การพัฒนาพื้นที่ด้วยการรับรู้จินตภาพเมืองตามรูปแบบการใช้ที่ดิน

Development Area by Using City Image Perception Based on Patterns of the Land Use

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Abstract

This article aims to analyze image perception in land based on patterns of the land use: dispersed and compact patterns. The main purposes of the study are: 1) to study patterns and types of building and land use in the target universities in order to be representative of dispersed and compact patterns, 2) to evaluate image perception, and 3) to raise issues and proper development on city image perception based on patterns of the land use. The results show that Thammasat Rangsit campus has been considered as a representative of dispersed pattern because of low intensity of building and land use. Non-fully potential land use. The participants felt that it is difficult to engage in image perception when entering into the place, got lost, due to the complicated structure of the land. Image perception is suggested to be brought as a facilitating factor dictating travelling behavior. The cognition in network of the route and recognisable symbol can be applied by installing a clear indicating sign at the most recognisable points. Srinakharinwirot Prasarnmit campus, it has been considered as a representative of compact pattern of land use. This is due to the fact that the university has an effective land management. Even though the place has a limitation in size, and a high intensity of building and land use are found, yet, the image perception shows that the participants were not nearly get lost. They felt that the land is complicated. A navigation, directional sign and referable points are recommended to solve the problem.

Keywords
City Image Perception
Dispersed
Compact
University Land Use

บทคัดย่อ

บทความนี้สนใจการวิเคราะห์จินตภาพในพื้นที่ ที่มีความแตกต่างกันในรูปแบบการใช้ที่ดินแบบกระจายตัวและแบบกระจุกตัว โดยมีวัตถุประสงค์หลัก ดังนี้ 1) ศึกษารูปแบบและประเภทการใช้อาคารและที่ดินของมหาวิทยาลัยเพื่อแสดงความเป็นตัวแทนของรูปแบบการใช้ที่ดินแบบกระจายตัวและกระจุกตัว 2) ประเมินการรับรู้จินตภาพของพื้นที่ 3) เสนอปัญหาและการพัฒนาพื้นที่ที่เหมาะสมด้วยหลักจินตภาพเมือง ตามความแตกต่างของลักษณะและรูปแบบการใช้ที่ดิน ผลจากการศึกษาพบว่า มหาวิทยาลัยธรรมศาสตร์ ศูนย์รังสิต ถือเป็นตัวแทนมหาวิทยาลัยที่มีการใช้ที่ดินแบบกระจายตัว เพราะมีค่าความหนาแน่นการใช้อาคารและที่ดินต่ำ พบการใช้ที่ดินไม่เต็มศักยภาพ การรับรู้จินตภาพเมื่อเข้ามาในพื้นที่ พบว่า จดจำพื้นที่ยาก หลง โครงสร้างพื้นที่ซับซ้อน จึงควรนำแนวคิดการรับรู้จินตภาพ ที่จะเป็นปัจจัยช่วยกำหนดพฤติกรรมการเดินทาง การรับรู้ในโครงข่ายเส้นทางของพื้นที่ สัญลักษณ์ของพื้นที่ที่น่าจดจำ มาปรับปรุงด้วยการติดตั้งป้ายบอกทางที่ชัดเจนไว้ในตำแหน่งที่มีกลุ่มตัวอย่างรับรู้องค์ประกอบจินตภาพที่จดจำได้มากที่สุด ส่วนมหาวิทยาลัยศรีนครินทรวิโรฒ วิทยาเขตประสานมิตร ถือเป็นตัวแทนมหาวิทยาลัยที่มีการใช้ที่ดินแบบกระจุกตัว พิจารณาได้ด้วยการจัดการเชิงพื้นที่ได้อย่างมีศักยภาพด้วยข้อจำกัดด้านขนาดพื้นที่ และความหนาแน่นการใช้อาคารและที่ดินสูง การรับรู้จินตภาพเมื่อเข้ามาในพื้นที่ พบว่า ไม่หลง แต่รู้สึกว่าพื้นที่มีความซับซ้อน จึงควรแก้ไขโดยเน้นมีการนำทาง ติดตั้งป้ายบอกทางและสถานที่ในตำแหน่งที่มีการจดจำองค์ประกอบจินตภาพได้มากที่สุด

คำสำคัญ
การรับรู้จินตภาพเมือง
กระจายตัว
กระชับ
การใช้ที่ดินในมหาวิทยาลัย

1. Introduction

Development on land should be done by considering the most suitable and full benefit for community's environment. The development can be studied through various considerations. Firstly, physical structure. Secondly, pattern use of the land. Thirdly, it can be learned through activities in which they can reflect effective use of the land. For education that responses the need for most beneficial use of public and community. Especially, the land used in the university. Due to the fact that the university contains a large area, a community, where it serves various purposes of the land users. The various use of the land is there for educational supports, social purposes, lifestyle, and to support the increase of population in the area of the university. The change in use of the land reflects space structure of the land, meanwhile, patterns of the land use can be seen through various activities. The patterns of land use: dispersed and compact, indicate physical form of the space. The physical form can lead to analyses of its structure, physical condition, and the effective use of the land. There is also an analysis of capability in image perception or the understanding of image of the land in which it can indicate relationship between people and the land. Then, they may have a good attitude toward the area. Ultimately, they may be able to analyze views, problems, land conditions, advantages, and disadvantages of the area used by people living in the area including visitors. The study of image perception in universities helps analyze potential, problems, and proper needs for area development. The study can be done by a 5- type image perception analysis of a city proposed by Kevin Lynch. The 5 types includes: paths used for travelling, edges identifying borders of the area, districts depending on purposes of living i.e., education, living, and commerce, nodes as a representative of central activities done by a large community, and landmarks used for gaining retention of the land. The location used in the study are Thammasat University (Rangsit campus) and Srinakharinwirot University (Prasarnmit campus). Due to the fact that land used by the two universities share the common patterns of usages either dispersed pattern or compact pattern. The analysis was done through image perception of the users of the land in the universities. Ultimately, the study aims to find ways to full and realistic development in the land used in the target universities.

2. Objectives of the study

1) to study patterns and types of buildings and land use in the target universities in order to be representatives of dispersed and compact patterns.

2) to evaluate image perception of the land.

3) to raise issues and proper development on land based on the principle of the city image perception, and patterns of use.

3. Concept and Theory

3.1 Concepts and theories of land use

- *Compact City and Dispersed City* The major problem in the city is waste in the resources, and wasteful potential use of the land cause an idea of finding resolutions of the problems. The idea focuses on how to develop the land use in a more efficient, less use of the space, reduce dispersion, less travelling, reduce personal car use (Boonlua, 2009). According to Jenks and Burgess (2002), there are some eminent characteristic of compact city i.e., the efficient use of the land, revitalizing of uncultivated areas, intensive use of the land in centralized and vertical patterns, integrative use of the land, non-waste use of power, less time travelling, less energy, less use of the land, more foot path, more bicycle and public vehicle uses, public utility control and limits, more social interaction. But the compact city land and house are expensive according to the limitation of the area, less open-spaced area, ecology and

natural resources effected, heavy traffic, less foot and bicycle paths, and inefficient car parking (Sitachitta, 2010). As for the dispersed city, the expansion of the use follows the increase of people. This phenomena causes building a new town. Less intensity of the expanding population but more travelling may occur in such city. The settlement in habitation of dispersed city differs from compact city in the way that the dispersed city is less intensity, not crowded, and closer to nature. However, the dispersed city uses more energy. This is because the location of the houses are spread largely. Public utility are disseminated based on the established town. Figure 1 illustrates a summary of the comparison between Compact and Dispersed (Jenks & Burgess, 2002).

