

PEDESTRIAN PATH CHARACTERISTICS ENVIRONMENT-BASED IN THE INTEGRATED BUSINESS CENTER AREA OF MAKASSAR CITY

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ABSTRACT

Pedestrian paths in the Karebosi field area must be balanced by providing facilities and infrastructure so that the room's function is degraded. The goal is to know the characteristics of pedestrian paths to formulate a general concept' of environmental insight. Using a collaborative approach survey method, described quantitatively and qualitatively. The results show that physical, behavioral, and environmental characteristics, influenced by comfort, safety, and land use factors, do not function effectively. The lane is a parking area connected to segment B, especially in segment A. The arrangement of street furniture and lane continuity affects comfort. Application of environmental insight, arrangement of several pathways that become barrier factors, and development of sustainable aspects, according to the embodiment of P2KH.

Keywords: Pedestrian path; environment; business

1. INTRODUCTION

The growth and development of the City of Makassar, especially those related to pedestrian facilities and infrastructure, has experienced a degradation of the function of space which needs to be balanced with various facilities for the convenience of pedestrians. From various locations where pedestrian paths are provided, many use these paths as a place to sell street vendors, parking lots, and several locations are also damaged because pedestrian paths currently need to meet the standard of space eligibility as pedestrian paths. The type of construction used on the path is not following the area's conditions, as well as the use of surface materials for pedestrian paths that are not attractive to function as pedestrian paths. Means of providing various other facilities related to the

comfort of pedestrians, especially in terms of providing public facilities, namely public restrooms, spaces for social interaction that are not environmentally friendly, even providing vegetation around pedestrian paths, is only a barrier because the placement of several trees that are not in place, so that it becomes an excuse for pedestrians not to use the area to function properly.

The phenomenon of increased activity in the Integrated Central Business District in Makassar City is different from an increase in existing facilities and infrastructure so that the capacity of facilities and infrastructure has decreased, along with increased community mobility. This condition creates a density of the area's circulation system, as well as aspects of architectural design, in the construction of elements of public space, where this does not pay attention to the proportion and scale of human needs so that it disturbs the level of comfort.

Currently, the Karebosi field area has several trading, office, educational and other health services activities, so the provision of pedestrian facilities is a priority for the local government to support activities around the area. However, the existing facilities have yet to be able to meet the criteria for pedestrian paths, namely safety, comfort, and attractiveness. On the pedestrian path, street vendors are selling on the sidewalk, and vehicles are parked on the sidewalk, the physical condition of the sidewalk and supporting facilities for the pedestrian path are inadequate, so space for pedestrians is disturbed. Besides that, according to (Regulation of the Minister of Public Works No. 3 of 2014), the function of the pedestrian path is as a space that can accommodate all pedestrian activities to provide smoothness, convenience, and comfort for its users, achieving the target.

The condition of pedestrian paths that need to be appropriately used will make it difficult to achieve sustainability. Because to make pedestrian paths sustainable, behavior, attitudes, insights, and community participation are supporting factors in shaping the city's image. City image, according to Kevin Lynch (1981) is a mental picture of an area following the average view of the community. Five elements can express a city image: path, edge, district, node, and landmark.

According to Ninik Anggriani (2009: 13) "Pedestrian Ways in urban design", reveals that the pedestrian path on the side of the road (sidewalk) is part of the pedestrian path system from the edge of the main road to the outer edge of the building's land. It was also disclosed that the front zone of the building is the area between the building wall and the pedestrians.

In addition, the opinion of Colhoun (1990), related to adjustment and human relations, is that the environment can influence behavior. The environment can hinder behavior, consequently limiting what one does. An environment can determine how far people can walk in it. The environment will affect self-image, and attributes and properties influence human behavior. The physical and non-physical conditions of the environment affect human behavior in it.

Several other factors influence people's behavior, so pedestrians, including environmental factors such as weather, the presence of street vendors, the surface of the pedestrian path, and security, cannot traverse the area. Meanwhile, accessibility factors, such as the distance traveled by pedestrian paths, friendly for persons with disabilities, and parking areas, affect user-friendliness and cannot be passed by pedestrians (Rohana et al. 2022).

