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Evaluation of pedestrian facilities to improve the pedestrian environment in The Central Market of Pangkalpinang

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Abstract. Plaza Pangkalpinang – Bangka Trade Center Area as The Central Market of Pangkalpinang, generates a large number of trips. The trips are not only vehicle trips but also trips of the pedestrian. The high pedestrian traffic requires pedestrian facilities. The availability of pedestrian facilities will affect the pedestrian environment. The pedestrian-friendly environment will encourage people to walk more. This study aims to assess pedestrian facilities to improve the pedestrian environment in Plaza Pangkalpinang – Bangka Trade Center Area. Pedestrian facilities are evaluated based on the walkability index. In this study, the area is divided into 2 zones, followed by determining the pedestrian routes in each zone. All of the pedestrian routes are divided into 16 road segments. Then, the walkability index will be assessed using 9 parameters in each road segment. The research finding shows that Plaza Pangkalpinang – Bangka Trade Center Area is in bad condition for walking and not pedestrian-friendly. The walkability index in this area is 49.17. It means the available pedestrian facilities are not good enough for walking. Furthermore, the result can be used as a consideration of the government for increasing pedestrian facilities to improve the pedestrian environment in Plaza Pangkalpinang – Bangka Trade Center Area.

1. Introduction

Plaza Pangkalpinang – Bangka Trade Center Area is the central market in Pangkalpinang. In this area, there are a market, shops, and two shopping centers (Plaza Pangkalpinang and Bangka Trade Center). As a central market, this area generates a large number of trips. The trips are not only vehicle trips but also trips of the pedestrian. Pedestrians are everyone who walks on the street in traffic[1].

The high pedestrian traffic in the Pangkalpinang Plaza Area - Bangka Trade Center requires pedestrian facilities. The availability of pedestrian facilities will affect the pedestrian environment. The pedestrian environment is a significant influencing factor in walking [2]. Also, the quality of the walkable environment determines people's willingness to walk [3]. The concept of walkability has a big impact on creating a pedestrian-friendly environment, where pedestrian-friendly environments will encourage people to walk more [4]. Walkability is a term used to explain and assess the connectivity and quality of pedestrian walking paths in cities. It can be assessed through a comprehensive assessment of available pedestrian infrastructures and studies linking demand and supply [5]. Besides that, the



walkability or how easy to walk can be expressed as environmental conditions to walk for a particular area to reach the desired destination in the area [6].

This study aims to measure pedestrian facilities to improve the pedestrian environment. Pedestrian facilities can be evaluated based on the walkability index [5,7–9]. The walkability index is a method to assess the quality of the pedestrian environment. The value of the walkability index shows the route that has problems in the feasibility of pedestrian facilities. Moreover, it can indicate the direction for improving pedestrian facilities based on each parameter value used [9]. Furthermore, the results of this study can be used as a consideration of the government for increasing pedestrian facilities to improve the pedestrian environment in Plaza Pangkalpinang – Bangka Trade Center Area.

2. Methodology

This research took place in Plaza Pangkalpinang – Bangka Trade Center Area as Central Market of Pangkalpinang. The area is divided into 2 zones, followed by determining the pedestrian routes in each zone. Then, all of the pedestrian routes are divided into 16 road segments.



Figure 1. Plaza Pangkalpinang – Bangka Trade Center Area

In this study, pedestrian facilities are evaluated based on the walkability index. The walkability index will be assessed using 9 parameters in each road segment, consist of walking path modal conflict, walking path availability, crossing availability, crossing safety, motorist behavior, amenities availability, disability infrastructure, obstructions, and security from crime [5]. In the assessment, each parameter is scored with a value from 1 to 5, which is the score of 1 for the worse condition and 5 for the best one. This research develops a questionnaire adopted from previous research [5,10].

The result of the walkability index is divided into 3 categories [11]:

- Green Category: highly walkable, score more than 70
- Yellow Category: waiting to walk, score between 50 – 70

- Red Category: not walkable, score less than 50

3. Result and Discussion

All of the walkability scores need to normalize on the scale of 100. The value of 100 expresses the best condition. Figure 2 presents walkability scoring for each segment. As shown in the graph, almost all segments have similar conditions with a score of less than 50. Only 5 out of 16 segments score 50 – 70. Based on the condition, most of the segments in Plaza Pangkalpinang – Bangka Trade Center Area are in bad condition for walking.

