

THE EFFECTIVENESS OF THE PEDESTRIAN PATH AND RAMP ON JL. IMAM BONJOL CORRIDOR SEMARANG

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Abstract.

Pedestrian paths and ramps are public facilities that are used by pedestrians and people with disabilities in accessing a place, moving from one place to another, connecting to a destination or carrying out other activities in urban space. Provision of pedestrian paths and ramps must be accessible, effective, and keep activities in urban spaces running well. One of the pedestrian and ramp lanes in Jl. Imam Bonjol corridor Semarang is interesting to study in which the existence of pedestrian paths and ramps can be said is still limited to providing public facilities without regard to quality, continuity of function of facilities and respect for users, both pedestrians and people with disabilities. However, the condition of the pedestrian paths and ramps in Jl. Imam Bonjol corridor is good enough, but there are some significant things that can hinder the user's circulation. Several sections of pedestrian paths and ramps are used as parking lots for vehicles, rickshaws and cars. The guiding line for the blind is cut off in several places and sometimes even leads to an open exhaust channel. In some sections it turns out to be difficult for the disabled to use it. This fact is very unfortunate because pedestrians and people with disabilities have the same rights in the use of pedestrian paths and ramps. This study aims to provide design solutions to the problem of designing pedestrian paths and ramps on Imam Bonjol Semarang street corridor to connect urban activity centers so as to provide an ease and convenience access and improve the quality of urban space. A qualitative descriptive method is used in this research, namely by describing the problem to be studied in more depth in order to find solutions and develop the findings of previous studies.

Keyword: *Pedestrian path, ramp, Jl. Imam Bonjol*

INTRODUCTION

The importance of pedestrian paths and ramps makes the government try to provide convenience and complete facilities on pedestrian paths for both pedestrians and people with disabilities. These facilities are in the form of pedestrian paths, guideways for the blind, ramps, benches, lighting, trash cans, bollards and aesthetic plants and shade trees to provide comfort for its users. By facilitating the community in using pedestrian paths, it is hoped that activities in urban spaces can run well and increase the vitality of urban spaces.

A humane urban environment is an urban environment that is friendly to pedestrians, and has dimensions based on a human scale. These efforts can be carried out through the development of pedestrian areas and the provision of adequate pedestrian facilities in urban areas, especially in the downtown area. This is an effort to create an urban environment that is in accordance with the characteristics and demands of pedestrian needs so that the city center remains humane, attractive for city residents to come, live, work, and carry out other activities in order to meet their physical and spiritual needs (PUPR, 2018).

Pedestrian paths and ramps are public facilities that are used by pedestrians and persons with disabilities in accessing a place, moving from one place to another, connecting to a destination or carrying out other activities in urban space. Pedestrian paths and ramps have an important role in supporting smoothness, comfort and security for the community in their activities in urban spaces and the creation of harmonious and accessible urban space activities for all levels of society.

Thus, the provision of pedestrian paths and ramps must be accessible so that activities in urban spaces can run well. One of the pedestrian and ramp lanes in the corridor of Jl. Imam Bonjol Semarang is interesting to study where the existence of pedestrian paths and ramps can be said to be limited to providing public facilities without regard to quality, continuity of function of facilities and respect for their users, both pedestrians and people with disabilities.

The condition of the pedestrian paths and ramps in Jl. Imam Bonjol corridor is good enough and equipped with supporting facilities along the pedestrian path, but there are several significant things that can hamper pedestrian circulation. Several parts of the pedestrian corridors and ramps are used as parking lots for motorbikes, rickshaws and cars, and the guideways are designed to be crooked so that they are ineffective, difficult and inhumane for the blind. The guiding line for the blind is cut off in several places. At the zebra crossing there are obstacles in the form of advertising poles and bollards as well as other problems.

Based on this, these pedestrian paths have not functioned as effectively as they should be, because the disable cannot hamper those facilities along the pedestrian paths comfortably and safely. This is so unfortunate because people with normal physical conditions and persons with disabilities have the same rights in utilizing urban open spaces.

