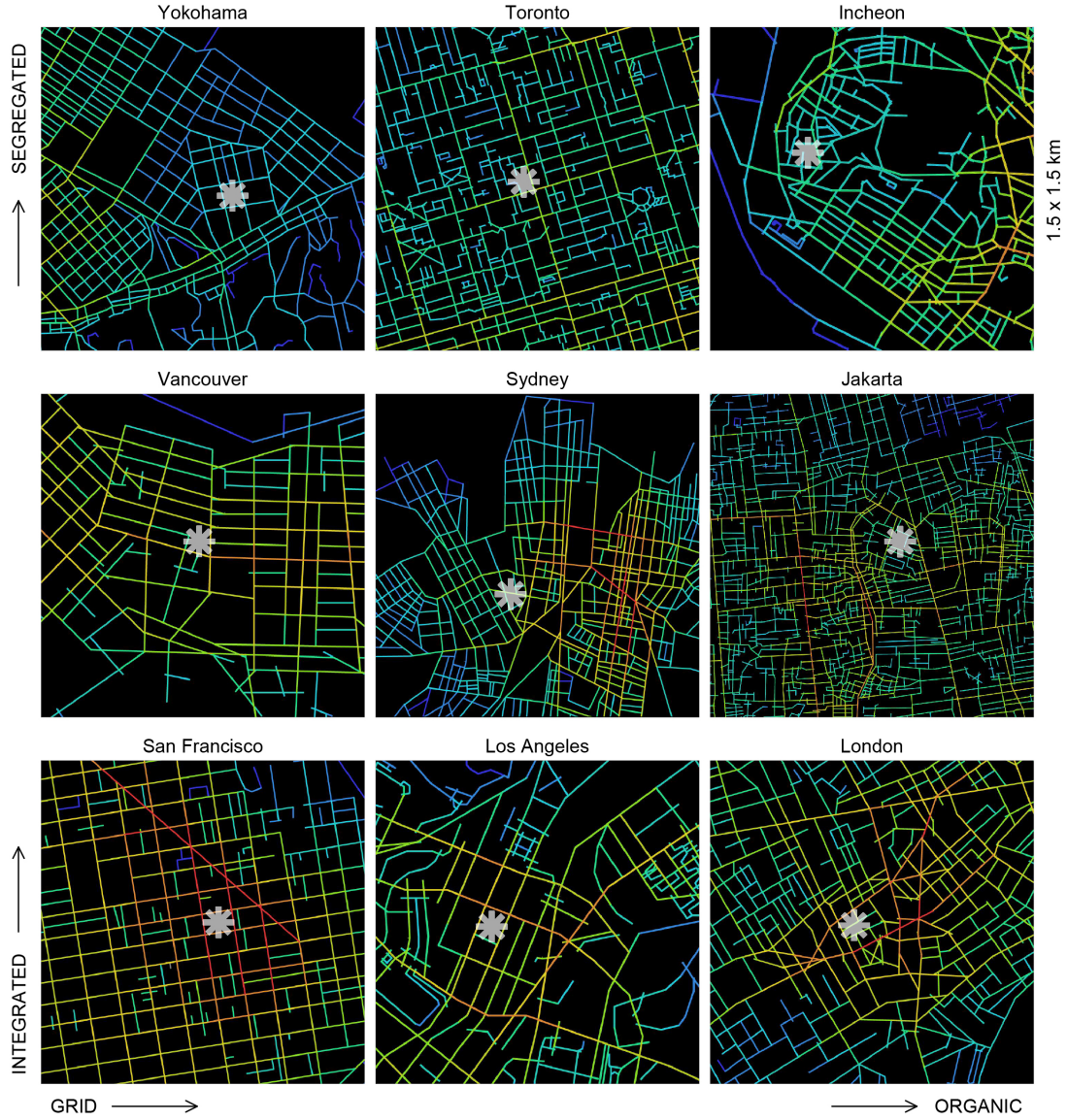


Figure 1: Taxonomy of Chinatown (marked with an asterisk) based on their spatial settings

