The figure comparison of the four spatial systems studied shown in Table 3.1 supports the process of city development suggested by Hillier (2001). The table shows that the more the city expands, the more segregated it will be and the deeper the system it will become. This city's spatial evolution pattern is somewhat anticipated. It is quite obvious that the city becomes globally segregated and has a deep structure (about half less integrated and three-time deeper a structure from the Rattanakosin to the greater ring road spatial system) due to the increase in a vast number of local area developments. Many of the local areas are not well integrated with the city structure, which we can see from the linear fashion pattern and the compartmentalisation of the local area development. However, the local areas themselves have developed with such a similar internal structure. This is seen from a marginal drop in local integration from Rattanakosin area to the greater ring road area, and despite the fact that each road has a tendency to have one less connection when the city expands – connectivity dropping from three in the Rattanakosin spatial system to two in the greater ring road system. By knowing that as the city expands the number of roads, i.e., axial lines, increasing enormously and more likely being short lines of the local areas, the raise in average line length would likely to be through the extending of a few long lines, or in some cases adding one or more long or medium-length lines in the system to try to consolidate all the local areas. This is an evidence of the city-as-object process mentioned by Hillier. In addition, the figure comparison also strengthens the findings from the graphic comparison between the spatial systems of the eastern and western areas of Bangkok: their differences; the similarity between the spatial systems of the eastern area and the city; and, the dependency of the western area's spatial system on the global network due to the local segregation.

studied area	no. lines	global integration	local integration	connectivity	mean length	mean depth
Rattanakosin	1,170	3.445	6.4203	3.2188	176.41	7.37
Rattanakosin & Historical Thonburi	1,718	2.7779	6.2488	2.9988	166.25	9.36
Ratchada	14,412	2.4226	6.2011	2.6797	167.88	13.63
Greater Ring Road	93,713	1.8173	6.1607	2.5567	188.28	21.55
Eastern Area	65,693	2.1155	6.2794	2.6389	199.73	17.93
Western Area	28,033	1.5087	5.8804	2.3624	162.87	23.27

Table 3.1: A comparison of the mean integration and other mean values of six studied spatial systems of the Bangkok road network

3.2 Discussion

We have set out to investigate the configuration evolution of the Bangkok road network, with a focus on the edge areas, due to their current development intensity. To do so, the configurations of the central road network's expansion were re-examined, but with different areal limits to the former study on the central road network expansion, in order to get a clear view of the changes. It was found that the pattern of spatial changes in the edge areas has continued from that in the central area expansion – global and local segregation and local area development pattern – and with more noticeable evidences and unique characters.

In the case of Bangkok, the segregation of the city as a whole, when it expands, results from the segregation of the two local area development patterns: the linear fashion development along the canal network and the compartmentalisation area development. However, their effects on the local areas are different between those locating in the central and the edge areas. Let us elaborate on this issue from the map. Box A in Figure 3.8 shows some central local areas of Bangkok, many of which have the broken grid structure. Due to the density of the city roads in the central area, these local areas' broken grids connect to the city's major roads with very few depths, and have more than one connection with the city lines. Box B in Figure 8, in contrast, shows some edge local areas, some of which have the broken grid structure, and many of which have the orthogonal or quasi-orthogonal grid structure. Because the city's major roads are quite few and far apart in the edges, the grids of these local areas sequentially link, with a number of depths, to the city's grid by one or two accesses.

a. Centrally locating local areas

b. Periphery locating local area

Figure 3.8: Examples of local areas development at the central and the edge area

These evidences suggest that there is a tendency that the internal grid structure of the central local areas will interweave with that of the city. This makes the central local areas' grids to become a part of the city's grid, and the grid lines themselves function in the city's movement economy process. This is not the case for the edge local areas. Their internal grid structure makes them to be more likely to serve the local purpose, due to their limited connection with the city's grid. These edge local areas, therefore, will likely to be a destination and hardly function in the city's movement economy process. In the other words, the linear fashion and the compartmentalisation of the local area development in the edges will have a greater effect on the spatial system of the city than the central local areas have. It is also worth asking whether the spatial exclusion of the edge local area has become problematic, in terms of spatial and movement relationship, in terms of spatial and social relationship, and so on.

The expansion of the city's spatial system is dependent on building or keeping extending long roads. Regardless of the spatial form of the city when it grows, long roads from the central city area continue to be extended to the edges (Figures 3.5-3.7). Because the process of building a major road, i.e., long line, is more difficult than that of the local road, i.e., short line, or of the extending the already existing long roads, it would be a good option to develop the local areas along them, and in turn continue to lengthening them. The long roads structure the city's spatial system and provide access to the local areas. Without them the city and the local areas would be disintegrated.

As the city expands and its spatial system becomes more complex, it is inevitably that sub-centres would emerge. However, the location of their emergence and the degree of their integration is an indicative to the transformation process of Bangkok, from a nuclei city to a multi-nuclei city, another new and significant finding here. The spatial realisation of the sub-centres, without an administratively planning with some measures putting in place to guarantee their service accomplishment, is worth a consideration from Bangkok Metropolitan Authority (BMA), who has been planning for so long for a multi-centre city (BMA, 1996). In the other words, the spatial location makes them a natural centre without a need to give any incentive. Their locations, therefore, could serve as an evidence for a site selection for BMA's new sub-centre development.

What all these mean to us then. They shows us this is a kind of the city Bangkok is now: a huge city with a dominant city centre, emerging two sub-centres, a vast number of compartmented (and less integrated) local areas, and a few major roads. With these spatial evidences and our

general knowledge of the city, in terms of social, cultural and economic of the city's inhabitants, we can begin to make a series of speculations worth a further study. Let us begin with the two obvious.

The spatially fragmented city should strongly associate with the social exclusion city. The compartmentalisation of the recently developed private housing estates in the edges not only create the spatial segregation but also generates the social exclusion – people of similar income group prefer to cluster with their social group instead of mix with the other social groups. This is contrast to the city centre where we can find a mix of people in different social groups. The question we should ask is neither we should or should not allow Bangkok to become even more fragmented which would eventually lead to a disintegrated society. Nor do we should or should not plan a new social management to prevent social disintegration. These are something that needs to be dealt with regardless of the degrees of the spatial and social fragmentations. The important question would be whether there is any other organic spatial configuration network in addition to the one we have modelled, or any disguise spatial usage to utilise the fragmented network. In what conceptual does it exist, if there is one? Can we model them? To what extent has such a spatial network complimented the road network, and particularly helping consolidate the society?

Or, with such a complex spatial system, one dominant city centre and two sub-centres suggest that most of the economic transactions would be made in the city centre. This means that the labour force would concentrate in the city centre. The association between integration and movement density (Hillier, 1992), the highly integrated major roads, and the persistent of the traffic problem generated by the movement of the labour force from home-to-work places in the city centre indicates that a different thinking to solve the problem of Bangkok's transportation is required, spatially. This could be a new mode of transportation, a different network of transportation, a new typology of road building programme, a re-direction of urban regulation to counter the city expansion and the compartmentalisation of local area development, or etc.

The point is that this spatial configuration map of Bangkok can now be a basis for the investigation between the spatial and the socio-economic aspect, of which the intrinsic relationships within individual systems are central to the study. It can also allow us to expand our investigation into the relationship between various physical factors, for example, traffic, land-use types, building types, etc. With all these understandings, what we can best hope for is the way we can literally and subtly change Bangkok into a kind of a city everyone wants it to be, or, at least, would be able to inhabit.

1 *Rattanakosin area is the historical area of Bangkok. It is where the city began. However, right before the development of Bangkok as a capital of Thailand, Thonburi, which is located on the west bank of the Chao Phraya River and opposite Bangkok, was a former capital. The investigation, therefore, attempts to understand the early development of the city as a system of its own, by limiting to the Rattanakosin area, as well as a system relating to Thonburi area which is so close, and in the early time of Bangkok was occupied by a number of aristocrats, who did not move to the other side of the river.*

2 *Hillier suggests that this kind of pattern is likely to be found in most cities studied by Space Syntax.*

3 *It should be noted that the Thonburi area was, and in some part still is, orchards, which requires a fine mesh of irrigation canal network, while the Bangkok area (the eastern side only) was, and again in some part still is, paddy fields, whose irrigation canals network could be wide.*

Chapter 4

Pratunam Market

The investigation of Pratunam Market in this chapter was framed by four questions. What kind of the area was it, spatially, visually and functionally? How many people, particularly shoppers, were in there? Where did people (shoppers) go inside the market? And, where did they shop? The details of Pratunam Market's investigation presented here consist of eight parts. They are: the general detail of the market, the market's spatial study, the market's visual study, the market's micro-distribution of the retail functions, the rental price distribution of the market, the shopper observation, the multivariate analysis and the graphic comparison analysis.

4.1 The general detail of Pratunam Market

Historically, Pratunam was an area locating to the east of the historical Bangkok area and commonly called after the water-flowing control gate of Sansa-ab Canal, a major canal linking the historical and the eastern area of Bangkok. The control gate was built to assist the canal transportation of the country's exporting rice from the paddy fields in the north and the East of Bangkok, Rangsit and Ladkrabang, to Chao Phraya River, the main port of the country. Vicinity of Pratunam area covers the area around the intersection of Petchaburi Road aligned along Sansa-ab Canal and Ratchaprarob Road, a section of a major north-south oriented road linking the northern area to the central business district of Bangkok, Silom (Figure 4.1).

Pratunam area had developed to be the transportation junction, initially of the canals and later of the buses and trains. Bus no. 16, one of the very first few operated bus lines in Bangkok, starts from the east of Bangkok (Sukhumwit), passes Pratunam and ends at the north-west of Bangkok (Kieak-kai). Many other bus lines also have routed passing Pratunam. Makkason train station and rail depots, one of Thailand's major rail depots, also locate within the area; the station area now has been developing into an airport-link mass transit station. Eventually, a fresh market developed. With the high density of people passing the area everyday, a number of markets and shops were also built. A modern hotel and a shopping complex, Indra Hotel and Shopping Complex with a number of shops and a movie theatre, were constructed in 1970 (Figure 4.2; TCDC, 2008). At its peak, the area had more than five movie theatres and four hotels. That said Pratunam has gradually turned into an important commercial area of Bangkok, although there was a time when the economics of the area was

less flourished. Nowadays, the area still boosts with a tallest hotel building in the country, and a number of shopping complexes have been constructed continually.

Figure 4.1: A map show a vicinity of Pratunam area

Figure 4.2: A historical picture of Indra Hotel from Ratchaprarob Road

Among the many markets, shops, hotels and movie theatres, Pratunam Market is very well known for wholesale clothes throughout Thailand, and perhaps the world. It could also be said that the area is viewed as one of the country's two central markets of the wholesale clothes industry. As introduced in Chapter 1, for this research Pratunam Market is defined for an area bounded by four roads: Petchaburi Road, Soi Petchaburi 19, Soi Indra Hotel and Ratchaprarob Road (Figure 4.3). The market has organically developed which makes it an unplanned shopping area, consisting of a number of shops, small markets and numerous stalls. Pratunam Market is also a pedestrianised market.

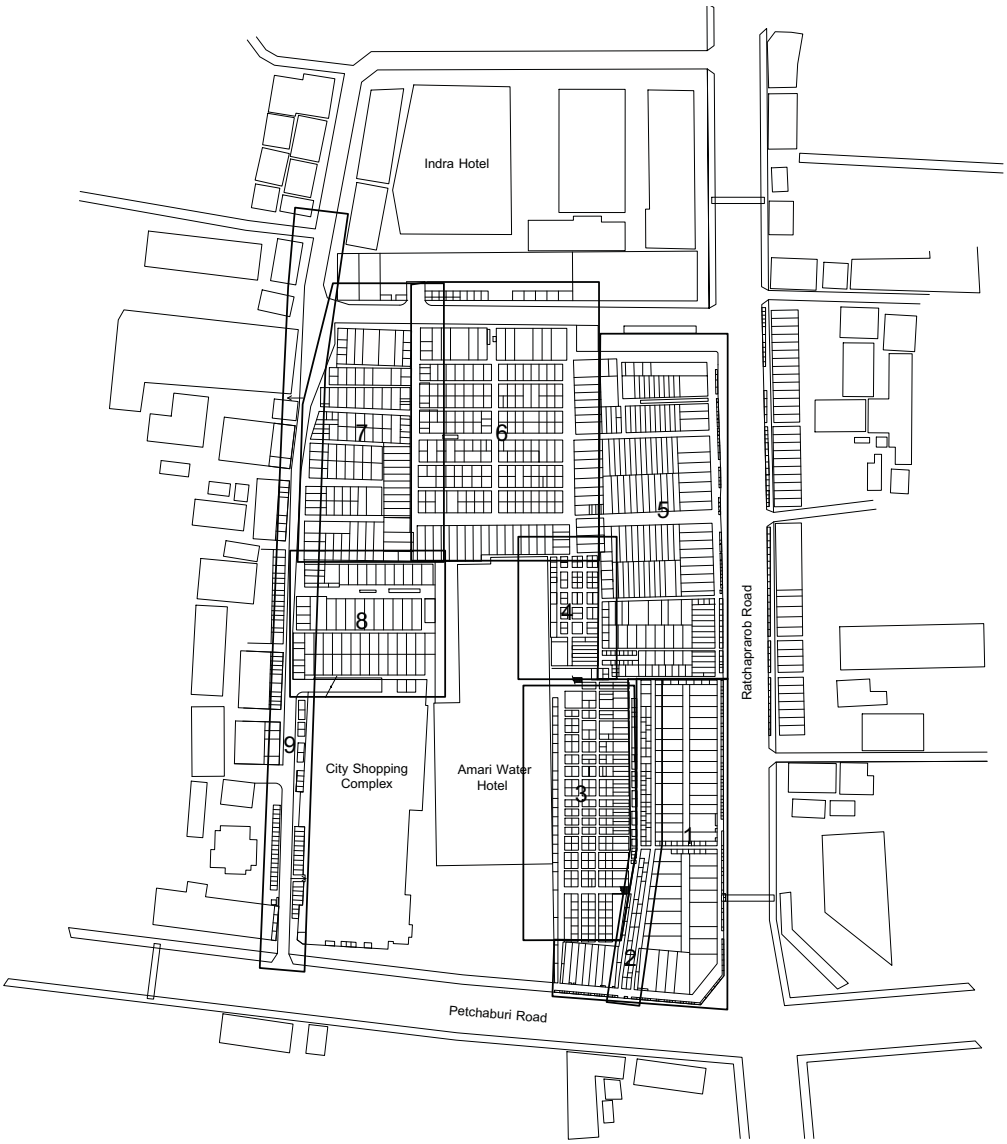


Figure 4.3: A map of Pratunam Market at the intersection of Petchaburi Road and Ratchaprarob Road, and being divided into nine sections