MATERIAL AND METHODS

This research is a qualitative research conducted by direct observation of pedestrian paths and ramps along Jl. Imam Bonjol Semarang. The method used is descriptive qualitative to collect actual information and describe the phenomena which occurs, identify problems and evaluate them. The method chosen is based on the objectives and benefits of the research, namely providing design solutions to the problem of designing pedestrian paths and ramps on Imam Bonjol Semarang street corridor so that urban activities can be well connected, provide easy and comfortable access for pedestrians and people with disabilities thus improve the quality of urban space. This method is focused on observation to describe facts in the field or certain characteristics that occur in the research object. Primary data collection was carried out directly at the study location, while secondary data was obtained from previous research literature and journals as well as maps.

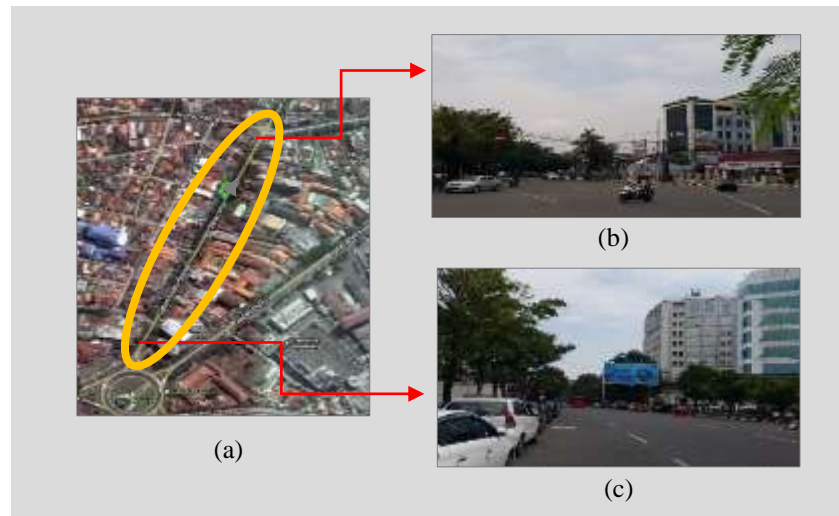


FIGURE 1. (a) Corridor research location Jl. Imam Bonjol Semarang. (b) Corridor Jl. Imam Bonjol – Semarang north side. (c) Jl. Imam Bonjol Corridor -Semarang south side.

Jl. Imam Bonjol which became the object of research was chosen because it has several problems on pedestrian paths. The selection of research objects is only at the road section from the Tugu Muda (on the south side) to the intersection of Jl. Piere Tendean (North side corridor). This research object is included in the Central Semarang District area. This road corridor has the status of a city road which is a one-way street with a road width of 10 meters.

Theory/Calculation

The pedestrian path on the left side of the corridor has a width of 2.25 meters and the right side of the corridor is 1.50 meters wide. The pedestrian path on the left side of the corridor is used more by the public because the left side consists of a type of public facility building with a high activity level, while the right corridor has a low activity level.

Observations were made on the location of Jl. Imam Bonjol, namely observing the activities of pedestrian and ramp users, position and condition of pedestrians and ramps, facilities on pedestrians and ramps. Observations on pedestrian and ramp users whose activities were focused on research objectives and were carried out since arriving, using pedestrians and ramps, and leaving the research location. The things that become the focus of observation consist of: 1) types of activities carried out by pedestrian and ramp users; 2) Observation of existing physical facilities along the Jl. Imam Bonjol is focused on its pedestrian and ramp. Observations were continued with interviews to find out their reasons for using the pedestrian and ramp and the effectiveness of these public facilities. The next step is to classify the data to step on the data analysis stage.

After analyzing and obtaining provisional findings, the interim research findings are dialogued with supporting theories. The research procedure in this study is a research design to obtain data and analyze data in accordance with the objectives and benefits of research to answer research problems. Based on the results of data processing, analysis and literature review, the results of the research that has been conducted can be identified.

