ifin_2020_IOP_Conf._Ser.__Earth_Environ._Sci._419_012107.pdf

by

Submission date: 09-May-2021 08:40AM (UTC+0700)
Submission ID: 1581550116
File name: ifin_2020_IOP_Conf._Ser.__Earth_Environ._Sci._419_012107.pdf (1.87M)
Word count: 2664
Character count: 14601

IOP Conference Series: Earth and Environmental Science

Walkability index of real estate housing in Makassar

Walkability index of real estate housing in Makassar

M Arifin[1], A R Rasyid[1], and W W Osman[1]

[1]Urban and Regional Planning, Engineering Faculty, Hasanuddin University, Indonesia

E-mail: mimiarifin@unhas.ac.id

Abstract. Makassar is considered a metropolitan city with about 1.469.601 residents. Therefore, there is a need to upgrade quality, especially the basic needs. The desire to make the city world-class should be a motivating factor towards quality improvement. Walkability Index (WI) is used as an indicator for implementing sustainable development of infrastructure in the era of industrial revolution 4.0. This is the reason why the study about the walkability index of Real Estate housing in Makassar was important to be conducted. To be a livable city, Makassar needs to have pedestrian infrastructure bolstering the mobility of its citizens. This study, therefore, was meant to determine the extent of Real Estate housing in Makassar as supported by pedestrian pathways and Walkability Index. Both Quantitative and qualitative methods with spatial analysis and Walkability Index were used. The result showed that only 9 (3%) out of 272 housing had pedestrians while 97 % had no pedestrian. From 9 housing, 5 were considered very good housing, 2 quite good, and 2 worst. The walkability Index had an average score of 54.55, indicating it was good for pedestrians.

1. Introduction

Makassar was projected to be a world-class city through its vision stated by the Mayor in 2014. Its international quality would be improved significantly. Its mission involved building bike paths, pedestrian pathways, and corridors. Today, its central area, especially the old pedestrian city in the shopping center and heritage area, has been revitalized. However, an ideal city should have pedestrian infrastructures connecting one area to another. Real Estate housing in Makassar has developed well, though the availability of pedestrian pathways does not support it. The developers tend to ignore the surrounding, such as the entry and exit way, pedestrian pathways (connecting to the outside passageways). It is important for an ideal housing to have infrastructure such as pedestrian pathways for residents to feel comfortable. European, Japanese, Australian, and American Housing prioritize the human aspect. The developers and the government always facilitate citizens by providing good paths. Usually, the right and left sides of the paths are covered by grass. There are usually big trees and fresh air along the road, which refreshes individuals as they walk. Additionally, the sidewalk is often well maintained.

The walkability index (WI) is one of the indicators used in measuring the implementation of sustainable development of infrastructure. Sustainable development has been the latest issue of industrial revolution 4.0 [1]. For this reason, the Walkability Index (WI) of *Real Estate* Housing in Makassar needs to be conducted. The problem questions for the study include the following questions:

the percentage of real estate housing with pedestrian pathways in Makassar and the walkability index (WI) score of the *Real Estate* Housing in Makassar.

2. Research methodology

2.1 Analysis method

Descriptive quantitative and qualitative analyses were used to identifying factors affecting the Walkability rate among pedestrians' pathways. The methods were also used to identify characteristic and Walkability Index (WI) score among pedestrians.

2.2 Literature review

Walkability is a term used to depict and measure of connectivity and quality of footpaths, and pathways in cities. It is determined through a comprehensive measurement of available infrastructure used by pedestrian and study connecting supply and demand [2]. To create walkable pedestrian pathways, accessibility, safety and convenience aspects for users should be put into consideration.

Global Walkability Index (GWI) gave qualitative analysis on pedestrian path conditions, including security, safety, and convenience for the users [3]. This analysis also gives information about Asia which grows much better in this regard. The parameter and description of Global Walkability Index Measurement are shown in the table 1.