Figure 4.3 shows that the market could be divided into nines sections. Section 1 was a sub-area filled with rows of shop-houses and facing to the two main streets, Petchaburi Road, in the south, and Ratchaprarob Road, in the east. The fronts of these shop-houses were occupied with a vast number of stalls. For example, Figure 4.4 is a picture of a row of shop-houses facing Ratchaprarob Road; their fronts were occupied with many stalls. Section 2 was a two-narrow alley connecting Petchaburi Road to the middle of the market, half the length of the market. These two alleys were not only very narrow but they were also poorly lit, naturally and artificially.

Figure 4.4: A picture of Ratchaprarob Road featuring Pratunam Market shops and stalls, and Soi Indra hotel

Section 3 was a relatively built new part of the market. It was filled with many small cubicles which located within a small-scale and fine-mesh grid, formed by a number of lanes. These cubicles were bigger than the stalls, but were not as large as the shop-house. Each of them usually had an approximate size of 1.5 x 2.00 metre or 2.00 x 2.00 metre. Similar to Section 3 was Section 4. It was filled with a number of cubicles. The lanes where the cubicles locating formed a small-scale and fine-mesh grid, and were not well lit.

Section 5, 6 and 7 were internally intertwined together and partly faced Soi Indra Hotel, which is perpendicular to Ratchaprarob Road. Section 5 was another set of shop-houses. Some of these shop-houses faced Ratchaprarob Road or Soi Indra Hotel. Majority of them formed a sub-market area along five lanes perpendicularly intersecting with Ratchaprarob

Road. These lanes were not as narrow as the two alleys in Section 2, and were also better lit artificially. Moreover, the lanes were covered with roofs over the rows of shops and stalls, for them to be able to run the business in all weathers, as seen in Figure 4.5.

Section 6 was another sub-market filled with many shop-house size cubicles, located along a number of lanes. The lanes formed a grid pattern with a bigger-scale than those of the Sections 3 and 4. Section 6 had the largest area of all the sections in the market. This section was also more airy and better lit than Sections 2, 3 and 4 were (Figure 4.6).

Figure 4.5: A picture of a lane in Section 4

Figure 4.6: A picture showing a shopping lane in Section 6

Section 7 was an area filled with many shop-houses and cubicles. Part of the section faced Soi Indra Hotel, while another faced Soi Petchaburi 19, the heart of Section 9. Section 9 itself was a narrow lane and allowed for vehicles to pass only in some parts, i.e., the northern and southern sections, not the central one. Interestingly, Section 9 was filled with a numerous small cubicles. The rows of shop-houses being accessible from Section 9 were of those form Section 7 and Section 8. As for Section 8, the area was formed by rows of shop-houses as similar to Section 7.

If we look at Figure 4.3 again, we can see that two big buildings were excluded from the defined market area to be studied. This is because one of the buildings is a hotel, Amari Watergate Hotel, while another is a small shopping complex, City Shopping Complex. Although the buildings are organically developed in relation to the area as a whole, they are too large in scale and the competition for retail location within them is too regulated than any of those in the 10 sections. For the objective of this research, it is viewed that the less regulated retail location for the highest competition for strategic retail location would be better than the too regulated one.

4.2 Pratunam Market's spatial structure

As described in the previous part, Pratunam Market consisted of 9 sections, each of which were formed and filled by different dimensions of lanes and retail premises. When the axial map of the market was draw, the axial network clearly depicts these differences (Figure 4.7). The area is bound with four long lines. Two of them are major streets, Petchaburi Road and Ratchaprarob Road. The other two are Soi Petchaburi 19 and Soi Indra Hotel. Inside the four perimeter lines, the grid of the market clearly has separated into five sub-grids.

The characteristics of the five sub-grids are given as followed. The first sub-grid is the grid of Section 2 and 3 (Box a in Figure 4.7), which has a very fine mesh formed by seven north-south oriented medium length lines intersecting at a perpendicular angle with 17 east-west oriented short lines, having an orthogonal grid pattern. The second one is the grid of Section 4 (Box b in Figure 4.7) which is similar in pattern, scale and mesh to that of Section 2 and 3. However, the length of the north-south oriented lines of Section's 4 grid is shorter that those of Sections 2 and 3. The third is the grid of Section 5, which is also an orthogonal grid, but its scale is almost the largest among the five sub-grids (Box c in Figure 4.7). Section 5's grid is formed mainly between two north-south oriented lines, one of which is the axial line of Ratchaprarob Road, and intersecting at a perpendicular angle with nine east-west oriented

lines. The fourth is the grid of Section 6 (Box d in Figure 4.7) which is another orthogonal grid, with a scale bigger than that of Sections 2 and 3 but smaller from that of Section 5. The last one is the grid of Sections 7 and 8 (Box e in Figure 4.7). This grid is very similar to the grid of Section 5, in terms of pattern and scale.

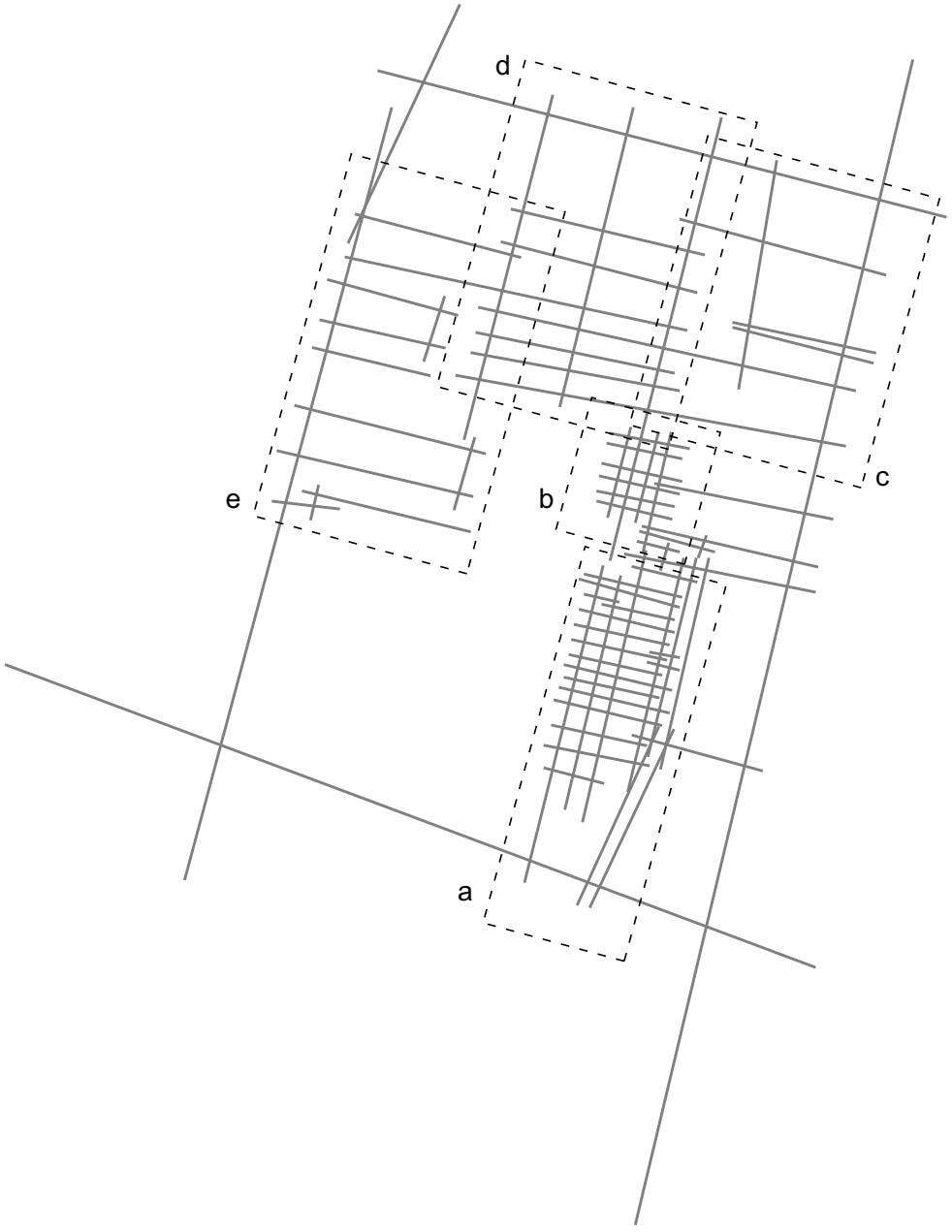


Figure 4.7: A map of axial network of Pratunam Market

Pratunam Market's grid was analysed for its configuration from the three spatial systems: an individual spatial system, an embedding spatial system within the city's grid at two kilometres distance from itself market (2-km embedded system), and an embedding spatial system within the city's grid at ten kilometres distance from itself (10-km embedded system). The findings are:

For the integration values shown in Table 4.1, it was found that the order of the mean global integration values among the three systems is different from that of the mean local integration and the mean connectivity values. The highest mean global integration value is the value of the 2-km embedded system, at 1.473, then the value of the individual system at 1.4168, and the value of the 10-km embedded system at 1.338. The highest mean local integration and highest mean connectivity values are those of the 10-km embedded system. The 2-km embedded system and the individual system has lower mean local integration and mean connectivity values respectively.

Analysed spatial system	Mean integration Rn	Mean integration R3	Mean connectivity	Intelligibility	Synergy
individual	1.4168	2.8465	4.7397	0.1592	0.1354
2-km embedded	1.473	3.069	5.324	0.224	0.106
10-km embedded	1.338	3.112	5.632	0.191	0.093

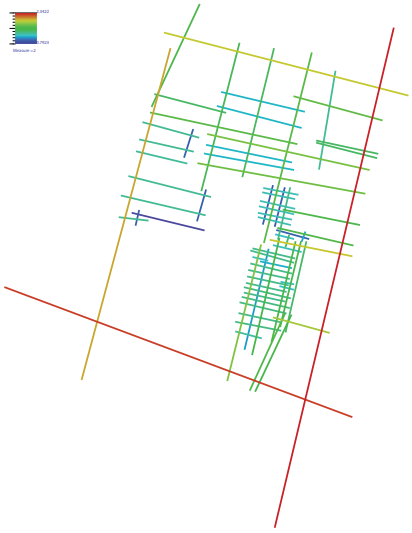
Table 4.1: A comparative integration values of the three spatial models of Pratunam Market studied

The difference in the order of the mean values suggests that in relation to the city as a whole the spatial structure of Pratunam Market seems to work best in a catchments area of two kilometres from itself. In fact, it structure could work independently from the city structure. By enlarging the catchments area of the study, it seems that the area is more locally integrated and better connects to the city structure. However, a closer look reveal that this pattern could occur because of two axial lines forming the grid of Pratunam Market being the major axial lines of the city grid – Ratchaprarob Road and Petchaburi Road. The larger the catchments area is studied the more number the axial lines connecting to the two major lines will be, making the mean values of local integration and connectivity higher.