Pedestrian Path

The term pedestrian comes from the Latin, *pedestress* which means people who walk (Darmawan, 2004). Pedestrians are pedestrian paths that are generally parallel to the axis of the road and higher than the surface of the pavement to ensure the safety of the pedestrians concerned. Current pedestrian paths can be in the form of sidewalks, pavements, sidewalks, pathways, plazas and malls. A good pedestrian path must be able to accommodate every pedestrian activity smoothly and safely. A good pedestrian system will reduce dependence on motorized vehicles in the city center, increase visitors to the city center, improve or promote human-scale systems, create more business activities, and also help to improve air quality (Riadi, 2020). According to the Ministry of Public Works (1999) that

pedestrian paths or pedestrian paths are paths intended for pedestrians or those in wheelchairs or people with disabilities, the elderly (elderly), and the blind, which are designed based on minimum space requirements to move safely, free and unhindered.

Ramp (Connection Line)

Ramp usually acts as a connecting lane from the main road to the pedestrian path or vice versa. According to the Ministry of Public Works (1999), a ramp is a path that has a certain slope or is horizontal which is located on a section/road that is planned for both vehicle traffic and for pedestrians. The width of the ramp must be considered so that it can be used optimally by both pedestrians and persons with disabilities. The ramp on the roadway also functions as a freight transport service so that the ramp design must meet the requirements for accessibility infrastructure on public roads in accordance with the provisions of the Ministry of Public Works (1999) so that it can make it easier for its users. According to the Department of Public Works, several things are taken into consideration in designing ramps, including: criteria for basic dimensions of space, criteria for slope and safety criteria.

Pedestrians and People with Disabilities

Pedestrians and persons with disabilities who carry out mobility in urban spaces, especially in road corridors or pedestrians, are users of road corridors who have the same rights in in term of using road corridors. Based on RI Law No. 8 of 2016, the right to accessibility for persons with disabilities is one of the rights in the use of public spaces/facilities, and to service like other normal people. Thus both of them have optimal accessibility infrastructure services on public roads to support the creation of an urban environment that is friendly to pedestrians and people with disabilities.

Pedestrians are one of the modes of transportation whose movement is natural (natural mobility). As a mode of transportation, pedestrians also have several characteristics as do other modes of transportation (Pradipto, 2014). Pedestrian paths are public facilities that are used by pedestrians to move from one place to another (Uak, 2020). Based on the decision of the Director General of Highways No.074/KPTS/Db/1999 dated December 7, 1999, a pedestrian path is a path intended for pedestrians or those in wheelchairs as well as for the disabled, the elderly (elderly) and the blind, designed based on minimum space requirement to move safely, freely and unhindered.

From the above definitions, it can be concluded that the pedestrian path is a path for the movement of pedestrians and people with disabilities which is very important to note, both in terms of function, space requirements, patterns of movement from one place to another and technical planning requirements. Meanwhile, according to the Public Works Department of Highways (1999), persons with disabilities are any person who has physical and/or mental disorders, which can interfere with or constitute obstacles and obstacles for him to carry out activities properly. Persons with disabilities consist of: persons with physical disabilities, persons with mental disabilities and persons with physical and mental disabilities.

Guide Path

Guiding paths are part of the pedestrian path which functions is to guide blind people to walk by utilizing the texture of the guiding tiles and the texture of the warning tiles against situations around the path that could endanger the blind (Dina Marga, 1999). Kurniawan argues (2014) that guideline is a path that is used to help provide travel information for people with disabilities by utilizing tiled textures as directions and warnings.

The texture of the directional tiles has a striped pattern that indicates the direction of travel/direction, while the texture of the warning tiles has a circular pattern that warns of changes in the surrounding situation. Areas that must use guiding blocks are areas in front of vehicle traffic lanes, in front of the entrance/exit to and from stairs and at public transportation terminals, pedestrian areas that connect roads and buildings, and in guide directions from public facilities to the public transport station. The following is a guiding tile texture on a guiding block.