Human behavior (including pro-environmental behavior) is influenced by many internal and external factors from past, present and future dimensions. However, as explained earlier that these factors are involved in a complex manner in influencing pro-environmental behavior because, basically, human behavior is not simple to understand and predict (Azwar, 2015).

Pro-environmental behavior has a broad scope, therefore in this study, the scope of the study is on the six aspects of pro-environmental behavior as proposed by Kaiser because these six aspects can describe pro-environmental behavior in general (general ecological behavior), and each aspect has a clear description. Furthermore, the six aspects of pro-environmental behavior are used as a construct for compiling a measurement scale because the pro-environmental behavior measurement scale compiled based on the concept of general ecological behavior has demonstrated reliability, internal consistency, and acceptable validity (Scannell & Gifford, 2010), the relationship between the environment and pro-environmental behavior and ecological behavior in adolescents (Uitto et al., 2015).

To support the productivity of Makassar City in terms of infrastructure improvement, the results of this study aim to determine the characteristics of pedestrian paths in the Central Integrated Business Area in Makassar City, to develop a general concept of environmentally sound pedestrian paths through the development of sustainable aspects which refer to the embodiment of the Green City Development Program (P2KH), to create comfort for Pedestrians, while still considering the heritage elements in the area.

2. METHODS

Viewed from the aspect of the method, this research is included in survey research combined with the general concept of Pedestrians. Research with survey methods is generally done to generalize from observations that are not in-depth. Although this survey method does not require a control group, as with the experimental method, generalizations can be more accurate if a representative sample is used (David Kline, 1980 in Sugiyono, 2003). Meanwhile, if seen according to the level of explanation (level of explanation) it is classified in the level of descriptive explanation, namely research conducted to determine the value of a variable without making comparisons or connecting one variable with another variable.

When viewed from data and analysis, this research uses quantitative and qualitative data. Quantitative data is used to analyze the Integrated Central Business area in relation to the population according to regional hierarchical units. Qualitative data in the form of pictures are used to analyze the characteristics of the Pedestrian Lane location. In contrast, qualitative data are quantified from the results of questionnaires and interviews to analyze aspirations in relation to the design of Pedestrian Lanes, which contain environmental elements. An approach model by collaborating the expertise of planners and the wishes of city residents through representatives.

3. RESULTS AND DISCUSSION

1. Pattern Movement of the Pedestrian Path in the Integrated Central Business Area

The pattern of pedestrian movement in the integrated business center area describes the behavior of pedestrian paths in public spaces through observation of a person or all other activities that use these lanes. Currently, activities that occur from morning to night are always dominated by other activities, such as its use as a place for pedestrians to walk.

Pedestrian movement patterns based on observations are divided into several segments:

- Segment A: direction from the South side (RA. Kartini Street) to the West (Kajaolalido Street)
- Segment B: direction from the West side (Kajaolalido Street) to the North (A. Yani Street)
- Segment C: direction from the North side (A. Yani Street) to the East (Jend. Soedirman Street)
- Segment D: direction from the East side (Jend. Soedirman Street) to the South (RA.Kartini Street)