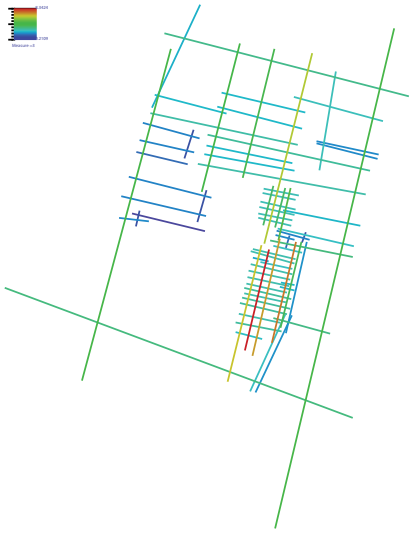
The two co-efficient values, intelligibility and synergy, were also studied as an index for the degree of navigating ability and the degree of embedding quality. Table 4.1 shows a different order of intelligibility and synergy to those of the mean integration value. For intelligibility, the 2-km embedded system has the highest value, then the 10-km embedded system and the individual system, respectively. For synergy, the individual system has the highest value then the 2-km embedded system and the 10-km embedded system, respectively. Nevertheless, the order of intelligibility values strengthens the finding that among the three studied systems Pratunam Market works best within two kilometres catchments area from itself. As for synergy, the larger the catchments area is studied the less integrated the area is to the city structure even though its mean local integration and mean connectivity values are actually higher.

The graphic comparison of the three spatial systems studied shown in Figures 4.8, 4.9 and 4.10 displays a number of consistently distinctive configuration patterns. All the three systems have the perimeter lines as the globally integrated lines. The axial line of Petchaburi Road is the most globally integrated line of the two embedded system, with the axial line Ratchaprarob Road being the second most globally integrated. For the individual system, the order is reversed. The axial line of Soi Petchaburi 19 is the third most globally integrated line in every system; and the axial line of Soi Indra Hotel is the fourth one. In general, the axial lines directly connecting to the axial lines of Ratchaprarob Road or Petchaburi Road are more globally integrated that those that do not.

Integration - Rn



Integration - R3



Connectivity

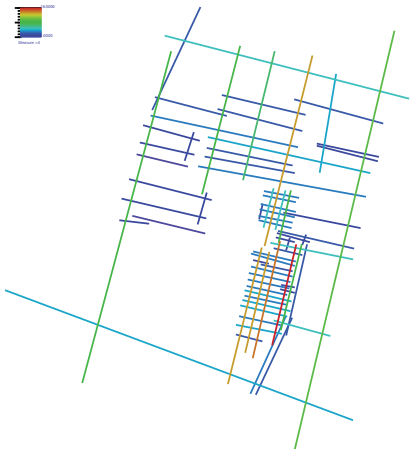


Figure 4.8: An axial analysed map of Pratunam Market as an individual system

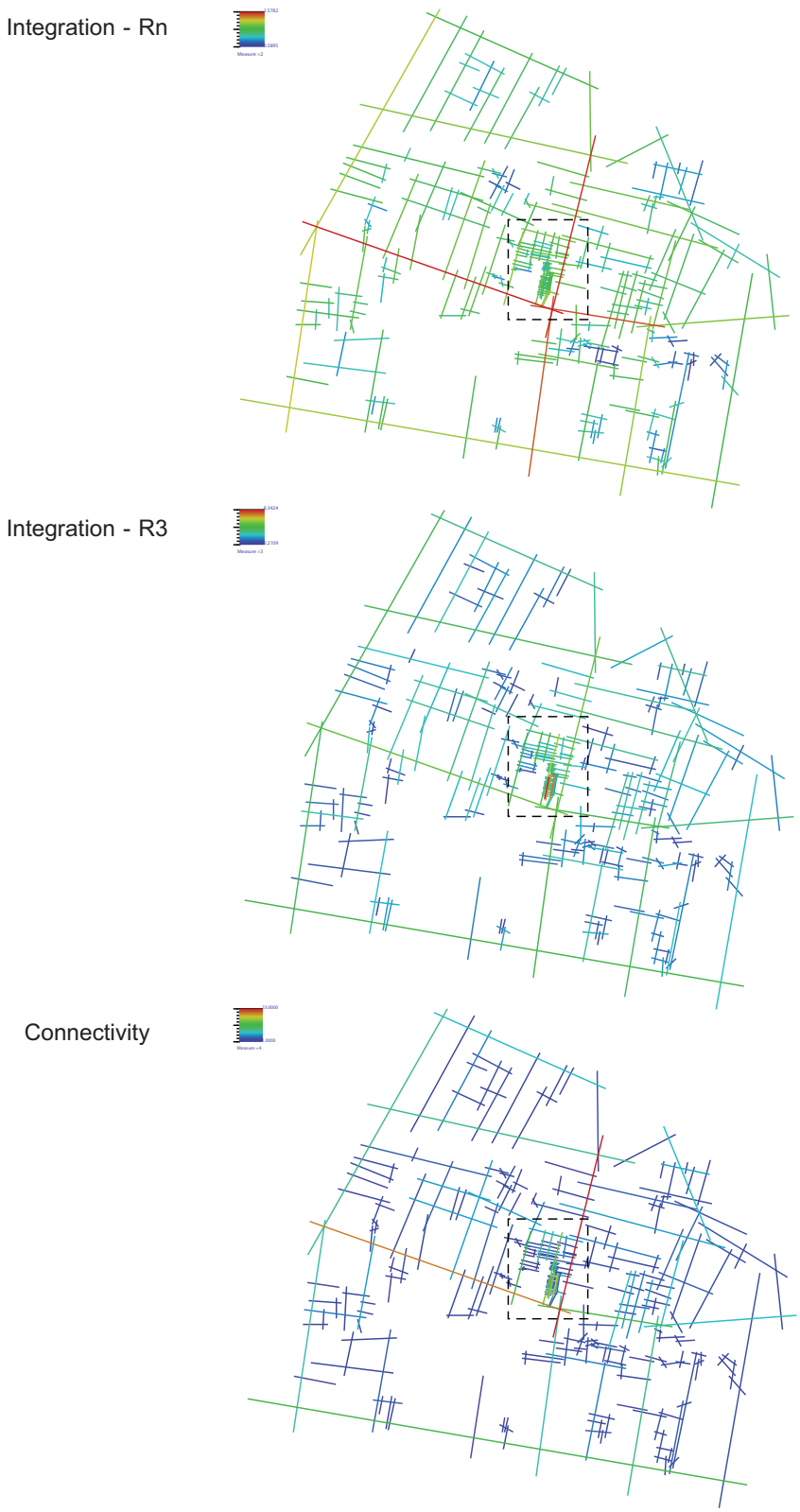


Figure 4.9: An axial analysed map of Pratunam Market as an embedded system within the catchments of two kilometres from the market

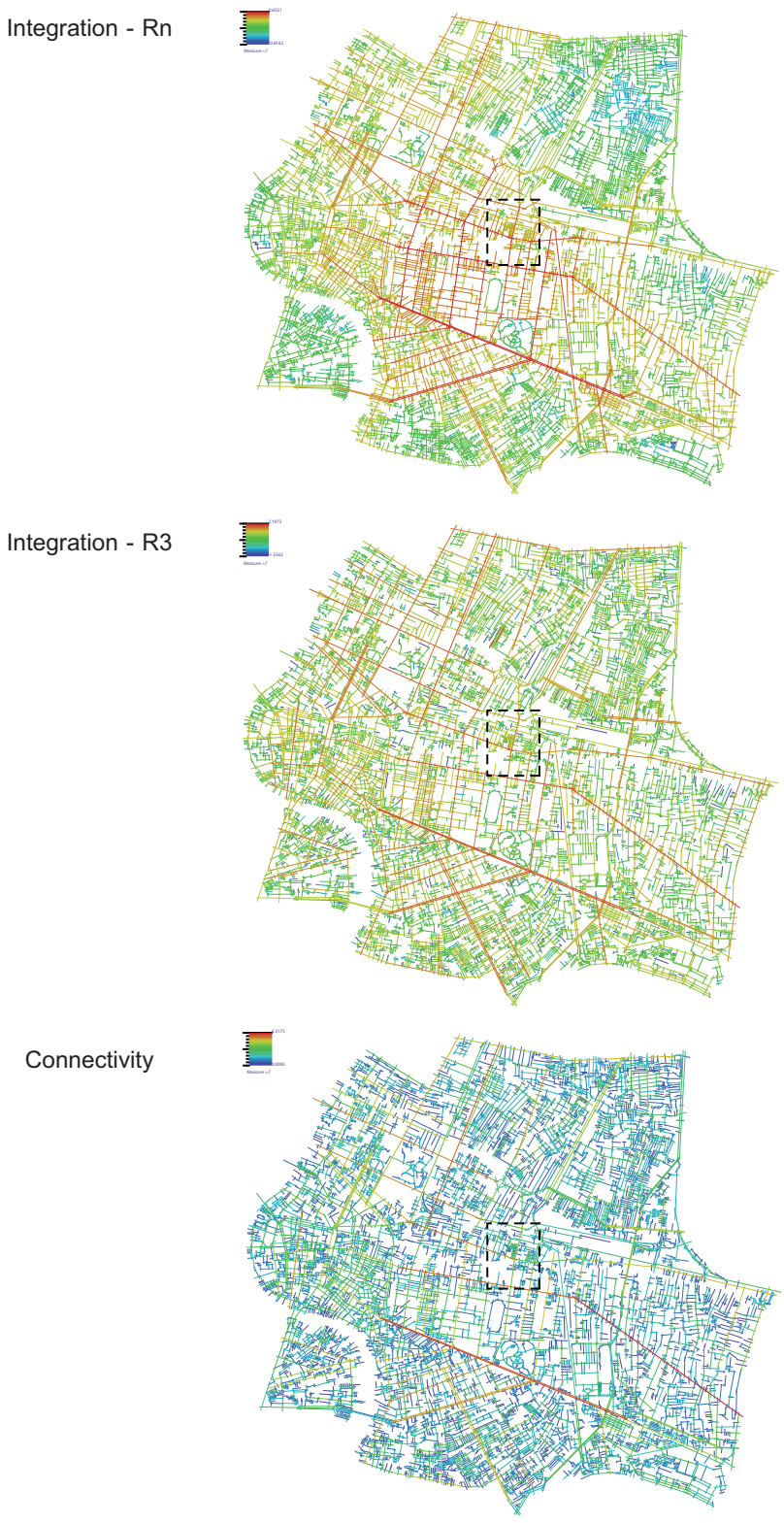


Figure 4.10: An axial analysed map of Pratunam Market as an embedded system within the catchments of ten kilometres from the market

While the perimeter lines are the globally integrated lines, it is the internal grid lines that are the locally integrated ones. Among them the north-south oriented axial lines are more locally integrated than the east-west oriented axial lines. This is quite opposite to the findings of the global integration pattern. Four north-south oriented lines of Sections 2's and 3's grid and a shared north-south oriented line of Sections 4, 5 and 6 are the most locally integrated ones. These five axial lines seem to form the internal structure of the area. Of the three internal grids, the grid of Sections 2 and 3 is formed by more number of the locally integrated lines than the grids of Section 4 and Section 6 are. On the other hand, most of the most locally and globally segregated lines form the grid of Section 8, making the section the most segregated sub-area.

To sum up for the spatial structure characteristics, Pratunam Market is an area forming by many scales orthogonal grid patterns, globally and locally. The market has a strong edge, i.e., globally integrated perimeters, as well as strong internal structure, i.e., locally integrated internal grid. Finally, the market's structure works best within the catchments area of two-kilometre distances from itself.

4.3 Pratunam Market's visual configuration

The visual configuration map of Pratunam Market (Figure 4.11) displays four distinctive patterns. First, the perimeter area is more visually integrated than the internal area of the market. Of the four perimeter roads, Ratchaprarob Road is the most visually integrated one. Soi Petchaburi 19 is the second most visually integrated area of the market. Petchaburi Road and Soi Indra Hotel seem to have an equal visual integration, which are the third most visually integrated one.

Secondly, the north-south oriented lanes are more visually integrated than the east-west oriented lanes within the internal area, in general, even though they may directly connect to Ratchaprarob Road. This feature is clearly found in Sections 2, 3, 4 and 6. For the east-west oriented lanes, they tend to be visually segregated, for example, the lanes in Sections 2, 3 and 4, which is not the case for the east-west oriented lanes in Section 6 that are visually integrated. Thirdly, there are some parts of the market whose visual integrations are so poor, for example, Sections 4, 7 and 8. Finally, if the intersections and the lengthways of a road or a lane were compared, the intersections are more visually integrated than the lengthways, which is understandable as the intersection can see and be seen from the other spaces than the lengthways of the lane.

