

## #71

### LEARNING FROM STRATEGIC SPATIAL LOCALISATION:

#### Thriving In The World Of Homogeneity Streetscape

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#### ABSTRACT

Streets, and particularly their sidewalks, in cities of the rapidly developing countries of the Southeast Asian Region have gradually been wiped clean of socio-economic activities under the banner of modernisation. The prime reason for this modernisation is a preference for the orderliness, cleanliness and safety for both pedestrians and automobiles. This modernisation results in the homogeneity and lifelessness of the streets, which is contrast to the spatio-cultural function of the streets, locally. In general, the local streets are lively and economically important to the neighbourhoods amidst their disorderliness, which leads to the authorities' agitation. Nevertheless, some local streets have survived this modernisation and continue to thrive with liveliness. To what extent could the study of spatial morphology and socio-economic activities unlock the survival of these lively local streets? And, to what extent could the outcomes offer insightfulness to establish an alternative urban design model steep in cultural heritage and benefit everyday usage instead of the homogeneous one?

Four rapidly developing Southeast Asian Cities (Yangon, Hanoi, Phnom Penh and Vientiane) and some of their local streets were chosen for the study as an initial attempt to try to answer these two questions. Spatial morphology, survey of the city centres, and street's micro land-use observations were carried out. Selective interviews with street users were also conducted to try to understand the operation of street activities. Some findings are reported in this paper. Relationships between strategic spatial localisation and degrees of liveliness could be established among the four cities. To some extent, they have been influenced by the maximisation of economic opportunity instigated by the surrounding settings. This maximisation is made possible by the spatial operation of the local streets. Thus, there is a possibility to establish an alternative urban design model, at least for these cities, which can maintain their spatio-cultural heritage and simultaneously reflect upon the drive for the modern look.

#### KEYWORDS

Southeast Asian Cities, Street, Localisation, Urban Design, Yangon, Hanoi, Phnom Penh, Vientiane

#### 1. INTRODUCTION

The transformation of streetscape in the rapidly urbanising cities of Southeast Asian countries is widely concerned among the region's urban scholars. This is due to a recent and common situation that city authorities have a preference for streetscape modernisation with orderliness and cleanliness instead of the conventional messy streets, particularly those in the historical area, which usually are littered with traffic jam, occupied by vendors on the sidewalks, and commercially and spatially extended from the front of the dense and continuous rows of shop houses. The modernisation preference is more apparent in the newly planned areas at the

fringes of the city centre. A good example of this is a case of Hanoi, which is due to the lack of resistance from long-term residents and the nature of the urban development itself, forming as an alliance between local government, public sector and private sector (Tran, 2015). In the historical area, the attempt to modernise streetscape has faced with more resistance. But the city authorities have taken a tougher stand, and resistance eventually began to subside. The removal of street vendors in the historical area of Bangkok, which is held as the capital of sidewalk eating, is another good example (BMA, 2014). The prime reason the city authorities provide is to ease the flows, of automobiles driving on the streets and of pedestrians walking along the sidewalks. Sidewalk shopping, loitering and the vendors are the main culprits. Thus, by removing both the streets and streetscape are safer to use and become more pleasant to visit, they have suggested.

As streetscape modernisation is inevitable and the acceptant view that streets in Southeast Asia and their sidewalks have strong socio-cultural values is widely shared, scholars began to offer ideas and alternative urban models from their researches. In their attempt to offer an alternative urban design model of streets in Asia, Mateo-Babiano and Ieda (2007) suggest that the adoption of Western street design standard and practices in Asian cities to function as a distribution network, with a preference for car domination and exclusion of the sidewalk design, lead to a deserted city. This is because the multi-activity space, i.e., the sidewalk prioritised by people through movement and non-movement behaviours and has socio-cultural attachment, is compromised. Although they fell short to offer a concrete alternative urban design model for streets, physically or morphologically, they successfully established the socio-cultural aspects, which are transportation hierarchical measures, pedestrian needs, speeds, culture of street uses and walking preferences, for consideration to the policy and design-guideline setting of the Asian streets. In doing so, the generalisation of streets could be manageable, theoretically.

A more physical model of street and streetscape is offered by Oranratmanee and Sachakul (2014) in their study of 15 streets in Thailand, which were classified as neighbourhood/pedestrian streets and town/city streets and locate in historical areas. The streets were surveyed and recorded for: operating time of retail shops and vendors, street dimensions, number of passer-by in a day, number of shops and vendors, arrangements of streetscape by vendors, fees for the vendor per setting, activities in the streets and operators. They are successful to categorise and establish characteristics of Thai pedestrian streets based on spatial, economic, social and political aspects. Hence, street is a public space with multi-functions and facets; and, urban designer should take into their consideration for these associated characteristics when designing. While Oranratmanee and Sachakul's study (2014) is highly valuable in terms of understanding the association of streetscapes, street life and some aspects of street operation, question arises whether accessibility, i.e., the way in which any street connect to its surrounding streets, has any role in the successfulness of the streets as public spaces. The implication for urban design would be that by imitating these spatial-economic-social-political characteristics to design as well as operation, a successful public space could be created. A number of Space Syntax researches have shown that this might not be the case.

In short, similar type of researches, which is very rich in social, economic and cultural aspects of Southeast Asian streets and streetscapes, has rarely investigated the issue of accessibility of the successful streets and their relationship with those aspects, for example, Drummond (2000) and Tran (2015). This gives rise to a question and an opportunity for the extent to which Space Syntax as a theory and methodology for morphological study of spatial network and its accessibility can unfold the relationships between the socio-economic successful streets and their spatial morphological characteristics. Given the nature of streetscape modernisation focusing on main and/or new streets, attention has been made on the successful, i.e., lively, local streets, many of which have survived and have more chances to survive streetscape modernisation. To what extent could the study of spatial morphology and socio-economic activities unlock the survival of these lively local streets? And, to what extent could the outcomes offer insightfulness to establish an alternative urban design model steep in cultural heritage and benefit to everyday usage instead of the homogeneous one? Hence, this is to supplement those studies mentioned above.