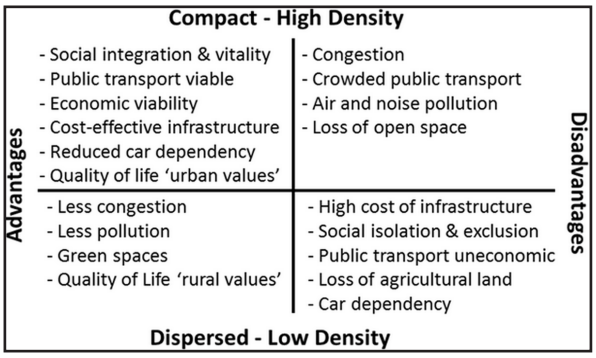


Figure 1. A summary of a comparison between compact and dispersed city land used

- *Potential of use acceptability* can be divided into 2 types: horizontal potential and vertical potential. First, horizontal potential, the expansion of this type of potential lies on open space which it can be beneficial for agricultural construction, or wasteland, not limited to public utilities. (Adams, 1994). The unwanted land covers derelict land such as the underdeveloped, abandoned, non-benefit, destructed from industries and other abandoned projects of the land owners (Whittick, 1974). Secondly, vertical potential, a capability of vertical intensity of the space. The ability to construct a higher or lesser building can be calculated by Floor Area Ratio (F.A.R). F.A.R. indicates vertical supporting potential that depends on commercial value of a shared land. According to Harris and Friedman (1997), a consideration of a non-fully potential land can be analyzed through a highest and best use analysis. The analysis governs a specific use of land. It also supports a commercial value. The commercial value of the land is based on a proper benefit and worthiness of a land.

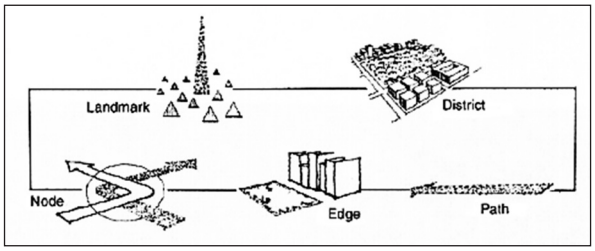
There is a study of a rehabilitation of a land located on Bangrak, researched by Jittrakorn (1982). The result of the study has been found that the efficiency of the land can be considered by a vertical potential. In addition, it has been found that there is a city plan tool used for controlling intensity of the mass of the building and opened space. The tool conducted for controlling and developing city plan can be considered based on the 5 components: 1) Floor Area Ratio (F.A.R.), 2) Open Space Ratio (O.S.R.) by the Bangkok Comprehensive Plan 2006 was enforced under a ministerial regulation as well as conditions related to FAR Bonus (Prasertsubpakij, 2014, pp.1-11) 3) minimum lot size, 4) height and 5) set back, measured from property line to building line (Vankaew, 2007).

- *An analysis of land use*. According to, Chapin, Kaiser, and Godschalk (1979), divided into 2 types: development ability analysis and perception analysis. the development ability analysis, considers how location suits for doing activities. It also considers how to find location that suits for supporting increase of future population. Perception analysis, facilitates how to indicate travelling behavior, location selection, social relation, identify public space clearly based on people's perceptions (Lisnund, 2016, pp. 99-122). It considers 4 dimensions: 1) perception in ease of reading, clarity of space, and the ease of city construction, 2) memorable or recognizable 3) communicative sign i.e., social status can be measured by living condition and 4) quality of life (Sitachitta, 2010).

3.2 Concepts and theories of city image

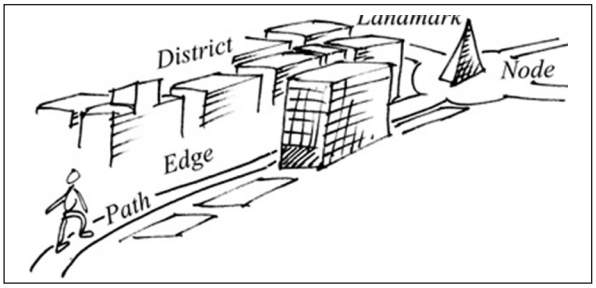
- Lynch (1960) asserts that there are 5 image elements that help memorizing of city environment.

1) Paths, include channels of travelling such as road, railway, foot path, and canal. 2) Edges, include long-sighting element where it can indicate border of the specific area. 3) Districts, considered as part of inside of a city where it contains a special characteristic that people can distinct it from other places. 4) Nodes, a central of all activities and travel and 5) Landmarks, a sign that help memorizing and indicating direction (for examples in Figure 2 to Figure 4).



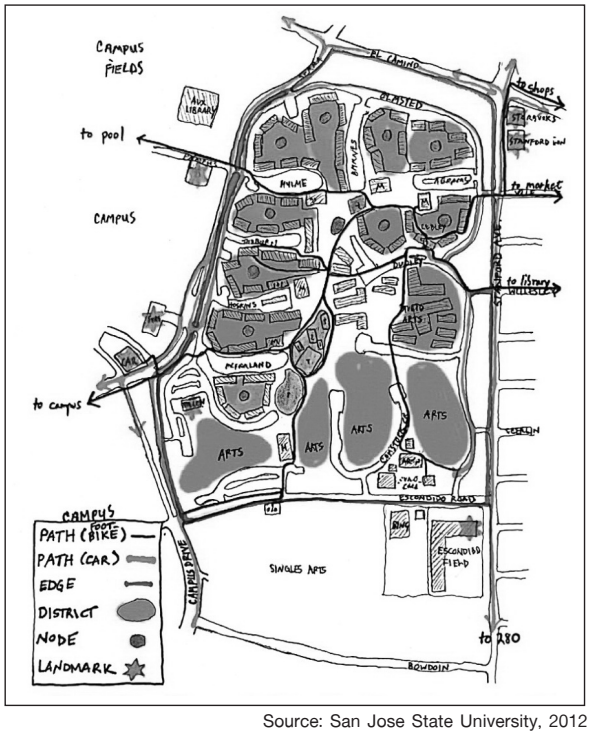
Source: Harbin Urban Planning Bureau, 2009

