

# The Application of the Concept Walkability in The City of Makassar In Terms of Behavioral Aspects

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## ABSTRACT

Presenting an environmentally friendly pedestrian path within the framework of the walkability concept is not easy to implement. Especially in Makassar City where the increase population and community mobility is quite high and has resulted in the emergence of various socio-economic and environmental problems, thus affecting the comfort level of pedestrians. One of the factors that affect the level of pedestrian comfort is the behavior of people which do not understand the importance of the existence of pedestrian paths. This study aims to identify the factors that hinder application of the Walkability concept in Makassar City, in terms of behavioral aspects, used in this study uses a descriptive qualitative approach which aims to reveal events or facts, phenomena, variables and circumstances that occurred during the research by presenting what actually happened, while the behavior mapping technique used is the Place centered mapping technique which aims to identify how humans, individually and in groups, utilize, use or accommodate their behavior in a particular time and place situation. From the results of the study, it was found that there are several factors that influence people's behavior, so that the area becomes not walkable according to the perception of pedestrians. Among them are environmental factors such as weather, the presence of street vendors, the surface of the pedestrian path and security. Meanwhile, accessibility factors such as the distance traveled by pedestrian paths, disabled friendly and parking areas, are influencing factors that are not user friendly and not walkable so that it is deemed necessary for the government and stakeholders to improve the area into an area that can be applied to the walkability concept.

**Keywords:** *Walkability; Behavioral; Pedestrian; Perception*

## 1. INTRODUCTION

Walkability is an innovation concept in creating pedestrian path facilities that prioritize pedestrian comfort and minimize air pollution levels, Sari [1]. Presenting an environmentally friendly pedestrian path within the framework of the walkability concept is not an easy thing to implement. Especially in the city of Makassar, where the increase in population and mobility of the community is quite high, resulting in the emergence of various socio-economic and environmental problems, thus affecting the level of pedestrian comfort. To improve pedestrian comfort in the city of Makassar, many factors need to be considered in meeting this level of comfort. One of the factors that affect the level of pedestrian comfort is the behavior of people which do not understand the importance of the existence of pedestrian paths.

The current condition of pedestrian paths that are not used properly will make it difficult to apply the area as a

walkability area, because to make pedestrian paths walkable, of course, behavior, attitudes, insights, and community participation are supporting factors in forming an image of the city. City image according to Kevin Lynch [2] is a mental picture of an area in accordance with the average view of the community. The phenomenon that occurs in several pedestrian paths in the city of Makassar, encourages the desire of researchers to identify and analyze the factors that influence people's behavior in responding to the existence of pedestrian paths that have been provided by the government but are not used properly. The results of this study can later be used as a direction to form a walkable pedestrian path as one of the characteristics of forming the image of the city. The boundaries of the research location were chosen based on the character of the area with a fairly high level of community activity, including the connectivity of the Pattimura street - SombaOpu street – Pasar Ikan street. The area is a Central Business District (CBD) in the zone 2 category and the level of community activity is quite high, integrated with zone 1 and zone 3 (Figure 1).

The research location is in the CBD area of Makassar City, divided into 3 zones. Zone 2 is the focus research that connects zone 1 and zone 3.



Figure 1. Location Study

## 2. LITERATURE REVIEW

### 2.1. Walkability

Walkability according to Land Transport New Zealand 2007, is a condition that describes the extent to which an environment can be friendly to pedestrians. Jan Ghel in Hafnizar [3], also argues that Walkability is a term used to describe and measure the connectivity and quality of pedestrian paths. According to Wowor, Kumurur, & Lefrandt [4] the concept of a walkable city or walkability is an idea in creating an area that is easily accessible on foot and supported by complete facilities. Furthermore, Land Transport New Zealand in Christiana [5] says that walkability is a condition to what extent an environment has an environmentally friendly impression on pedestrians.

