Optimization of utilization pedestrian trails and green lines in the city

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Abstract. Pedestrian and green lanes are needed to increase the comfort of the activities of urban communities to support population circulation, beautify the city, and maintain the air quality in cities. Nevertheless, the condition of pedestrian and green lanes in urban areas is often not well maintained so that their utilization is not optimal. This can be seen from the improper use of pedestrian paths, damage to supporting facilities, and the death of plants planted in the green lane. This study identified the characteristics of pedestrian paths and green lanes in downtown Garut and evaluated the use of pedestrian paths and green lines in urban areas. The method used is descriptive qualitative analysis. The perception of the community of pedestrian users was analyzed from the results of the questionnaire. Respondent was chosen randomly from pedestrian and green lane users along Ahmad Yani road, which is the center of Garut. The condition of the pedestrian path along the Ahmad Yani road from the Asian crossing to the Bunderan Suci was damaged in several points so that it disturbed the comfort of pedestrians. Circulation of pedestrians is also disrupted because some pedestrian spaces are used by street vendors to sell. The pedestrian facilities along Ahmad Yani road are still incomplete, and some of them are in damaged condition. Facilities that are damaged and not as needed are benches, lack of trash bins, and non-lit lighting. Plants in open space, which is a green path are in poorly maintained condition, and many even die. Community perceptions of the importance of the existence of pedestrian lanes and green lanes also influence the awareness of the user community to help maintain and maintain pedestrian paths and green lanes in urban cities.

1. Introduction

Pedestrian and green lanes in the city center play an important role in supporting the movement or movement of people from one place to another [1] and as an effort to reduce air pollution [2]. The downtown area is generally a shopping area that is the center of the economy, the center of the crowd and community activities. To carry out its functions, optimally, pedestrian, and green lanes in urban areas need to be carefully planned. Constraints faced on the sidewalk [3], namely: have limitations due to lack of being able to travel long distances; very sensitive to natural disturbances; and become obstacles caused by the flow of traffic around the vehicle.

In addition to shops, along the Ahmad Yani Garut road starting from the Asian intersection to the Bunderan Suci there are several schools and areas of leather industry centers so that not only the local community, many domestic and foreign tourists visit the area. Therefore, the presence of pedestrians and green lanes needs attention.
In reality, the condition of the pedestrian path and green lanes in the city cannot yet function optimally. Arrangement of pedestrian and green lanes in the area still does not meet the terms and conditions based on Minister of Public Works Regulation No. 03 / PRT / M / 2014 as well as the utilization that is not optimal.

2. Methods
The research location is one part of the city center of Garut where there is a shopping center and Sukaregang leather industry center. Pedestrian paths and green lines along Jl. Ahmad Yani starts from the Asian crossing until the Bunderan Suci, which has two lanes right and left. This study aims to identify the conditions of pedestrian and green lanes in urban areas and evaluate the use of pedestrian paths and green lanes in downtown Garut.

Primary data collected included: pedestrian volume, sidewalk conditions, community perceptions of pedestrian users, and the condition of green lanes along the sidewalk. Data collection is done through observation and surveys. Also, recording of pedestrian activities is also carried out to carry out activities on the track. The time of observation is adjusted to the time of activity, namely morning (06.30-07.30), afternoon (12.00-13.00) and afternoon (17.00-18.00). The perception of the community of pedestrian users was analyzed from the results of the questionnaire. Respondent is chosen randomly from pedestrian and green lane users at points determined based on the surrounding activities.

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3. Results and discussion
Sidewalks are a means to carry out activities in certain areas, especially trade, which are needed by pedestrians who need a sufficient space to be able to choose a destination store, before deciding to enter one of the shops in the trading area [4] A road is considered necessary to be equipped with sidewalks when there are places along the road which will lead to the growth of pedestrians and are usually followed by an increase in traffic flow [4,5]. The places include housing/schools, shopping centers, bus terminals, office centers, entertainment centers, centers of social activities, and industrial areas.

The advantages of sidewalk facilities [1], namely:
- important elements in urban design;
- are formed to create comfort in existing urban space life, not only in aesthetics only;
- will reduce attachment to vehicles in the downtown area;
- increase willingness for walking;
- the quality of the environment through a structured and humanized design system;
- helps improve air quality in the surrounding area.

Based on the purpose of sidewalk and green line planning in urban sidewalk space needs must be by Permen PU No. 03 / PRT / 2014. In terms of dimensions, the width of the sidewalk based on the volume of pedestrians calculated at the research location has already fulfilled the requirements. The sidewalk width along the observation location is not the same because of the different activities at each observation point. Point 1 is the location of shops, points 2, 3 and 4 are locations for junior and vocational schools, point 5 is a shopping center and leather craft tourism. Point 6 is the location near the eyelash factory.

Based on the survey in the field, the minimum width of the sidewalk if added to RTH at locations 1 to 6 does not meet the requirements of PU Candy No. 03 / PRT / M / 2014 because the area is already dense.
Table 1. Calculation of pavement width needs based on pedestrian volume.

| Observation Point | Pedestrian Volume | Existing Sidewalk Width (meter) | Sidewalk Width Analysis (meters) |
|-------------------|-------------------|---------------------------------|---------------------------------|
| 1                 | 4,17              | 2,2                             | 1,10                            |
| 2                 | 5,7               | 2,2                             | 1,16                            |
| 3                 | 4,53              | 2                               | 1,12                            |
| 4                 | 5,60              | 2                               | 1,16                            |
| 5                 | 4,04              | 1,6                             | 1,10                            |
| 6                 | 55,9              | 1,3                             | 2,59                            |
| Average           | 4,99              | 1,88                            | 2,36                            |

Source: Data from Field Survey Results

On the sidewalk, at the intersection of Asia, the sidewalk on the left has a width of 2 meters. Sidewalk elevation 0.35 meters from the road surface. The surface of the pavement uses ceramic that is coarse-textured, so it is not slippery and colored so that it can be seen at night. The right sidewalk has a width of 2 meters. The condition of the surface of the sidewalk is not maintained; many ceramics are broken, causing discomfort for pedestrians.

