GUIDELINES TO THE IMPROVEMENT PUBLIC SPACES FOR KLONG SUAN MARKET 100 YEARS

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ABSTRACT

Khlong Suan Market 100 Years is an old market, which in Samut Prakan Province and Chachoengsao Province, Thailand. The most inhabitant is the elderly include travelers. When did a primary survey, it found that the public space did not support to elder. Therefore, it should be divided public space into 8 parts, such as 1.Parking space for market 2. Indoor parking space 3.Public toilet 4.Entry/exit end of the market 5.Entry/exit opium den alley 6.Entry/exit side walkway 7.Entry/exit cross the mosque 8. The Riverside walkway. For analysis solves the problem in each space. The research used the survey method and using PAR method by collect the data to questionnaire from 399 samples and bring both results to analysis for modifying space design. It can conclude the main issue as follow : Modified parking space, both car, and motorcycle and added parking for disabled, modify surface walkway, choose the material with rough and anti-slip, added the handrail with two level and use the material without accumulated thermal, modified the toilet include added the toilet for the disabled, added public seating for travelers and elder, modified the landscape for shady and choose the material without accumulated thermal.

Keyword: Elder, Disabled, Physical Environment, Public Space, Thermal

I. INTRODUCTION

"Khlong Suan" is a massive community since The King Chulalongkorn the Great (Rama V). This space was a passage to Bangkok, from Pratunam thaw pier (Chachoengsao) passage to Khlong Suan Market before passage to Pratunam (Srapathum Palace), Bangkok. Khlong Suan's folklife is a multicultural due to they are both Thai-Chinese, Thai-Buddhist, Thai-Muslim, which become multicultural. To enjoy life together, we see from the building such as the vegetarian cafeteria, temple, mosque, which are establish nearly. "Khlong Suan Market," which is the old market, has also called the "Two provinces market," that is, half of the market live in Ban Pho District, Chachoengsao Province, and another half live in Bang Bo District, Samut Prakan. It was the only wooden bridge that connects to both spaces. The quality of a building was wooden adjunction building abundantly. The front is a trading area and the inside is a residential area (Boonnarapithak, Mankatitham, Sonthirat, & Siriponnoppakun, 2019) and maintain architecture value until receiving Architectural Design Awards in B.E.2547. It deems that Khlong Suan Market is essential to history and is a center of local folk life who have a bond tightly. It should be maintained for the new generation to have seen and inherit Inhabitants and travelers who are the elder will encounter quite a problem in public space. Whether unsuitable parking space, slippery walkway, etc. All of this might cause an accident. The modified indoor market public space for the elder need to participatory action research (PAR) suggest to modified. The process of Exchange is a primary concept (Polpanadham, 2011), which begins to change for the elder in the future and is the way to develop the quality of elder in Khlong Suan 100 Years Market

II. OBJECTIVE

2.1 To explore the outdoor and indoor public space of Khlong Suan Market 100 Years and bring the result to analysis and modified public space suit for elders.
2.2 To check the perspective of travelers’ views to Khlong Suan Market 100 Years about elderly traveler's service

2.3 For the present about modification and solve the space condition that obstacle to folk and elderly travelers

III. RESEARCH METHODOLOGY

When studying in Khlong Suan Market 100 Years space, it can divide two zones, such as zone A, which is Samut Prakan Province, and zone B, which is Chachoengsao Province. Both zones can divide 8 subspace, such as:

3.1 Entry parking market
3.2 Indoor parking
3.3 Public toilet
3.4 Entry/exit end of the market
3.5 Entry/exit opium den alley
3.6 Entry side walkway
3.7 Entry/exit ross the mosque
3.8 Riverside walkway

Then explore all of 8 spaces of physical to understand the problem and limitation of space. (Chanasith, 2018) It found that Khlong Suan Market 100 Years is private property, has quite limitation to modified. This research, therefore, presents the fundamental way of development

![Khlong Suan Market 100 Years Map](image)

**Figure 1:** Khlong Suan Market 100 Years Map

People and the target group can divide into two groups, such as:

1. People live in Khlong Suan 100 Years Market space, Thep Rat Sub-District, Ban Pho District, Chachoengsao Province, and Khlong Suan Subdistrict, Bang Bo District, Samut Prakan Province; Thailand follow by Khlong Prawet Buri Rom. There are about 190 people

2. The number of travelers: due to unsettling in the number of travelers, it is necessary to calculate sample groups with 95 % confidence (Suansri, 2016). It is about 40 people per day as 14,459 travelers per year respond to design presentation, respond to most suitable for each user group. The origin number of travelers reference to Pak Khlong Talat committee and Miss Chantima Achapanit, President of the community committee (Suthitakon, 2012) Provide 399 samples of the questionnaire by using Taro Yamane’s formula and the result of the questionnaire to modified public space design

Calculation of sample group by using Taro Yamane’s formula
Providing questionnaire come from data analysis and issue involved with the design

3. Providing questionnaire come from data analysis and issue involved with the design

![Diagram of Questionnaire](image)

**Figure 2:** Diagram of Questionnaire

4. Managing collect the data from sample groups

![Sex classification](image)

**Figure 3:** Sex classification

![Status classification](image)

**Figure 4:** Status classification

![Ages Table](image)

**Figure 5:** Ages Table
For figure 3-6 show that female travelers answer the questionnaire more than male travelers by proportion 58% of female, 42% of male. The respondents are 31-40 years as 24% and graduated in bachelor’s degree as 63%.

Figure 7: Public space usage satisfaction

For figure 7, travelers have satisfied with public space usage of about 34%. It shows that there is a problem in public space, which effect inconvenient to travelers many things.