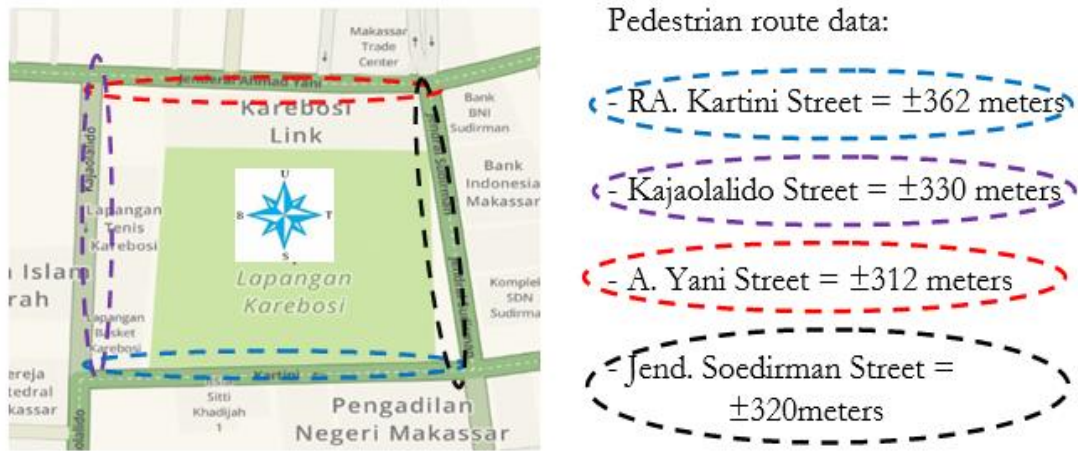


Figure 1. Pedestrian path in the integrated central business area (around Karebosi field)
(Source: Researcher analysis, 2022)

Data from survey results during observation of activities that occur in the Makassar integrated business center area which can influence pedestrian movement patterns are presented as follows:

a. Activities that occur in the morning (08.30 – 10.00).

- 1) Pedestrian activities that utilize the pedestrian path are people who take a small walk or jogging track as a relaxation sport in the morning before office activities begin.
- 2) Office activities in the area begin after community activities that utilize the pedestrian path as a two-wheeled parking lot. And there are several people around the area who use it as a jogging track for people who are aged between 50-70 years.

b. Activities that occur during the day (11.00 – 13.00).

- 1) Educational activities are visible during the day when sellers and buyers occur at that time. And all the shops around the area are all open. Although actually there are still some shops that use it only as a place to live.

- 2) For the activities on the pedestrian path, street vendors are scattered at several placement points in the area and parking for two-wheeled vehicles not far from the street vendors' activities.

c. Activities that occur in the afternoon (15.00 – 17.30)

- 1) Pedestrian activities that utilize the pedestrian path are people who take small walks or jogging tracks as a relaxation sport during the day after office activities are finished.
- 2) Office activities in the area ended after community activities took advantage of the pedestrian path as a two-wheeled parking lot. And several people around the area use it as a jogging track for people aged between 40 and 60.

2. Characteristics of Pedestrian Path

a) Segment A

Kartini Street is a banking and health service center area, with a pedestrian path length of about 362 meters which has 1 lane for two-wheeled and four-wheeled vehicles, and is not served by public transportation. The existing condition of the pedestrian path consists of several variables, including: comfort (sidewalk width, footing height, material), security (street vendor, markings, signs), accessibility, connectivity (continuity), street furniture (trash cans, lighting, benches), eco-friendly (heat and weather, green belt, reading board):

Table 1. Assessment of respondents and researchers

No.	Variable	Respondents	Researches	Description
1.	Convenience	2	2	Same
2.	Security	2	2	Same
3.	Accessibility	2	2	Same
4.	Connectivity	1	1	Same
5.	Street furniture	3	2	Different
6.	Environmentally friendly	3	2	Different

Score: (4) Comfortable, (3) Comfortable enough, (2) Less comfortable, (1) Uncomfortable



From the table, there are different interpretations of the assessment regarding street furniture and the assessment on the environmentally friendly section. However, the dominance of the 4 (four) variable points that have the same assessment, it can be said that the pedestrian paths that are in the

Karebosi field cover, are classified as not meeting the standards recommended by the government regarding the law on providing facilities and infrastructure for pedestrians. This can be seen in the field survey documentation that was carried out during data analysis through the interview method and measurements of the physical condition of the area.



Figure 2. Characteristic data of segment A pedestrian path (Kartini Street)
(Source: Researcher analysis, 2022)