Table 1. Global walkability index measurement

No	Parameter	Description
1	Walking Path Modal Conflict	The Extent of conflict between pedestrians and other modes, such as bicycles, motorcycles, and cars on the road
2	Walking path availability	The availability of pedestrian paths
3	Crossing availability	Include zebra cross, bridge, etc.
4	Grade Crossing Safety	Pedestrians cross the road using some facilities
5	Motorist Behavior	Motorists have a good attitude towards pedestrians, showing them respect as they cross the road.
6	Amenities	The availability of amenities such as trash bin, benches and shade
7	Infrastructure for disabled people	The availability of infrastructure for disabled people
8	Obstruction	The absence of obstruction on the pedestrian pathways such as a street seller, parking area, and any other obstruction
9	Security form Criminal	The general feeling of security.

3. Finding and discussion

3.1 Amount of real estate housing having pedestrian pathways in Makassar

Pedestrian pathways were built by developers in Makassar to make the foot-travelers feel comfortable. In some locations, there were pedestrian pathways on the road [4]. The availability of these pathways in the study area was limited and did not meet the standard set by the regulation of public work minister No. 03 the year 2014 on guidelines for planning, service provided and utilization, facilities and infrastructure of pedestrians in the city areas expected to have good infrastructure. The pathways in real estate housing is shown in figure 1.

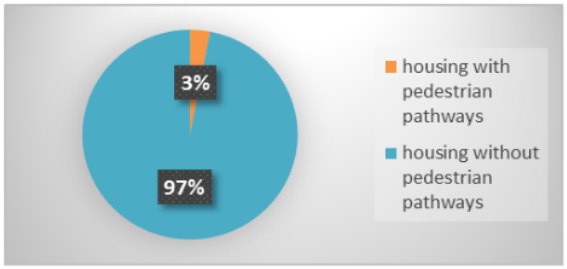

Figure 1. Pedestrian pathways in *Real Estate* Housing

The results showed that only 9 (3%) out of 272 housing had pedestrian pathways, 97% lacked. Moreover, the availability of pathways was limited. The middle-up housing such as Angin Mammiri, Makassar Metropolitan, Danau Biru Villa, Elysium, Green Mansion and Pavillion dominated the percentage [5]. Figure 2 shows the map of Real Estate Housing in Makassar with pedestrian pathways.

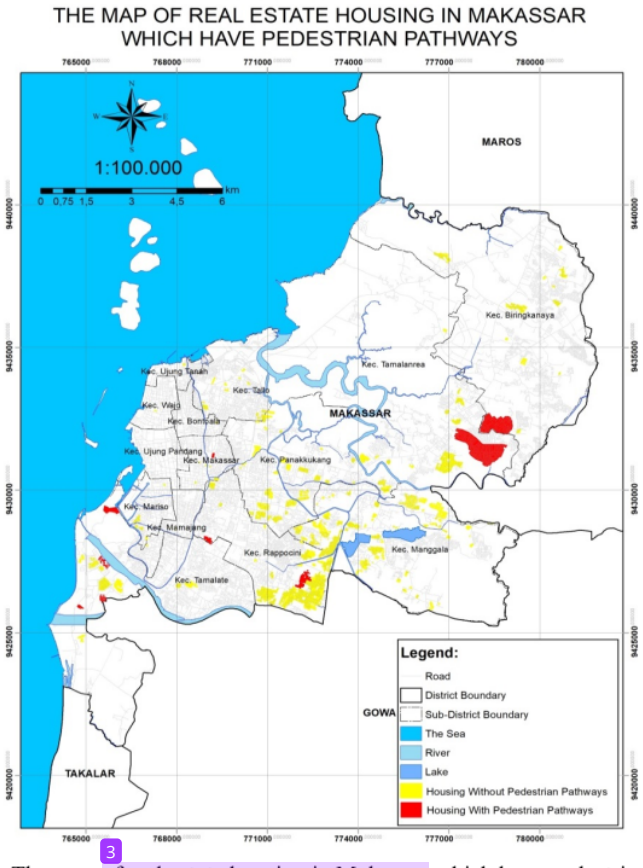

Figure 2. The map of real estate housing in Makassar which have pedestrian pathways