Figure 2. Main elements of city image 1



Source: Monro, 2012

Figure 3. Main elements of city image 2



Source: San Jose State University, 2012

Figure 4. Map of housing image 3

4. Scope of Research

4.1 Scope of areas

Density of the land use among the participant universities are analyzed in both dispersed and compact patterns of the land use as follow. Firstly, King Mongkut's Institute of Technology Ladkrabang has a dispersed pattern with the land width of approximately 1,041 Rai. It is being called the university with an explode pattern (the land pattern having Chalong Krung Road and Eastern Rail Way pass through the middle). The pattern causes unified pattern of land. Public transportation is obviously found as a main purpose of the area. The patterns of buildings used is reported that there are some 12-storey lecture buildings and dormitories with a majority of less than 3-storey buildings. The second participant university is Mahidol University Salaya Campus. With the width of 1,250 Rai, situated on Baromratchonnee Road, Nakorn Pathom, the land is used with less density. As well, less crowded with large space for activities especially in the west of the university is seen. Due to the policy of the university that is announced to be an expected green campus, thus, the highest buildings is limited to 10-15 storeys. Those are dormitories with majority of 6-storey buildings. Thamasat Rangsit is situated on Phaholyothin Road, Pathum Thani with the space of 1,757 Rai. A horizontally dispersed pattern of land use is reported. The pattern is considered from the building arrangement and the height of the buildings. The highest dormitory was reported at 14 storeys. Srinakharinwirot Prasarnmit, situated on Sukhumvit Soi 23, Wattana, Bangkok. With a space of 102 Rai, the integrated patterns of the land use is obviously reported. The transportation around the university is well-organized. But due to the limitation of space with a high demand of land use, some buildings was designed to have 22 storeys. Suan Sunandha Rajabhat Uniersity, located on Samsen Road, Dusit, Bangkok. The university is surrounded by government offices,

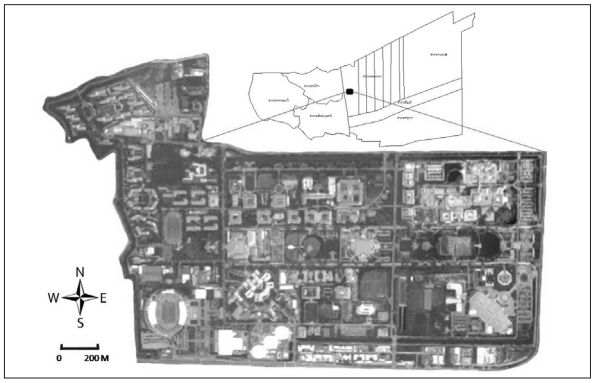
educational and commercial buildings. This causes high density of land use. Many of the buildings were built closely. Narrow lanes for main transportation is found. Yet, a whole space condition is not crowded due to a limitation of the height of the buildings which is limited to 6 storeys. This limitation is forced by law of government areas. Also, a leisure space settled in the middle of the university causes a wider and non-crowded space condition. From the comparison of benefits and constraints (Figure 1) together with the aforementioned patterns of land used among various participant universities, it is apparent that Thammasat Rangsit University is considered to be a good representative of the dispersed pattern of the land use with horizontal foundation (Figure 5). As for Srinakharinwirot Prasarnmit which is considered to be a good representative of the compact pattern. This is due to the integrated pattern of land used that is suitable for transportation on foot (Figure 6).

4.2 Scope of content

First, an analysis of representativeness of land patterns including dispersed and compact patterns found in the target universities by conducting spatial data. As for types of land and building use, location characteristic, land dispersion, Floor Area Ratio (F.A.R.) and Open Space Ratio (O.S.R.) were used to measure its intensity. Secondly, an evaluation of image perception was obtained from the questionnaire. The question consists of a drawing a map shown to the participants. Then, the participants were asked to write numbers according to the image elements from their memory.

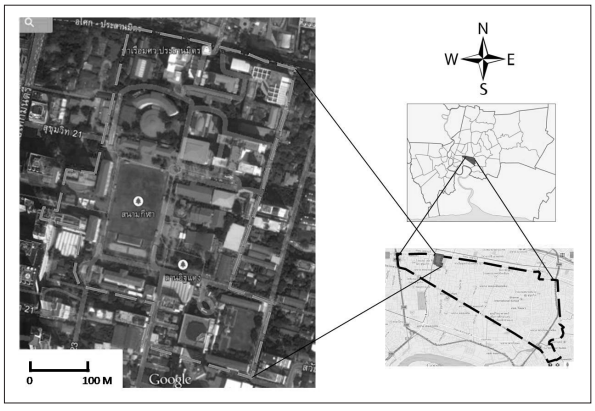
5. Methodology

There are 7 steps of methodology used in this study; first, a review of concepts and theories. Secondly, a physical observation was conducted to collect data of building forms, numbers of floor, patterns of use of land and building. Thirdly, the field observation was used to consider image elements. Fourthly, the questionnaire was designed to evaluate image perception from the participants. Fifth, the intensity of use of land and building will be analyzed by a random sampling method, used to represent compact and dispersed patterns. The patterns were analyzed to through F.A.R. and O.S.R. Sixth, image perception was obtained from the returned questionnaire and the observation. Finally, the development on area by using image perception vary from patterns of use was presented in the next chapter (Figure 7).



Source: Google Earth Pro, 2015

Figure 5. Location of Thammasat University, Rangsit Campus



Source: Google Earth Pro, 2015

Figure 6. Location of Srinakharinwirot University, Prasarnmit Campus

5 research instruments were used in the study. First, a field note recorded physical data and evaluated image data for the questionnaire. Secondly, the samples of this research. The samples were drawn from a whole target population. There were 100

samples selected in the study. 50 samples were selected from each university. The samples were divided into 2 groups. First, 80% of the samples were the staff from the two universities. Secondly, 20% of the samples were the passerby around the two universities. They were convenient, so called, accidental samples. Of the first samples, according to the Registration Offices of the two universities collected in 2012, there were 63,494 samples including 51,857 students and 11,637 staff. The study conducted a sampling method due to the suggestion of Yamane (1973). The confidence interval of the sampling was set at 90% whereas the standard error was set at 0.10. There were 99.84 or 100 samples participated in this study. A measurement of building line and Google Earth, were conducted in order to analyze representativeness from intensity of the land use.

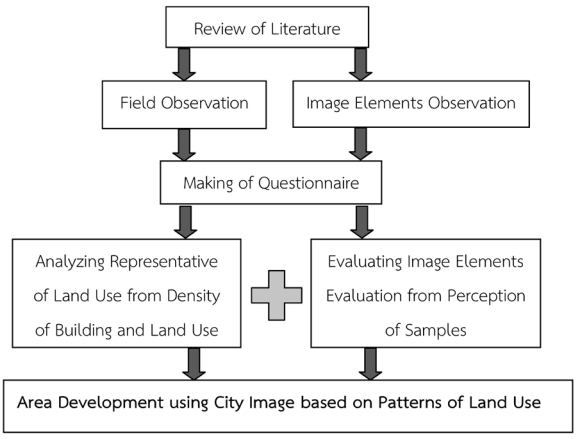


Figure 7. Research framework

6. Results

6.1 Thammasat University Rangsit Campus

Land use and patterns of the building use. The result has been found that there were 11 patterns of land use (Figure 8), based on patterns occurs in accordance with characteristic of activities, teaching and learning activities. Patterns of the building use, it was divided into 3 dimensions.