Table 2. The existing situation of pedestrian paths in segment A

No.	Situation Analysis
1	The existence of the pedestrian path is used as a parking area for motorists who have an interest in managing a true drive SIM, so that the pedestrian path becomes functional
2	The type of material used on the pedestrian path, still uses low quality paving blocks, so that the surface condition of the pedestrian path looks damaged, has holes and there is a decrease in the surface (landslide)
3	The height of the sidewalk surface is good enough, but there are still a number of two-wheeled vehicles that use the area as a vehicle parking area so that the risk of pavement damage will occur quickly
4	Placement of billboards and guard posts at the intersection of pedestrian paths, becomes a barrier for pedestrians to walk along the pedestrian path, so that pedestrian comfort and safety are disturbed
	 Pedestrian path
	 Path for two-wheeled and four-wheeled vehicles

b) Segment B

Kajaolalido Street is an education and office service center area with a pedestrian path length of about 330 meters, which has 1 (one) lane for two-wheeled and four-wheeled vehicles and is not served by public transportation. The existing condition of the pedestrian path consists of several variables, including comfort (sidewalk width, footing height, material), security (street vendor, markings, signs), accessibility, connectivity (continuity), street furniture (trash cans, lighting, benches), eco-friendly (heat and weather, green belt, reading board):

Table 3. Assessment of respondents and researchers

No.	Variable	Respondents	Researches	Description
1.	Convenience	2	2	Same
2.	Security	2	2	Same
3.	Accessibility	2	2	Same
4.	Connectivity	2	1	Different
5.	Street furniture	2	2	Same
6.	Environmentally friendly	2	2	Same



Score: (4) Comfortable, (3) Comfortable enough, (2) Less comfortable, (1) Uncomfortable

From the table, the perceptions of respondents and researchers as a whole have almost the same thing in assessing the pedestrian paths around the karebosi field envelope. This can be seen in Figure 6, which has been reviewed from various aspects and the existing conditions of the pedestrian paths in segment B.



Figure 3. Characteristic data of segment B pedestrian path (Kajaolalido Street)
(Source: Researcher analysis, 2022)

Table 4. The existing situation of pedestrian paths in segment B

No.	Situation Analysis
1	There is a PLN substation pole which is positioned right in the middle of the lane, so that pedestrians feel disturbed and avoid the risk of current voltage at the substation which will affect pedestrians
2	Along the pedestrian path in segment B, the width of the sidewalk is not balanced, some dimensions are 1 - 1.5 meters and some are even 2 meters and are used as four-wheeled parking areas so that pedestrians feel disturbed by the presence of several forms of barriers around the lane pedestrian
3	There is a 60 cm high dividing wall in the middle of the segment B pedestrian path, so it is enough to disturb the comfort and safety of pedestrians who want to cross that lane
4	On some of the karebosi dividing walls with pedestrian paths, there are walls that are littered with graffiti or pictures that are not good and not educational in nature, so that the view of pedestrians is disturbed by the various types of narrative images that exist
	 Pedestrian path
	 Path for two-wheeled and four-wheeled vehicles

c) Segment C

The pedestrian path along Achmad Yani Street has quite risky characteristics in terms of being unsafe. The crossing distance between the adjacent pedestrian paths is quite far and does not have a cross-section as a crossing path. The sidewalk surface is quite high from the road body of about 50-60 cm, so it seems far from feeling safe. The dimensions of the sidewalks are also quite diverse, around 70-150 cm, which will interfere with the comfort of pedestrians who will cross the pedestrian path. Achmad Yani street is a congested, one-way lane, traversed by two-wheeled and four-wheeled vehicles and public transportation.

Table 5. Assessment of respondents and researchers

No.	Variable	Respondents	Researches	Description
1.	Convenience	1	1	Same
2.	Security	1	1	Same
3.	Accessibility	2	2	Same
4.	Connectivity	1	1	Same
5.	Street furniture	2	2	Same
6.	Environmentally friendly	1	1	Same



Score: (4) Comfortable, (3) Comfortable enough, (2) Less comfortable, (1) Uncomfortable

Respondents' and researchers' perceptions have similarities in various assessments of several variables found in the pedestrian path. This condition can be seen from various points of view documented by researchers.