Theoretical framework of this research is Hillier's theories of foreground and background network and urban areas (Hillier, 2007; 2009; 2012; Hillier et. al, 2007). Syntactically, there is a dual generic form of the city, in this case based on the morphological segment characteristics. One is a foreground network. Another is a background network. The former links centres of different scales together and is created by the interaction of economic and social factors against the latter which minimises energy for movement. They might be defined as general accessibility. The foreground network is created by the lines most likely to continue in their direction, i.e., being less likely to change angles of connection when continuing their routes and often being long lines. The background network usually is formed by short lines connecting to each other at right angle or near right angles and typically is a numerous cluster of residential areas connecting among them and to the foreground network. With regarding to syntactic measurements, there are basically two measurements measuring two types of movement. 'Choice' measures 'through movement', which is how likely one will pass through segments on trips within a spatial system. 'Integration' measures 'to movement', which is how segments most likely to be destinations within a spatial system. The hypothesis here is that the lively local streets act as the centre of the foreground network of the local centre, spatially, functionally, socially and economically. These streets are the cores of the local live centres, i.e., having been occupied by movement dependent uses such as retail and catering (Hillier et. al., 2007). They should, in theory, be the links between the foreground and background network. This means that the micro-distribution of retail and catering can take advantage of the accessibility, which helps facilitate those two movement types and support socio-economic functions of the local areas. This, therefore, might contribute to the streets' survival from the streetscape modernization.

## 2. DATASETS AND METHODS

Four rapidly developing Southeast Asian Cities (Yangon, Hanoi, Phnom Penh and Vientiane) and some of their local streets were chosen for this study. Of the ten Southeast Asian countries forming the Association of South East Asian Nations (ASEAN), these four countries are rapidly urbanised at an extreme scale that is fuelled by high GDP growth among the other ASEAN countries, currently. Forecast for average annual percentage change for GDP growth from 2016-2020 of Viet Nam is at 6%, Cambodia and Laos at 7.3% each, and Myanmar at 8.2% (OECD, 2016). In comparison, Thailand has average annual percentage change for GDP growth from 2016-2020 forecast at 2.7% and Singapore at 2.4% (OECD, 2016). Two studies were carried out: morphological and fieldwork studies.

### 2.1 MORPHOLOGICAL STUDY

The morphological study was carried out through the Space Syntax morphological analysis of the street network. The patterns of street networks of the cities, based on data obtained from Open Street Map and city survey, were first investigated. Then, their findings were analysed to frame a more focusing syntactic study in terms of scale of and studied area, and inform the selection of the streets for fieldwork surveys. Segment analyses were chosen for the syntactic studies at the city and the detailed scale. As the research focuses on the detailed scale, the historical area model and the historical area with back-lane model were chosen as the spatial models to study. The back lanes are sub-streets or alleys, which may or may not be accessible by cars, i.e., only for pedestrianising, bicycling and motorcycling. The importance of these sub-streets will be discussed in the next section.

### 2.2 FIELD TRIP STUDY

The fieldwork study was made by the street survey. There were 13 surveyed streets, three in each city, but four in Phnom Penh. There were two main criteria for their selection. They are local streets with clear evidence of social functions, for religion, political or personal purposes. They have clear evidence of functions, which constitute to live centres as defined by Hillier (2001) that are retail and catering. These surveys consisted of:

- a) Recording changes of the street setting, for example: vendors' locations, shop/street furniture moving and people activities within the streets. They were carried out on a weekday and three times a day: in the morning, lunch and afternoon;
- b) Measuring dimensions of streets and the various settings within the streets. Again, they were carried out on a weekday and three times a day: in the morning, lunch and afternoon;
- c) Selective interviewing of street users that are shop sellers/vendors and buyers/passers-by. Some questions are spatial related, for example, where the sellers/buyers live and where the products come from. Some are usage/operational related such as how often they come to the streets, their purposes, the ability to change the spatial settings, the ability to initiate the activities and their participation with any activities. In total, 289 people were interviewed, 60 from Hanoi, 72 from Yangon, 106 from Phnom Penh and 25 from Vientiane. Of the total, 147 of them are buyers/passers-by, 19 from Hanoi, 57 from Yangon, 57 from Phnom Penh and 14 from Vientiane. 142 of them are shop sellers/vendors, 42 from Hanoi, 15 from Yangon, 49 from Phnom Penh and 36 from Vientiane.
- d) However, movement observation of pedestrian and vehicular densities has not been made for the fieldwork study due to the prohibition from the cities' authorities.

It should be noted here that findings reported in this paper are not from all of the fieldwork study results. They are selectively presented on the findings of how Space Syntax could initially shed light on the systematic relationships between accessibility and usage of the studied streets. As a result, recommendations for conserving selected types of streets from the streetscape modernisation can be made.

### 3. RESULTS

#### 3.1 SELF-ORGANISING GRID PATTERNS

The four studied cities are colonial cities. The British planned Yangon, while the French did that for Hanoi, Phnom Penh and Vientiane. Three cities are capital cities, Hanoi, Phnom Penh and Vientiane, and one a former capital, Yangon. They are the political and economic centres of their countries. The morphological study of the city model gave a broad result for all the studied cities. Because of the research's focus at the areal scale and on the areas being the centre for retail and catering as defined by Hillier, the historical areas of these four cities fit with this focus. They are their cities' major retail and catering centres. Therefore, the two historical area models, the historical area model and the historical area with back-lane model, are the studied spatial models.

For all the four cities, the patterns of street networks within the historical area and their immediate surrounding areas clearly show evidence of the colonial influences. This can be seen from the orthogonal or quasi-orthogonal grids, from the medium-to-large-scale grids in Hanoi, Phnom Penh and Vientiane and from the small-scale grid in Yangon. These grids had been planned. The planning processes have been noted by many scholars (Logan, 2000; Molyvann, 2003; Clément-Charpentier et. al, 2010; Morley, 2013; Fanchette, 2016).

