Walkability level study in Kota Tua area of Meulaboh district

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Abstract. The pedestrian pathway is a facility for pedestrians and also as a means of connecting one region to another on the side of the main road. The case study in this research is in the Kota Tua area of Meulaboh National Road and Teuku Umar Street. As an old city this location has historical value so it attracts people to come. At this location there is also a hawker and culinary center so this location will be crowded to visit. This study was conducted to determine the walkability index of the pedestrian pathway to be studied. Based on the results of observations made, the pedestrian lane in this Kota Tua has a lack of facilities and infrastructure that supports comfort for users. This study uses a mixed-method method where field observations will be conducted to assess the conditions of the pedestrian path. Based on observations made, the results of the walkability index on the National Road, Jalan Iskandar Muda, and Jalan Teuku Umar were declared uncomfortable. Whereas the Area Walkability Index value of 45.75 means it is uncomfortable. Based on the above calculation, the pedestrian path is declared uncomfortable to pass. In order for pedestrian lanes to be comfortable when traversed it is necessary to arrange pedestrian lanes so that pedestrian lanes are comfortable to pass. The structuring carried out refers to Minister of Public Works Regulation No. 3 of 2014.

1. Introduction

Walking is a major and fundamental mode of transportation for almost all humans. Pedestrian lane is access for pedestrians and a means of connecting between one region and another separated from the main road as a motorized vehicle movement lane for motorbikes or cars. [1]. Rapid development of the city needs to be balanced with the provision of pedestrian facilities in support of the realization of a comfortable city (Livable City) and pedestrian-friendly (Walkable) [2], Pedestrian path and environmental conditions are the main components to support the mode of walking transportation. A functional pedestrian path has supporting factors that shape it, including physical dimensions or factors (which include the length, width, and height of the pedestrian area itself), pedestrian accessibility, actors or users, the frequency of activities that occur, the relationship with the surrounding environment (area settlements, offices, trade, trade, and city magnets that support social interaction [3], is a way to assess the environmental quality of pedestrian walking activities. Based on preliminary observations made, the pedestrian path in the Kota Tua area, Meulaboh has a level of comfort that is not good. [4]. In urban areas, pedestrian paths are an important element of urban planning to be considered. [5]. The comfort factor greatly influences the quality of the pedestrian path. Figure 1 are displayed pictures of pedestrian path location conditions in Kota Tua, Meulaboh.
The research location is in the area of the old town of Meulaboh, which is along the area of the National Road and Jalan Teuku Umar in the city of Meulaboh, Johan Pahlawan, West Aceh Regency. The selection of this route is done because this path is a shopping center and culinary business area and has a historical side as the Kota Tua that must have a pedestrian path that is comfortable for its users. From the problems above, it is necessary to know how the exciting conditions of the pedestrian facilities and the feasibility of the pedestrian path in the Kota Tua area, how the pedestrian path walkability index in the Kota Tua area, and how to plan a good pedestrian location and in accordance with the Planning Principles. So that the pedestrian lane users are comfortable when passing through this pedestrian lane.

2. Area of study, data collection, and processing
Research conducted is on the national road and Teuku Umar Street, as shown in Figure 2. The length of the road under study for the National road is 200 Meters divided into 2 lanes namely left and right lanes and divided into 2 STA for one lane, the length of 1 STA examined is 100 meters, meaning that on the National road there are 4 STA examined. While the Teuku Umar roadway survey that was investigated was 700 meters divided into 2 lanes namely left and right lanes divided into 14 STA with each STA having a distance of 100 Meters. In this research, data processing and analysis were carried out using the mix method method with a descriptive approach. For the assessment of the lane in the pedestrian lane segment studied, a scoring system with a score of 1 to 4 is used where 1 is not very good, 2 is not good, 3 is good, and 4 is very good. For the type of facilities and infrastructure to be observed there are 6 items, as for the items as follows: 1. Availability of lanes, 2. Traffic signs, 3. Seats, 4. Availability of ramp, 5. Surface conditions of pedestrian lines, and 6. Safety side.
3. **Analysis Method**

The study was conducted by observing and evaluating the pedestrian path in the Kota Tua area along the National Road, and Teuku Umar Street, Meulaboh City, Johan Pahlawan District, West Aceh Regency. The stages in this study are as follows:

1. **Preparation Stages**
   - Formulate background
   - Gather literature in accordance with the research to be conducted
   - Preparation of research tools such as cameras, stationery, meters as a field observation tool as well as checklist forms and questionnaires.

2. **Implementation Stages**
   - Field observations to see pedestrian path conditions that are located in the shopping area of National Road and Jalan Teuku Umar, Meulaboh City, Johan Pahlawan District, West Aceh Regency.
   - After further observations, walkability index calculations of the pedestrian track are examined.