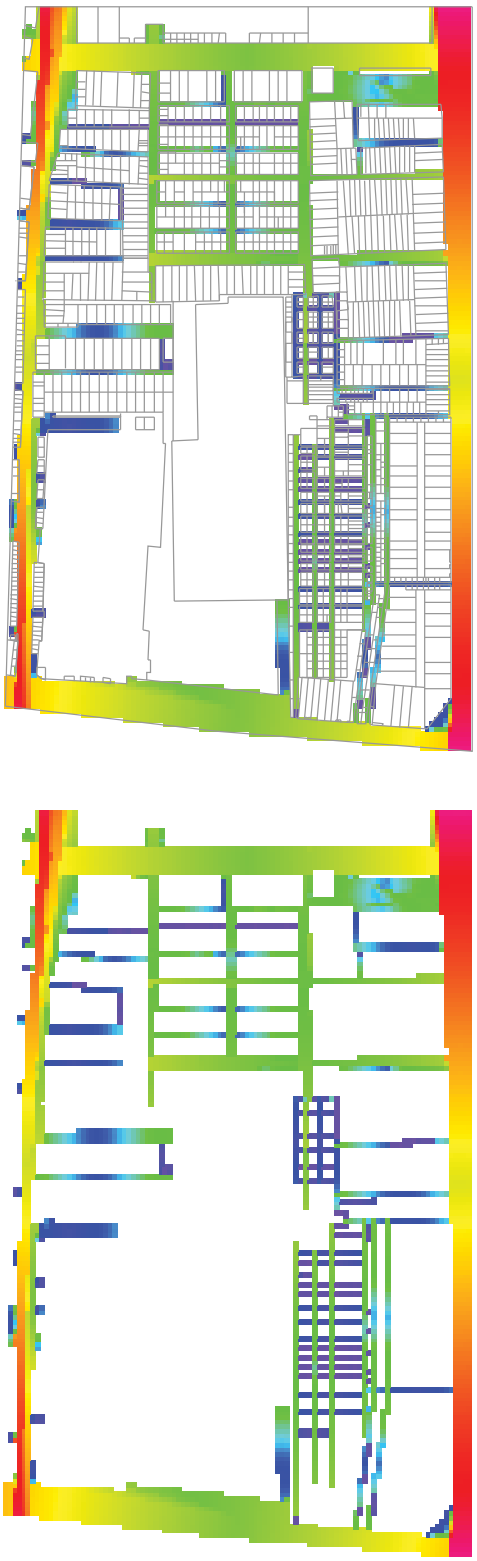


Figure 4.11: A visual integration map of Pratunam Market, superimposed on the market's plan and on its own.

If the spatial configuration and the visual integration were compared, they are more similar than different. Both have two strong features: the perimeter being the globally and visually integrated and the internal area in general being locally and visually integrated. The difference is that internally the most locally integrated area, Section 3, is not the most visually integrated, Section 6. We shall see how these features may affect the other patterns occurring within the market.

4.4 Pratunam Market's micro-distribution of the retail function

As described in section 4.1 of this chapter, Pratunam Market is well-known as one of the two central markets for wholesale clothes in Thailand, another being Bo-bae Market. However, the results of the micro-distribution of the retail function survey show that the market is a vibrant commercial area; it was filled with many commercial functions that were of the clothes-relating types and that were not. It should be noted here that, the word 'retail' used in this research is defined as the commercial function whose business can be of the retail or the wholesale commerce, i.e., the retail shops for the wholesale shopping and the retail shops for the retail shopping, as mentioned in Chapter 1. Table 4.2 shows all the detailed land-use types found in the market. Regardless of the premises, there were 1,296 commercial units during the time of the survey. Of these, 1,058 were commercial cubicles or shops, and 238 were stalls. There were three hotels found in the vicinity of the market, but they were excluded from the study. There also were 128 storage units, 32 vacant units, 23 residential units, three under construction unit and four cultural-relating units.

For all the land-use types occupying shop-houses, cubicles or buildings, they could be classified into twelve types, some of which could also be further sub-classified (Table 4.2). The commercial types were: convenience/grocery, services, fabric/fashion, appliances, financial, eatery, and hotel. The convenience/grocery could be sub-classified into five types that were: department store, delicatessen, snack/drink, convenience store and flower. Services could be sub-classified into ten types that were: gift/souvenir, pharmacy, toy/internet, spectacles/watch, laundry, barber/knife sharpening, massage, dental clinic, film processing, and stationary/music record. Fabric and fashion, whose 967 units were the highest number of commercial units in the area, could be sub-classified into eleven types. They were: general apparel (being the sub-types with highest number of units at 778), bag/handbag, sport apparel, cosmetics, gold jewellery/jewellery, fabric, school uniform, traditional dress, apparel accessories, shoes/hat/umbrella and tailor/dressmaker (being the sub-type with second highest number of units at 41). Appliances were sub-classified into three types: household (further divided into bed, bed linen,

general household appliances and furniture), electrical appliances and others (further divided into hair dressing equipment, chinaware and silverware). Financial type was sub-classified into bank, cash machine (ATM) and prawn shop. Eatery type was sub-divided into coffee shop, restaurant and rice/noodle.

As for the stalls, they could be classified into four types, all of which could also be further sub-classified. (Table 4.2) They were: produced stalls divided into fruit and flower; delicatessen stalls divided into delicatessen, food and drink/snack; goods stalls divided into clothes, cosmetic, bag, shoes, fabric, apparel accessories, gifts, chinaware and fragrance; and, service stalls divided into watch, cd, spectacles, radio, toy, key/lighter and pocket knife. Of all the stalls, the number of good stalls was the highest, at 192 stalls. As for the sub-types, clothes stalls had the highest number at 110.

It is clear now that the commercial function range within Pratunam Market was quite broad and also rich with different detailed land-use types. An interesting thing is that although the market is known for wholesale clothes, a number of clothes-relating functions were also found, and some of them indeed were of the specialty type. This can be seen from the variety of bag, apparel accessories, shoes, school uniform and dressmaker/tailor types.

As we now know the range of the commercial function in Pratunam Market, let us go back to the distribution of these functions with the market. Figure 4.12 is a map showing the distribution of the twelve detailed land-use types found within Pratunam Market, and Figure 4.13 is a map showing the distribution of each type. The maps show that the market was almost fully occupied with the commercial type of fashion/fabric in every section except Section 3, which was occupied by storage cubicles. Most of the other commercial types were found at the perimeters, particularly along the two major roads. Some vacant units were found in Sections 5 and 8, whereas the residential types were found in Sections 5 and 7. A number of eatery places were found to cluster in some part of Section 3, with a few located along Ratchaprarob Road and inside Sections 7 and 8. Finally, although the map does not display the sub-types, it should be noted here that the specialty types such as dressmaking/tailor were found to cluster in Section 2.

	Detailed land-use categories		**units**
a	**Convenience/grocery**		16
	a1	department store	4
	a2	delicatessen	1
	a3	snack/drink	4
	a4	convenience store	5
	a5	flower	2
b	**services**		38
	b1	gift /souvenir	3
	b2	pharmacy	5
	b3	toy/internet	3
	b4	spectacles/watch	3
	b5	laundry	10
	b6	barber/knife sharpening	4
	b7	massage	4
	b8	dental clinic	2
	b9	film processing	2
	b10	stationary/music record	2
c	**fabric fashion**		967
	c1	general apparel	778
	c2	bag/handbag	32
	c3	sports apparel	14
	c4	cosmetics	11
	c5	gold jewelry/jewelry	11
	c6	fabric	16
	c7	school uniform	7
	c8	traditional dress	21
	c9	apparel accessories	18
	c10	shoe/hat/umbrella	18
	c11	tailor/dressmaker	41
d	**appliances**		11
	d1	household	
		d1.1 bed	1
		d1.2 bed linen	1
		d1.3 general household appliances	2
		d1.4 furniture	1
	d2	electrical appliances	3

d	**appliances**		11
	d1	household	
		d1.1 bed	1
		d1.2 bed linen	1
		d1.3 general household appliances	2
		d1.4 furniture	1
	d2	electrical appliances	3
	d3	other	
		d3.1 hairdressing equipment	1
		d3.2 china ware	1
		d3.3 silver ware	1
e	**financial**		5
	e1	bank	1
	e2	atm	3
	e3	prawn shop	1
f	**eatery**		21
	f1	coffee shop	4
	f2	restaurant	5
	f3	rice/noodle	12
g	**hotel**		3
h	**cultural/religion**		4
	h1	pimpilai shrine	1
	h2	shrine	3
i	**storage**		128
j	**residential**		23
k	**vacant**		32
l	**under construction**		3
m	**stall**		238
	m1	produce stall	
		m1.1 fruit	7
		m1.2 flower	1
	m2	delicatessen	
		m2.1 delicatessen	2

Table 4.2: A classification of the retail types found in Pratunam Market

	Detailed land-use categories		**units**
	m3	goods stall	
		m3.1 clothes	110
		m3.2 cosmetic	2
		m3.3 bag	21
		m3.4 shoe	16
		m3.5 fabric	4
		m3.6 apparel accessories	29
		m3.7 gift	4
		m3.8 china ware	4
		m3.9 fragrance	2
	m4	service stall	
		m4.1 watch	11
		m4.2 cd	2
		m4.3 spectacle	6
		m4.4 radio	2
		m4.5 toy	4
		m4.6 key/lighter	2
		m4.7 pocket knife	3

Table 4.2: A classification of the retail types found in Pratunam Market

Figure 4.12: A land-use distribution map Pratunam Market

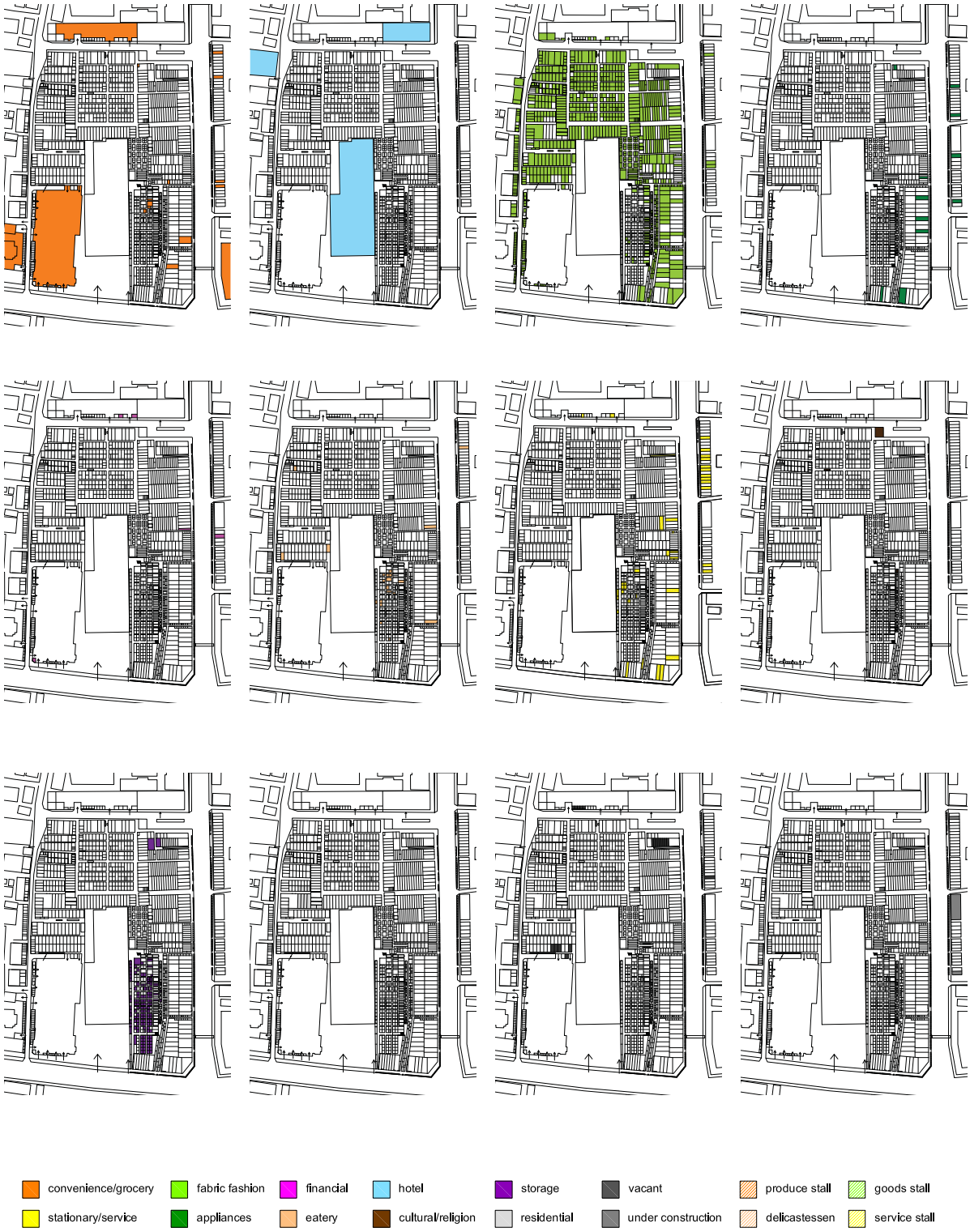


Figure 4.13: A map showing the individual distributions of the land-use types in Pratunam Market

4.5 Rental prices

Please be noted here that the study of the rental prices are of certain limit due to the fact that some retail premises were own but not rent. Thus, the rent of the stalls could not be obtained, and as a result they are omitted from the study. Figure 4.14 is a map of the rental prices in Pratunam Market. The map shows the ranges and the distribution of the rental prices per month of the retail premises. The rental prices per month per retail premise could be ranged into 15 ranges, from owning to 210,000.00 baht. The lowest price was of 15,000.00 baht per month, where as the highest price was of 200,000.00 baht per month.

As for the distribution, majority of the retail premises had the rental prices at 15,000.00 baht per month, then at 30,000.00 and 40,000.00 baht per month respectively. Majority of the retail premises with the lowest rental price per month were those clustering in Sections 3 and 4. If the micro-distribution of the retail function were considered, they were the storage cubicles and the retail cubicles of the wholesale fashion/fabric. The retail premises with the rental prices of 30,000.00 and 40,000.00 baht per month were the retail cubicles of the wholesale fashion/fabric in Sections 5 and 6.