There are two patterns found: a sub-division of medium-to-large-scale grid and a continuity of small-scale grid (Figure 1). The medium-to-large-scale grids of Hanoi, Phnom Penh and Vientiane are further subdivided by denser network of sub-streets. These sub-streets could be alleys or front/back lanes within neighbourhoods or street blocks. Buildings locating along these sub-streets are accessible through them. Majority of the sub-streets only allows pedestrianising, bicycling and motorcycling. The denser networks of the sub-streets are very pronounced in Hanoi and Phnom Penh and less so in Vientiane. The sub-streets locating within the blocks of Phnom Penh often connect directly to the main streets. This is contrast to Hanoi, where the city sub-streets could continually stretch and connect among themselves at a long distance, until joining with the main streets. Furthermore, the denser grids of the sub-streets of the historical areas of Phnom Penh and Vientiane are of orthogonal or quasi-orthogonal pattern, while that of Hanoi is of organic pattern.

Yangon has none of this sub-division. This could be because the city's historical areas already has small-scale grid. A preference for small-scale grid in Yagon can also be seen from their existence almost throughout the city areas. There is an exception in the central and the northern area of the city, which has a medium-to-large-scale grid. This is a residential area for the city's upper income residents, whose houses' lots are often very large.

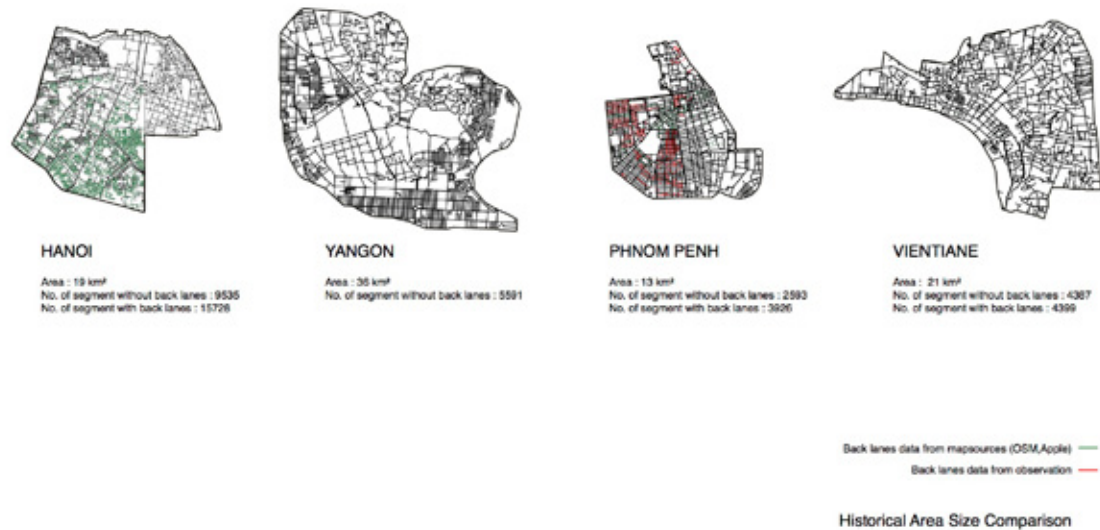


Figure 1 - A comparison of the historical areas' street network patterns of Hanoi, Yangon, Phnom and Vientiane

Sources and data: Open Street Map, personal surveys and  
<http://unstats.un.org/unsd/demographic/products/dyb/dyb2.html>

City	Hanoi	Yangon	Phnom Penh	Vientiane
Area	19 sq.km.	36 sq.km	13 sq.km	21 sq.km
Number of segments without back lanes	9,535	5,591	2,593	4,387
Number of segments with back lanes	15,728	n/a	3,926	4,399
Max NACH without back lanes	1.5121	1.4734	1.5304	1.4805
Max NACH with back lanes	1.5346	n/a	1.5636	1.4848
Mean NACH without back lanes	.8327	.8969	1.0437	.8501
Mean NACH with back lanes	.7744	n/a	.9773	.8497
Max NAIN without back lanes	1.3664	1.1387	2.0666	1.1048
Max NAIN with back lanes	1.4989	n/a	2.0289	1.1096
Mean NAIN without back lanes	.8804	.8392	1.4631	.7692
Mean NAIN with back lanes	.9429	n/a	1.4089	.7701

Table 1 - A comparison of some syntactic values of Hanoi's, Yangon's, Phnom Penh's and Vientiane's historical area street network

The emergence of the sub-streets can be seen as an evidence of self-organising characteristics of the historical area grids, which have adapted to the socio-economic needs and functions. Table 1 shows some comparative figures of the studied areas. However, the syntactic values shown in Table 1 have no significant differences between the two models analysed for each city and between those of the four cities. Overall, the values indicate that the historical area grid of Phnom Penh has the strongest structure among the four, is most likely to have continuous grid patterns and ease of accessibility. The degrees of structural and continuous grid patterns of the other three cities are less different. Hanoi's historical area grid may have high degree of accessibility, but its grid is frequently interrupted. There are similarities found in Yangon's and Vientiane's historical area grids' values. It could be said that the substantial increase of segments when the sub-streets were included in the analyses could impact very locally so much so that the mean and max values do not reflect their inclusion. If this is the case, the segment maps should illustrate and support the evidence of the self-organising characteristics of the historical area grids by the sub-streets better than the values.