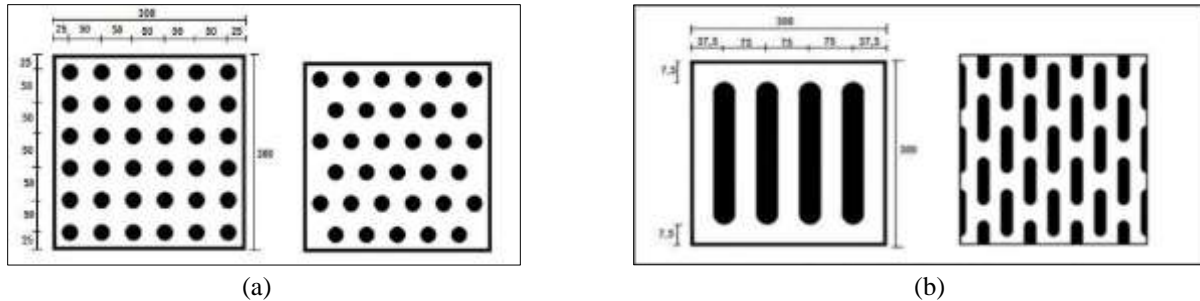


FIGURE 2. (a) Dome tiles/blocks as a warning. (b) Line tiles/blocks as guides.
Source: Ministry of Public Works and Public Housing, 2018

In addition to the tile profile or motif, the characteristics of this directional tile are also identified by its color which is generally yellow, although in some countries (such as Australia and Italy) this directional tile uses gray or other colors. The use of yellow was chosen because this color can always be identified (or does not experience significant changes) by everyone, including people with color blindness. Another thing that gives added value to the use of these guide tiles or paths is that these paths are not only beneficial for people with visual impairments, but also for the mobility of elderly who walk (Sari, 2015).

Accessibility On Public Roads

The term *accessibility* means a facility provided for all pedestrians, including people with disabilities, to get equal opportunities in all aspects of life and livelihood (DPU, 1999). Accessibility aims to provide convenience, security and comfort for its users. In creating urban spaces that are accessible to pedestrians, there are influencing factors, namely pedestrian access routes which can be in the form of formal access (directly to an area) or informal (providing choices for users, such as bridges and underground routes). In this case, pedestrian paths play an important role in connecting and supporting the vitality of an urban space. Ease of accessing city public spaces on pedestrian paths is something that is needed by pedestrians and people with disabilities. Accessibility on pedestrian paths must be considered according to the needs of its users, providing comfort and safety so that it can improve the quality of urban space and can be enjoyed together.

Basic Principles of Accessibility

Accessibility infrastructure planning has provisions that must be met some requirements so that road users can carry out activities on those pedestrian paths comfortably without hindrance. In an effort to realize the rights of persons with disabilities in public spaces, the government has outlined the principles of accessibility in the law on persons with disabilities (Law No. 4 of 1997) as follows:

- Priority principle, namely the principle of prioritizing certain areas to provide accessibility infrastructure on public roads, especially for pedestrians including persons with disabilities.
- The principle of integration, namely the principle of providing accessibility infrastructure on public roads that is integrated with accessibility infrastructure in public buildings and the environment, so that the users of this infrastructure become independent without feeling they are objects of charity.
- The principle of continuity, namely the principle that pays attention to accessibility infrastructure continuously without interruption from origin to destination for users of this infrastructure so that everyone can enter and enjoy accessibility infrastructure on public roads properly.

RESULTS AND DISCUSSION

Building Functions Along the Corridor

Types of activities on the left and right of Jl. Imam Bonjol corridor are educational buildings, transportation services, trade, lodging, places to eat, health facilities and offices so that the existence and role of pedestrian paths and ramps are more needed along this side.

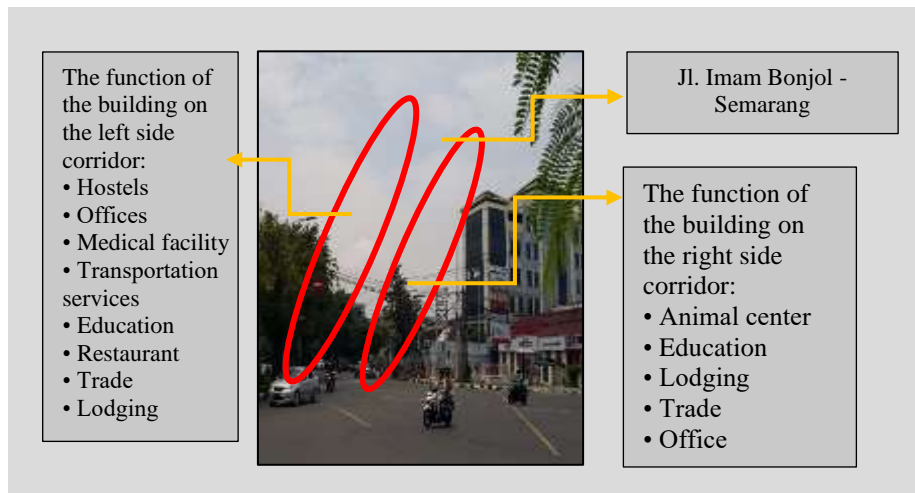


FIGURE 3. The function of the building on the left and right corridors of Jl. Imam Bonjol Semarang.