While the premises with low rental price per month were in the internal area, most of the premises with high rental prices were those located along Soi Petchaburi 19, the only perimeter that the rental prices could be obtained. In fact, all premises with the highest rental were located in the Soi. The retail premises located along the lanes directly connecting to Soi Petchaburi 19 also had high rental prices. All these high rental premises were the retail cubicles or shop-houses of the wholesale fashion/fabric.

Although the survey recorded the rental prices per month of the retail premises, these prices were average into the rental price per month per square meter for the multivariate study. They were summed up and average to be the assigned rental prices of the axial lines. Those that were owned were excluded from the multivariate study. The findings of the study are presented in section 4.7 of this chapter.

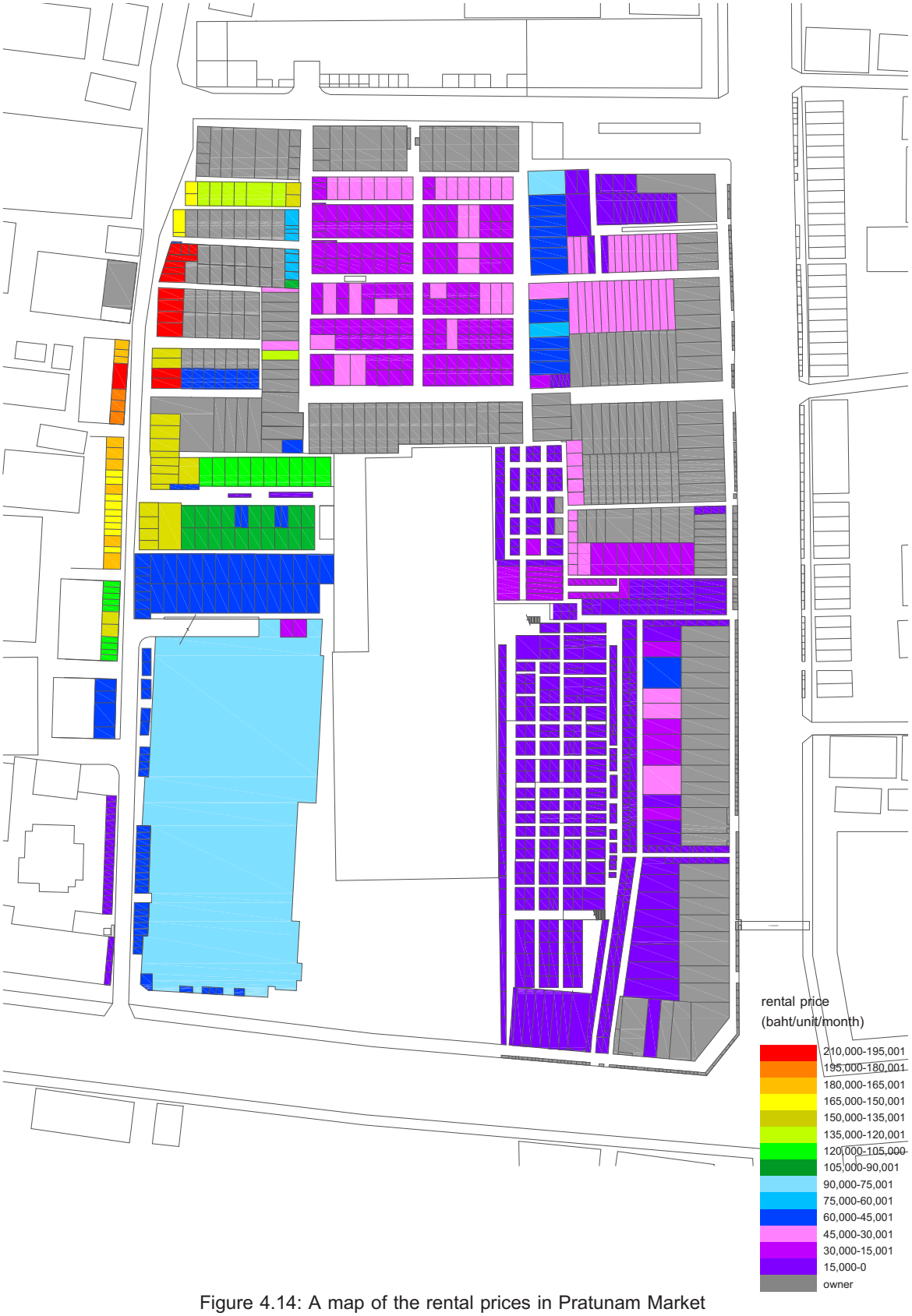


Figure 4.14: A map of the rental prices in Pratunam Market

4.6 The observation

The findings of the observation presented in this section consist of three categories: the movement density, the people following and the static observation. The findings of the questionnaire to check the reliability of the observation is also given. The details are:

4.6.1 The movement density observation

The movement densities were observed for two major categories: pedestrian and vehicular. Figure 4.15 is a map showing movement density per hour of both pedestrian and vehicular categories, with the equal number of range at ten intervals, but with the differences in the figures of each interval. The map shows that the market had relatively high movement density for both categories at the perimeters. For pedestrian, the perimeter having high movement density was Soi Petchaburi 19, whereas for vehicular, it was Petchaburi Road. However, this study concentrated on the pedestrian movement as the market is a pedestrianised one. Accordingly, apart from Soi Petchaburi 19, the other three perimeters had not had high pedestrian movement density. Their pedestrian movement densities per hour were in the low ranges though not the lowest. Among the three, Petchaburi Road had more density than Ratchaprarob Road and Soi Indra Hotel had. It is more likely that the intersections of the perimeters had higher density than the lengthways of the perimeters themselves.

In contrast, the internal area had a remarkably low movement density compared to Soi Petchaburi 19; even the sections of the market directly connecting to the Soi were less pedestrianised still. Why this is the case we shall know from the multivariate analysis and the graphic comparison in the next part. Interestingly, the observation of pedestrian movement density shows that on the average there were 106,212 people passing through or being within Pratunam Market every hour. This is a significantly high number which strengthens the importance of the market.

4.6.2 The people following observation

The people-following observation was studied on the collective patterns of all the peopled observed in both observation days, to see where people would normally go. This is different for the movement density observation study, which was made on the average density per hour. Figure 4.16 is a map of people following observation in Pratunam Market. It shows the collective passing routes in the first fifteen minutes from 22 starting points of the two observation days.

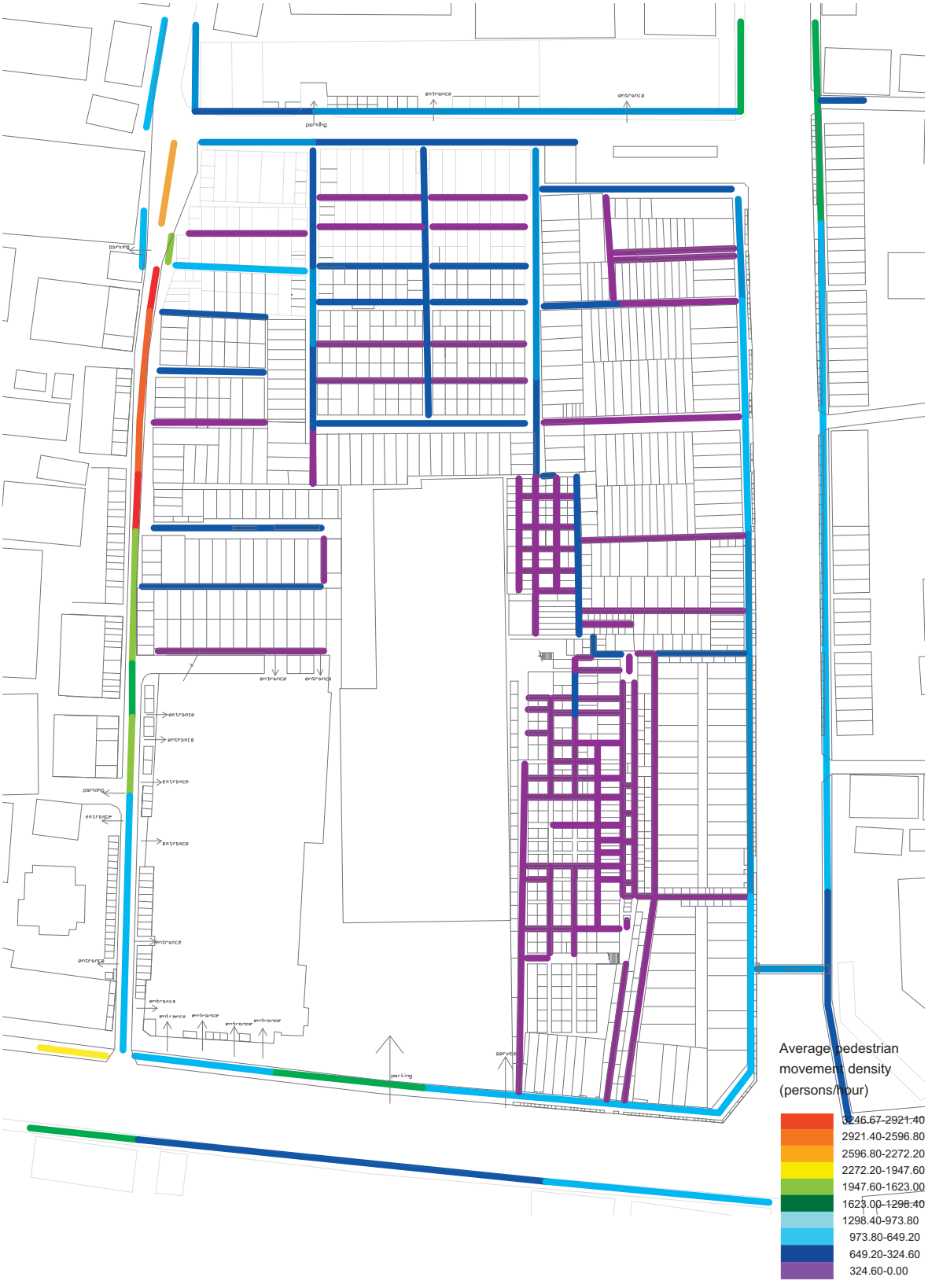


Figure 4.15: Movement density map of Pratunam Market, showing the density per hour

Figure 4.16: A people following observation map of Pratunam Market

It is clear that people tended to walk along the perimeters rather than within the internal area, particularly in Soi Petchaburi 19. Within the internal area, people were more likely to go to Section 6, which is a locally and visually integrated are of the market. Very few people walked through Section 3. A few of them walked through Sections 2 and 4, the other three areas with strong local integration but less visibility. Quite a number of people were found in the internal lanes directly connecting to the perimeters. All these suggest that the pattern of space where people tended to go during their first fifteen minutes in the market is similar to the pedestrian movement density pattern.

4.6.3 The static observation

Similar to the people following observation's study method, the static observation was investigated on the collective pattern of the locations where the activities occurred in Pratunam Market. The static observation map (Figure 4.17) displays a different pattern, found in the pedestrian movement density and people following maps. It is quite obvious from the static observation map that the 19 activities of all the observed categories of people were found almost everywhere in the market, except the western part of Section 3. The activities occurred as high in the perimeters as in the internal area. The weekday's static observation pattern was also as similar as the Saturday's static observation pattern. However, there were more number of people and activities on Saturday than the weekday. (Figure 4.18)

As discussed in Chapter 2, all the 19 activities were re-categorised and selected to study in detail for the two shopping-relating activities: buying and browsing. Figure 4.19 is an observation map of the two shopping-relating activities. Figure 4.20 is a comparative observation map of the buying and the browsing activity. It was found that the pattern of the shopping-relating activities was similar to that of the overall activities, but with a markedly lower number of activities. The shopping-relating activities tended to be found along the perimeters, particularly Soi Petchaburi 19. A large number of them were also found in the internal area, more prominently in Sections 6, 7, 2 and 8, respectively. In Sections 2, 4 and 5, only a few activities were found.