To support the creation of a walkable environment, according to Hafnizar [6] there are four things that must be considered, namely: 1) Access, 2) Aesthetics, 3) Safety and security, 4) Comfort. Hafnizar also added that the concepts to support Walkable City include: Mixed use planning, Public Transportation and Transit Oriented Development.

The main purpose of implementing walkability is to guarantee comfort, safety, and economy in traveling on foot. Walkability occurs when an environment or settlement is built by providing a comfortable and safe pedestrian path to encourage people to walk, where the pedestrian path can connect the person with the purpose of his trip and provide interesting views along the way [7].

Walkability can increase social interaction, resulting in population mixing, having more friends and associates where people live, reducing crime rates (with more people walking and monitoring neighborhoods, open spaces, and main roads), increasing pride, and increasing volunteerism.

Socio-economic factors contribute to the willingness to choose to walk rather than drive private vehicles.

Income, age, race, ethnicity, education, household status, and having children in the household can all affect walking journeys, from Joh, Kenneth. Etc. [8]

### 2.2. Behavioral

Environmentally-oriented theories in psychology are mostly studied based on behavioristic, namely theories that view human behavior as determined by environmental factors in which humans live. The existence of different locations where they live and develop will produce different behaviors, from Helmi [9]. Behavior is defined as an action-reaction organism in this case humans to their environment. New behavior occurs when something is needed to cause a reaction, namely the so-called stimulus that produces a certain reaction or behavior, assumption Notoatmodjo [10]. Individual behavior or activity in a broader sense includes visible behavior (over behavior) and invisible behavior (insert behavior). Human behavior does not appear by itself without the influence of the stimulus received, both external and internal stimuli. However, most human behavior is the result of responses to external stimuli received [11].

The views or opinions of experts reveal that the behavior carried out by humans towards space can be seen from the atmosphere or conditions that exist in the space. Two conditions exist in the space, such as threatening or pampering humans which use the space [12].

Behavior mapping is an empirical chart of what people do in a room. This behavioral mapping was discovered jointly by Ittelson, Proshansky and Rivlin. According to Bell et al. [13] behavior mapping is a structural observation technique on behavior, recorded and plotted into a map [14].

According to Sommer [15], behavioral mapping is a sketch or diagram of an area where there are humans carrying out their activities. These maps provide information about behavior, human interactions and are very useful in the design process.

2.3. Place Area

According to Adisasmita [16], that the area is an area that is geographically very wide or limited area, for example a large forest area and a limited commercial area. According to Yunus [17], a commercial area is an area characterized or marked by economic activities, namely commercial activities. The function of the city as a commercial center area can be seen from the life of the city. Every city is a commercial center, while the commercial center area consists of one or more fields in the central area of a city which is an area with high land value with characteristics of having a high concentration in the form of trade, offices, theater, hotels, and services, and with high traffic flow [18].

3. METHOD

The method used in this study uses a descriptive qualitative approach which aims to reveal events or facts, phenomena, variables, and circumstances that occurred during the research by presenting what happened. According to Nazir [19], descriptive method is a method of researching a group of people, an object, a condition in the present. While the behavior mapping technique used is the Place centered mapping technique which aims to identify how humans, individually and in groups, utilize, use, or accommodate their behavior in a particular time and place situation. Researchers recorded behavior by depicting symbols on a base map.

The research area is in the downtown area which is integrated with cultural heritage and tourism which is in Bulo Gading Village, Ujung Pandang District, Makassar City. The location is close to Losari Beach, Fort Rotterdam, and other trading centers. There are many newly built areas so that the area has the potential to be used as a commercial area. (Figure 2).