1) the height of the building and the positioning of the building. This dimension was based on the height of the building evaluated by overall numbers of storey of the buildings located in the universities. The highest building storey consists of 14 levels. Thus, based on this explanation, a criterion on a consideration of height was reported at 3 types. First, above 8 floor- buildings, situated inside public service areas such as, Asian games dormitories, 14 floor-dormitories. Secondly, medium height (above 5-8 floors) buildings, used for both education and public service. Finally, low (1-4 floors) buildings, most of the buildings are for teaching and learning, welfare, dormitories, sports, gyms number 1 - 7. The position of the building, it has been found that most of the land used in the city are horizontally central-dispersed. The buildings contain a small number of floors. The use of the space is small but various such as engineering buildings, residential buildings.

2) intensity of the land use. This can be measured from space and height of the buildings. As above mentioned, the 3 types for representatives of the target universities were measured. The measurement of space on the building line was conducted together with Google Earth program. The height was also measured according to the number of floors in each building, the result from the measurement were used to calculate intensity of the land use and divided into 2 dimensions: Floor Area Ratio (F.A.R.) calculated from all space (including building space multiply by numbers of floors, then, divided by all land space); or Open Space Ratio (O.S.R.), calculated from ratio of available space (all land space minus with building space, then, divided by all land space, after that, the result was multiplied by 100) (Table 1).

Table 1. A calculation of F.A.R and O.S.R Thammasat University Rangsit Campus

Types of buildings	Building names	All space (sq km)	Building space (sq km)	Number of Floors	Building space* Number of Floors	F.A.R.	Open space ratio	O.S.R
Low	All Lecture Building 1	0.01581	0.00443	2	0.00886	0.56	0.01138	71.97
Low	Puay Ungphakorn Library	0.00769	0.00602	3	0.01806	2.35	0.00167	21.75
Low	Social Science	0.04068	0.01549	4	0.06199	1.52	0.02518	61.90
Low	Kiengdome 7	0.00588	0.00189	4	0.00759	1.29	0.00398	67.69
Medium	SIIT Faculty	0.01112	0.00474	5	0.02372	2.13	0.00637	57.33
Medium	Faculty of Architecture and Planning	0.02663	0.00447	7	0.03135	1.18	0.02215	83.18
Medium	Thammasat Hospital Dormitory	0.00622	0.00314	7	0.02204	3.54	0.00307	49.43
Medium	Kittiwattana Building	0.03004	0.0124	7	0.08748	2.91	0.01755	58.41
Medium	Faculty of Engineering	0.04016	0.00646	7	0.04522	1.13	0.03369	83.91
Medium	Dormitory C4	0.00655	0.00137	8	0.01103	1.68	0.00517	78.96
High	Kunakorn Building	0.00703	0.00367	9	0.03308	4.70	0.00335	47.74
High	Faculty of Law , Social Administration	0.01440	0.00264	9	0.02384	1.66	0.01175	81.60
High	Faculty of Commerce	0.01459	0.00294	9	0.02654	1.82	0.01164	79.79
High	Piyachart Building	0.00839	0.00443	12	0.05316	6.34	0.00396	47.21
High	14 floor dormitory	0.00719	0.00193	14	0.02711	3.77	0.00525	73.09

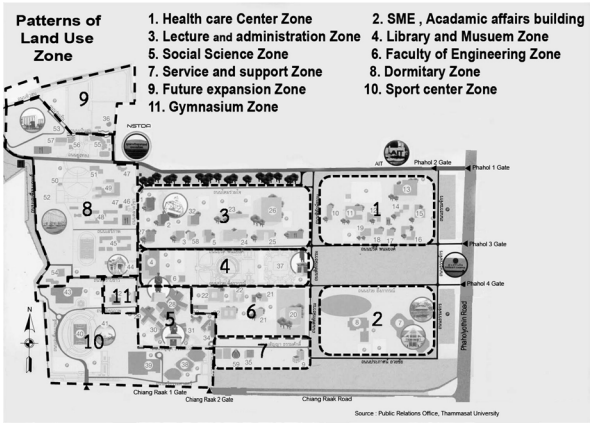


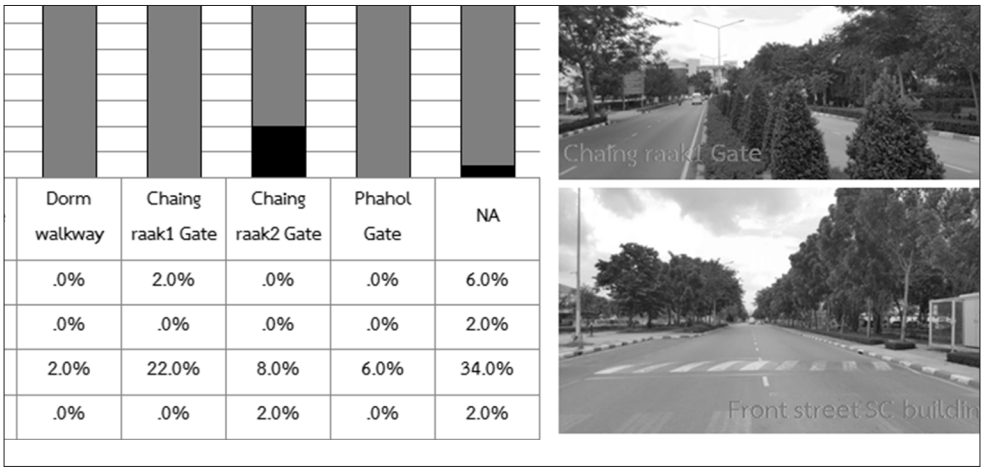
Figure 8. Pattern of land use of Thammasat University Rangsit Campus

3) Image evaluation, according to the 5 elements, the finding patterns that explain the highest significant difference were found in age. Samples classified by age can be categorized into 4 ranges, based on the samples' educational background and working experiences. The age is explained in figure 9. The result shows that the average age of the sample of 18-25 years old were those who most recognize path of Chiangrak 1. The samples who rated unrecognizable and those who left the blank responses were recorded as N/A into each elements.

Figure 10, the result gained from the interview regarding Edge shows that most of the samples have best recognition on Chiangrak Wall, and Canal consecutively. They were those who have an average age of 18-25 years old.

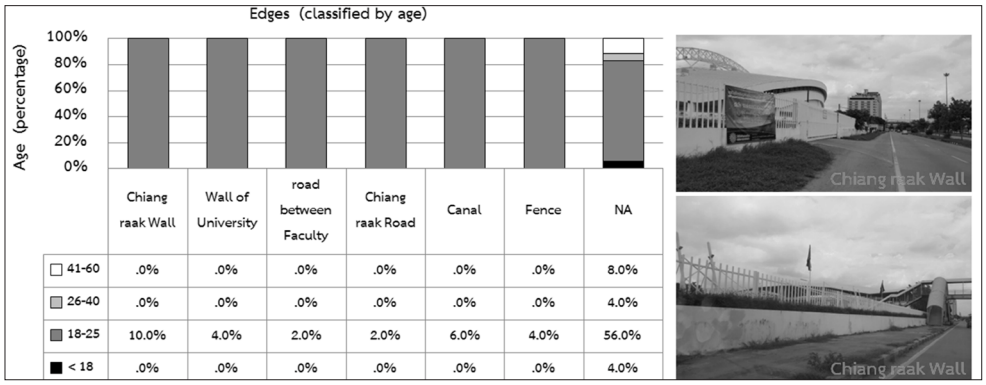
Figure 11, the result obtained from the interview regarding District shows that most of the samples have best recognition on Interzone Market, and U-Square consecutively. They were those who have an average age of 18-25 years old. Figure 12, The result obtained from the interview regarding Node reports that most of the samples have best recognition on both Naga and Interzone in the same range. Then, Student Activities Center was reported secondly. They were those who have an average age of 18-25 years old.