Pedestrian Path Conditions

The physical condition of the pedestrian paths on the left and right sides of Jl. Imam Bonjol is quite good, equipped with street furnitures in a well-maintained condition but several sections of the pedestrian path have been damaged. The width of the pedestrian paths on the left and right sides of the corridor is 150 cm - 225 cm, which meets the minimum pedestrian width requirements of the Ministry of Public Works and Public Housing (2018), which is 150 cm wide.

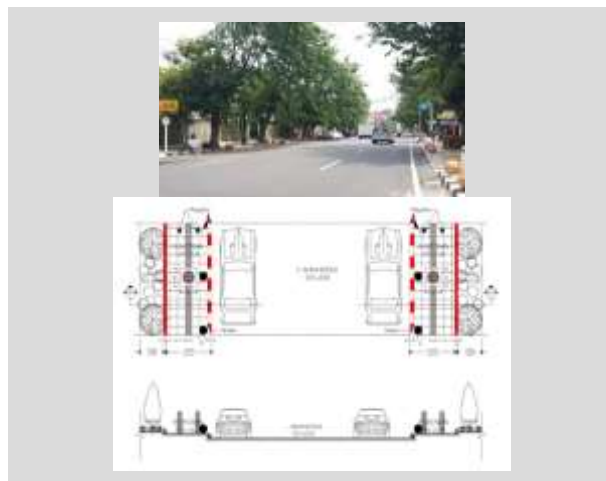


FIGURE 4. Existing sections of the pedestrian path along the left and right of the road corridor.

Several sections of the pedestrian path are used for parking motorbikes, cars and tricycles. This is very disturbing for pedestrian path users, especially people with disabilities. The cutting-off of the guiding lane in this pedestrian paths causes discomfort in several sections of the pedestrian paths.



FIGURE 5. The pedestrian path is used for parking for modes of transportation so that pedestrians and people with disabilities cannot access the pedestrian path. (a) Pedestrian lanes are used to park two-wheeled vehicles. (b) Pedestrian lanes are used to park two and four-wheeled vehicles. (c) Pedestrian lanes are used to park pedicabs

Pedestrian paths as a place for users to move and move from one place to another should also considers the relationship between user's movements so that activities on the pedestrian path run smoothly, safely and comfortably. The dimensions of the pedestrian paths differ between each road class, in this case it is necessary to look at the class of roads in the corridor. If the pedestrian path is available previously, then some creativity is needed in designing the pedestrian path to make it more effective. Besides that, it is necessary to look at government regulations regarding pedestrian paths and other applicable provisions.

The effectiveness of pedestrian and ramp service can be seen from how much the pedestrian and ramp can accommodate the needs of its users. Based on observations of pedestrian paths, it can be seen that users with special needs on pedestrian paths need more specific things, including:

- The need for wide pedestrian paths that are sufficient for movement
- The need for a guiding line as a guide
- Ramp slope requirements
- Material safety used
- Feeling safe and comfortable in the pedestrian path
- Not hampered by existing facilities on the pedestrian path
- Continuity of pedestrian paths (not interrupted or cut-off)
- Use of walking aids or carry out activities on pedestrian paths (crutches and wheelchairs can access pedestrian paths without obstruction)

The problems that arise in the pedestrian corridor of Jalan Imam Bonjol originate from the arrangement or design along the pedestrian path which causes users to feel uncomfortable and disturbed. User discomfort can be observed from the problems that exist along the pedestrian path. The design of pedestrian paths that do not fit the conditions of the research object results in users being forced to accept all discomforts so that user activities cannot be served properly. If this phenomenon tend continue, it can be said that the pedestrian path is not effective and over time it will be abandoned by its users.