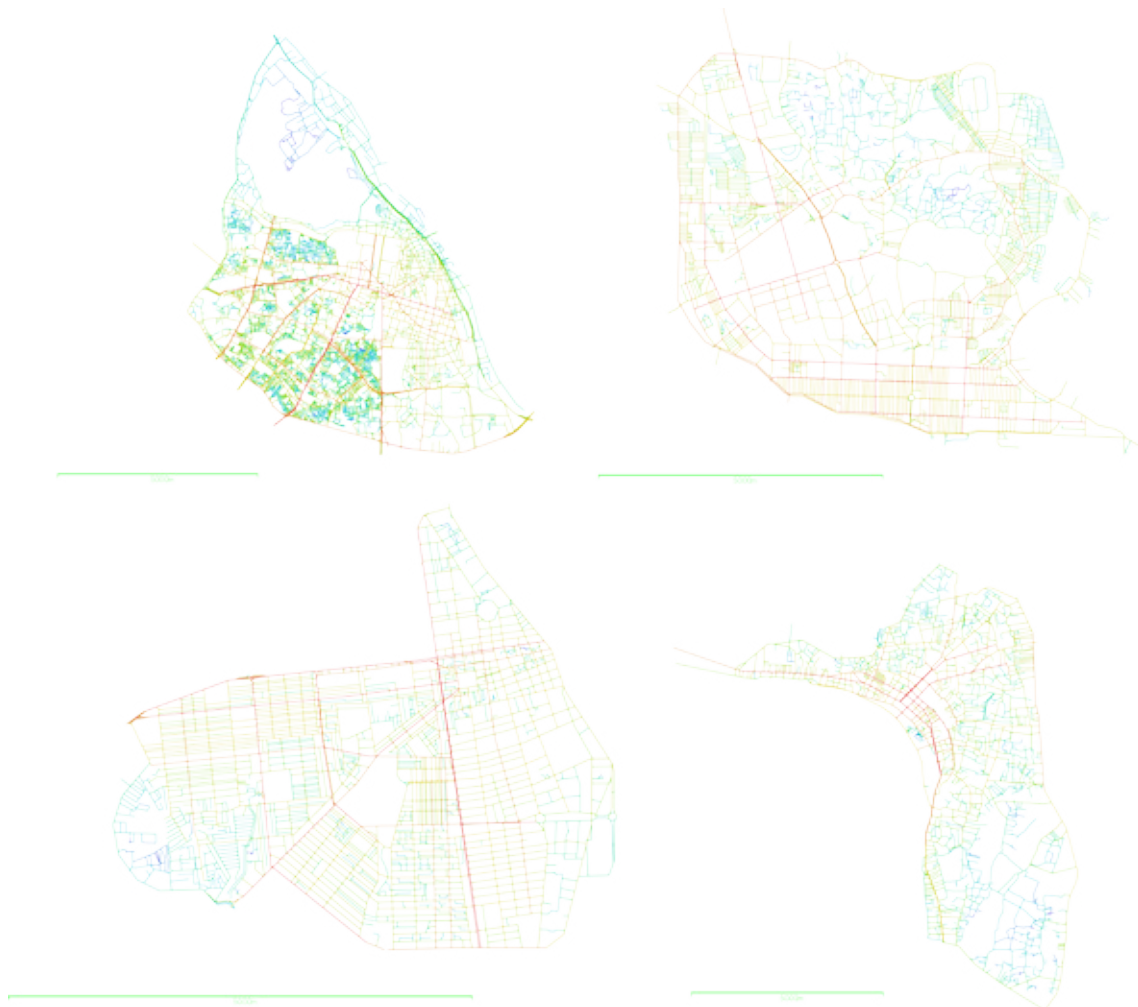


Figure 2 - A comparative NAIN map at radius N of the historical areas with sub-streets of Hanoi (top left), Yangon (top right), Phnom Penh (bottom left) and Vientiane (bottom right)

The segment-analysed maps show that there are some similarities of the city grid pattern as suggested by Hillier (2009): the dual characteristic that accounts for the general accessibility within the city grid. The large-scale grids are the structure of the cities and form their foreground networks. Major live-centre functions of the cities occupy the foreground networks, for example, wholesale markets, shopping centres, banks and offices, and so on. The small-scale grids are residential areas and form the background networks connecting to the foreground network. Figure 2 is a comparative NAIN map at radius N of the historical area model with back lanes of Hanoi (top left), Yangon (top right), Phnom Penh (bottom left) and Vientiane (bottom right).



Figure 3 - A comparative NAIN map at radius N of the historical areas with and without sub-streets of Hanoi and Phnom Penh

When the historical area with and without the back-lane maps are compared, for example, Hanoi and Phnom Penh, the two cities with distinguished sub-street grid patterns, the self-organising grid characteristics within the historical areas can begin to be established (Figure 3). It is markedly clear that the sub-streets strengthen the accessibility of the main streets within which they are directly or sequentially connected to. This is more apparent from NAIN. Syntactic values of these main streets also noticeably increase. Moreover, the sub-streets themselves form a number of local areas in Hanoi, creating another pattern of the background grid. Within these areas, some of sub-streets are their local spatial centres, while majority of the sub-streets are just very local streets. This might be because the sub-streets have to fill large land areas. As for Phnom Penh, the sub-street impact seen from the maps and the increase in syntactic values of their surrounding main streets are less pronounced than those in Hanoi. The sub-streets in Phnom Penh just compliment the over all accessibility of the main streets of the blocks they subdivide.

These patterns are evidences of self-organising characteristics of the historical area grids. They have adapted to the socio-economic needs and functions. They are the local centres, facilitate movement as the links between the foreground and background grids, and even form the background grids themselves. Furthermore, as the sub-streets tend to be organically developed and have been rarely planned (Molyvann, 2003). They could therefor be called 'the spatial lassier faire' for these four cities.

### 3.2 FOREGROUND NETWORK OF THE LOCAL GRIDS

The study sets to investigate the local streets, which act as the live centre of the neighbourhoods, i.e., the background grids. It proposes that these local streets should have spatial characteristics in term of accessibility, which supports the ways in which they can function as social and economic centres. In addition, for the selected four cities and 13 studied streets, these local streets should be the sub-streets. Figure 4 shows locations of the 13 studied streets in the historical areas of Hanoi, Yangon, Phnom Penh and Vientiane. Figure 5 is an example of street setting records of the four surveyed streets in Phnom Penh, which marked the land-use types of ground floor buildings and vendors and their locations. However the dimensions of occupied spaces are not shown here. Figures 6-9 are maps made from some spatial related answers of the interviews. Table 2 displays the radii of the studied streets that have the highest NACH and NAIN values.

Overall, it was found that there were 61 types of the retail and catering functions for shops, and 41 types for vendors. The number of types ranges from four, the minimum, to 30, the maximum on a studied sub-street. In general, there were 15-20 types found in a sub-street. Similar patterns are also found for the vendors. Given that these studied sub-streets are not long streets, the varieties of the types found suggest that they really are the local live centres. Nevertheless, there is no significant relationship between NACH and NAIN with the number of types and the number of premises, which are non-residential, along the segments as shown in Figure 10. The correlations between NACH and NAIN against movement density should give a clearer picture of the relationships although this is not possible due to the reason mentioned previously.