Chinatown in San Francisco is the most integrated into its host city's grid street network thanks to its location at the end of the diagonal street Columbus Ave which play a significant role in improving connectivity of its adjacent streets. The mean integration value of streets in the Chinatown area is 1.7 times higher than that of the whole city ($\varphi_{sanfrancisco}$ = 1.71). Although the Chinatown in Vancouver is also part of the city's regular grid, it is less integrated ($\varphi_{vancouver}$ = 1.49) due to having more longer and larger street blocks (180x80m compared to 150x80m in Vancouver city centre or 130x90m in San Francisco). The location of Vancouver Chinatown at the transitional area between two grid systems leads to an absent of many long streets constituting the grid in the district. Although the grid in Yokohama is smaller than the afore-mentioned cities (50x100m), the grid of Chinatown is larger than those in other districts, with

some block sizes are up to 100x125m, making it less competitive and attractive to foot traffics compared to the nearby city centre ($\varphi_{yokohama}$ = 0.89).

Los Angeles's and London's Chinatowns are found to be highly integrated in their host cities ($\varphi_{lostangeles}$ = 1.66, $\varphi_{london}$ = 1.89) although they have more organic street system. These districts were form along some major city routes that densely connect to many other shorter streets. The topography of Sydney makes the city grid less regular / more organic, creates many transitional, less integrated areas ($\varphi_{sydney}$ = 1.27), one of which is occupied by Chinatown. In Toronto's Chinatown sits at the intersection of two major streets constituting the super grid (500x500m) locating just outside the Old Toronto where the street blocks are much smaller and more regular. Such configuration makes only a few streets in Toronto's Chinatown moderately attractive to local foot traffic, and most others are segregated. Chinatowns in Jakarta and Incheon both have highly organic street network; yet the one of Incheon situates on the edge, constrains by large transport infrastructure to the west and a hill to the east, therefore are much more segregated ($\varphi_{incheon}$ = 1.07, $\varphi_{jakarta}$ = 1.39).

Figure 2 shows the locations of Chinese ethnic businesses and building footprints, supplements a layer of spatial and economic data overlooked in space syntax axial map. The mapping suggests that locating in close proximity to major flows of pedestrian is critical for Chinese ethnic businesses, as identified in San Francisco, Los Angeles, London, Vancouver, and Toronto. In Sydney and Jakarta, the Chinese businesses gather along less integrated streets, yet they form a clear cluster bounded by highly connected streets. The most disadvantages clusters of Chinese businesses are those in Yokohama and Incheon, however, their colocation has created a strong 'magnet' attracting customers and creating a unique identity.

Morphologically, a large majority of these businesses occupy small-scale, low-rise buildings. In some cases, the Chinatowns stand in a morphological 'valley' existing at the core (such as Sydney, Yokohama) or edge (such as San Francisco, Los Angeles, Vancouver, Toronto) of the high-rise city centres. These buildings are usually aged, offers affordability and adaptability to low-yield businesses which prefer good locations and being in a cluster with other businesses of the same kind.