Ramp on Pedestrian Path

In general, the condition of the ramp along the pedestrian path is in good condition and the slope of the ramp is relatively sloping and meets the allowable ramp slope requirements. However, there are several ramps that are damaged and not repaired. Ramp usually acts as a connecting lane from the main road to the pedestrian path or vice versa. The ramp on the roadway also functions as a freight transport service so that the ramp design must meet the

requirements for accessibility infrastructure on public roads so that it can make it easier for its users. The ramp design must consider the basic dimensions of space, slope and safety in order to function more effectively and optimally. The condition of the ramp on the corridor Jl. Imam Bonjol can be seen in the following figure.



FIGURE 6. (a) Condition of damaged ramp. (b) The condition of the ramp which is damaged and not repaired.

Driver Path Conditions

The Imam Bonjol street corridor is equipped with a guiding block. Some of the guideways function properly, but some of them are in damaged condition and even cut off, so that it is very dangerous for pedestrian path users and cannot function as it should. Some of the pedestrian paths are not equipped with guide lanes and are even used for parking motorcycles.

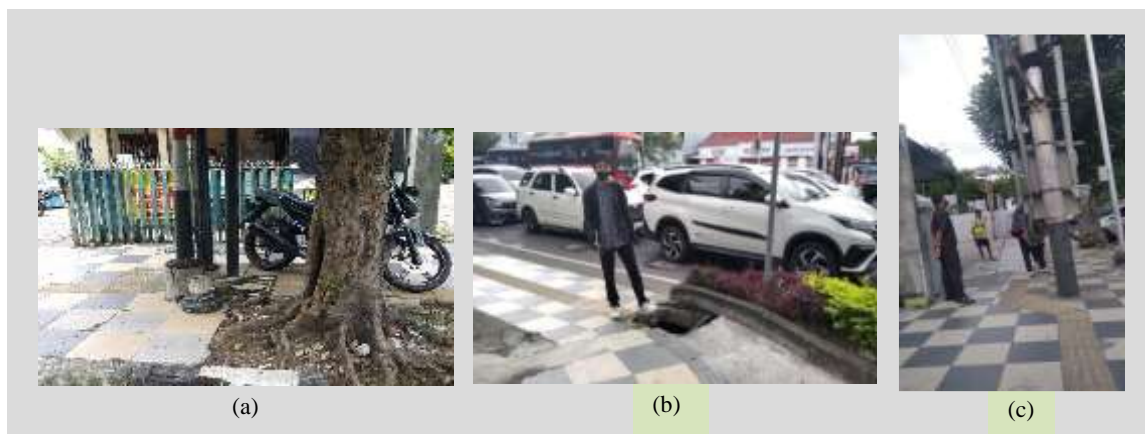


FIGURE 7. (a) The guideway is blocked by trees, utility poles and vehicles. (b) The guideway is interrupted by the channel hole. (c) The guideway is blocked by a power pole.

Several conditions of the guideline cause inconvenience and endanger the user because they are designed so winding in following the street furniture on the pedestrian path, and they are placed more close to the main road. With a comfortable enough width of the trottoir, the guide lines should be placed adjacent to the building fence so that the blind can move more freely and safer. Pedestrians and people with disabilities have the same rights in accessing public spaces. The guide path that causes inconvenience, especially for people with disabilities, can be seen in the following figure.

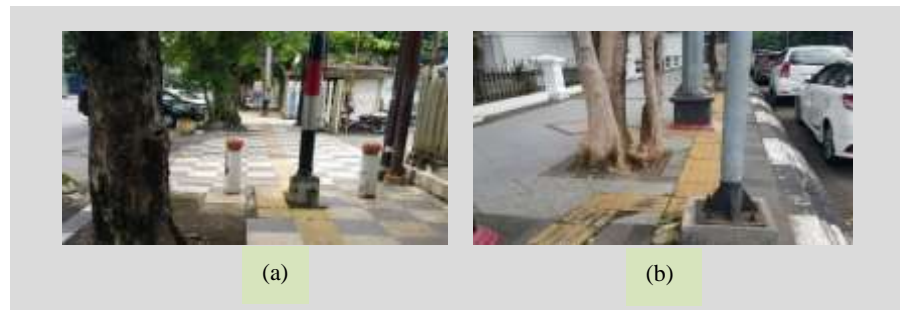


FIGURE 8. (a) The guideway is blocked by electric poles so that the blind, pedestrians with crutches and persons with disabilities in wheelchairs cannot access the pedestrian path. (b) Placement of guide lines that are crooked and inhumane.