Figure 13, the result gained from the interview regarding Landmark reports that most of the samples who are 18-25 years old have best recognition on both Dome Administration Building and The Statue of Puay in the same range. Then, SC Building was reported secondly.



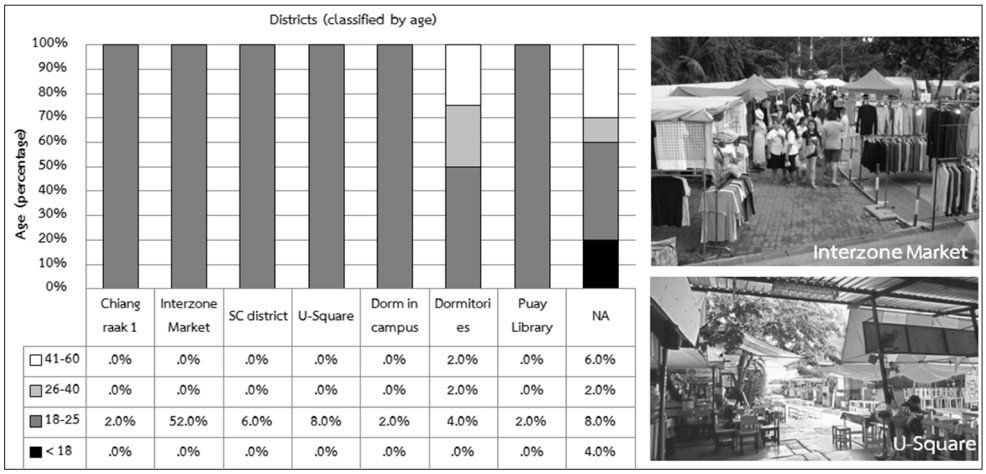
Dorm walkway	Chaing raak1 Gate	Chaing raak2 Gate	Phahol Gate	NA
.0%	2.0%	.0%	.0%	6.0%
.0%	.0%	.0%	.0%	2.0%
2.0%	22.0%	8.0%	6.0%	34.0%
.0%	.0%	2.0%	.0%	2.0%

Figure 9. The most recognizable paths are Chiangrak 1 Gate and the front street of SC building



	Chiang raak Wall	Wall of University	road between Faculty	Chiang raak Road	Canal	Fence	NA
41-60	.0%	.0%	.0%	.0%	.0%	.0%	8.0%
26-40	.0%	.0%	.0%	.0%	.0%	.0%	4.0%
18-25	10.0%	4.0%	2.0%	2.0%	6.0%	4.0%	56.0%
< 18	.0%	.0%	.0%	.0%	.0%	.0%	4.0%

Figure 10. The most recognizable edge is Chiangrak Wall



	Chiang raak 1	Interzone Market	SC district	U-Square	Dorm in campus	Dormitories	Puay Library	NA
41-60	.0%	.0%	.0%	.0%	.0%	2.0%	.0%	6.0%
26-40	.0%	.0%	.0%	.0%	.0%	2.0%	.0%	2.0%
18-25	2.0%	52.0%	6.0%	8.0%	2.0%	4.0%	2.0%	8.0%
< 18	.0%	.0%	.0%	.0%	.0%	.0%	.0%	4.0%