Figure 4 - A location map of the 13 studied streets in the historical area of Hanoi (top left), Yangon (top right), Phnom Penh (bottom left) and Vientiane (bottom right)

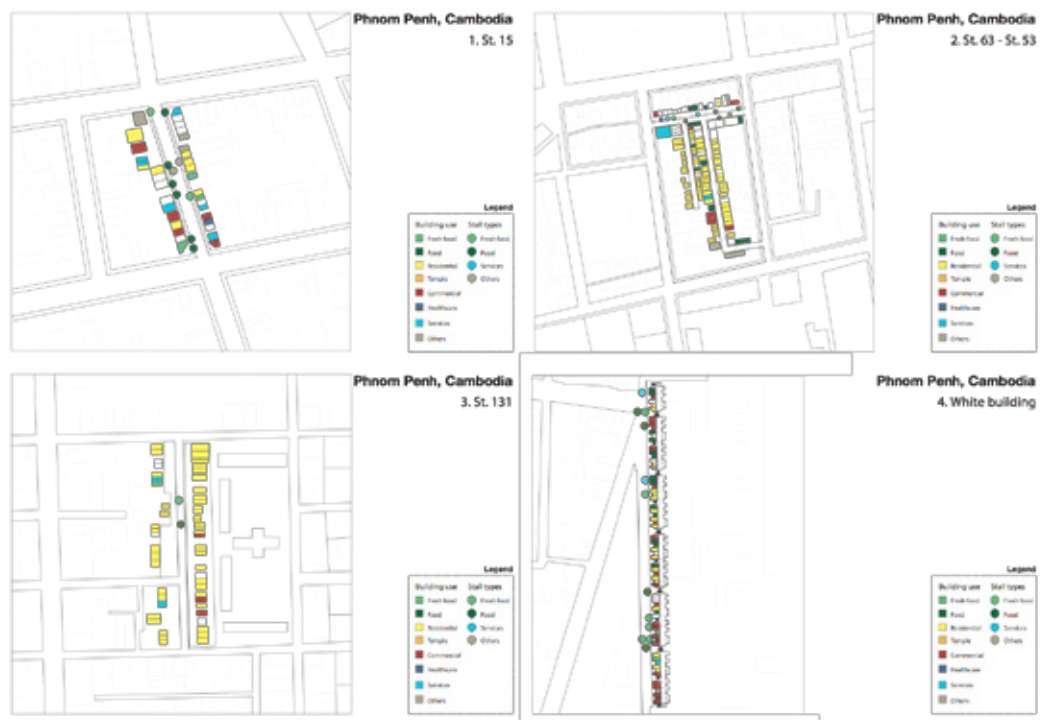


Figure 5 - An example of street survey records of Phnom Penh's four studied streets