FIGURE 9. The guideline which is located on the ramp is still in good condition and the ramp has a height according to the provisions.

Pedestrian Line Facilities

The pedestrian path is actually equipped with guideline facilities, benches, street lighting, bus stops, bollards, vertical gardens, plants or trees, but it appears that some of these facilities are not maintained.



FIGURE 10. Facilities on pedestrian paths. (a) Vertical garden with unkempt condition and some damaged. (b) Benches, bollards, signs and plants. (c) Street lighting. (d) Bus stop (placement closes the pedestrian path).

The function of the planned pedestrian path should be known in advance, whether it is used for users with normal physical conditions or users with special needs. This will affect the facilities that must be met in it and whether on the pedestrian path there are displacements or crossings and so on. The design of pedestrian paths and ramps must be designed to serve its users, in this case all levels of society so that they can use pedestrian paths to carry out their activities properly. Pedestrian path users are pedestrians and persons with disabilities (blind persons, people with crutches, and wheelchair users). Identification of pedestrian path users must be known to obtain an overview of the facilities and infrastructure needed and of course it differs between users with normal conditions and users with special needs.

Design Alternatives of Pedestrian and Ramp Path

The design of pedestrian paths and ramps should consider the applicable regulations or provisions in order to obtain effectiveness in their use. Several design alternatives as a solution to the problems that exist on the pedestrian path of Jl. Imam Bonjol Semarang below can be applied to locations with similar conditions. Designs alternative for pedestrian paths on research objects can be seen in the following figure.

Design Alternative 1:

Design alternative 1 is planned by considering the needs of pedestrians with normal physical conditions and pedestrians with special needs such as the blind, pedestrians with crutches and wheelchair users. The user's movement space is a design consideration, especially the space for people with disabilities and the provision of bench facilities, lighting and trash cans.

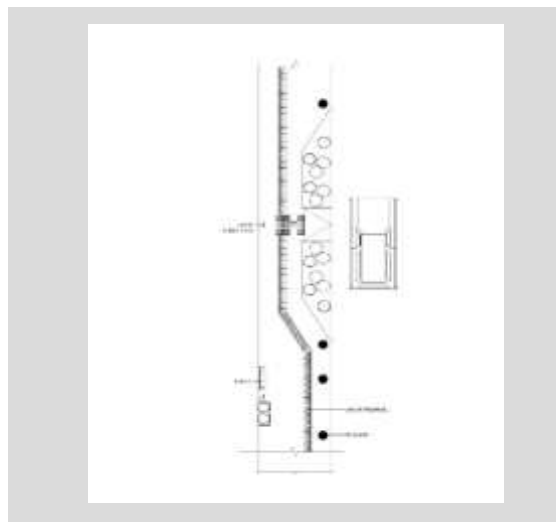


FIGURE 11. *Alternative design on the pedestrian path with a garden on the front which borders the road and is placed on the left and right sides of the ramp.*

Design Alternative 2

Design alternative 2 is applied to pedestrian paths with vehicle-stop niches, namely by placing warning tiles on the ramp. This design considers the safety of the disable person in transferring to modes of transportation on pedestrian paths and creating convenience along pedestrian paths. Placement of benches and other facilities on the crossing paths is also considered to provide comfort and smooth activities on the pedestrian paths.

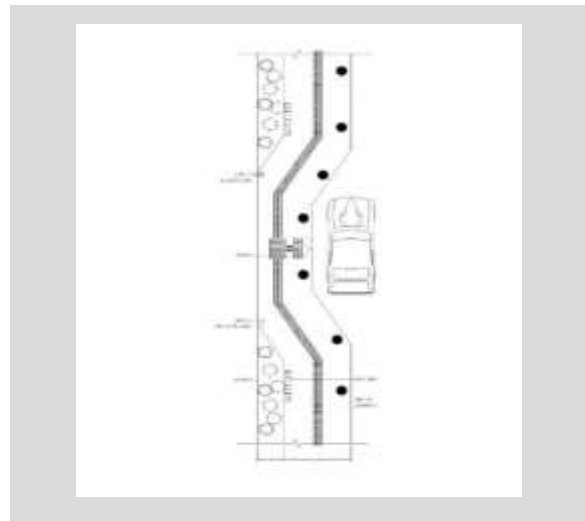


FIGURE 12. An alternative design on the pedestrian path by placing warning tiles at the end of the crossing area on the pedestrian path with vehicle stop niches.