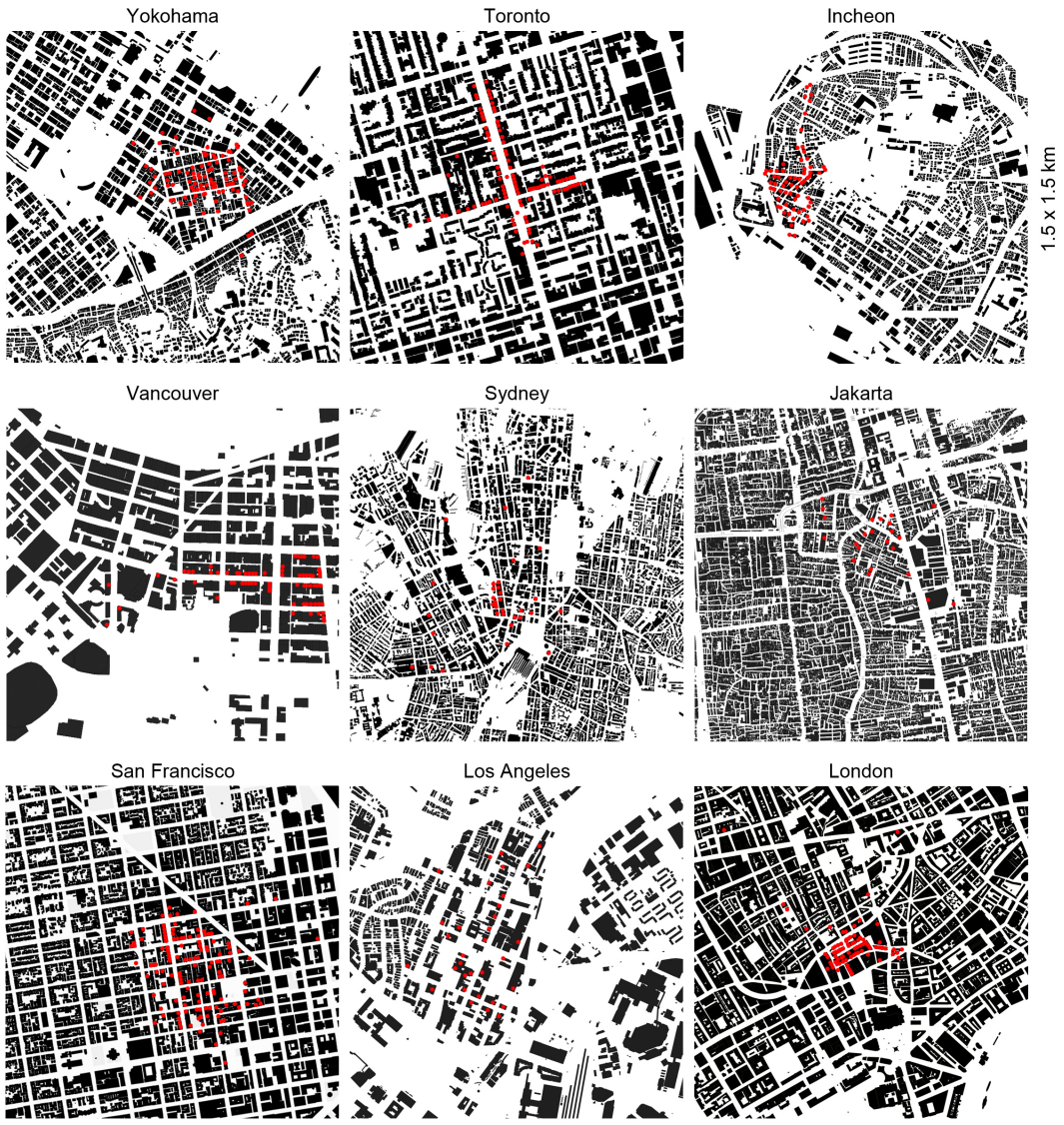


Figure 2: Mapping of clusters of Chinese businesses (red dots)

Figure 3 demonstrates a mapping of the existence and exposure of Chinese-culture-related features in a public space in the heart of Chinatown in Yokohama. These features are identified thought the appearance of 'obvious Chineseness', such as signages with Chinese characters, pagoda-style roofs, lanterns, and the use of Chinese favourite colours including red, green, and gold. To examine a more permanent manifestation of ethnic identity, this map only captures architectural and decorative elements on the building façade rather than the mobile advertisement boards placed on the sidewalk. The map shows the exposure of Chinese elements in the public realm at the corner of Chinatown Boulevard and *Ichiba dori*, providing a much more detailed understanding of the impacts of Chinese immigrant's place-making practices. Yokohama's Chinatown was formed in 1859, home to Canton and Hong Kong immigrants. Due to hostile diplomatic relations between Japan and China, this Chinatown only gained its official status in 1955 and became a commercial centre run by and providing services to Chinese immigrants, and was also a tourist attraction.