Figure 8: Toilet space usage satisfaction

In the public toilet space usage satisfaction, it found that most travelers feel not bothered with a public toilet. It means that most travelers think an average about 43%.

Figure 9: Riverside walkway usage satisfaction

For the riverside walkway and entry/exit market, it found that travelers quite like riverside due to the pleasant environment, shady, amount to 26-33% of satisfaction. The entry/exit not quite a negative comment but said not bad, which are amount 39%.
The original parking usage was quite a problem due to there is no organization. It can make more than 30% of travelers give an opinion that it should be modified to new parking.

Demanding a toilet for elder and disabled by travelers (Figure 12) found that there are 78% of demanding. While 58% of travelers still require the handrail at riverside walkway (Figure 13) (Sinworn, Surachat Sinworn, Viriyawattana, 2015)

In the different ramp, there was no ramp inside the market space support wheelchair for elder and disabled. The most travelers often to take their family, so it found that 43% of travelers demanded the ramp

**IV. FINDINGS AND DISCUSSIONS**

From explore physical data and interview include questionnaire can provide analysis on how to modified in each space as follow:

**4.1 Parking space for market**

**Problem:** 1. Space condition was a small stone, and it will make dust when breeze or automation moving 2. Lack of parking organization for car and motorcycle include lack of parking for disabled 3. Lack of footpath and seating space 4. Lack of light in at night
Solution: 1. Modify road by paving asphalt rubber for preventing dust, convenient for elder’s wheelchair. 2. Assign four cars parking space size 2.50 x 6.00 m. And six motorcycles size 1.00 x 1.50 m include three motorcycles parking space for disabled. 3. Added footpath on park side comparison with three materials such as:

4.1.1 Stamped Concrete with anti-slip

4.1.2 Paving block

4.1.3 Exposed aggregate finish

When a comparison was suitable, it will be selected type 1 as stamped concrete with anti-slip due to easy to use and durable, inexpensive. The paving block had a problem with the joint between tile that unsuitable for a wheelchair. The exposed aggregate finish is a danger for an elder. When they are falling, they will have more injure and added the seating at the park side (the material is Artificial Wood, which is resistant to weather) for waiting. (Mankhititham, 2012) 4. Added the light at night by using an LED solar cell system for saving energy.

Figure 15: Parking space before modified

Figure 16: Parking space after modify

Figure 17: Seating at park

Figure 18: Footpath model
4.2 Indoor parking space

**Problem:** Same problem at parking market space

**Solution:** Use the same solution with parking market space by using 24 car space, three cars for disabled, seven motorcycles, three seating, and modified pavilion’s length. The stamped Concrete with anti-slip use for maintaining the simplicity and folk identity, and combine with traditional living. The footpath material, seating, and electricity post-use solution as space 1 (parking market space)

![Figure 20: Indoor parking space before modified](https://example.com/image1.png)

![Figure 21: Indoor parking space after modified](https://example.com/image2.png)

4.3 Public toilet

**Problem:** It was not suitable for male-female hygiene and too high ground. 2. Lack of toilet for elder and disabled. 3. Lack of seating for waiting and eating

**Solution:** 1. Modify male-female toilet 2. Added toilet for elder and disabled by establishing on the front for convenience to entry/exit, prevent the accident 3. Added seating and select the Stamped Concrete with anti-slip
4.4 Entry/exit end of the market

**Problem:** 1. A quite narrow walkway, not suitable, the sidewalk had swamped when raining. 2. Lack of handrail prevents falling

**Solution:** 1. Modify slope level and material, select the Stamped Concrete with anti-slip (Same as parking space) 2. Added the double-level metal and wooden handrail to prevent falling for people and wheelchair across the walkway.
4.5 Entry/exit opium den alley

**Problem:** 1. The walkway quite narrow, unsuitable condition, the walkway was wooden with dilapidated

**Solution:** 1. Change wooden to harden wood with durable
4.6 Entry/exit side walkway

**Problem:** 1. The surface was not smooth that might cause slippery

**Solution:** 1. Modify the surface, select the stamped Concrete with anti-slip (Same as the parking space in space 1)

![Figure 30: Entry/exit opium den alley after modify](image)

![Figure 31: Entry/exit side walkway before modified](image)

![Figure 32: Entry/exit side walkway after modify](image)

4.7 Entry/exit cross the mosque

**Problem:** 1. The surface was not smooth that might cause slippery

**Solution:** 1. Modify the surface, select the stamped Concrete with anti-slip (Same as the parking space in space 1)

![Figure 33: Entry/exit cross the mosque before modified](image)

![Figure 34: Entry/exit cross the mosque after modify](image)

4.8 Riverside walkway

**Problem:** 1. The riverside walkway was quite a danger for the elder and wheelchair. It might cause falling into the water. 2. Lack of handrail prevents slipping
**Solution:** 1. Modify the surface, select the stamped Concrete with anti-slip (Same as the parking space in space 1) and 2. Added the handrail prevent falling and added the handrail with double-level harden wood for people and wheelchair

![Figure 35: Riverside walkway before modified](image1)

![Figure 36: Riverside walkway after modify](image2)

V. **CONCLUSION AND RECOMMENDATIONS**

The analysis modifies method in public space in Khlong Suan Market 100 Years for the elder will prepare to change for an elder in the future and developed quality elder life in Khlong Suan Market 100 Years. It begins to modify public space support to the traveler and elder and affects the environment, combines with living, not demolish traditional community includes awareness to the least cost

For modification of Khlong Suan Market 100 Years, it still has many spaces that non-exist in this research. For example, sales space or riverside, etc. Therefore, this can conduct research that not done it yet, include any modify which considers community identification and also combine with folklife. (Thongpanya, 2018)

**REFERENCES**