

ASSESSING THE UNIVERSAL DESIGN OF PEDESTRIAN FACILITIES IN THE CENTRAL AREA OF CILEGON CITY

Attiya Arrum Sari¹, Weni Laysa Nilma^{*2}

¹ Institut Teknologi Sepuluh November, Indonesia

² Daegu University, South Korea

Corresponding Author: wenilaysanilmaa@gmail.com

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| <p>Info Article</p> <p>Received : 01 Oktober 2024</p> <p>Revised : 04 November 2024</p> <p>Accepted : 02 Desember 2024</p> <p>Publication : 30 Desember 2024</p> <p>Keywords: <i>Pedestrian Way, Universal Design, Cilegon City</i></p> <p>Kata Kunci: Jalur Pejalan Kaki, Desain Universal, Kota Cilegon</p> <p><i>Licensed Under a Creative Commons Attribution 4.0 International License</i></p>  | <p>Abstract: <i>This research examines the application of universal design to pedestrian facilities in the Cilegon City. It uses descriptive qualitative methods where the data are gathered from observation. The findings reveal that some issues include uneven sidewalk widths, misaligned pedestrian routes, and improper slopes at crossings, compounded by obstacles such as street vendors, damaged drainage covers, and uneven pavement materials. While elements like seating and guiding paths have been considered, their implementation does not meet necessary standards. The lack of bollards, safety rails, and speed control devices compromises pedestrian safety, especially in high-traffic areas. The study also highlights challenges for individuals with disabilities, including difficulties faced by wheelchair users and the elderly due to uneven surfaces, discontinuities in guiding paths, and insufficient resting areas. Overall, improvements in accessibility, safety, and infrastructure continuity are recommended to ensure that Cilegon City's pedestrian facilities are fully inclusive and usable by all, regardless of physical ability.</i></p> <p>Abstrak: Penelitian ini mengkaji penerapan desain universal pada fasilitas pejalan kaki di Kota Cilegon. Penelitian ini menggunakan metode kualitatif deskriptif di mana data dikumpulkan melalui observasi. Temuan penelitian mengungkapkan bahwa beberapa masalah yang ada meliputi lebar trotoar yang tidak merata, jalur pejalan kaki yang tidak sejajar, dan kemiringan yang tidak tepat di persimpangan, yang diperburuk dengan adanya hambatan seperti pedagang kaki lima, penutup saluran drainase yang rusak, dan bahan pavemen yang tidak rata. Meskipun elemen seperti tempat duduk dan jalur panduan telah dipertimbangkan, pelaksanaannya belum memenuhi standar yang diperlukan. Ketidakhadiran bollard, pagar pengaman, dan perangkat pengendali kecepatan mengancam keselamatan pejalan kaki, terutama di area dengan lalu lintas padat. Penelitian ini juga menyoroti tantangan bagi individu dengan disabilitas, termasuk kesulitan yang dihadapi oleh pengguna kursi roda dan lanjut usia akibat permukaan yang tidak rata, ketidakraturan jalur panduan, dan kurangnya area tempat istirahat. Secara keseluruhan, disarankan adanya perbaikan dalam aksesibilitas, keselamatan, dan kontinuitas infrastruktur untuk memastikan bahwa fasilitas pejalan kaki di Kota Cilegon sepenuhnya inklusif dan dapat digunakan oleh semua orang, tanpa memandang kemampuan fisik.</p> |
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INTRODUCTION

In Indonesian cities, pedestrian facilities are problematic since they do not satisfy pedestrians' needs in terms of both quantity and quality (Tanan, 2011). Pedestrian facilities are infrastructure such as roads or paths designed for pedestrian activities. The success of public transportation networks depends heavily on the availability of pedestrian pathways and the provision of pedestrian services. As a result, pedestrian walkways need to be correctly designed to serve their purposes. The pedestrian path is one of the elements of the city that functions as a public space. According to the Law of the Republic of Indonesia, Article 25, No. 22, Year 2009, every road intended for public traffic must have pedestrian facilities for people with disabilities (Erianti & Sardjono, 2022).