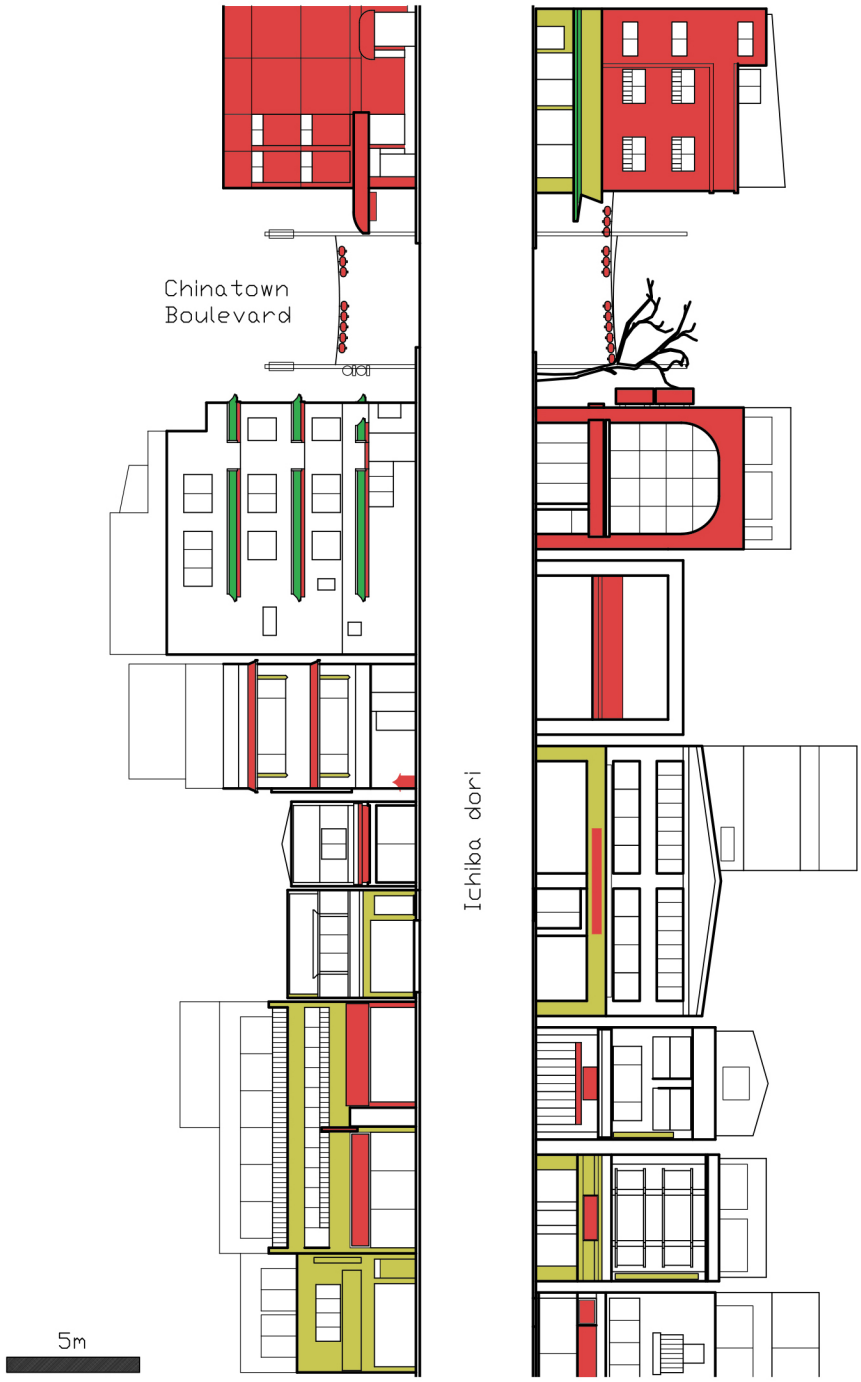


Figure 3: Mapping of Chineseness in public space in Yokohama's Chinatown

Nowadays, the Chinese residents claim their citizenship in Yokohama by exhibiting their identity through establishing Paifang gates, advertising their businesses with large Chinese words, using pagoda-style roof to decorate their buildings, hanging lanterns to enhance visual exposures. All these attempts have created a strong, enclosed enclave, attracting curious customers into a rather discrete district which offers exotic experiences. This is in contrast with the unbounded Chinatowns such as those in Sydney and San Francisco.