At the observation point, 2 pedestrian paths on the left have a width of 2.1 meters. Curb elevation of 0.30 m from the road surface. The sidewalk that is close to the Garut 4 Junior High School has an elevation of 0.30 m with a width of 2.3 meters. The condition is not well maintained, causing inconvenience for pedestrians.

At location 3 near SMK Muhammadiyah Garut, the left sidewalk has a width of 2.05 m with an elevation of 0.30 m from the road surface. The surface of the sidewalk is installed with rough textured paving so that it is not slippery and can absorb rainwater. The less well-maintained sidewalks in the area can be seen that means a lot of paving blocks are removed so that the surface of the sidewalk is uneven and hollow.

At location 4 near SMPN 3 Garut, the left sidewalk is 1.75 m wide, 0.25 meters elevation, using paving blocks that function to absorb rainwater. The condition of the sidewalk is poorly maintained because there are still many holes. The right sidewalk has a width of 1.4 meters with a rough texture; the condition is quite good.

At location 5 the left sidewalk has a width of 1.35 meters with fairly well-maintained conditions because the flat surface has no holes while the sidewalk on the right has a width of 1.43 meters with good conditions. Maintenance of sidewalks in this area is quite good considering that the area is the center of leather craft as one of the tourist icons of the city of Garut which is visited by many tourists.

At location 6 PT. Danbi False Eyelashes The left sidewalk has a width of 1.3 m with an elevation of 0.2 m from the road surface and the surface of the sidewalk is installed paving which serves to absorb water and coarse-grained, so it is not slippery. The right sidewalk has a width of 1.35 with an elevation of 0.15 m. The area is sheltered for pedestrians. The condition of the sidewalks in the area is poorly maintained because there are still many pedestrian paths with holes and drainage channels that are not closed so that visible dirt, waste water from the factory and garbage - garbage that disrupts the comfort of pedestrians who cross the area. A large number of street vendors in the area adds to the inconvenience of sidewalk users in the area.

From the observations, it is known that pedestrian facilities along Ahmad Yani road are still incomplete. Some of the ones in damaged condition, for example, the bench near SMP 4 cannot be occupied because the backs are cut, the trash can be still very rare so the sidewalk users prefer to throw garbage into flower pots along the sidewalk. In addition, some lighting lamps do not light up so that at night, the atmosphere becomes not bright, so the holes on the sidewalk are not visible.
3.1. Evaluate the needs of the green line

Green open space is an elongated/lined and clustered area, whose use is more open, where plants grow, both naturally grown and intentionally planted [6]. The green space function includes the city lungs/air circulation system, shade, air pollution absorbers, limiting vision, oxygen producers, etc. [7,8]. One form of green space is the pedestrian space green space. RTH pedestrian space plays an important role, especially in traffic-intensive areas of the vehicle as well as on the road of Ahmad Yani Garut.

Most of the RTH pedestrian spaces along the Ahmad Yani Garut road in the form of large pots are partly in the form of road corridor green open space. Even though there are still plants, but almost all of the pot in unkempt conditions can be seen in the condition of plants that are almost dead, the pot is full of garbage, and the shape of the pot is not intact anymore. In RTH the road corridors are mostly poorly maintained.

![Figure 1. Blumbak and RTH conditions on the road corridor along Ahmad Yani road.](image)

3.2. Optimization of the use of pedestrian and green lanes

Guided by Minister of Public Works Regulation No. 03 of 2014 concerning the need for pedestrian lane and Minister of Public Works Regulation No. 05 of 2008 concerning Green Open Space, based on observations, it can be seen that pedestrian paths and green lanes along Ahmad Yani Garut road are not optimal.

In terms of the dimensions of space and physical conditions, there is still a mismatch between the volume and the need for pedestrian space. The average requirement for sidewalk width of 2.4 meters is only available an average of 1.9 meters. The utilization is also not by the rules because some of the sidewalk and green lane spaces are used for parking and street vendors, which further limits the pedestrian space. This is compounded by the condition of the physical quality of pedestrian paths and untreated green lines, incomplete and damaged supporting facilities.

Based on interviews with the community of pedestrian and green lane users in Jl Ahmad Yani Garut, it is known that poor sidewalk conditions and poorly maintained green lanes make people uncomfortable. Community awareness of users to take care of and maintain pedestrian paths and green lanes in urban cities is still lacking because they tend to use pedestrian and green lanes as they wish regardless of their proper functions such as private parking vehicles [9,10], throwing trash in flower pots, damage plants and so on. Public perceptions regarding the use of pedestrian lanes and green lanes can be a reference in sidewalk planning and RTH for pedestrian space so that their utilization can be optimized [11,12].

4. Conclusion

Pedestrian paths and green lanes are important elements for the comfort and beauty of the city. The utilization will be more optimal if the pedestrian and green lane are in conditions that meet the requirements and are maintained. Community perceptions of the importance of the existence of pedestrian lanes and green lanes affect the awareness of the user community to help maintain and maintain pedestrian paths and green lanes in urban cities.
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