

# EVALUATION OF SIDEWALK BASED ON THE INDONESIAN GUIDELINE FOR TECHNICAL PLANNING OF PEDESTRIAN FACILITIES

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## *Abstract*

*Sidewalks are pedestrian paths generally parallel to road and higher than the pavement surface to ensure the safety of pedestrians. Sidewalk is important for pedestrians; thus, it has to meet the standards of technical requirement. This study aimed to evaluate condition of sidewalk in Kudus City, Indonesia to find out whether the existing sidewalks had complied with the technical requirement as stipulated in the Indonesian guideline for technical planning of pedestrian facilities. This was a descriptive quantitative study involving sidewalks as the sample. Data were collected through survey and analyzed quantitatively. Despite having several issues around design of the construction, the existing sidewalk in Kudus City, Indonesia had been in accordance with the provision as prescribed in the Indonesian guideline for technical planning of pedestrian facilities. Finding of the study suggested that sidewalks need for further improvement for the convenience of pedestrians, especially signposts, sidewalk accessories, direction and other relevant properties.*

**Keywords:** *Descriptive qualitative study, Indonesian standard of public facilities development, pedestrians, sidewalks*

## 1. INTRODUCTION

Sidewalk is a special space built to make people walk safely, and comfortably. It runs along the side of a road. Other than its primary function, it can also trigger social interaction among communities (Almahmood et al., 2017; Kim, 2012). To provide for convenient and safe movement of pedestrians, sidewalks have to meet certain standards. These standards are essential as reference to manage how sidewalk should be designed and constructed in order to allow equal access, especially for people with physical disabilities. In Indonesia, sidewalks have been available in all cities across the country, including the city of Kudus, Central Java, Indonesia. However, their existence was not yet pedestrian friendly. It has not provided convenience and safety for those passing by. Although sidewalk is one of the major level of service parameter for public facilities, research on sidewalk has received scholarly less attention (Kim, 2012). Earlier studies on sidewalks have been previously conducted (Almahmood et al., 2017; Shafabakhsh et al., 2014; Tajgardoon & Karimi, 2015; Wood, 2018), yet study to evaluate the existing condition of sidewalk based on the technical terms in the guideline for technical planning of pedestrian facilities remain underexplored.

### **Sidewalk based on the technical requirements in the guideline for technical planning of pedestrian facilities**

Sidewalks are pedestrian paths generally parallel to road and higher than the pavement surface to ensure the safety, convenience, smooth access for pedestrians from vehicles passing by. Likewise, it is a place for social interaction (Almahmood et al., 2017; Kim, 2012). To provide convenience and safety for its users, its construction has to fulfill certain standards as required. In the context of Indonesia, the applicable rules for sidewalk construction are based on the requirements as stipulated in the guideline for technical planning of pedestrian facilities. Thus, it is important to comply for equal benefit of all pedestrians. Rules as employed for this study refer to parts of technical terms in the guideline book as to 1) width and capacity of sidewalk – these terms refer to effective width of sidewalk based on the need for one person is 60 cm with the width of additional movement space of 15 cm to move without belongings. Therefore, the need for the total line for two pedestrians walking side by side or passing by without any body contact is 150 cm; 2) elevation from the road surface; 3) free space of elevation; 4) longitudinal slope – it is ideally 8% and provided with a flat base in every 9.00 m distance with a minimum length of 1.20 m; and 5) transverse slope – it must have a surface slope of 2% to 4% for surface water channeling. The direction of the surface slope is adjusted to the drainage plan (Technical committee 91-01, 2018).

## **2. RESEARCH METHOD**

### **Sample and Data Collection**

This study employed a descriptive quantitative approach as a method for investigation and intensively focused on a particular object as a case. Altogether 5 sidewalks located in Kudus Regency, Central Java, Indonesia were used as the samples of the study. Data for the study included, but not limited to road geometry, pedestrian dimension, traffic volume in the five sites of the study, pedestrian number passing by the observation points, traffic flow and pedestrian behaviors. As types of data were already identified, the data were collected through field measurement, official documents and literature review. Field measurement was conducted by mapping and measuring in detail on the pedestrian path dimension, then recorded in the form of video and photograph; documents here referred to the existing files and reports from the relevant agencies,

including design concepts of sidewalk in the city. While literature resources were gained from books, journal articles and earlier studies.