Figure 11. The most are Interzone Market and U-Square

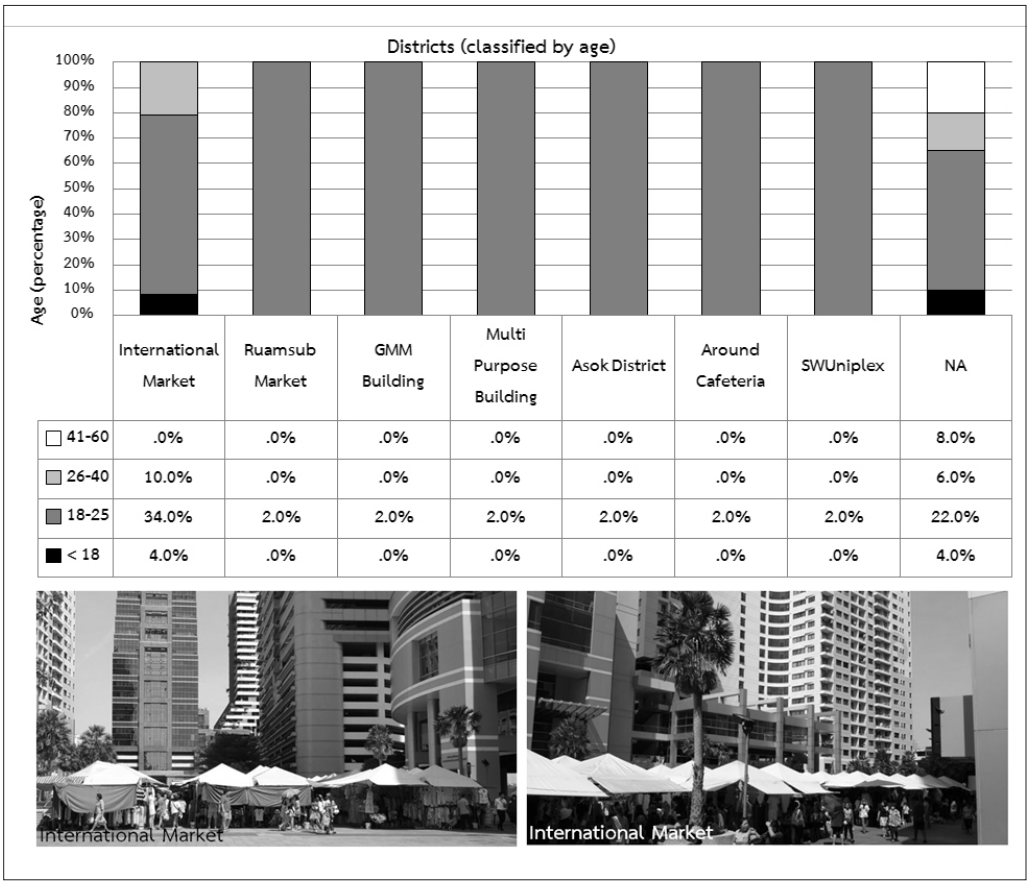


Figure 12. The most recognizable nodes are Naga yard and Interzone

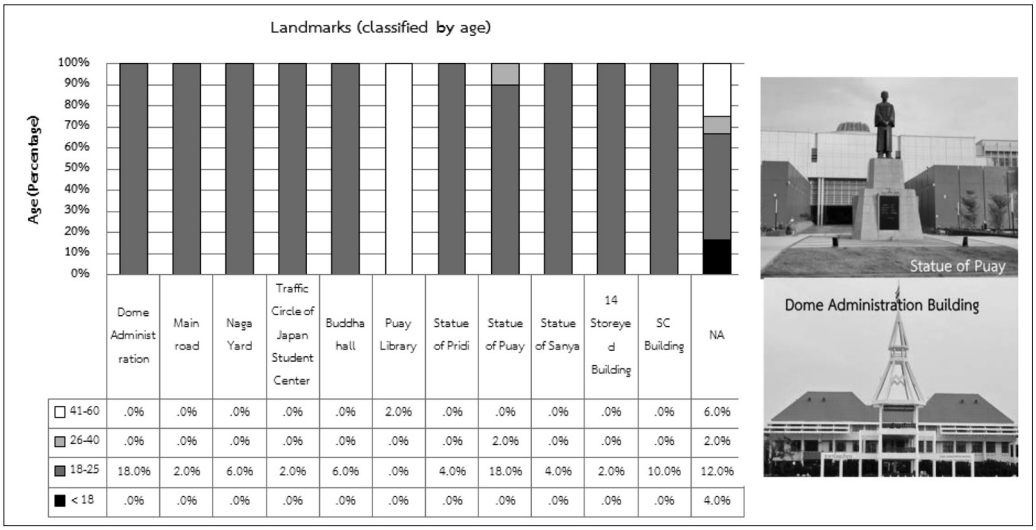


Figure 13. The most recognizable are Dome Administration Building and The Statue of Puay

6.2 Srinakharinwirot University (Prasarnmit Campus)

1) Land use and patterns of the building use.

The result has been found that there were 3 types of land use. First, the land used for teaching and learning, buildings lie on each faculty including all lecture building. Most of the land use are shared, they do not have boundaries. There is a small space in each faculty; one or two buildings. Secondly, the land used for services and facilities. The land are used for educational services, and it also facilitates in academic study. Same as above, most of the land use are shared, and they do not have boundaries. Finally, the land used for leisure and recreation. It is used for relaxing, recreational activities, and meeting.

As for consideration of patterns of the building use, the criterion for measuring the height of the buildings was in general. Due to the fact that the height of the buildings differs from that of Thammasat University. Srinakharinwirot buildings are used in a limited area. There are a large number of floors. The height of the buildings can be divided into 3 types. Low, 1-5 floor- buildings, medium, 6-10 floor-buildings, and high, 11-22 floor-buildings (Figure 14).

2) Intensity of the land use, considered according to the 3 types of buildings. The consideration can be divided into 2 dimensions: F.A.R and O.S.R (Table 2).

3) image evaluation, according to the 5 elements, it has been found that samples classified by age, have evaluated the elements in a more distinctive way than that of those classified by gender, as follows: Figure 15, the result obtained from the questionnaire reports that most of the samples have best recognition on Asoke Gage. The second best recognizable paths were Sukhumwit 23 Gate and Saensab Canal. Both paths were reported at the same range. The average age of the most recognizable samples was 18-25 years old.

Figure 16, the result obtained from the Edge reports that all age ranges of samples have best recognition on SaenSab canal. The second best recognizable paths were Wall, Asok Gate, and Sports Field. Figure 17, the result gained from the District shows that all age ranges of samples have best recognition on International Market. Especially, most of the samples were those who have an average age of 18-25. Besides, areas that were recognizable by a few groups were Ruamsub Market, GMM Building, Multipurpose Building, Asoke District.

Figure 18, the result gained from the interview regarding Node reports that best recognition on Lenlor Square and second was Sports field.

Examples of Height of Building			
Thammasat University (Rangsit Campus)		Srinakharinwirot University (Prasanmit Campus)	
High (Asian Game Dormitories)		**High** - Innovation Development Building - Faculty of Fine Arts - Faculty of Dentistry	
Medium (Group of Social Science Building)		**Medium** Faculty of Social Science	
Low (Dome Administration Building)		**Low** (H.R.H. Princess Maha Chakri Sirindhorn Research and Continuing Education Building)	

Figure 14. Examples of the 3 types of buildings

Table 2. A calculation of F.A.R and O.S.R Srinakharinwirot Prasarnmit Campus

Types of buildings	Building names	All space (sq km)	Building space (sq km)	Number of Floors	Building space* Number of Floors	F.A.R	Open Space Ratio	O.S.R
Low	Cafeteria 2	0.00208	0.00124	1	0.00124	0.60	0.00084	40.42
Low	Meeting Hall	0.00369	0.00139	2	0.00278	0.75	0.00230	62.30
Low	Research and Continuing Education	0.00451	0.00269	2	0.00539	1.20	0.00181	40.22
Low	Educational and Psychological Test	0.00185	0.00096	4	0.00387	2.09	0.00088	47.77
Low	Petnaitom Dormitory	0.00121	0.00065	5	0.00325	2.68	0.00056	46.33
Medium	Faculty of Humanities	0.00178	0.00130	6	0.00784	4.38	0.00048	26.98
Medium	Central Library	0.00327	0.00168	7	0.01181	3.60	0.00159	48.53
Medium	Pre Clinic Building	0.00344	0.00152	8	0.01220	3.54	0.00192	55.73
Medium	Social Science Building	0.00134	0.00071	9	0.00641	4.75	0.00063	47.22
Medium	Faculty of Education	0.00171	0.00101	9	0.00912	5.31	0.00070	41.00
Medium	Faculty of Science	0.00403	0.00206	10	0.02068	5.13	0.00196	48.71
High	International College	0.00200	0.00105	11	0.01158	5.79	0.00094	47.39
High	All Lecture building	0.00280	0.00155	13	0.02017	7.19	0.00125	44.67
High	Faculty of Fine and Applied Arts	0.00263	0.00143	14	0.02009	7.64	0.00119	45.45
High	Innovation Building: Saroj Buasri	0.00317	0.00205	22	0.04525	14.26	0.00111	35.19
High	Social Communication Innovation College	0.00316	0.00113	17	0.01922	6.08	0.00202	64.22