Design Alternative 3:

Design alternative 3 is applied to pedestrian paths equipped with bus stops. Bus stops must not reduce the effective width of the sidewalk and can be placed in front or behind the pedestrian path and must be equipped with access for disables and supporting facilities such as seats, roofs, and other equipment.

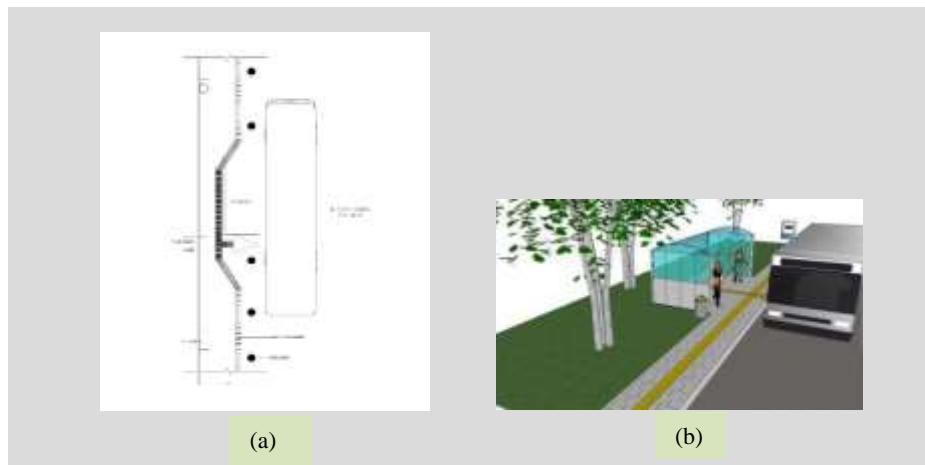


FIGURE 13. Alternative design on pedestrian paths with stops. (a) Alternative design with pedestrian paths and guide lanes behind the bus stop equipped with a ramp. (b) An alternative design with pedestrian paths and guideways in front of the bus stop equipped with a ramp (source: Ministry of Public Works and Public Housing, Technical Planning for Pedestrian Facilities, 2018, SE Minister of PUPR Number: 02/SE/M/2018).

CONCLUSION

From the observation and analysis of pedestrian paths along Jl. Imam Bonjol Semarang and by considering the related regulations, it can be seen that the width of the pedestrian paths on the left and right corridors of Jl. Imam Bonjol has fulfilled the requirements. Meanwhile, the placement of bus stops are not quite proper, because they use the entire width of the sidewalk so that user circulation is cut off and this placement is not in accordance with government regulations. The inaccuracy in the placement of bus stops is caused by the presence of pedestrian paths that are available first and then the need for bus stops arises.

Placement of guide lines is not effective, especially at meetings with pedestrian path facilities such as electric poles, lighting lamps, bollards, and trees so that the design of the guide path is winding and does not meet the minimum space requirements for movement and makes it difficult for persons with disabilities to move. Some parts of the ramp facilities on the pedestrian path need to be repaired, while the ramp is quite safe for users. Pedestrian service in Jl. Imam Bonjol corridor as a whole can be said to be less effective for people with disabilities.

Things that need to be considered in planning pedestrian paths are the freedom to go ahead and the freedom to pass other pedestrians without crossing them, and the safety to cut off other pedestrians. Security against the possibility of a collision with other road users (vehicle traffic) as well as an optimal level of pedestrian comfort such as the slope factor and distance traveled as well as pedestrian guide signs also should be taken into consideration. The effectiveness of pedestrian paths in accommodating the needs of pedestrians and people with disabilities can be seen from how much the pedestrian paths can function optimally in accommodating the activities of their users safely and comfortably.

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