### **Data Analysis**

Quantitative approach was adopted to analyze the data in the present study. Analyses were numerically made by employing the measurement data, video, photographs, official documents, and relevant literatures. To result in data as required, focus of the analyses was geared towards compatibility of the five aspects such as 1) width and capacity of sidewalk 2) elevation from the road surface, 3) free space of elevation, 4) longitudinal slope, and 5) transverse slope on the Indonesian standards of public facility development.

## **3. FINDING AND DISCUSSION**

### **Width and capacity of Pedestrian Path**

The need for pedestrian path space to stand and walk was calculated based on the dimensions of the human body as stated on the guideline for technical planning of pedestrian facilities (Technical committee 91-01, 2018). Dimensions of the fully clothed body were 45 cm for the body thickness as the short side and 60 cm for the shoulder width as the long side. Based on the dimension calculation of human body, the minimum space requirements for pedestrians are 1) 0.27 m<sup>2</sup>, for carrying no goods and at rest, 2) 1.08 m<sup>2</sup>, for carrying no goods and in motion; and 3) between 1.35 m<sup>2</sup> to 1.62 m<sup>2</sup>, for carrying goods and moving. While the space requirements based on the guideline suggested that the normal and the minimum dimensions required for sidewalk were 1) for a capacity of 1 person, the normal dimensions were 1.2 meters, while the minimum dimensions were 0.9 m, 2) for a capacity of 2 people, the normal dimensions were 2.6 meters, while the minimum dimensions were 2.2 m, and 3) for a capacity of 3 people, the normal dimensions were 4.0 meters, while the minimum dimensions were 3.2 m (P.6).

From the results of the comparative analysis between position of pedestrian on road side (right and left) and the existing provision as stated in the guideline for technical planning of pedestrian facilities, it was revealed that capacity of the lane width for pedestrian was sufficient for 1 person which means it has been in accordance with the standard as applied:

**Table 1. Results of data collection on the width and capacity of the sidewalk**

No.	Sidewalk location	Position of sidewalk on the road side	Existing Width (cm)	Width of minimum standard for 1 person (cm)	Compatibility
1.	Sidewalk on Jl. Bakti	Right	104	90	Compatible
		Left	104	90	Compatible
2.	Sidewalk on Jl. Pemuda	Right	110	90	Compatible
		Left	110	90	Compatible
3.	Sidewalk on Jl. Menur	Right	126	90	Compatible
		Left	126	90	Compatible
4.	Sidewalk on Jl.R.Agil Kusumadya	Right	-	-	Compatible
		Left	100	90	Compatible
5.	Sidewalk on Jl. Ahmad Yani	Right	120	90	Compatible
		Left	120	90	Compatible

**Elevation from the road surface**

From the results of the comparative analysis between the sidewalk elevation and the existing provision as stated in the guideline for technical planning of pedestrian facilities, it was recognized that the sidewalk had the maximum height from the road surface of 20 cm which means it has been in accordance with the standard as applied (See table 5 for detail):

**Table 2. Survey results of the elevation from the road surface**

No.	Sidewalk Name	Sidewalk location on the side of the road	Road surface elevation (m)	Maximum height standard (m)	Compatibility
1.	Sidewalk on Jl. Bakti	Right	0.2	0.2	Compatible
		Left	0.2	0.2	Compatible
2.	Sidewalk on Jl. Pemuda	Right	0.2	0.2	Compatible
		Left	0.2	0.2	Compatible
3.	Sidewalk on Jl. Menur	Right	0.2	0.2	Compatible
		Left	0.2	0.2	Compatible
4.	Sidewalk on Jl.R.Agil Kusumadya	Right	-	-	-
		Left	0.2	0.2	Compatible
5.	Sidewalk on Jl. Ahmad Yani	Right	0.15	0.2	Compatible
		Left	0.15	0.2	Compatible