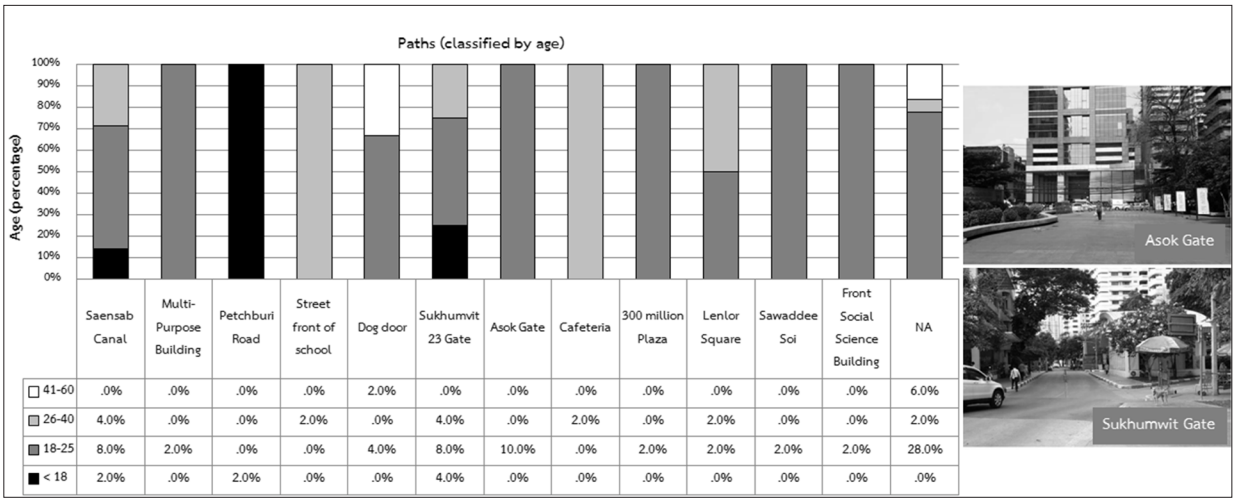
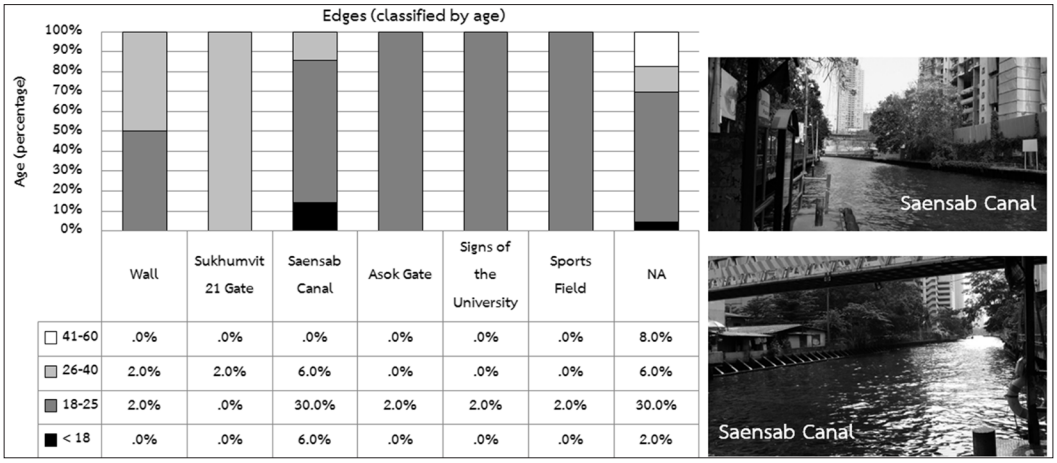
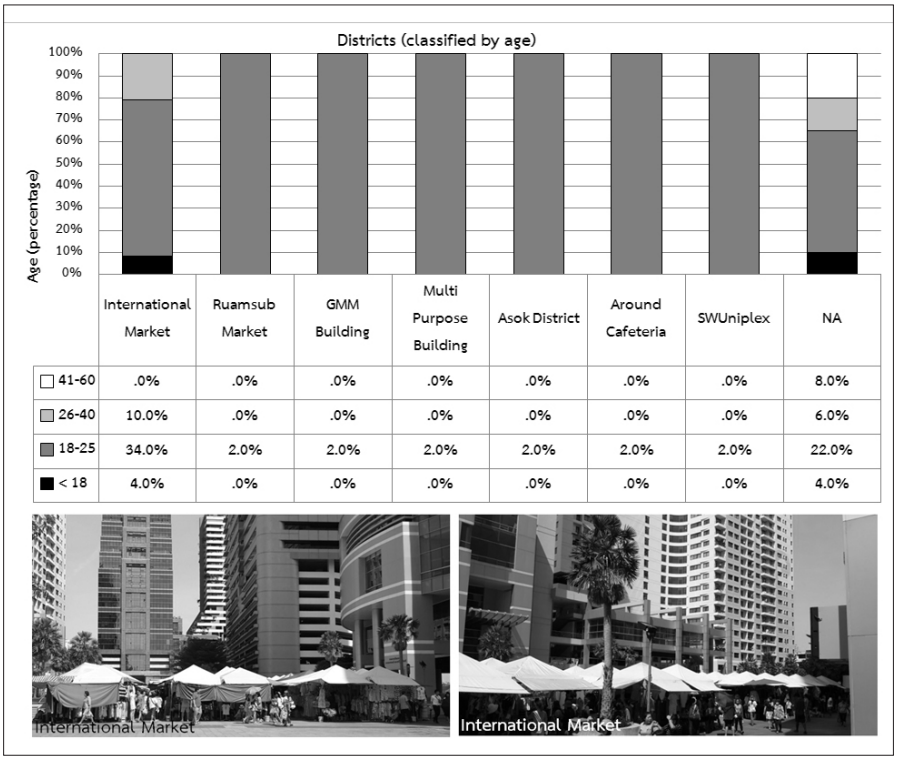


Figure 15. The most recognizable paths are Asoke Gage and Sukhumwit 23 Gate



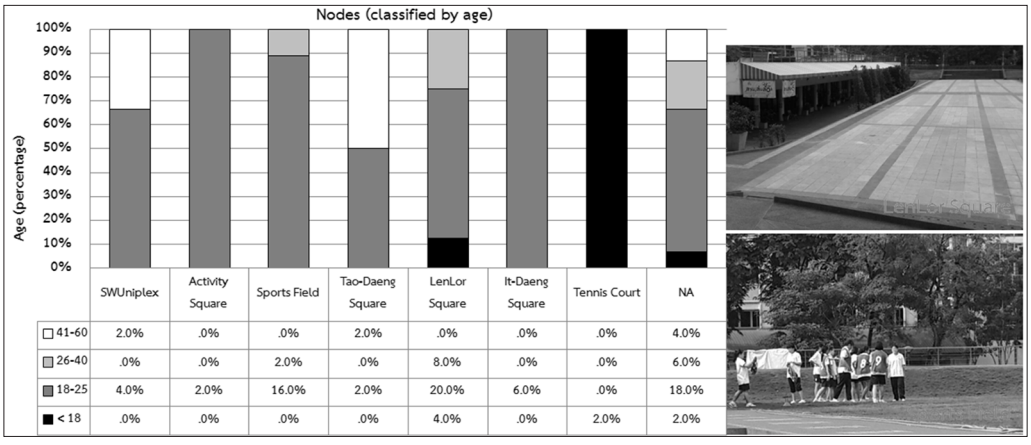
	Wall	Sukhumvit 21 Gate	Saensab Canal	Asok Gate	Signs of the University	Sports Field	NA
41-60	.0%	.0%	.0%	.0%	.0%	.0%	8.0%
26-40	2.0%	2.0%	6.0%	.0%	.0%	.0%	6.0%
18-25	2.0%	.0%	30.0%	2.0%	2.0%	2.0%	30.0%
< 18	.0%	.0%	6.0%	.0%	.0%	.0%	2.0%