Walking is an essential part of the city's linkage system. It serves as both an internal city movement and a connection between other modes of transport (Sakinah et al., 2018). A pedestrian street is a linear structure in the urban environment that serves as the main pedestrian path for residents' daily routes and, additionally, as a tourist attraction (Mendzina & Vagule, 2021). Therefore, pedestrian streets contribute to the city's social, economic, and cultural vibrancy and are essential to improving the whole urban experience.

Pedestrian facilities are well-designed, especially in downtown areas close to government centers, such as Jakarta, Yogyakarta, and Surabaya. As a result, the Jakarta government has changed its transportation policy priorities: first, pedestrians and cyclists; second, public transportation; third, environmentally friendly vehicles; and last, private vehicles (Mulyadi et al., 2022). In contrast, other downtown areas still lack adequate pedestrian facilities, especially for all users, including people with special needs.

In the design of pedestrian facilities in Indonesia, the government has established principles, technical aspects, and required specifications. Four main principles are considered feasible for use: (a) fulfilling the system's integrated aspects, including the arrangement of the environment, transportation system, and accessibility between areas; (b) ensuring continuity between places of origin and destination, or vice versa; (c) ensuring elements of safety, security, and comfort; (d) ensuring accessibility for all users, including those with various physical limitations (Ministry of PUPR, 2023).

The fourth principle aligns with universal design, or design for all. This principle refers to the seven principles of equitable use: flexibility, simple and intuitive use, perceptible information, tolerance for error, low physical effort, and size and space for

approach (Burgstahler, 2021). Meanwhile, the Regulation of the Minister of Public Works No. 30 of 2006 states that the application of universal design must satisfy four main principles: 1) Safety: Contractors must design public buildings with the safety of all users in mind. 2) Ease: Everyone should be able to reach and use public buildings or facilities easily. 3) Usability: Everyone should be able to use all public facilities without hindrance. 4) Independence: Individuals should be able to access and use public facilities without relying on the assistance of others (Auriansyah, 2024).

This research will discuss the universal design principles of pedestrian facilities in the Cilegon City government center through technical feasibility tests. These tests will compare the standardization based on the specifications of the technical guidelines from the Ministry of PUPR in 2023, evaluate the completeness of pedestrian facilities, and assess the feasibility of the facilities based on the needs and behavior of pedestrian users, along with the four principles of implementation.

METHOD

This research uses a descriptive qualitative method. According to Creswell (2012), qualitative research is a method used to test specific theories by examining the relationship between primary and secondary data (Fauzi, 2023). Primary data is obtained through field observations, while secondary data are gathered through a literature review on the specifications or standards for designing pedestrian facilities and Universal Design as assessment points. The discussion will analyze the feasibility of pedestrian facilities in the downtown Cilegon area.

The observation was conducted in downtown Cilegon (Figure 1), which is divided into several sections. Starting from the Cilegon City landmark, it is divided into three lanes: Lane 1 (yellow), which runs along Jalan Jendral Sudirman and National Route 3 with four lanes divided into two lanes; Lane 2 (blue), which runs along Cilegon Industrial City Street and Jalan KH. Yasin Beji, a two-lane one-way street; and Lane 3 (red), which runs along Jalan Letnan R. Suprpto, a one-way street near Cilegon Square Park and the DPRD office with two lanes.

After the literature review, several elements of pedestrian facilities were identified as important and will be used as minimum design requirements. After comparing the feasibility based on the standards and specifications put forward by the Ministry of PUPR in 2023, feasibility will be tested based on the nature and behavior of the users, especially users with special needs, in accordance with universal design principles. The element

will classify the element that directly affects users with special needs. The following Table 1 shows the elements and requirements for designing pedestrian way.