### Free space of elevation

From the results of the comparative analysis between the sidewalk elevation and the existing provision as stated in the guideline for technical planning of pedestrian facilities, it was recognized that the sidewalk had the maximum height from the road surface is as follow:

**Table 3. Free space of elevation**

No.	Sidewalk Name	Sidewalk location on the side of the road	Free space of elevation (m)	Standard	Compatibility
1.	Sidewalk on Jl. Bakti	Right	2,1	2.5	Not compatible
		Left	2,2	2.5	Not compatible
2.	Sidewalk on Jl. Pemuda	Right	-	2.5	Compatible
		Left	-	2.5	Compatible
3.	Sidewalk on Jl. Menur	Right	-	2.5	Compatible
		Left	-	2.5	Compatible
4.	Sidewalk on Jl.R.Agil Kusumadya	Right	-	-	Compatible
		Left	-	2.5	Compatible
5.	Sidewalk on Jl. Ahmad Yani	Right	-	2.5	Compatible
		Left	-	2.5	Compatible

### Longitudinal slope

From the results of the comparative analysis between the actual slope in the field and the maximum standard as stated in the guideline for technical planning of pedestrian facilities, it was recognized that sidewalk in the district of the city had slopes in accordance with the longitudinal direction. See the following table for detail.

**Tabel 4. Survey results of longitudinal slope**

No.	Sidewalk Name	Sidewalk location on the side of the road	Maximum Standard (degree)	Actual slope in the field (degree)	Overloaded Angle (degree)
1.	Sidewalk on Jl. Bakti	Right	4.76	3.0	Compatible
		Left	4.76	3.0	Compatible
2.	Sidewalk on Jl. Pemuda	Right	4.76	2.5	Compatible
		Left	4.76	2.5	Compatible
3.	Sidewalk on Jl. Menur	Right	4.76	2.0	Compatible
		Left	4.76	2.0	Compatible
4.	Sidewalk on Jl.R.Agil Kusumadya	Right	-	-	
		Left	4.76	2.5	Compatible
5.	Sidewalk on Jl. Ahmad Yani	Right	4.76	2.0	Compatible
		Left	4.76	2.0	Compatible

**Transverse slope**

From the results of the comparative analysis between the actual slope in the field and the minimum standard as stated in the guideline for technical planning of pedestrian facilities, it was recognized that transverse slope of the sidewalk in the city was in accordance with the standard of 20 to 40. See the following table for detail.

**Table 5. Survey results of the transverse slope level**

No.	Sidewalk Name	Sidewalk location on the side of the road	Minimum Standard (degree)	Actual slope in the field (degree)	Overloaded Angle (degree)
1.	Sidewalk on Jl. Bakti	Right	2° - 4°	2°	Compatible
		Left	2° - 4°	2°	Compatible
2.	Sidewalk on Jl. Pemuda	Right	2° - 4°	2°	Compatible
		Left	2° - 4°	2°	Compatible
3.	Sidewalk on Jl. Menur	Right	2° - 4°	2.5°	Compatible
		Left	2° - 4°	2°	Compatible
4.	Sidewalk on Jl.R.Agil Kusumadya	Right	-	-	-
		Left	2° - 4°	2°	Compatible
5.	Sidewalk on Jl. Ahmad Yani	Right	2° - 4°	2.4°	Compatible
		Left	2° - 4°	2°	Compatible

Despite being in accordance with the guideline for technical planning of pedestrian facilities, the existing sidewalks in the city were not without issues such as width of the

pedestrian path which was not in accordance with the existing requirements due to the presence of an electricity pole in the middle of the sidewalk (See Fig.1), shophouse close to the border of the sidewalks (See Fig.2), and flower pots in the middle of the sidewalk (See Fig.3).



(1)



(2)



(3)

#### 4. CONCLUSION

From one-month evaluation program, we learned that this project was taking a great benefit from descriptive qualitative approach. Findings of the study reported, despite being encountered with some issues around design and the construction, overall, the existing sidewalks in Kudus City, Indonesia had been in accordance with the provision as prescribed in the guideline for technical planning of pedestrian facilities. To optimize function to serve the surrounding community, quality of the existing sidewalks, including signposts, sidewalk accessories, direction and other relevant properties needs for improvement.

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