After observing the scoring for each answer and then it will be averaged and the percentage is made with the formula Walkability Index [6] as equation 1 states.

\[
\text{Segment Score} = (\text{value} \times \text{weight})
\]  

Then the value of the segment score is divided by the number of walkway segments examined. So that the index of each region that can be calculated using equation 2.

\[
\text{Utility Area} = \frac{\sum \text{Skor Segmen}}{\Sigma i}
\]  

Information:

\( n \) = total parameter  
\( i \) = segment  
\( I \) = parameter
To get the weight value of each value in the survey form in this study, the assumptions are made as in the equation 3.

\[
\text{Weight} = \frac{\text{Area Percentage value of each question}}{\text{Number of questions on the survey form}}
\]  

So we get the weight value for each score as Table 1 shows.

| No | value | weight |
|----|-------|--------|
| 1. | 1     | 4,17   |
| 2. | 2     | 8,33   |
| 3. | 3     | 12,5   |
| 4. | 4     | 16,67  |

### 4. Analysis of Results and Discussion

After field observations, an assessment of the conditions of the pedestrian path on the National Road and Teuku Umar Road was obtained. After evaluating the pedestrian path, then the walkability index will be calculated based on the assessment of the pedestrian path condition. An assessment of the conditions of this pedestrian path is shown in Table 2:

| Street Name         | Total Answers | Weight value of each question | Road segment score | Total walkability index value (wi) |
|---------------------|---------------|-------------------------------|-------------------|-----------------------------------|
| National Street     | 13 3 8 0      | 4,17 8,33 12,5 16,67          | 179,16            |                                   |
| Teuku Umar Street   | 40 15 29 0    | 4,17 8,33 12,5 16,67          | 654,16            |                                   |

After obtaining the segment score of each road that is observed then the walkability index value is calculated for each of the studied roads.

- **National Street**
  \[
  \text{score segment} = \frac{\text{segment score}}{\text{Total STA}} = \frac{179,16}{4} = 44,79
  \]

- **Teuku Umar Street**
  \[
  \text{segment score} = \frac{\text{segment score}}{\text{Total STA}} = \frac{654,16}{14} = 46,72
  \]

The Walkability Index values for the old town of Meulaboh is:
\[
WI_{Region} = \frac{WI_{National\ street} + WI_{Teuku\ Umar\ street}}{2}
\]

\[
WI_{Region} = \frac{44.79 + 46.71}{2}
\]

\[
WI_{Region} = 45.75
\]

Based on field observations and walkability calculation of pedestrian lane facilities and infrastructure, it is stated that the pedestrian pathways studied did not have comfort, whereas the area walkability index score was 45.75, which according to the walkability index score table issued by ADB stated that it was uncomfortable. Table 3 summarizes walkability levels based on research that has been conducted [6].

| Score | Information                                                                 | Rating          |
|-------|-----------------------------------------------------------------------------|-----------------|
| >70   | In carrying out daily activities it does not require a motorized vehicle or most activities are carried out on foot | Highly Walkable |
| 50-70 | Some facilities can be reached on foot                                      | Waiting to Walk |
| <50   | Few facilities can be reached by foot or almost all activities requiring motorized vehicles | Not Walkable    |

Based on the calculation that has been done, it is necessary to improve the pedestrian path in the Old Town of Meulaboh. The repairs made must follow the standards issued by the government through Ministry of Public Works Regulation No. 3 of 2014 related to pedestrian paths. The pedestrian path structuring concept can be seen in Figure 3.

![Figure 3](image-url)
5. Conclusion
Based on the results of the calculation of the Walkability Index pedestrian path on the National road has a Walkability Index Value of 44.79 or uncomfortable, and Jalan Teuku Umar of 46.72 = uncomfortable. While the Walkability Index value for the Old Town Area, Meulaboh is 45.75 = Uncomfortable. Based on the results of observations made The conditions of the pedestrian track that were examined were not good because the pedestrian path was used as a place for placing merchandise from shop traders, did not have signs, did not have a good Ram for people with disabilities, the condition of the path surface was not good and not good have side security that can cause pedestrian lane users to feel threatened. Based on the results of calculations that have been carried out, it is necessary to arrange pedestrian lines in accordance with Minister of Public Works Regulation no. 3 of 2014. For readers, the results of this study are expected to add insight to knowledge related to the Walkability Index in the pedestrian path of the old town, Meulaboh. Especially those who are interested to know more about the Walkability Index (conducting research), it is necessary to modify the independent variables to either add variables or add time series data. Hence it will be more objective and varied in conducting research. For the Government of West Aceh Regency, as a reference in future policy making in the efforts to Structure the Pedestrian Path in the Old Town, Meulaboh or the whole Pedestrian pathway in the City of Meulaboh.

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