Table 2.1. The Element and Requirement for Designing Pedestrian Way

| Section | Requirement | Element |
|----------------------|--|---------|
| Sidewalks | Arterial Road: Minimum 4 meters wide Collector Road: Minimum 3,5 meters wide Local Street: Minimum 3 meters wide | A1 |
| Crossing Zone | non-crossing (bridge or tunnel) or crossing at intersections with traffic signals | A2 |
| Slope or gradient | The slope of the road does not exceed 8%, with 1-sided handrails with a clearance of 0.8m. | A3 |
| Pavement material | It's not slippery when it rains | A4 |
| Path guide | Installed straight without interruption, with a right-left width of 60 cm, each end of the pavement is given a warning block | A5 |
| Speed controller | Length 370-400 cm Maximum height: 10 cm | A6 |
| Waiting stall | Minimum width 1.2 meters | A7 |
| Lighting | Every 10 meters with a height of 4 meters | A8 |
| Safety Railing | Height 90cm | A9 |
| Shading (Green Zone) | Peripheral planting strip, placed between the footpath and vehicular traffic lane with a width of 1.5 meters. | A10 |
| Seating | Maximum placement distance of 10 meters | A11 |
| Rubbish bin | Maximum placement distance of 20 meters. | A12 |
| Bus stop | In every 300 meters radius | A13 |
| Drainage | Width 50 cm and height 50 cm | A14 |
| Bollards | Distance 30 cm from <i>kerb</i> , diameter 30 cm. Height 0.6-1.2-metres and maximum distance 1.4 meters. | A15 |

RESULTS AND DISCUSSION

Results

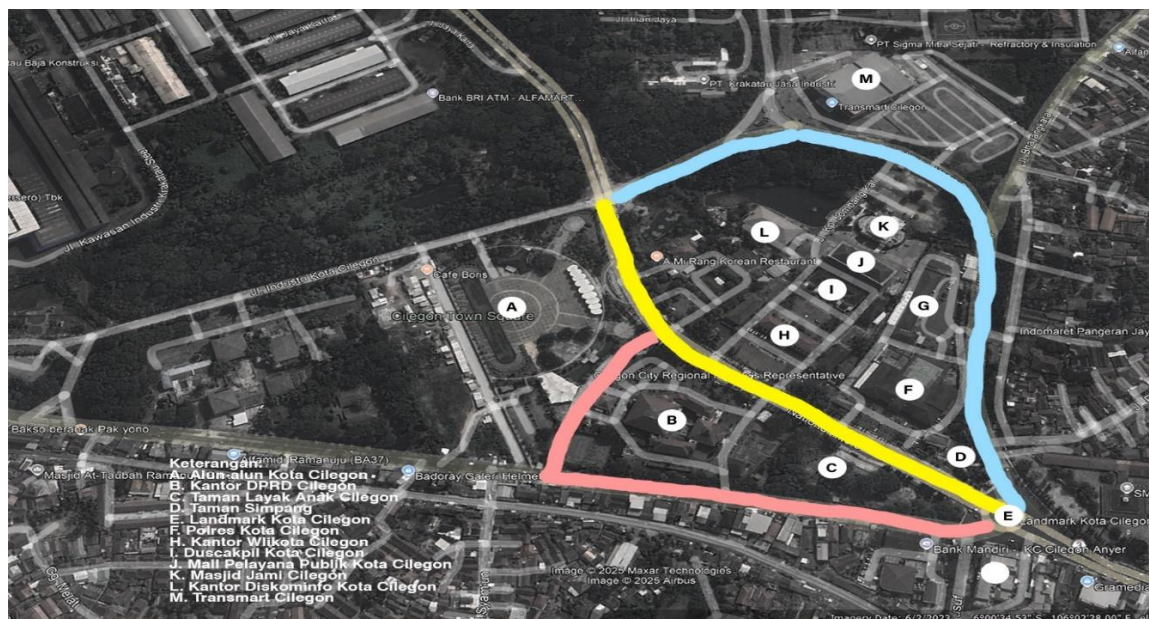








Figure 3.1. Cilegon City Government Center Area

Based on the Cilegon City Structure Plan Map, Line 1 (yellow) and Line 2 (blue) are categorized as primary arterial roads. Meanwhile, Line 3 (red) has two types of roads: Letnan R. Suprpto Street is a Primary Collector Road. In contrast, the road between the Cilegon city square and the Cilegon City DPRD office is a Secondary Local Road. These classifications influence the design and function of the pedestrian facilities along these roads, impacting factors like traffic volume and pedestrian accessibility.