## 5 CONCLUSIONS

The paper demonstrates that space syntax analysis offers a new layer containing novel information on urban characters of Chinatown. It is useful to classify and provide new knowledge on the role of Chinatowns as a spatial unit in the city, allowing a multi-scalar understanding of the district as a distinctive place (Dovey, 2016). The morphological mapping of Chinese clusters sheds light on the existence of Chinatown, suggests its territory, centre, and boundary. The analysis also shows the spatial conditions that are beneficial to Chinese ethnic businesses, allow them to settle, inhabit, adapt and thrive. At the finest resolution, the mapping of Chinese elements in the public realm provides an insight into the spatial manifestation of ethnic identity, the most subtle home-making practices. The coexistence of all these 3 layers of information evidences the role of Chinatowns in their host city as well as the status of citizenship of Chinese immigrants in their host society.

## REFERENCES

Anderson, K., Ang, I., Bono, A. D., McNeill, D. & Wong, A. 2019. *Chinatown Unbound: Trans-Asian Urbanism in the Age of China,* London, Rowman & Littlefield.

Beynon, D. 2005. Melbourne's 'Third World-looking' architecture. *Suburban fantasies: Melbourne unmasked.* Melbourne: Australian Scholarly Publishing.

Boeing, G. 2021. Spatial information and the legibility of urban form: Big data in urban morphology. *International Journal of Information Management,* 56.

Chau, H.-W., Dupre, K. & Xu, B. 2016. Melbourne Chinatown as an iconic enclave. *UHPh 2016: Icons: The making, meaning and undoing of urban icons and iconic cities.* Queensland: Griffith University.

Conzen, M. R. G. 1988. Morphogenesis, morphological regions and secular human agency in the historic townscape, as exemplified by Ludlow. *In:* DENECKE, D. & SHAW, G. (eds.) *Urban historical geography: Recent progress in Britain and Germany.* Cambridge: Cambridge University Press.

Dovey, K. 2016. Place as multiplicity. *In:* FREESTONE, R. & LUI, R. (eds.) *Place and Placelessness Revisited.* London: Routledge.

Lai, D. C. 1988. *Chinatowns: Towns within cities in Canada,* Vancouver, University of British Columbia Press.

Lozanovska, M. 2019. *Migrant Housing: Architecture, Dwelling, Migration,* London, Routledge.

Lynch, K. 1960. *The Image of the City,* Cambridge, MA, MIT Press.

Omer, I. & Zafrir-Reuven, O. 2010. Street Patterns and Spatial Integration of Israeli Cities. *The Journal of Space Syntax,* 1**,** 280-295.

Scoppa, M. D. & Peponis, J. 2015. Distributed Attraction: The Effects of Street Network Connectivity upon the Distribution of Retail Frontage in the City of Buenos Aires. *Environment and Planning B: Planning and Design,* 42**,** 354-378.

Song, Y., Zhang, Y. & Han, D. 2021. Access structure. *Environment and Planning B: Urban Analytics and City Science,* 48**,** 2808-2826.

Thai, H. M. H., Stevens, Q. & 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**,** 926-946.

Thai, H. M. H., Stevens, Q. & 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*, 1-27.

Thai, H. M. H., Stevens, Q. & Rogers, J. 2022. Mapping and measuring spatial connectivity of the pathways to home-based businesses within informal urban contexts. *Archnet-IJAR: International Journal of Architectural Research,* 16(1), 90-111.