The development of Real Estate in Tanjung Bunga seemed promising, necessitating the need to consider the reasons it was becoming a strategic housing area. Mall Phinisi Point, Pantai Area improvement, culinary center, and other facilities have significantly developed. However, GMTD did not develop as expected, lacking pedestrian pathways in some places. The pathways were only available in some area, such as in front of Trans Makassar Mall and near Cheng Ho Mosque. Nevertheless, their width did not meet the required standards. Besides, there was no pedestrian pathway in places such as trading areas, offices, CCC, The Rinra Hotel, Gammara Hotel, Upper Hills, Siloam Hospital, and in some sections of the main road (Metro Tanjung Bunga Street).

3.2 The characteristics of pedestrian pathways of real estate housing in Makassar

Angin Mammiri Housing had a well-maintained pedestrian pathway. Its width reached 1,5 m. There was no conflict between pedestrians and other transportation users. Furthermore, there were also no obstructions. It was difficult to find any danger in this area due to the low-speed level and the presence of signs to control the speed. Additional amenities include well maintained big trees, lighting, trash bin, gazebo, median and road sign. However, there was no marking road and ramp for disabled people. Alfamart and park were the reason people chose to walk.	
Makassar Metropolitan Housing had maintained pedestrian pathways. The road was a rough road with holes of 1.5 meter. There was also no obstruction in this area. There was no danger due to the low-speed level and supported by signs to control the speed. Additional amenities include well maintained big trees, lighting, trash bin, median, and road sign. However, there was no marking road or ramp for disabled people.	
Elysium housing was characterized by good quality pedestrian ways with a width of 1 m. There was also no obstruction in this area. It was difficult to find any danger since had low-speed level limits and as well as road signs to control the speed. Additional amenities include well maintained big trees, lighting, benches, trash bin, median, and road sign. However, there was no sign marking or ramp for disabled people.	
Bumi Tamalanrea housing had poor pedestrian pathways. The pathways were used as a parking lot for motorcycles and cars, street vendor, and stakes blocking out the pedestrians. The pathways were only available in some parts of the main road. Additional amenities provided were plants/big trees, lighting, and trash bin, with no marking or ramps.	
Samalona Housing had 2 meter-pedestrian pathways. However, they were not well-maintained and had many rough road and holes, unconnected pathways, trees that limited the road space, making pedestrians uncomfortable. There was also no obstruction in this area. There was no danger in this area due to low-speed level limits with signs to control speed. Additional amenities include well maintained big trees, lighting, and trash bin. However, there was no	

sign marking or ramps for disabled people.	
Villa Danau Biru Housing had pedestrian pathways with a width of 3 meters. They were not well maintained with many rough roads, unconnected pathways, and trees that limited the road space, making pedestrians uncomfortable. There was also no obstruction in this area. It was difficult to find any danger due to the low-speed level and signs to help control speed. Other amenities included well-maintained plants/big trees, lighting, and trash bin. However, there was no sign marking or ramps for disabled people.	
Green Mansion Housing had well-maintained pedestrian pathways with a width of 1.5 meters and had no obstructions. There was no danger due to the low-speed level supported by signs. Additional amenities included well-maintained plants/big trees and lighting. However, there was no sign marking or ramps for disabled people.	
Telkomas Housing had poor pedestrian pathways with many street vendors. Unconnected pathways and street vendors were the sources of the problems. There were only a few pedestrian pathways along the main road. Additional amenities include plants/big trees and lighting. However, there was no marking or ramps for disabled people.	
Pavilion housing had well-maintained pedestrian pathways with a width of 2, 4 meter in the entrance and 1.2 meters in the inside. There was also no obstruction or any danger. Additional amenities included well-maintained big trees, lighting, benches, trash bin, and road sign. However, there was no marking or ramps for disabled people.	