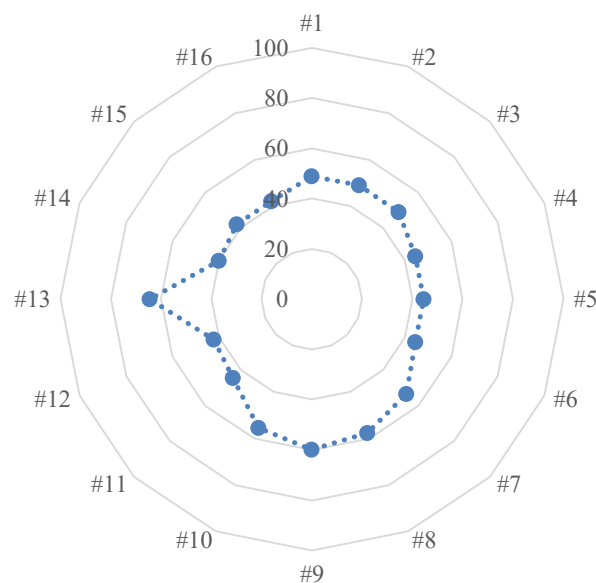


Figure 2. Walkability scoring by segments

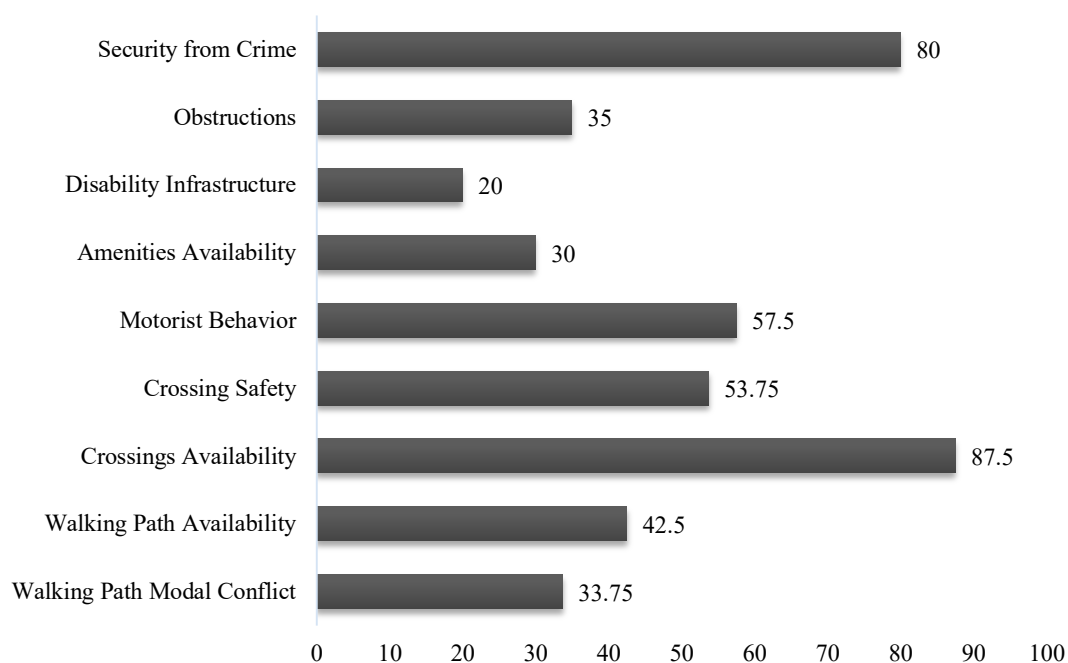


Figure 3. Walkability scoring by parameter

Figure 3 gives information about the walkability scoring for each parameter. The graph shows almost all of the parameters are in bad condition. The availability of disability infrastructure gets the lowest, while the availability of crossings gets the highest score following by security from crime. The lowest score for disability infrastructure means it is the worst condition. Besides that, amenities availability, obstructions, walking path modal conflict, and walking path availability also get the low score. The low scores for 5 out of 9 parameters show that Plaza Pangkalpinang – Bangka Trade Center Area is not pedestrian-friendly. On the other hand, the average walkability index (Table 1) for this area is 49.17 out of 100. It means the available pedestrian facilities in this area are not good enough for walking.

Table 1. The walkability index for The Central Market of Pangkalpinang

Segment	Segment Length (m)	Total Score	Walkability Index
#1	80.8	22	49.17
#2	80.8	22	
#3	80.8	22	
#4	83.7	20	
#5	67.5	20	
#6	90.0	20	
#7	88.3	24	
#8	72.2	26	
#9	78.4	27	
#10	86.5	25	
#11	55.0	20	
#12	65.5	19	
#13	84.9	29	
#14	96.0	18	
#15	53.4	19	
#16	74.0	19	

4. Conclusion

The research findings show that Plaza Pangkalpinang – Bangka Trade Center Area is in bad condition for walking and not pedestrian-friendly. The walkability index in this area is 49.17. It means the available pedestrian facilities are not good enough for walking. This study reveals that pedestrian facilities in this area such as disability infrastructure, amenities availability, obstructions, walking path modal conflict, and walking path availability need more increasing. Furthermore, it can be used as a consideration of the government to improve the pedestrian environment in Plaza Pangkalpinang – Bangka Trade Center Area.

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