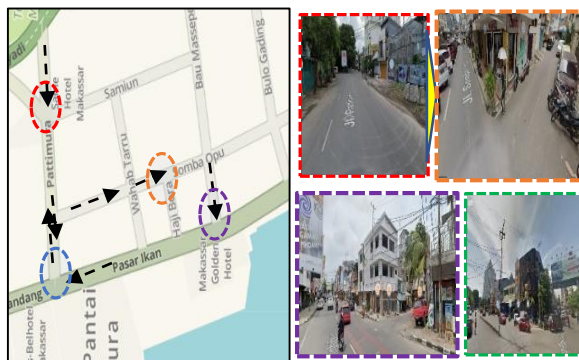





Figure 2. Detail Location and Building

4. RESULT AND DISCUSSION

Based on the mapping of pedestrian behavior that occurs in the area from segment 1 to segment 3, it can be




seen the categorization of pedestrian user activities including: (1). Walking activities: Pedestrians are quite high, which occurs in segment 2. (2). Sitting activity: This activity mostly occurs in segment 2, but this activity uses a motorbike seat which is temporarily parked, while in segment 1, sitting activity occurs in the cafe shop and restaurant space, considering that there are many places to eat and drink (3). Standing activity: This activity occurs in each segment, with the assumption that pedestrian behavior while enjoying the atmosphere while discussing, this activity is more dominant in segment 2. (4). Selling activities: In almost every shop front in segment 2, there are street vendors selling activities which are quite disturbing to pedestrians, so pedestrians feel uncomfortable walking because of the presence of several street vendors at several points in the area.

Some of these activities can be seen in the mapping table that has been carried out:

Segment 1	Pedestrian path condition	Score
<b>Pattimura street</b> 	<ul style="list-style-type: none"> <li>- The pedestrian path is used as a parking space by shop owners, so that pedestrians walk outside the area</li> <li>- There are no special lanes for the disabled</li> <li>- Poor tidiness of pedestrian paths</li> <li>- There are no supporting facilities such as trash cans, benches</li> </ul>	2
	<ul style="list-style-type: none"> <li>- The condition of the surface of the pedestrian path that has cracks</li> <li>- There is no continuity between pedestrian paths, such as markings (signs)</li> <li>- Laying of vegetation in the form of trees, irregular</li> <li>- Pedestrian users still depend on transportation modes</li> </ul>	1
	<ul style="list-style-type: none"> <li>- Utilization of pedestrian paths as parking areas</li> <li>- There are no facilities for people with disabilities.</li> <li>- The lack of pedestrian paths is in a situation where the path is not user friendly or not suitable for use because of the many obstacles that exist on the pedestrian path</li> </ul>	1




Score : 4 (Comfortable), 3 (Quite comfortable), 2 (Uncomfortable), 1 (Uncomfortable/poor)

Figure 3. Mapping Pedestrian Behavior Segment 1

Segment 2	Pedestrian path condition	Score
<b>SombaOpu street</b> 	<ul style="list-style-type: none"> <li>- The pedestrian path is used as a parking space by shopkeepers and visitors</li> <li>- Along the pedestrian path, there are many street vendors</li> <li>- Many pedestrians walk off the track, so the safety of users will be disturbed</li> <li>- There is no comfort</li> </ul>	2
	<ul style="list-style-type: none"> <li>- Several areas of pedestrian paths around SombaOpu street, only used as parking spaces</li> <li>- There are no supporting facilities such as benches, trash cans, so some people use the pedestrian path as a trash can</li> </ul>	2
	<ul style="list-style-type: none"> <li>- Inconvenience for pedestrians, because they are often blocked by several obstacles on the pedestrian path</li> </ul>	2

Score : 4 (Comfortable), 3 (Quite comfortable), 2 (Uncomfortable), 1 (Uncomfortable/poor)

Figure 4. Mapping Pedestrian Behavior Segment 2

Segment 3		
Pasar Ikan street	Pedestrian path condition	Score
	<ul style="list-style-type: none"> <li>- Placement of electric poles, bollards is quite disturbing for pedestrians</li> <li>- There are no special lanes for people with disabilities</li> <li>- Unmaintained pedestrian paths</li> </ul>	3
	<ul style="list-style-type: none"> <li>- Pedestrian path, in addition to being used as a parking space, it is also used as a path for motorcyclists</li> <li>- Some individual flower pots, which are placed perfunctory, which only spoils the beauty of the pedestrian path</li> <li>- Pedestrian paths are not maintained</li> </ul>	2
	<ul style="list-style-type: none"> <li>- There is a PLN substation and the accumulation of vegetation only destroys the beauty of the pedestrian path</li> <li>- Placement of billboards that are quite pedestrian when walking</li> <li>- There are no supporting facilities</li> </ul>	2