Figure 4.17: A static observation map of Pratunam Market, showing collective static activities of all observed categories for the weekday and a Saturday

Figure 4.18: A comparison of Pratunam Market's collective static activities on a weekday and a Saturday

Figure 4.19: A static observation map of the two shopping-relating activities combined

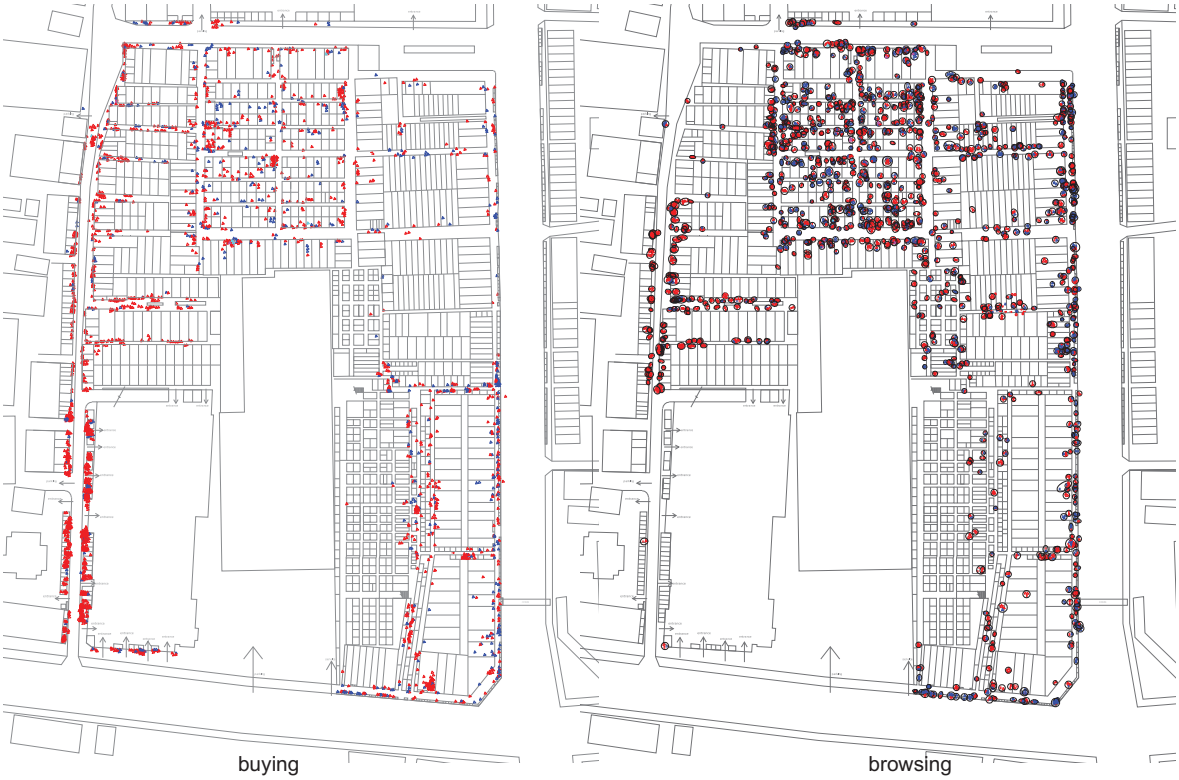


Figure 4.20: A comparative static observation map of the buying and the browsing activity

When the distributions of the buying and the browsing activities were separately investigated, a noticeable difference emerged. The buying activities were found to spread out almost through out the market. They were more likely to cluster along the perimeters than within the internal area (Figures 4.20). Among the four perimeters, the highest number of buying activities was found in Soi Petchaburi, then in Ratchaprarob Road, Soi Indra Hotel and Petchaburi Road, respectively. Within the internal area, they were found in the lanes directly connecting to the perimeters more than the lanes connecting to each other. This pattern was very clear in Section 6. Sections 3 and 4 were the sections where almost none of the buying activities were found. This is understandable for Section 3 as majority of the cubicles in the area were storages, but it should not happen in Section 4 as its cubicles were the shops.

In contrast, the browsing activities were found to cluster within the internal area, particularly in Section 6 (Figure 4.20). They also tended to cluster in the lanes connecting to each other, mostly the east-west oriented lanes. A significant number of browsing activities were also found in Sections 4, 5 and 8. Among the four perimeters, the clustering of browsing activities spread throughout Ratchaprarob Road, whereas they were clustered in some parts of the other threes, for example, on the section of Soi Petchaburi 19 where Section 8 connected,

at the intersection between Petchaburi Road and Ratchaprarob Road, and in front of Section 6 in Soi Indra Hotel. Similar to the distribution of the buying activity, the absence of browsing activities in Section 3 was due to the area's cubicles being used as storages. To sum up, the browsing area was not exactly the buying area.

By far, all the observation patterns – the pedestrian movement density, the people following and the static observation – were more similar than different (Figure 4.21). People, their preferable routes and their activities were found throughout the market, except in Section 3. It is only when the details of the two shopping-relating activities were investigated, we can begin to see a clear difference of the distributions of the buying and browsing activities, which mattered the most for the economics of the market. This difference could be an indicator of the strategic location for the micro-distribution of the retail function. In the next two parts, the analyses of the factors that give rise to this strategic location and the way they work.

Figure 4.21: A comparative observation map of the pedestrian movement density, the people following, the buying activity and the browsing activity

4.6.4 The questionnaire

Prior to the multivariate analysis and the graphic comparison analysis, we should have a look at the findings of the questionnaire that was carried out to check the reliability of the observed people. For them were the true shoppers, the passer-bys, or the local residents. There were 259 people answered the questionnaire. 49.8% of them were female; and 50.2% were male. Majority of the people answering the questionnaire were of 26-30 year-old age group. Then, they were of 21-35 year-old age group (19%), 31-35 year-old age group (17.1%), 36-40 year-old age group (15.9%), 20 years old and younger (8.3%), 51 years old and older (4%), 45-50 year-old age group (25) and 41-45 year-old age group (1.71%), respectively.

The people who came to Pratunam Market were from different places. Majority of them lived in Bangkok (64.2%). Then, they came from other provinces (29.6%), the greater area of Bangkok (4.7%) and foreign country (1.6%), respectively. Their primary objective to come to the market was for shopping, whether just for shopping in general or just shopping for themselves, the first and the second most answered. Majority of them did have regular shops to visit (88%) also.

The most regularly visited shops were the fashion/fabric shops (88.1), with the second most visited shops being the appliances shops (27.3%). Stationary/service, eatery and convenience/grocery shops were also visited more often. Similarly, the shops where they brought product the most were the fabric/fashion shops (88%). However, they also bought the other types of products from the other shops too. Finally, majority of them usually visited the market less than once a month or even longer (37.2%). Then, they visited the market once a month (26.5%), for the first time (10.6%), once a week (8.8%), almost everyday or everyday (4.9%) and twice or three-times a week (3.5%), respectively.

It is clear that the observed patterns from the people within the market are reliable. We did observe the shoppers or the passer-bys. These people did come to shop in the area. We can now move to the two analyses.

4.7 The multivariate study

The multivariate study was carried out to establish two issues. Firstly, is there any spatial factors associating with the pedestrian movement density, as found in many studies applying the Space Syntax technique, one of which is the study by Kasemsook in 2003? If so, which spatial factor strongly associate with the pedestrian movement density? Secondly, which is the spatial factor most associated with the rental prices?

Nine spatial factors were assigned as the independent variables in the regression analysis. They were: global integration of the independent system (integ Rn-ind), local integration of the independent system (integ R3-ind), connectivity of the independent system (conn-ind), global integration of the 2-km embedded system (integ Rn-2-km emb, local integration of the 2-km embedded system (integ R3-2-km emb), connectivity of the 2-km embedded system (conn-2-km emb), global integration of the 10-km embedded system (integ Rn-10-km emb, local integration of the 10-km embedded system (integ R3-10-km emb), and connectivity of the 10-km embedded system (conn-10-km emb). Two dependent variables were: pedestrian movement density per hour and rental price per square meter per month.

The multivariate analysis of the movement density was carried out on two scales. The first was the scale of the observation gates where all the observed gates were assigned with their own pedestrian movement density per hour. To cross check the findings, the study at the scale of the axial lines was also made. For this analysis, all the movement densities of the gates locating on an axial line were averaged and assigned as the density of that line.

For the association between the spatial factors and the pedestrian movement density at the gate level, a simple regression showed that the global integration of the independent system (integ Rn-ind) is the most associated spatial factor with the movement density, with an r-squared value of .391, and a p-value of .0001 in the multiple regression (Figure 4.22). This factor was also depicted in the stepwise regression. The second and the third most associated spatial factors with the movement density were the global integrations of the 2-km embedded system and of the 10-km embedded system, respectively. In contrast to the global integration, the local integration and connectivity of the independent system almost did not associate at all with pedestrian movement density. Similarly, the local integration and connectivity of the two embedded system had a very poor association with the movement density.

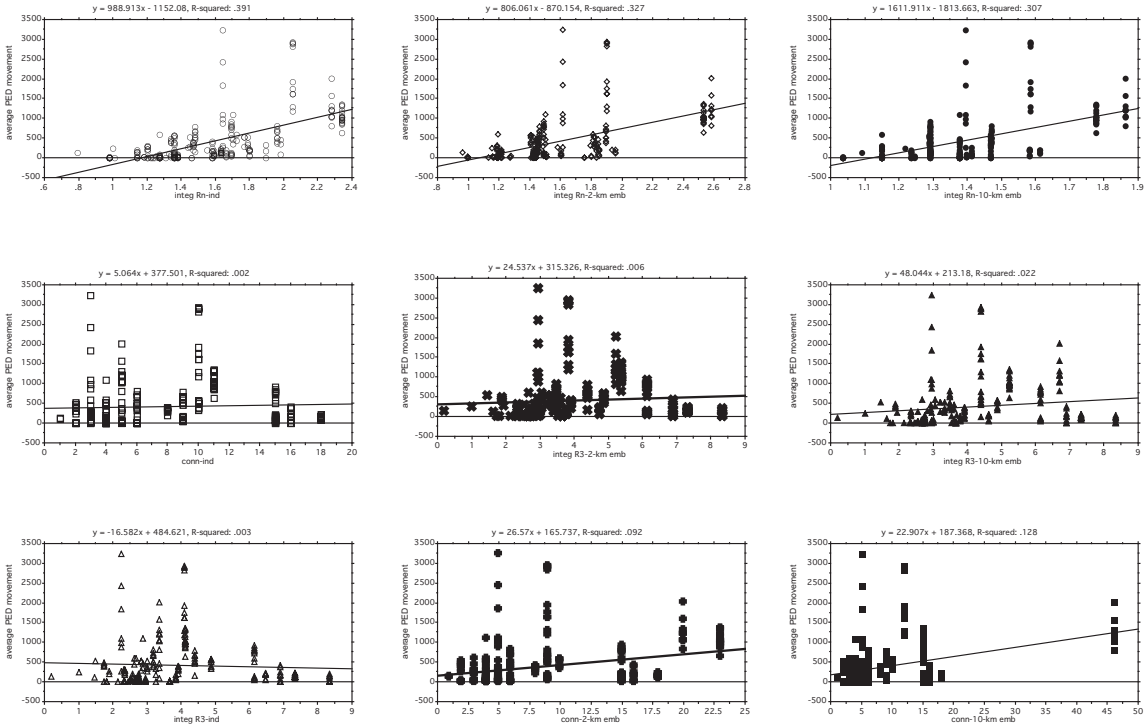


Figure 4.22: Scattergrams of the gate-level multivariate analysis of the nine spatial factors and average pedestrian movement density/hour

The findings from the line-level analysis confirmed those found form the gate-level analysis. The global integration of the independent system was the spatial factor most associated with average pedestrian movement density (Figure 4.23). A simple regression gave an r-square value of .361, with a p-value of .0001 from the multiple regression. It was the only spatial factor picked up in the stepwise regression. The global integrations of the 2-km embedded system and of the 10-km embedded system were the second and the third most associated spatial factor, respectively. However, their r-squared values were very low, lower than .3. This means that they poorly associated with the movement density. Moreover, the local integration and connectivity of all the systems studied even had a poorer association to movement density than the global integration of the two embedded systems had. All these mean that the global integration of the independent system was the strongest spatial factor for the pedestrian movement density of Pratunam Market.