Two analysis of particular roads were used to determine the Walkability Index score, first by measuring the aspects related to pedestrian pathways based on criteria index and second by using questionnaire made for authorized institutes [6]. The location of the study was divided into segments and the measurement of index criteria was based on a questionnaire result (Likert scale). In this stage, the answers from respondents were categorized into three: Worst, Quite Good, and Very Good. The data were processed and analyzed to develop a Walkability Index. The score was converted in a range 0-100 and an approach was used in grouping the Index Walkability into three categories.

- Green category, score >70, highly walkable
- Yellow category, score 50-70, good enough for a walk
- Red category, score < 50, not walkable

These scores could depict the Walkability Index of *Real Estate* Housing

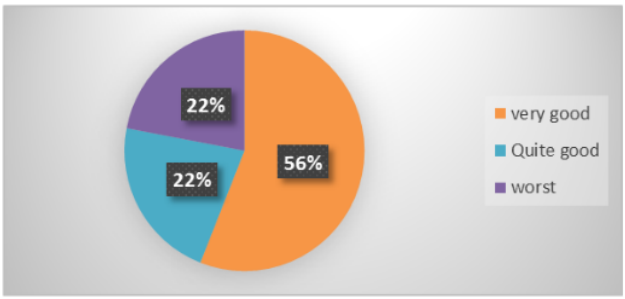

Figure 3. Walkability index rating

From figure 3, it is evident that 3 out of 9 housing units were had pedestrian pathways. Then56% was categorized as very good, 22 % quite good, and 22 % worst. Table 3 showed *Real Estate* Housing with pedestrian pathways have a walkability index average of 45.55 (walkable), though it might be upgraded. Bumi Tamalanrea and Telkomas housing showed the lowest rate of walkability index (30). This is because the pedestrian pathways were poorly maintained, with the presence of street vendors and parking lots [7,8]. However, the highest walkability index was from Angin Mammiri, Elysium, and pavilion housing (75-90), which were all well maintained and supported by various facilities for street vendors. The results of the walkability index of each parameter shown in figure 4.

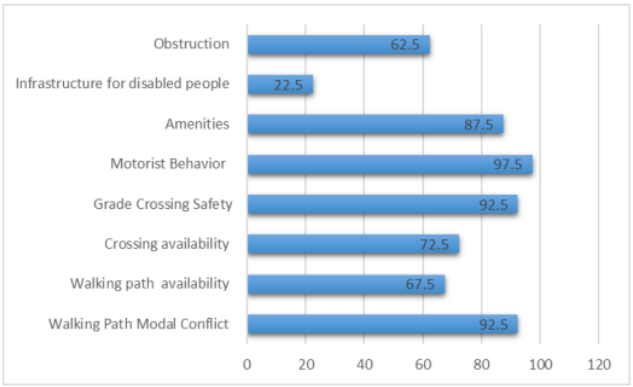

Figure 4. The results of the walkability of each parameter

According to its parameters in figure 4, the highest score as much 97.5 is from motorist behavior due to low-speed levels in the area. There were also road signs which helped a motorist in controlling their drive. This was a hint that the areas have the potential to be walkable. Infrastructures for disabled people had the lowest score as much 67.5. There were no markings or ramps in all housing. The availability of amenities would increase the inconveniences and interest to walk, especially for disabled people. The law requires an audit to be conducted in order to guarantee the availability of infrastructure. These were the minority often neglected by government and developers and therefore their accessibility should be guaranteed. This includes the right to access public facilities and appropriate accommodation. As government work on completing the infrastructure it should also

ensure accessibility for disabled people by providing pathways. People will be very comfortable in case developers complete the additional amenities connected to pedestrian and meet the set standards.

4. Conclusion

Based on the finding and discussion, this study concludes that there was only 3 %, 9 out of 272, Real Estate Housing equipped with pedestrian pathways. This shows insufficiency in pathways which were dominated by middle-up housing such as Angin Mammiri, Makassar Metropolitan, Villa Danau Biru, Elysium, Green Mansion, and Pavillion housing. From 9 housing, 56% were considered very good housing, 22% quite good, and the other 22% were worst. The average Walkability Index was 54.55. The lowest, 30, was Bumi Tamalanrea Permai and Telkomas Housing while Angin Mammiri, Elysium, and Pavilion Housing had highest (75-90).