Figure 4. Characteristic data of segment C pedestrian path (Achmad Yani Street)
(Source: Researcher analysis, 2022)

Table 6. Assessment of respondents and researchers in segment C

No.	Situation Analysis
1	The intersection of the pedestrian paths of Achmad Yani Street and Kajaolalido Street is not continuous. One of the meetings experienced a narrowing of about 60 cm, making it unfit for pedestrians to pass. The BRC fence that is on the lane takes the body of the lane as a garden which functions as an aesthetic property
2	The height of the sidewalk surface along the Achmad Yani pedestrian path has a height of around 50-60 cm, so it is very risky for pedestrians. The pavement surface material is quite slippery and unfriendly, because it uses slippery tiles and there is no provision for people with disabilities
3	Every corner where the pedestrian path meets, all of them experience narrowing, and it is quite disturbing for pedestrians because several street furniture is placed at the corners of the pedestrian path, so that the pedestrian path does not seem to create connectivity between one lane and another
	 Pedestrian path  Path for two-wheeled and four-wheeled vehicles

d) Segment D

The pedestrian path along Jenderal Soedirman Street is fairly congested, with both pedestrians and vehicle lanes that are traversed in two directions or two lanes. The Soedirman street area has characteristics as an office and education area, so the existence of pedestrian paths in the area is really needed by the community as a mobility area to walk while waiting for public transportation to cross several sectors. If viewed from several observations of researchers regarding the condition of the pedestrian path, the condition is quite apprehensive because the community's need for the completeness of various street furniture ornaments on that route does not meet the eligibility standards set out by the Minister of Public Works regulation No. 3 of 2014. The condition of the pedestrian path on Jenderal Sudirman street can be seen from the survey results, including:

Table 7. Assessment of respondents and researchers



No.	Variable	Respondents	Researches	Description
1.	Convenience	2	2	Same
2.	Security	2	2	Same
3.	Accessibility	3	3	Same
4.	Connectivity	2	1	Different
5.	Street furniture	3	3	Same
6.	Environmentally friendly	3	2	Different

Score: (4) Comfortable, (3) Comfortable enough, (2) Less comfortable, (1) Uncomfortable



Figure 5. Characteristic data of segment D pedestrian path (Jenderal Sudirman Street)
(Source: Researcher analysis, 2022)

Table 8. The situation of existing pedestrian paths in segment D

No.	Situation Analysis
1	<p>The junction of the two pedestrian lanes between Kartini street and Jend Soedirman street, is filled with several ornaments that are quite disturbing to pedestrians around the area such as the PLN substation, telephone poles, guard posts, and several lane dividing poles that are not properly managed. Of course the scenery. disturbing the view, especially the position of the line is at the main corridor crossroads</p>
2	<p>Some of the paths use a variety of materials, and the quality of the paving is not up to standard, and the conditions are starting to get damaged and have holes. While the quality of the paving is quite good, there is no special pathway for disabilities. Public awareness to maintain the completeness of the property provided is still poorly understood. So the importance of socialization about environmental insight</p>
3	<p>Along the way there are no stops, the surrounding area is widely used as a place to wait for public transportation. Some pedestrians still use the road as a place to wait for public transportation, and there are two-wheeled and four-wheeled vehicles used as temporary parking areas to pick up school children</p>
	<p> Pedestrian path  Path for two-wheeled and four-wheeled vehicles</p>

Based on the researcher’s analysis, the pedestrian paths in each segment have several situation characteristics that are almost the same in several assessments, both from respondents and researchers. But what stands out the most from the results of this assessment is about connectivity and comfort. So the researchers assume that the currently-used pedestrian path is not included in the LOS (Level Of Service) standard.

DISCUSSION

The characteristics of pedestrian paths in several segments, both researchers and respondents, on average give an assessment that could be more comfortable and comfortable. The inconvenient aspects are in the following parts:

1. Physical Characteristics

- a. The use of space for walking on pedestrian paths, used as a parking area, placement of guard posts, temporary offices, street vendors, and several user facilities for the Karebosi area, which

use as parks, permanent advertisements and PLN substation poles at several points, which of course will affect pedestrian comfort.

- b. The dimensions of the lanes on the pedestrian path do not comply with the Indonesian National Standard (SNI) which has been stipulated in (the Ministry of Public Works and Housing 2014) Regulation of the Minister of Public Works No. 3 of 2014 concerning guidelines for planning, providing, and utilizing pedestrian network infrastructure and facilities in urban areas, the characteristics of pedestrian paths or pedestrians which are taken into consideration in developing urban areas.
- c. The type of material used, most of them are low-quality, so that the surface of the path used for walking suffers much damage and seems to disturb the comfort of pedestrians.