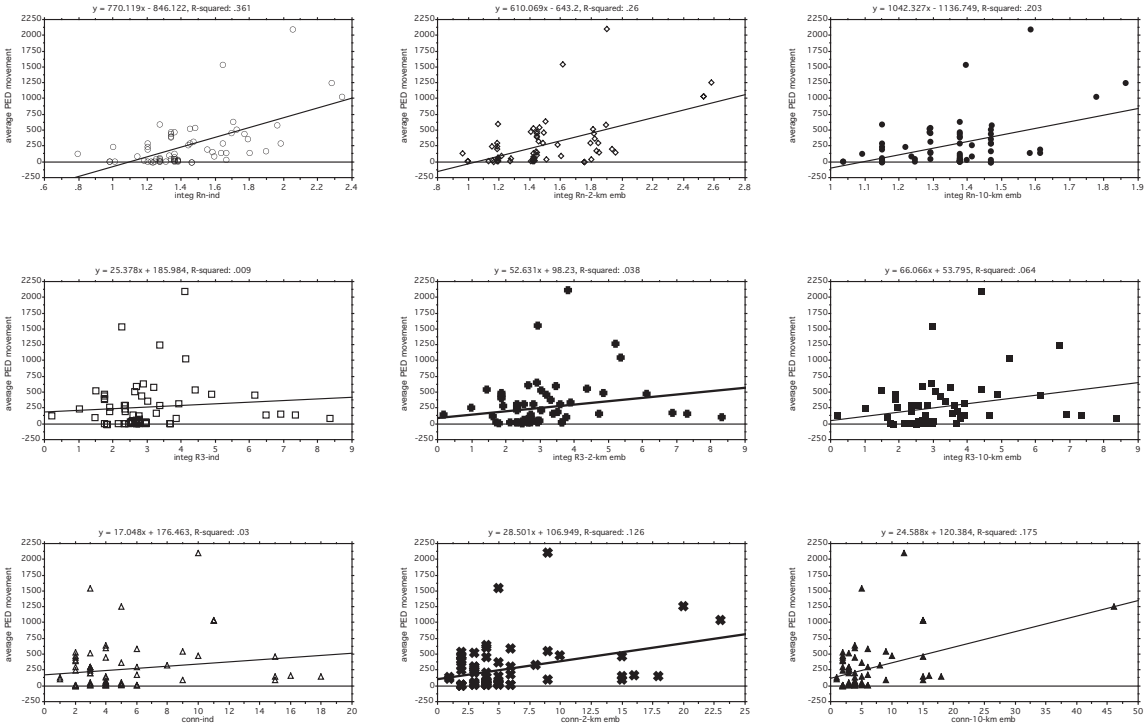


Figure 4.23: Scattergrams of the line-level multivariate analysis of the nine spatial factors and average pedestrian movement density/hour

As for the rental prices, the multivariate analysis was carried out only on the scale of the axial lines. To be used in the multivariate study, the rental prices per month of all the retail premises locating along an axial line were averaged to be the rental price per square meter per month. It was then assigned to the rental price of the line. Pedestrian movement density was also added as another independent nine spatial variables in this analysis. Rental price per square meter per month was the only dependent variable. It was found that all of the spatial factors did not associate at all with rental price per square meter per month. (Figure 4.24) It was only the average pedestrian movement density that had any association with the rental price. A simple regression of the two variables showed an r-squared value of .378, with a p-value of .0001 in the multiple regression. (Figure 4.25)

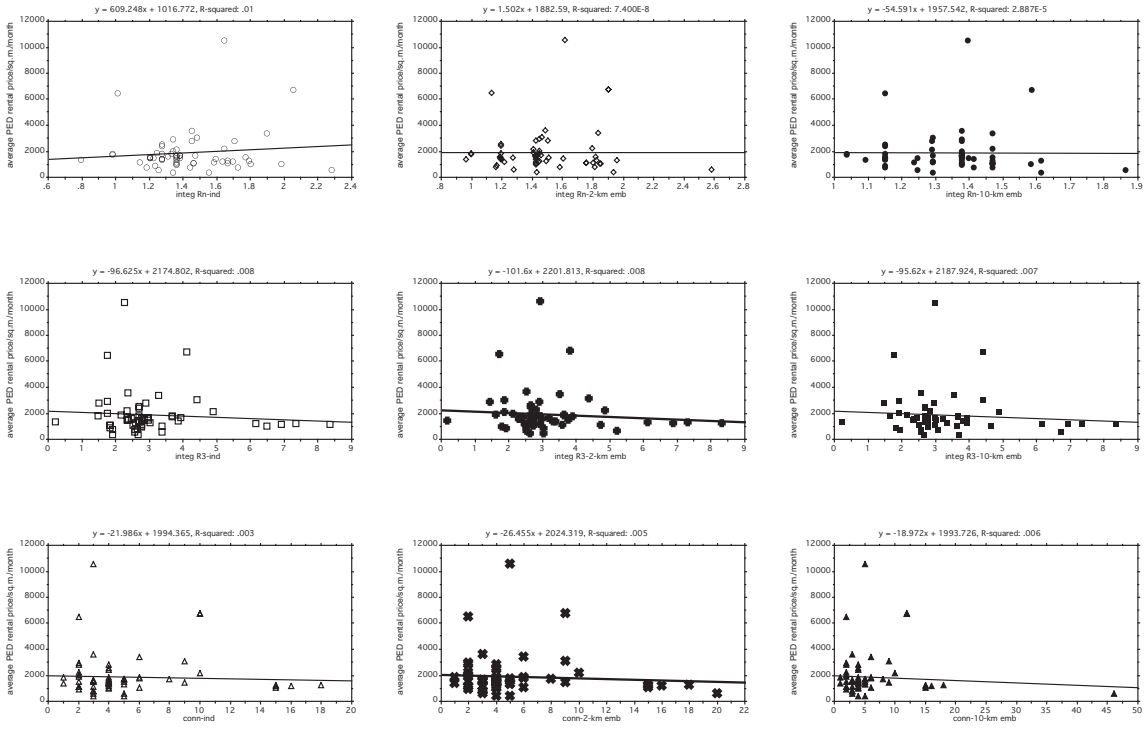


Figure 4.24: Scattergrams of the line-level multivariate analysis of the nine spatial factors and rental price/ sq.m./ month

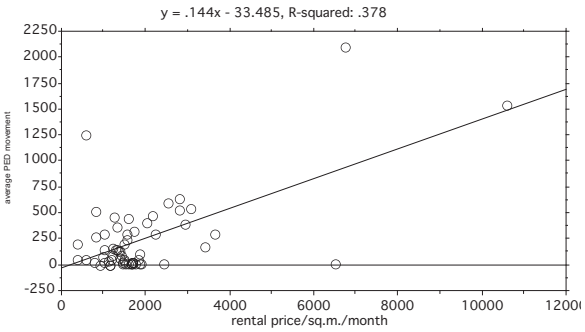


Figure 4.25: A scattergram between average pedestrian movement density and rental price/ sq.m./ month

The findings of the multivariate analysis indicate that similar to the other studies by the Space Syntax approach, there has been found a spatial factor strongly associating with pedestrian movement density. However, this spatial factor and the other spatial factors of the analysis did not associate with the rental price. This means that movement density became the strong factor for the rental price. Again, as introduced twice, the study of the rental price here has some certain limits.

4.8 The graphic comparison

The graphic comparison attempts to establish any relationship among spatial structure, movement density and the two-shopping relating activities as well as to investigate how visibility involved in this relationship. As pointed out in the multivariate analysis, the spatial factor most associated with movement density was the global integration of the independent system, and second to it was the global integration of the 2-km embedded system. In contrast, the local integration and connectivity made a poor association. Accordingly, the spatial factors selected for the graphic comparison were the global and local integrations of the independent and the 2-km system. Figures 4.26 and 4.27 are the comparative maps of the integration, the visibility, the detailed land-use distribution, the rental price, the movement density observation, the distribution of the buying activity and the distribution of the browsing activity, of the independent and of 2-km embedded system, respectively.

Let us now try to find the answers for the two questions set for the analysis. There are two relationships among the integration, the movement density, the buying activity and the browsing activity. Firstly, the globally integrated spaces were more likely to have high pedestrian movement density and were clustered with the buying activity. This relationship was also pronounced for the space directly connecting to the globally integrated space, particularly the perimeters (one-step depth space from the globally integrated spaces). Secondly, the locally integrated space would be more likely to have low pedestrian movement density but could also be more clustered with the browsing activity than the buying activity, though the buying activity itself tended to spread out through the globally and locally integrated spaces. Internally, the clustering of the browsing activity could be within the two-step depth spaces from the perimeters (the space connecting to the perimeter through another space), of the orthogonal grid structure.

When the visibility (visual configuration) was considered, finer details emerged. All the two shopping-relating activities would occur where there were both spatially and visually integrated. The buying activity tended to cluster where there were globally and visually integrated, internally or peripherally. The one-step depth space to the globally and visually integrated perimeter space could have a significant number of the buying activity. However, the space needed to be visually integrated although it may not be highly integrated. The browsing activity on the other hand were more likely to cluster where there were locally and visually integrated. Even if the spaces connected at two steps from the globally and visually integrated perimeters. The spaces being locally integrated but visually segregated were unlikely to have the buying activity although the browsing activity could occur.

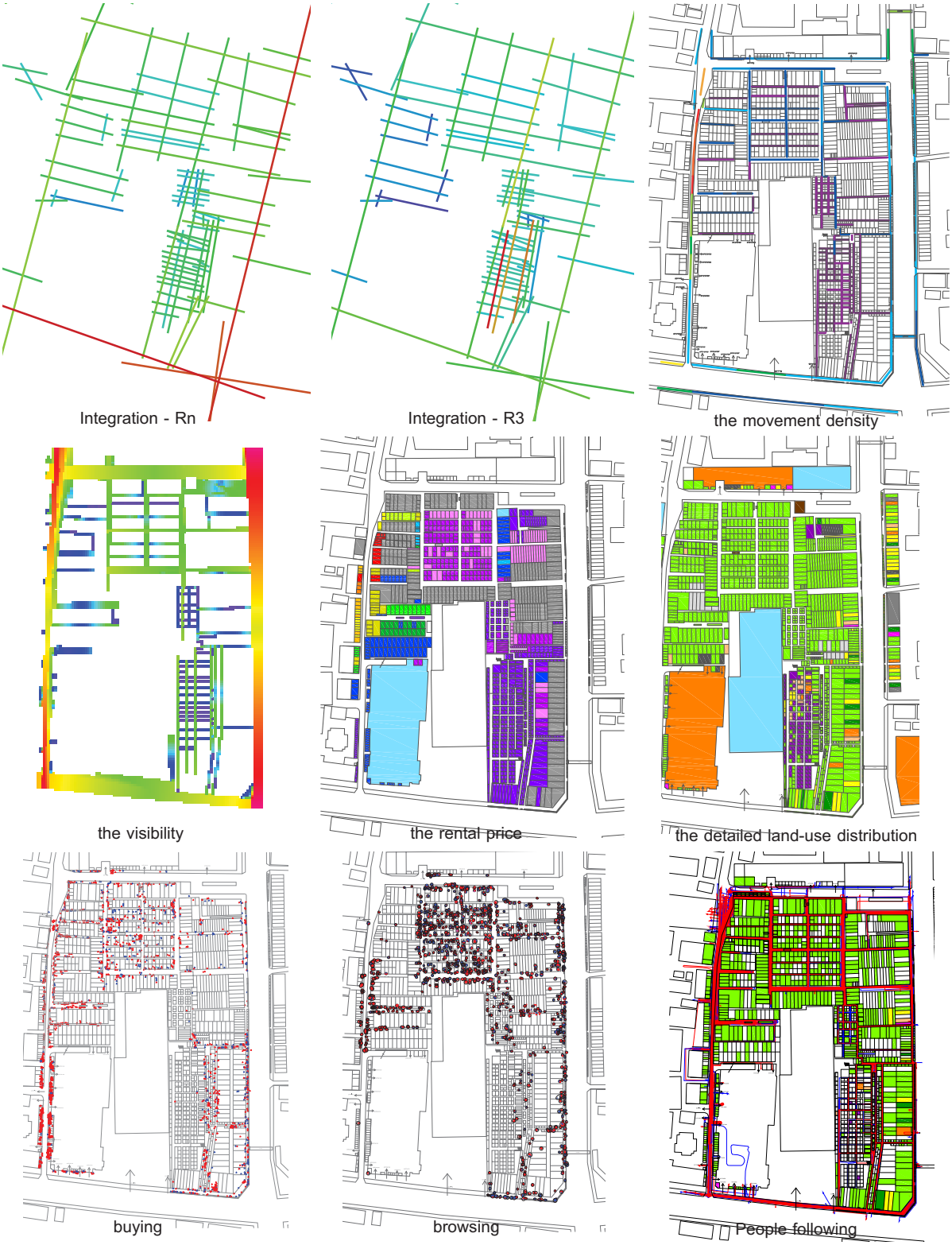


Figure 4.26: A comparative map of the 2-km embedded system's integration, the visibility, the detailed land-use distribution, the rental price, the movement density observation, the buying activity observation and the browsing activity observation