References

[1] Department of Sport and Recreation, Government of Western Australia 200. *A Walking Strategy for Western Australia*
[2] Leather, James, Herbert F, Sudhir G, A Mejia 2011. *Walkability and Pedestrian Facilities in Asian Cities State and Issues*. Manila: ADB.
[3] Krambeck, Holly dan Shah J 2006. *The Global WalkabilityIndex: Talk the Walk and Walk the Talk*. Washington D.C.: World Bank
[4] Geronimo S W 2014 *Pendekatan Konsep Walkability pada Kawasan Pasar Kebayoran Lama Jakarta*. Jakarta : Universitas Bina Nusantara.
[5] G Sudhir. 2011. *Walkability Survey In Asian Cities*, Clean Air Initiative for Asian Cities (CAI-Asia) Center. Ortigas Center, Philippines: ADB.
[6] Forsyth, Ann and Southworth, M 2008 'Cities Afoot -Pedestrians, Walkability and Urban Design', *J. Urban Design.* **5** (12) 276 – 300
[7] Kementerian Pekerjaan Umum. 2011. *Program Pengembangan Kota Hijau (P2KH): Panduan Pelaksanaan.* Jakarta: Ditjen Penataan Ruang. Ikatan Ahli Perencanaan Indonesia (IAPI). 2009. *Indonesia*
[8] Peraturan Menteri Pekerjaan Umum No.3. 2014. *Pedoman Perencanaan, Penyediaan, dan Pemanfaatan Prasarana dan Sarana Jaringan Pejalan Kaki di Kawasan Perkotaan.*

ifin_2020_IOP_Conf._Ser.__Earth_Environ._Sci._419_012107.p...

ORIGINALITY REPORT

9%	%	9%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	R Safitri, R Amelia. "Evaluation of pedestrian facilities to improve the pedestrian environment in The Central Market of Pangkalpinang", IOP Conference Series: Earth and Environmental Science, 2019 Publication	3%
2	Sri Utami Azis, Kartika Eka Sari, Hanita Nirvana. "Mapping of potential green city attributes in Batu District, Batu City", IOP Conference Series: Earth and Environmental Science, 2019 Publication	2%
3	Dwiky Erlangga, Dewi Handayani, Syafi'i. "Analysis of Walkability Index and Handling of Pedestrian Facilities of Slamet Riyadi Street, Surakarta", Journal of Physics: Conference Series, 2021 Publication	1%
4	Mallikarjun Patil, Bandhan Bandhu Majumdar, Prasanta K. Sahu. "Evaluating Pedestrian Crash-Prone Locations to Formulate Policy	1%

Interventions for Improved Safety and Walkability at Sidewalks and Crosswalks", Transportation Research Record: Journal of the Transportation Research Board, 2021
Publication

---

5 M Ohashi, G Oomi, H Sakurai. "Effect of pressure on the giant magnetoresistance of Fe/Tb multilayer", Journal of Physics: Conference Series, 2006 — 1%
Publication

---

6 I Vaníček, D Jirásko, M Vaníček. "Role of Geotechnical Engineering in BIM process modelling", IOP Conference Series: Earth and Environmental Science, 2021 — <1%
Publication

---

7 A O Bielinskyi, I Khvostina, A Mamanazarov, A Matviychuk, S Semerikov, O Serdyuk, V Solovieva, V N Soloviev. "Predictors of oil shocks. Econophysical approach in environmental science", IOP Conference Series: Earth and Environmental Science, 2021 — <1%
Publication

---

8 J G I Cypriano, L F Pinto, L C Machado, L C P da Silva, L S Ferreira. "Energy management methodology for energy sustainable actions in University of Campinas - Brazil", IOP Conference Series: Earth and Environmental Science, 2019 — <1%
Publication

Exclude quotes	On	Exclude matches	< 5 words
Exclude bibliography	On		