Table 3.1. Road Lanes in the Cilegon City Government Center Area

| Category | Lanes 1 | Lanes 2 | Lanes 3 |
|----------------------|---|--|---|
| From Landmark |  |  |  |
| Function Road System | Primary Arterial Road | Primary Arterial Road | Primary Collector Road |
| Condition | 6/2 Shared (2 – way) | 4/2 not shared (one-way) | 4/2 not shared (one-way) |
| The last point |  |  |  |
| Function Road System | Primary Arterial Road | Primary Arterial Road | Local Secondary Road |
| Condition | 6/2 Shared (2 – way) | 4/2 not shared (one-way) | 2/2 not shared (one-way) |

The condition of the pedestrian way in Cilegon City, particularly along the Primary Arterial Roads (Lines 1 and 2), is assessed based on several key factors. These factors include the condition and design of sidewalks, pedestrian crossing zones, slope or gradient, pavement material, guiding paths for visually impaired individuals, speed control mechanisms, waiting stalls, lighting, safety railings, shading through green zones, seating, rubbish bins, bus stops, drainage systems, and bollards. Each of these elements plays a crucial role in ensuring the safety, accessibility, and comfort of pedestrians. Additionally, the assessment highlights the need for better integration of universal design principles to ensure that the pedestrian infrastructure caters to a diverse range of users, including those with physical disabilities, the elderly, and children.

*Lane 1***Table 3.2. Findings and Condition of Pedestrian Elements on Lane 1**

| Element | Finding |
|---------|---|
| A1 | Sidewalks along the length of the road have several width variations ranging from 3-metres to 1.5 meters. There is 1 spot with no pedestrian path |
| A2 | There are no bridges or tunnels for specialized road crossings, at the intersection area there is an unguided zebra cross, and a pelican crossing in front of the police station. |
| A3 | Along the sidewalks, the slope is appropriate, however, at the entrance or gate to the building, the slope between the sidewalk and the entrance area has a slope of more than 8%, at some points there are no ramps, making it difficult for users with special needs. |
| A4 | Stucco material colored green and yellow, when it is wet, it becomes slightly slippery. |
| A5 | The laying of the guideways is messy, not continuous with some missing spots due to passing over the top of drainage covers or hitting lampposts and trees. There is no continuous guideway as it passes through the entrance gate to the building. |
| A6 | No speed control as it is an arterial route |
| A7 | No waiting stalls, and middle stalls, switching lanes |
| A8 | In accordance with the required specifications. |
| A9 | No guard rails |
| A10 | The shade strip is not between the pavement and the carriageway, the trees are within the building area or other public facilities. |
| A11 | Seating can only be found at the front of the interchange park, the children's park and the junction from lane 1 to lane 2. |
| A12 | There are not many rubbish bins along this road, with only a few located in areas adjacent to the park. |
| A13 | There are no bus stops along the way for passengers to get on and off. |
| A14 | Drainage uses a closed system but there are some drainage points that do not have covers. Size is appropriate and more than the required specifications. |
| A15 | There is no placement of bollards along the road. |

*Lane 2***Table 3.3. Findings and Condition of Pedestrian Elements on Lane 2**

| Section | Finding |
|---------|---|
| A1 | The width of the road varies, with the lane adjacent to the police station facility, the pedestrian facilities can still be used while opposite the pedestrian path has been used for stalls and is only 0.8m - 1 meter wide, this is the case on KH Yasin Beji road. |
| A2 | The crossing on KH. Yasin Beji Road is located at 3 points: in front of Transmart parking lot to public service mall, in front of the police chief, and in front of the intersection park and all of them are with pelican cross type. |
| A3 | Along the sidewalks, the slope is appropriate, however, at the entrance or gate to the building, the slope between the sidewalk and the entrance area has a slope of more than 8%, at some points there are no ramps, making it difficult for users with special needs. |
| A4 | Along the KH Yasin Beji road there are 2 types of pavements using plastering and paving blocks. While in Industrial Kota Cilegon Street using white paving blocks. |
| A5 | Only on one side of the police office sidewalk, on the other side starting from Transmart to the front of the Cilegon City hotel area. |