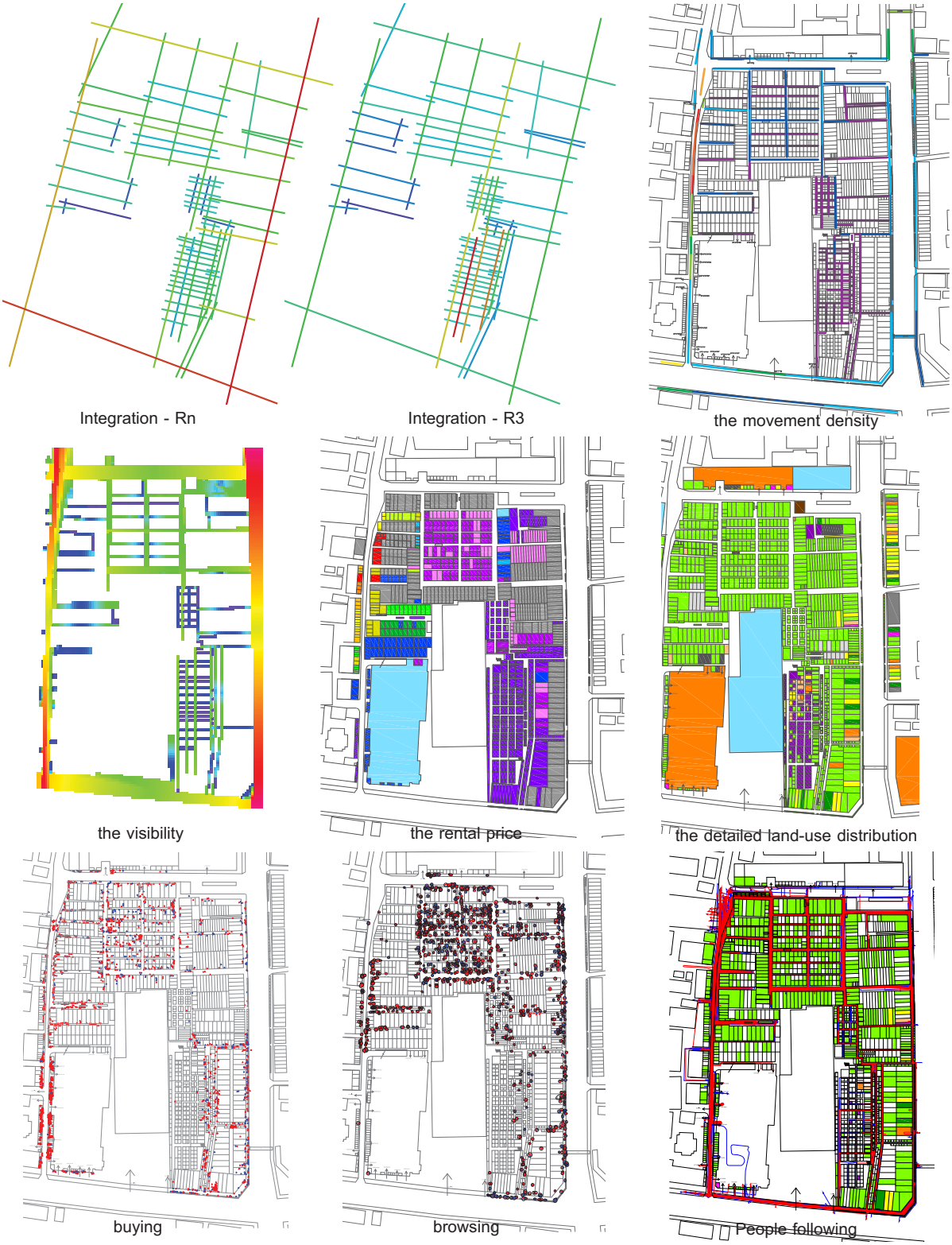


Figure 4.27: A comparative map of the independent system's integration, the visibility, the detailed land-use distribution, the rental price, the movement density observation, the buying activity observation and the browsing activity observation

These findings suggests that the global integration instigates the movement density, and together with the visually integration they can trigger the buying activity. Where there is a poor visibility, the buying activity will never occur, generally. The local and visual integrations allow the browsing activity to take place. But when the buying decision are made, it could be either at the globally or the locally and visually integrated spaces. To sum up, visibility is highly important for the buying activity, providing that it is made in a highly accessible space.

The findings are partly reflected through rental prices of the retail premise (be reminded of the limit of the rental price study). The rental prices of the retail premises within the globally and visually integrated space where high movement density and the buying activity can mostly occur will be relatively high when they are compared with the rental prices of the other retail premises locating somewhere else in the area. The rental price of the locally and visually integrated spaces where some movement density and the buying and browsing may conveniently occur will be substantial. The rental price of the locally integrated but visually segregated space will be very low because the two shopping-relating activities will unlikely to occur. It seems that the strategic locations for the micro-distribution of the retail function and the mechanisms of how visibility works with spatial structure to influence the distribution cab be established. These will be discussed in the next chapter.

Chapter 5

Discussion & Conclusion

Let us now discuss the findings from the two analyses in relation to the research questions and objectives set out in the beginning.

To what extent does visibility involve in the process of spatial-movement relationship influencing the micro-distribution of the retail function?

Visibility involves as a second helper to the spatial-movement relationship, to influence the micro-distribution of the retail function. The process within which the visibility works is more subtle than the process of the spatial-movement relationship. Here is how it works.

We have seen that in Pratunam Market there is a relationship between spatial configuration and movement density. This relationship is very clear between the global integration and the pedestrian movement, and it is less pronounced with the local integration. This means that the shoppers come into the market via the spaces that are well connected to the city network. When they arrive at the market, they disperse. It is here that the 'theory of movement economy' of Hillier (1996) set in.

In the case of Pratunam Market, the local grid is strong structurally. It can also be broken up into five sub-grids, three of which even have a stronger structure than the local grid of the market itself. With this strong local grid configuration, shoppers can easily go anywhere within the market, particularly within the three sub-grids. This is the reason we find the pedestrian movement densities along the axial lines of the internal area were almost equal to each other, i.e., having the densities in the same range. From the spatial configuration point of view, the internal area of Pratunam Market has no significant spatial advantage, except from those spaces directly connecting to the city spaces. This suggests that the 'movement economy' can fully operate within the internal area of the market because every space almost connects to all other spaces. This allows several choices of the shopping routes to be preferably selected and shortening the length of the shopping trip. Therefore, we should find the buying and browsing activities throughout the internal area of the market. Nevertheless, this is not the case as the static observation of the buying and the browsing activity shows the clustering of the activities. It is here that the visibility comes in to the process.

Pratunam Market is the case to the point. It is a market where most of tits retail premises sell products from the same category, i.e., fabric/fashion. From the business point of view, the shops compete among their very immediate neighbours, making their locations to be critical for the business, adding to the competition of the product quality. It is also a market with a strong internal grid configuration which minimises the locational advantage within the market. It is here that the visibility can help generating the locational advantage for the retail function within the market on a finer scale. This is why we tend to find the clustering of the buying and browsing activities in the visually integrated space. Moreover, while the browsing activity can occur within the internally strong configuration and the less visually integrated space, the buying activity would be unlikely to occur in such space. The buying activity will likely to occur within the space where it is spatially and visually integrated.

The reason why the visibility is the second help in the process of spatial-movement relationship influencing the micro-distribution of the retail function is that without the strong spatial configuration the shoppers will not come into the market. If we can see but cannot get there, how can we shop? In contrast, we can easily shop if we can get there and can easily see the shop and the product.

How has rental price reflected 'the structure of visibility' in relation to the micro distribution of the retail function?

The rental price has not reflected the structure of visibility in relation to the micro distribution of the retail function alone in Pratunam Market. It does reflect the inter-relationships among the spatial structure, the visibility, the movement density and the shopping-relating activity. Where there is a strong inter-relationship among the four factors, the rental price tends to be high. Where there is a weak inter-relationship among them, the rental price tends to be low.

However, it has been found out by Kasemsook (2003) that among these factors, it is the spatial factor that initiates the land value distribution, which in this research rental price was chosen to study instead. The spatial factor sets out the process by influencing the movement density, and together with the movement density they influence the distribution of the retail function in the urban areas, in general. For a highly concentrated retail area such as Pratunam Market where many variables involve, the rental price distribution, therefore, is a reflection of the inter-relationships described.

Are there any 'types' of location, spatially and visually, that would be a strategic location for the retail function?

There are both a strategic location and a favourable location for the retail function. The strategic location means a location where the retail function can take a full advantage of such location for its business. It is the most preferable location for the retail function in normal circumstances. This strategic location must be highly accessible and clearly visible, i.e., spatially and visually integrated. It can get the shoppers in and move through and around as well as to see and compare the products and theirs prices so that the business can benefit from the regular customers and attract the passer-bys.

The favourable location is a location which is less strategic to the retail function, but still capable of generating some opportunities for the retail business. For example, the spatially integrated but visually segregated location can get the shopper into to browse the product although they may or may not buy it. This is because the movement economy can operate in such location even though the poor visibility can deter the buying activity. Such location can be better used for the specialty shops. In the case of Pratunam Market, we see this in Section 2 of the internal area where the dressmaking/tailor shops locate. It is a location where shoppers will go for the need of some particular products or services whose business does not need to compete for the passer-bys or the comparison of prices.

It is therefore obvious that the unfavourable location for the retail function is the location which is inaccessible and invisible. First, shoppers cannot get in, or cannot see the location to get in. Second, even if they can get in, they cannot move through. The movement economy is incapable to operate in such location. As a result, the retail function cannot take advantage for their business from any passer-by.

Visualising Retail Location: Involvement of Visibility in the Spatial Structure and Micro-distribution of the Retail Function

In conclusion, the research achieves what has been set out in the beginning: to try to find a spatial and visual mechanism that can benefit the retail function. It is viewed that the properly working of the retail function for its business can instigate the liveability of the city or the urban area. Moreover, it can also help generating a proficient socio-economy of the city.

This research is an extension to the previous study by Kasemsook (2003). The former focuses to the distribution of the retail function in the urban areas in general; the latter

concentrates on the distribution of the retail function in the retail area. Together, their findings could be used for any urban planning or urban design development project in Thailand or else, depending on the scale of the development. The development project does not necessarily to be the new one. It can be of the conservation area development, which is more challenging, to bring back the live to the once prosperous area. Perhaps, the historical areas in many provinces of the country can benefit from this research.

However, like all other researches, there are rooms to be further study. For example, this study was carried out on the unplanned shopping area, what if it is applied to the planned shopping area or complex. What would be the out come of the same process? Another example is that of the rental price. For this research, the rental prices of some premises could not be obtained. If all the rental prices of all the premises in the studies area can be obtained, we will be able to get a clearer picture of how the visibility works with the spatial-movement relationship influencing the micro-distribution of the retail function. A vibrant market like Chatuchak Weekend Market would be a suitable candidate. Hence, the redevelopment or the newly planned project will become successful.

Bibliography

Askew, M. Bangkok: Place, Practice and Representation. Routledge. London. 2002.

Bangkok Metropolitan Authority. The Bangkok Plan. Bangkok Metropolitan Authority. Bangkok. 1996.

Berry, B. "The spatial organisation of business land uses". in W. Garrison et al. (eds.). Studies of highway development and geographic change. University of Washington Press. Seattle. 1959a. Chapter 3.

Berry, B. "Ribbon developments in the urban business pattern". Annals of the Association of American Geographers. Volume 59. 1959b. pp. 145-155.

Berry, B. Geography of market centres and retail distribution. Prentice-Hall. Englewood Cliffs. NJ. 1967.

Brown, S. Retail location: a micro-scale perspective. Avebury. Aldershot. 1992.

Christaller, W. Die centralen Orte in Suddeutschland. Gustav Fisher. Jena. translated by C. W. Baskin, Central places in Southern Germany. Prentice Hall. Englewood Cliffs. NJ. 1933.

Dawson, J. A. (ed.) Introduction, in Retail Geography, Croom Helm. London. 1980. pp. 13-17.

Devar, D. and Watson, V. Urban markets: developing informal retailing. Routledge, London. 1990.

Guy, C. The retail development process. Routledge. London. 1994.

Hillier, B. Space is the machine. Cambridge University Press. Cambridge. 1996a.

Hillier, B. "Cities as movement economies". Urban Design International. Volume 1. 1996b. pp. 49-60.

Hillier, B. "Centrality as a process: accounting for attraction inequalities in deformed grids". Urban Design International. Volume 3/4. 2000. pp. 107-127.

Hillier, B. "A theory of the city as object: or how spatial laws mediate the social construction of urban space". Proceeding of the Third International on Space Syntax. 2001. Atlanta, GA.

Hillier, B. and Hanson, J. Social Logic of Space. Cambridge University Press. Cambridge. 1984.

Hillier, B., Penn, A., Hanson, J. Grajewski, T., and Xu, J. "Natural movement: or,

configuration and attraction in urban pedestrian movement". Environment and Planning B: Planning and Design. Volume 19. 1992. pp. 29-66.

Kaothien, U. and Webster D. 'The Bangkok Region'. in R. Simmonds and G. Hack eds. (2000) World City Region. Routledge. London. 2000. pp. 23-37

Kasemsook, A. Spatial Layout and Functional Patterns in Urban Areas: A Case Study of Bangkok. Unpublished PhD Thesis. University College London. 2003a.

Kasemsook, A. "Spatial and Functional Differentiation: A Symbiotic and Systematic Relationship". Proceedings of the 4th International Seminar on Space Syntax. London. 2003b. pp. 11.1-11.18.

Kivell, P. T. and Shaw, G. "The study of Retail Location", in J. A. Dawson (ed.). Retail Geography. Croom Helm. London. 1980. pp. 95-155.

Krafta, R. "Modelling intraurban configurational development". Environment and Planning B: Planning and Design. Volume 21. 1994. pp. 67-82.

Penn, A. and Turner, A. "Space Layout Affects Search Efficiency for Agents with Vision". Proceedings of the 4th International Seminar on Space Syntax. London. 2003. pp. 09.1-09.16.

Siksna, A. "The effects of block size and form in North American an Australian city centres". Urban Morphology. Volume 1. 1997. pp. 19-33.

Scott, P. Geography and retailing. Hutchinson & Co. London. 1970.

TCDC. Modern Thai Architecture 1996-1997. Bangkok. 2009.

Turner, A. et al. "From Isovists to Visibility Graphs: A Methodology for the Analysis of Architectural Space". Environment and Planning B: Planning and Design. Volume 28. 2001. pp. 103-121.

Ullman, E. "A theory of location for cities", in H. M. Mayer and C. F. Kohn (eds.). 1959. Reading in urban geography. University of Chicago Press, Chicago. IL. 1941. pp. 202-209

Wilson, A. Complex spatial system: the modelling foundations of urban and regional analysis. Prentice Hall. Pearson Education. Essex. 2000.