2. Characteristics of behavior

Pedestrian behavior causes more space for pedestrians. The behavior referred to includes pedestrians carrying baby trolleys, shopping baskets for women, or the habit of walking together while talking in the pedestrian path and the habit of making shopping transactions to hawkers who walk along and trading along the pedestrian path, of course, will require additional pedestrian lane width.

3. Environmental Characteristics

In environmental characteristics, there are several roles in the service level of pedestrian network infrastructure and facilities which form the basis for the design criteria for pedestrian network infrastructure and facilities, namely (Riadi 2020):

- a. Conveniences, such as the availability of weather protection and public transport stops.
- b. Enjoyment, such as the ability to walk and the availability of signs.
- c. Safety, such as pedestrian safety with vehicular traffic.
- d. Security, such as the availability of traffic lights, assurance of an unobstructed view when crossing, not slippery, and suitability of the amount of space for pedestrians with environmental conditions.
- e. Economics, such as pedestrian cost efficiency associated with travel delays and inconvenience.

- f. Linkages between activities and other modes of transportation and types of land use or activities.

Of the several characteristics that affect pedestrian paths, it is deemed necessary to review further the paths in the area, especially the use of the paths around the karebosi field. Conducting studies in the form of adjusting the eligibility standards set by the government or redesigning them based on standard guideline criteria from several existing literature sources. Utilization of pedestrian paths, of course, requires some in-depth analysis and studies, both from stakeholders and the community in general.

The alignment of education-based parks, which support pedestrian paths, will provide added value to create sustainable pedestrian paths. The research location is a public area, also known as a green zone, so the potential for adding parks integrated with pedestrian paths will enable the realization of the Green City Development Program (P2KH).

From the results and discussion, the researcher considers it necessary to provide general concept directions regarding the characteristics of environmentally sound pedestrian paths in the integrated business center area, including:

1. Make the area's pedestrian paths more effective as comfortable and good paths, through increasing the width, especially in segments C and D, by taking several parts of the park body on these paths.
2. The need to pay attention to physical standardization related to continuity, especially placing several ornaments at every corner where the two lines meet.
3. Surface height on the pedestrian path, the road surface is made with a height difference that is not too high and adjusted between ramps and intersections. This standard can be seen in the guidelines for procuring pedestrian space facilities.
4. To obtain the expected characteristics, it is necessary to pay attention to various supporting elements, especially the placement of various street furniture so that it is adjusted to the region's needs.
5. Adding other elements can support the comfort level of pedestrian paths in the area, namely the provision of bus stops, especially in segment D.
6. Structuring the area by providing facilities and parking arrangements needs special attention by prioritizing aspects of pedestrian comfort, especially on the paths in segment C.

7. Surface materials that need to be considered in the provision of paths for pedestrians are surface materials that should use concrete paving or rough or non-slippery textured materials so pedestrians do not fall or slip easily.

The realization of P2KH through the concept of environmentally sound pedestrian paths emerged and developed with deep attention to ecological aspects in development. The concept of sustainability is one of the embodiments of the concept of an environmentally sound city so the implementation of the P2KH embodiment at research sites has the potential to be applied.

CONCLUSION

The characteristics of pedestrian paths in several segments are experiencing a change of function, especially connectivity problems. Using pedestrian paths as parking areas and commercial spaces (non-permanent offices) will disrupt the comfort, security, and safety of pedestrian path users. The use of materials in each segment should use the quality recommended in the guidelines for providing public area infrastructure facilities and infrastructure.

Improving the quality of service by adding inadequate supporting facilities, especially adding the width of the dimensions of pedestrian paths and supporting facilities such as street furniture and several factors that hinder pedestrians, of course, realignment is needed, and in-depth studies are needed to meet the needs of safe pedestrians, comfortable by adjusting the standard Level Of Service (LOS).

The embodiment of the pedestrian path with an environmentally sound concept, of course, requires the attention of several stakeholders and the level of community participation in maintaining and properly utilizing the pedestrian path. Optimization of green zones in the application of environmental awareness education will help pedestrians about the importance of sustaining effective and sustainable pedestrian paths.

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