| | |
|-----|---|
| A6 | There are 3 and 4 points (as it is a one-way road) of speed control in accordance with the specifications. |
| A7 | There is no need for stalls, the road area is not too wide. |
| A8 | In accordance with the required specifications |
| A9 | No guard rails |
| A10 | Shade lanes are not located between the pavement and vehicle lanes, Trees are located within building areas or other public facilities. |
| A11 | Seating can only be found in front of the interchange park, the junction from Lane 1 to Lane 2. |
| A12 | There are not many rubbish bins along this road, with only a few located in areas adjacent to the park. |
| A13 | Bus stop is only in front of TranSmart |
| A14 | Drainage uses a closed system but there are several drainage points that do not have a suitable size cover and are more than the required specifications. |
| A15 | There is no placement of bollards along the road. |

Line 3 (primary collector and local secondary), is assessed based on sidewalks, crossing zones, slope or gradient, pavement materials, guiding paths, speed controllers, lighting, shading (green zones), seating, rubbish bins, and drainage.

Table 3.4 Findings and Condition of Pedestrian Elements on Lane 3



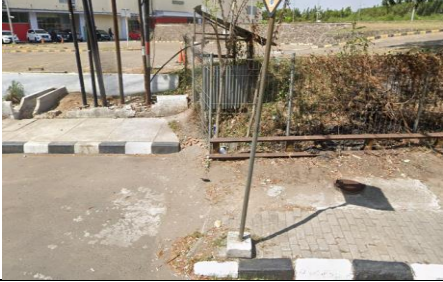



| Element | Finding |
|---------|---|
| A1 | Only on the side that has a pedestrian way on Jendral R. Suprpto Strat is the side adjacent to the DPRD Office and the Child Friendly Park. While on the other hand, there are no sidewalk facilities built, there are only footpaths formed from shop parking areas. |
| A2 | There are no road crossing markings along Line 2. |
| A3 | Along the sidewalks, the slope is appropriate, however, at the entrance or gate to the building, the slope between the sidewalk and the entrance area has a slope of more than 8%, at some points there are no ramps, making it difficult for users with special needs. |
| A4 | Used cement plaster material, when wet conditions are still somewhat slippery, especially the pedestrian way which is overgrown with moss. |
| A5 | Only on the built-up side of the pavement |
| A6 | No speed control |
| A7 | According to the required specifications |
| A8 | Shade lanes are not located between the pavement and vehicle lanes, Trees are located within building areas or other public facilities. |
| A9 | Only along the DPRD Office area on Letnan R. Suprpto Street |
| A10 | There are not many rubbish bins along this road |
| A11 | Drainage using a closed system |

Discussion

After observation, it was found that the sidewalks have several issues, including varying widths ranging from 1 to 3 meters (Table 3.5). Additionally, one of the lanes lacks pedestrian infrastructure altogether. In some areas, there are intersections in the design in front of gates without proper slopes, and open drainage systems without covers.

Furthermore, the construction of new and old pedestrian paths is misaligned, resulting in discontinuity between the two. This issue is further exacerbated on Jalan K.H. Yasin Beji, where street vendors occupy and obstruct the sidewalk area.