Score : 4 (Comfortable), 3 (Quite comfortable), 2 (Uncomfortable), 1 (Uncomfortable/poor)

Figure 5. Mapping Pedestrian Behavior Segment 3

So, from the results of the walkability assessment in several segments in Makassar City in terms of the behavioral aspects of pedestrians in the area, it can be assumed that: there are several factors that influence community behavior, so that the area becomes unfit for pedestrians to pass according to pedestrian perceptions. Among them are environmental factors such as weather, the presence of street vendors, the surface of the pedestrian path and security. Meanwhile, accessibility factors such as the distance traveled by pedestrian paths, friendly for persons with disabilities and parking areas, are factors that affect not being user friendly and cannot be passed by pedestrians.

To implement walkability and provide a sense of comfort and safety for pedestrians in the integration of the area from segment 1 - segment 3, it is deemed necessary for the government and stakeholders to improve the area into an area that can be applied to the walkability concept. In general terms, the effectiveness of the pedestrian path model and the path users that the researchers recommend is (Figure 6).

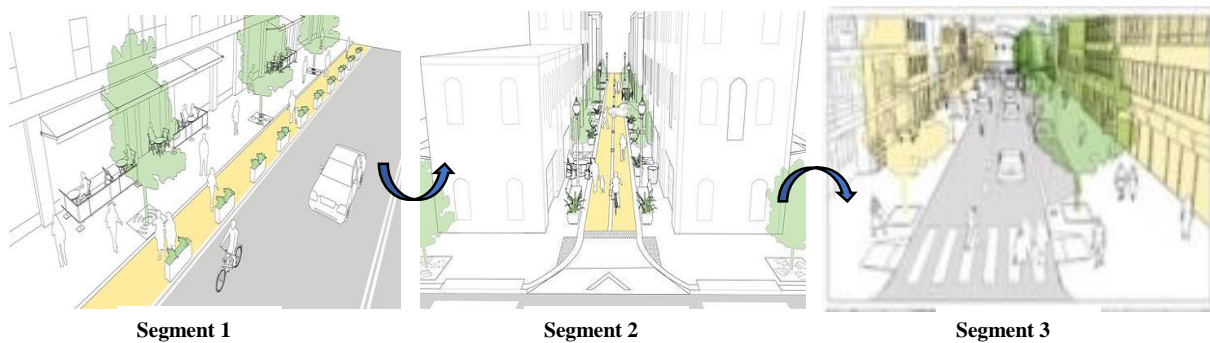


Figure 6. Recommendation design pedestrian path with the concept walkability

In addition, the completeness of several supporting facilities that are in accordance with the appropriate standards for providing infrastructure facilities on pedestrian paths, need to be considered and equipped.

### 5. CONCLUSION

From several factors that influence people's behavior, so that the area becomes impassable for pedestrians according to pedestrian perceptions. Among them are environmental factors such as weather, the presence of street vendors, the surface of the pedestrian path and security. Meanwhile, accessibility factors such as the distance traveled by pedestrian paths, friendly for persons with disabilities and parking areas, are factors that affect not being user friendly and cannot be passed by pedestrians.

To implement walkability and provide a sense of comfort and safety for pedestrians in the integration of the area from segment 1 – segment 3, it is deemed

necessary for the government and stakeholders to increase the area into an area that can be applied to the walkability concept by completing several supporting facilities that are the needs of pedestrians and other stakeholders. in accordance with the appropriate standards of infrastructure provision.

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