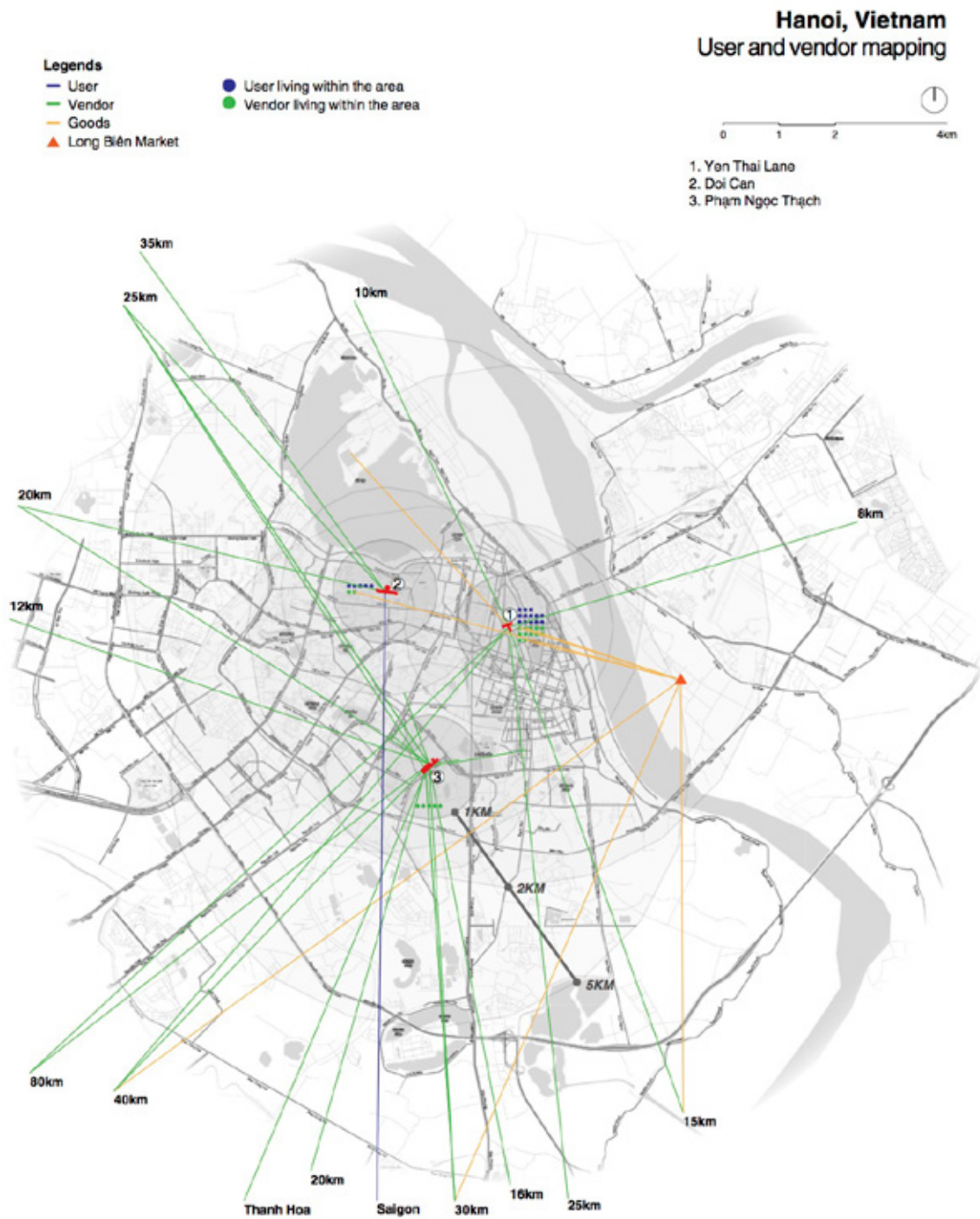


Figure 6 - A spatial related interview map of Hanoi's three studied streets

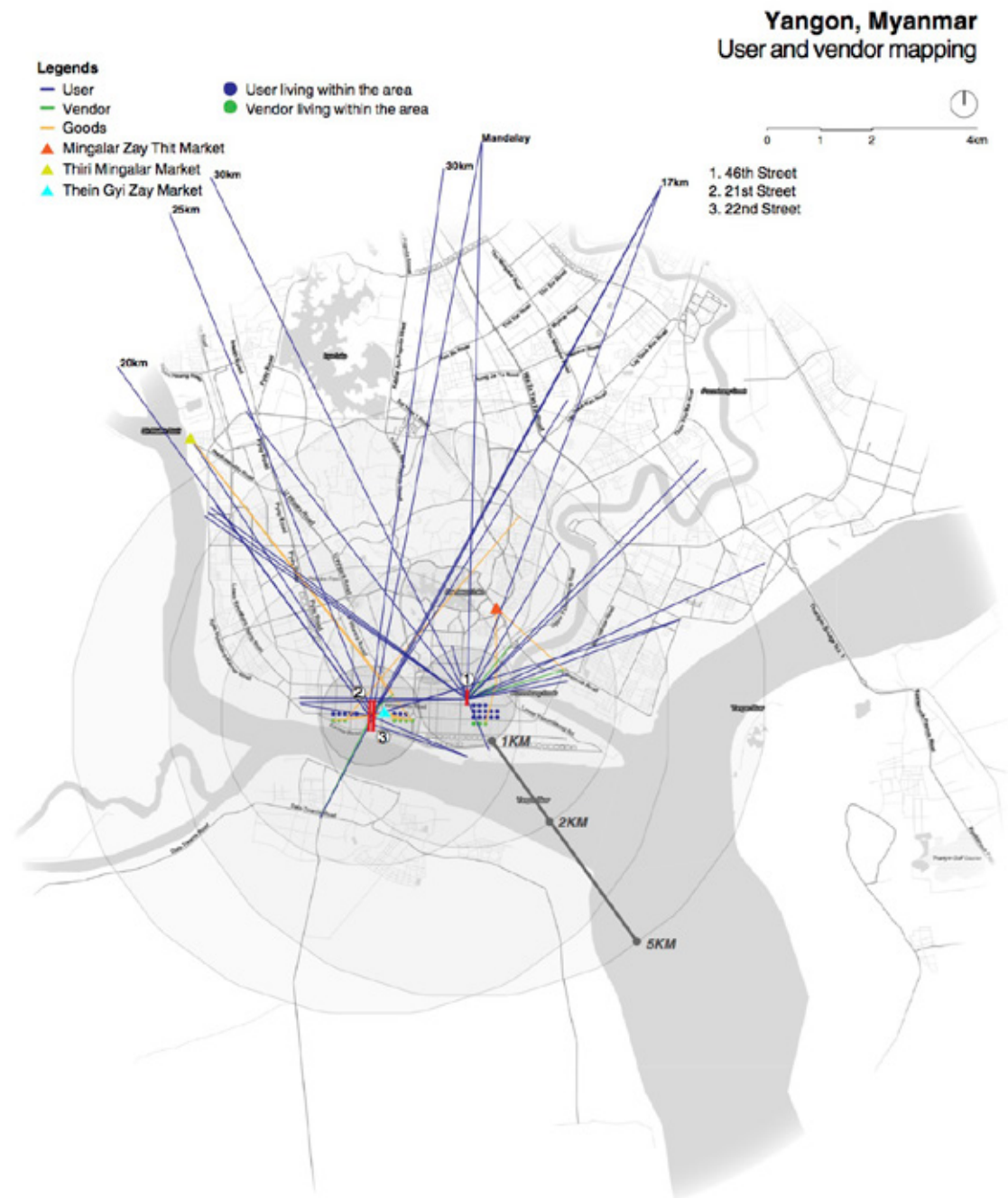


Figure 7 - A spatial related interview map of Yangon's three studied streets

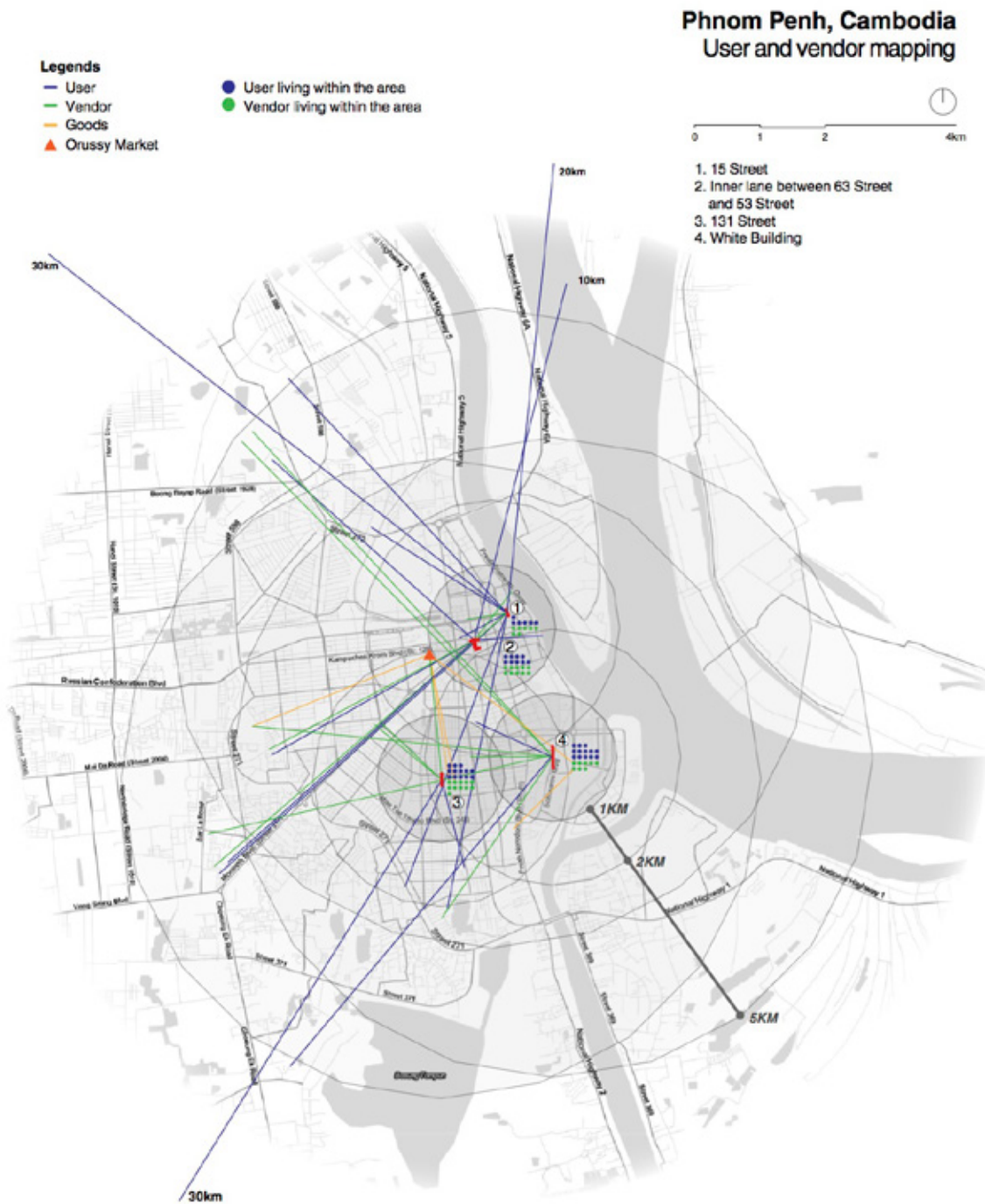


Figure 8 - A spatial related interview map of Phnom Penh's four studied streets

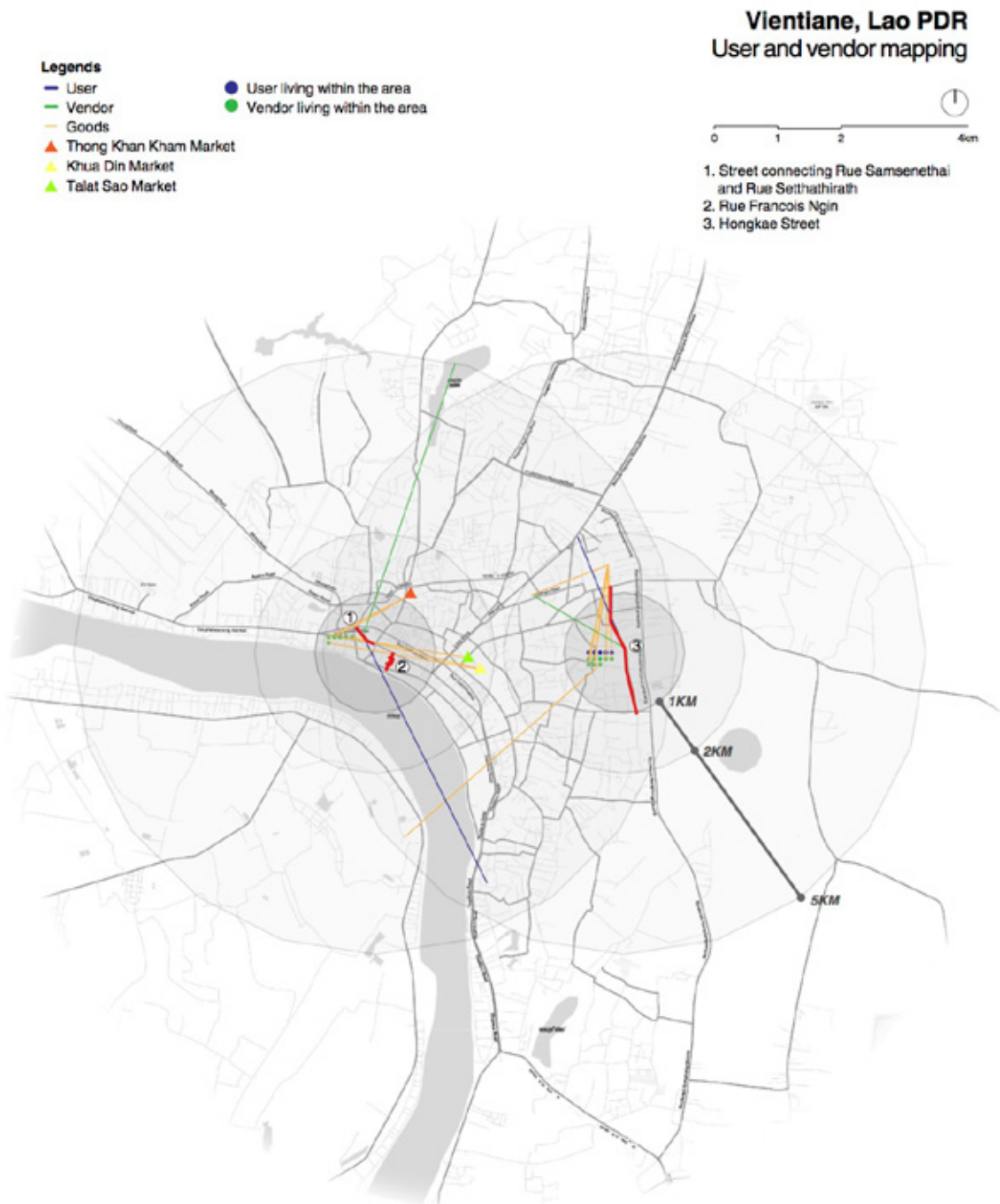


Figure 9 - A spatial related interview map of Vientiane's three studied streets

City	Radii with highest values (m.)	
	NACH	NAIN
<b>Hanoi</b>		
1. Yen Thai Lane	R300	R1500
2. Ngo Ngoc Ha, Doi Can	R800	R2500, R6000
3. Pham Ngoc Thac	R600	R3000, R5000
<b>Yangon</b>		
1. 46 <sup>th</sup> Street	R2000	R700
2. 21 <sup>st</sup> Street	R1000	R900
3. 22 <sup>nd</sup> Street	R1500	R900
<b>Phnom Penh</b>		
1. 15 <sup>th</sup> Street	R700	R2000, R5000
2. Inner Lane between 53rd/63rd Streets	R900	R5000
3. 131 <sup>st</sup> Street	R900	R2000
4. White Building's front Lane	R2000	R2000
<b>Vientiane</b>		
1. A street connecting Rue Samsenethai and Rue Sethathirath	R1500	R3000
2. Rue Francois Ngin	R300	R3000
3. Hong Kae Street	R1000	R500

Table 2 - A comparison on radii with highest syntactic values of the studied streets in four cities

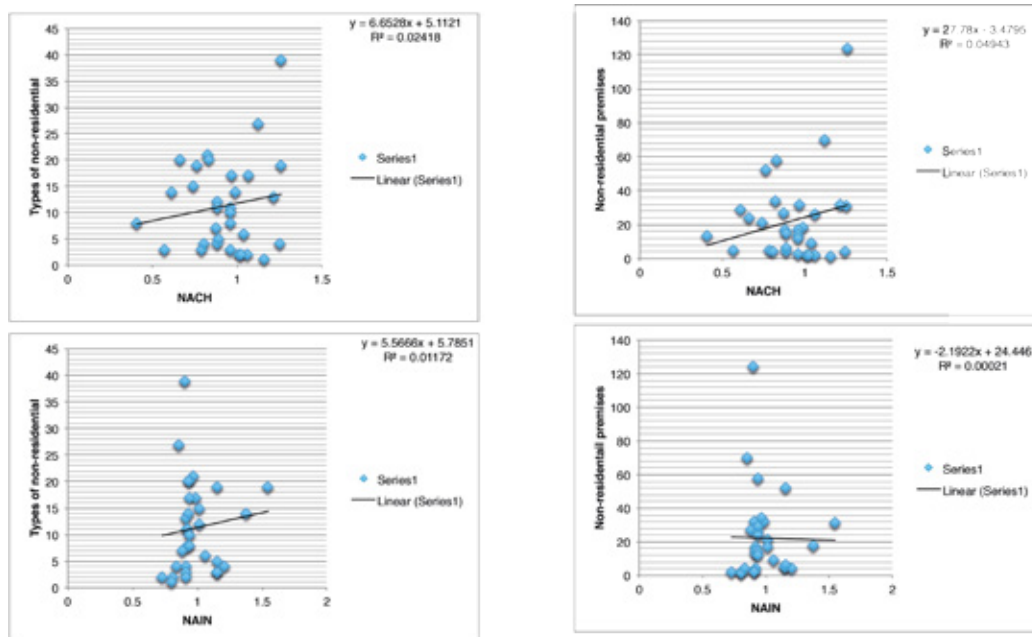


Figure 10 - Scattergrams showing correlations between NACH and NAIN against types of non-residential premises and against number of non-residential premises on the segments

The key findings here are the approximating distances of buyers/passers-by, obtained from the interviews, and the radii with highest syntactic values (Figures 7), and the tendency to have more local radii for NACH and more global radii for NAIN (Table 2). Majority of the buyers/passers-by lived in the sub-streets. This means that the sub-streets are their local