Figure 16. The most recognizable edge is Sansab Canal edge



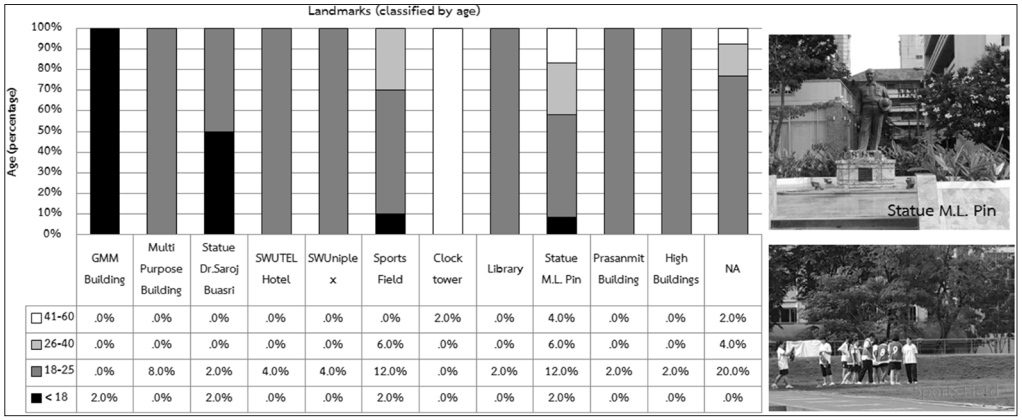
	International Market	Ruamsub Market	GMM Building	Multi Purpose Building	Asok District	Around Cafeteria	SWUniplex	NA
41-60	.0%	.0%	.0%	.0%	.0%	.0%	.0%	8.0%
26-40	10.0%	.0%	.0%	.0%	.0%	.0%	.0%	6.0%
18-25	34.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	22.0%
< 18	4.0%	.0%	.0%	.0%	.0%	.0%	.0%	4.0%

Figure 17. The most recognizable district is International Market



	SWUniplex	Activity Square	Sports Field	Tao-Daeng Square	LenLor Square	It-Daeng Square	Tennis Court	NA
41-60	2.0%	.0%	.0%	2.0%	.0%	.0%	.0%	4.0%
26-40	.0%	.0%	2.0%	.0%	8.0%	.0%	.0%	6.0%
18-25	4.0%	2.0%	16.0%	2.0%	20.0%	6.0%	.0%	18.0%
< 18	.0%	.0%	.0%	.0%	4.0%	.0%	2.0%	2.0%

Figure 18. The most recognizable nodes are Lenlor Square and Sports field



	GMM Building	Multi Purpose Building	Statue Dr.Saroj Buasri	SWUTEL Hotel	SWUniple x	Sports Field	Clock tower	Library	Statue M.L. Pin	Prasanmit Building	High Buildings	NA
41-60	.0%	.0%	.0%	.0%	.0%	.0%	2.0%	.0%	4.0%	.0%	.0%	2.0%
26-40	.0%	.0%	.0%	.0%	.0%	6.0%	.0%	.0%	6.0%	.0%	.0%	4.0%
18-25	.0%	8.0%	2.0%	4.0%	4.0%	12.0%	.0%	2.0%	12.0%	2.0%	2.0%	20.0%
< 18	2.0%	.0%	2.0%	.0%	.0%	2.0%	.0%	.0%	2.0%	.0%	.0%	.0%

Figure 19. The most recognizable landmarks are the statue of M.L.Pin and Sports Field

Figure 19, the result from the interview reports that there were 2 landmarks which were most recognizable: statue of M.L. Pin; and Sports Field.

7. Conclusion and Discussion

This section explains originality of development area. The results strengthens image perception towards image occurred in individual elements. The result perception can be contributed to promote area development based on revealing issues and requirements of people using the area. The suggestion of the area development was drawn from the city image perception towards the 5 elements. As for the land use, Thammasat Rangsit University has used dispersed pattern. It is apparent that the pattern of land use at Thammasat was evaluated by a report of a high level of O.S.R. and a low level of F.A.R. On the contrary, a compact pattern of land use was found in Srinakharinwirot University, Prasarnmit Campus. Noticeably, although the patterns of land use of the 2 universities were different, a similar problem was found. The shared problems were reported. First, a complex of area construction was reported. As well, there were lots of green space but the space has not been recognizable by users. Thus, a lack of green space was found. 1) The result of analyzing land use and an analysis of intensity of building use shows that Thammasat Rangsit Campus can be considered as a representative of a university where there is a dispersed land use. It is in space use, buildings, a loose position of buildings creates a large area for doing activities. A accordance with the concepts of dispersed city. It is considered by the characteristic of low intensity of the use of building and land has been found. (a supporting data on intensity of the use is Floor Area Ratio or F.A.R. indicates only 0.56 - 6.34 whereas O.S.R shows 83.91). The result suggests that there should be an improvement on land structure to be able to make more use of it. A horizontal adjustment on wasteland to be fully potential is also suggested. The need to be restored should not depend on intensity of the building. This is because most parts of the land can be shared with the surrounding buildings. 2) Drawn from the participants' perception in land use, there was less green space, it has been perceived quite small, because the people has not recognized those spaces. The implication of the 5 elements image perception should be considered, to increase more on the land use at the recognizable places. For example, adding more green space into Interzone. As for, Administrative Dome, although there are green space and relaxing corners situated around the place. Yet, the place still needs a more convenient to use it. 3) The results gained from the participants' image perception toward the land use shows that there is a difficulty found in the first visit. They feel it hard to remember the image

of the place. They might get lost. They also feel that the construction is too complicated and too large for them to recognize the place from the first time of entry. There should be a sign indicated the direction clearly in the place by bringing the aforementioned of the image elements as a referable points. They are useful for communication, and public relation. For example, the sign should be placed at the Chiang raak Gate 1 and 2, Taladvicha Road, Interzone, Naga yard, and also at the administrative dome. 4) Srinakharinwirot University, Prasarnmit Campus, it has a compact pattern. It has been considered a representative of a potential land use. It is obvious because the university has a limited area, and having a high intensity in building and land use. (According to the supporting data of the intensity of the land use having F.A.R was at 0.6 - 14.26 whereas O.S.R shows only 64.22). The results reflect that there has been a fully potential found in physical use of the land. An integrated and shared use of the land has also been found. 5) According to the limited size, the shared use was found. The shared use of the land caused less perception on the green area, less close to the nature, small leisure areas. The 5 elements of image perception should be linked into the use of the recognizable points. For example, adding more green area into SWUNIPLEX, Lenlor Square, and the statue of M.L.Pin are recommended. A good settlement, shading, and the ease of entry are also recommended. 6) The participants' perception on the land use, they did not get lost from the first visit. But the space are quite complicated because of the limited size, and unclear structure. According to the limitation in a shared building and land, a direct navigation into each place is recommended. In bringing the recognizable elements as a referred point, a sign showing a direction to each place is needed to be installed. The navigation should start from the beginning point of the area i.e., the most recognizable points such as the route between Sansab canal and Sukhumvit 23 gate, SWUNIPLEX, the statue of M.L.Pin, SWUNIPLEX or international market. These points should be used as starting navigation points. Even more so, the complicated and multi-functional areas should also have such communicative signs. Further investigation may focus on sampling method. Sampling might affects land users' image perception. For example, age, this is because age impacts directly to users' personal experiences, learning, activities, and behaviors. These factors affects the survey responses. This study utilized majority of age of the samples which fell into the range of 18-25. They are mostly students. Therefore, the responding perception might be derived in the same direction.

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