centres. A lot of them visited the sub-streets everyday. If they came from other places, those places tended to approximate the radii with highest syntactic values, notably NAIN radii. Among the four cities, Phnom Penh has the closest approximation. Figure 8 shows that buyers/passers-by who came from outside, represented by blue lines for their trips' origins and destinations, were more likely to come from the 2000-metre distance, while NAIN radius which has highest syntactic value is at radius 2000m too. This is suggestive to establish that the sub-streets are more likely to be their destinations. However, the approximation cannot be concluded for Vientiane due to the limit number of the buyers/passers-by interviewees.

Their tendency to have more local radii for NACH and more global radii for NAIN could help explain the strategic locations of the sub-streets. Given that these sub-streets are the streets of the background network, in order to be a destination the strategic sub-streets should have two spatial characteristics. One is that they should well connect to the foreground network. Having more global radii for NAIN is an evidence of this accessibility and connection. This spatial characteristic help bring to-movement into the sub-streets. Another is that the strategic sub-streets should help minimise local journey distance. This can be achieved by having the more local NACH radii. The local NACH radii generate local through-movement. The strategic sub-streets therefore line on the shortest routes within the neighbourhoods. For both cases, the retail and catering functions can take advantage of the to- and through-movements generated by the accessibility of the sub-streets from their surroundings. These are their strategic spatial characteristics. And, it could be said that this type of sub-streets form the foreground network of the local grids.

#### 4. CONCLUSIONS

The research set out to apply Space Syntax theories and analytical techniques to spatially and systematically investigate the local streets, which have been created by the self-organising grids within the historical areas of Hanoi, Yangon, Phnom Penh and Vientiane, and are also the local socio-economic centres. It is successful to establish that the local streets are spatially strategic. Their strategic locations help facilitate movements that the socio-economic functions within them can take advantage of. Because of this there are relationships between strategic spatial localisation and degree of liveliness. Furthermore, these local streets form the foreground network of the local grids.

Let's now come back to the reflection on urban design learning from this research. Because of the importance of these local streets, streetscape modernisation should not be applied to them. By getting rid of those vendors or street-settings that thrive on and serve for movements is the miss of opportunity to maximise the spatial nature of these streets for socio-economic uses and purposes. Hence, the alternative urban design model should start with identifying the streets having strategic locations for the local usage, i.e., being local live centre. Then, the design should support the local streets to function as live centres, rather than undermine them. If the streetscape modernisation will be inevitably applied to main streets in such a way that they will become homogeneous, the survival of these strategic local streets systematically could help maintain the heritage of the city life, as a result make the city less generalised and less boring, at least at the areal scale.

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