Table 3.5. Condition Of Pedestrian Way in the Central Government Area of Cilegon City

| Section | Right Side | Left Side |
|---------|---|--|
| Lanes 1 |  |  |
| Lanes 2 |  |  |
| Lanes 3 |  |  |

The pavement materials used consist of three types (Table 3.5): smooth plaster with yellow-green paint, rough plaster, and paving blocks. In the area with smooth stucco, the surface becomes slippery when wet, posing a risk to users. Additionally, in lane 3, where trees grow densely and are shaded from the sun, moss has developed on the pedestrian path, which can also create slippery conditions. In the paving block area, the guiding path is not installed (Table 3.7). Furthermore, safety fences are not installed; according to the Ministry of PUPR, safety fences are not required unless pedestrian density exceeds a certain threshold, or if vehicle traffic surpasses 500 vehicles per hour. Since this area does not meet these criteria, safety fences are unnecessary. However, it is recommended that bollards be installed to provide users with a sense of security, especially along primary arterial roads.

Regarding speed control measures, lanes 1 and 3 do not have speed controllers because roads with primary arterial functions are not typically equipped with them. However, a speed controller should be installed if a road crossing on a primary arterial is not a tunnel or bridge. In lane 2, three-speed controllers were observed, which are needed due to the differing road levels. The guiding path has been installed, but its placement is irregular (Table 3.7) and does not meet the required standards. The directional blocks (yellow-striped tiles) should be placed along the pedestrian path with at least 60 cm of free space on each side and installed as straight as possible for easy pedestrian navigation. In areas with higher pedestrian traffic, the free space should exceed 60 cm. However, the guiding path in the field is often placed too close to building fences and obstructed by streetlamps, trees, or other objects (Table 3.7). In some locations, such as on sidewalks with block paving (Table 3.7, Lane 2), no guiding path has been installed

Table 3.6 Condition of Path Guide on Pedestrian Facilities

| Section | Right Side | Left Side |
|---------|---|--|
| Lanes 1 |  |  |
| Lanes 2 |  |  |
| Lanes 3 |  |  |

The installation of seating in pedestrian facilities is also important because seating provides a temporary resting place for pedestrians and allows them to enjoy the beauty of the city surroundings. However, in the area, seating is only placed near intersections

and parks (Ramah Anak Park and Simpang Park), which does not align with the required placement standards.

Furthermore, shading is typically achieved by providing plants in the pedestrian area. The shading component is included in the green space specifications, but the conditions in the field do not meet the standards. For example, the green area is between the pedestrian and vehicle lanes. While some trees are located inside the sidewalk, others are placed between the pedestrian and vehicle lanes (Table 8), which do not follow the proper placement guidelines. In this area, existing bus stop facilities are only found on Line 2 (in front of Transmart). However, this bus stop facility is not functioning as intended because the public transport system in Cilegon is not government managed. There are no city buses (trans), only “Angkot” (minibus for public transport), and most “Angkot” drivers drop off and pick up passengers at various locations. As a result, the bus stop facility is almost never used for its intended purpose and has become a temporary resting place.

Regarding utilities (lighting and drainage), the dimensions and location of their placement conform to the required specifications. However, the drainage system in this area uses a closed drainage system, and in several locations, drainage covers are either damaged or not closed. Some cover even cut into the guiding path and sidewalk (Table 7), which can disrupt pedestrian activities. Additionally, the placement of garbage bins does not align with the requirement, as most of the bins are located near the parks.

Table 3.7 User Identification Behavior and Need

| Category | User Identification | User Need | Element of design |
|------------------------|---|---|---|
| People with low vision | No-sense aspect: visual impermanent space guiding: memory, smell, temperature, light, atmosphere, breeze, sound, texture and barrier (Sari, et al 2020) | Guiding the direction, secure of the place | Proper guiding patch design (A5) Clear items (without obstacle) on the pedestrian way (B1) |
| Wheelchair | Slow in movement, there needs more space, Different eye level (Sari, et al 2020) | Easy to movement, the material must have smooth, there is no affordance or hole in the way. The way should not slippery when it is rain | Proper pavement material (A4) Perfect space or dimension to move (A1) Proper slope or gradient (A3) |
| Kruk | Slow movement, want more space (Sari, et al 2020) | Easy to movement, the material must be smooth, there is no | Proper pavement material (A4) |

| | | | |
|----------------|--|---|--|
| | | obstacle or hole in the way. The way should not slippery when it is rain | Clear items (without obstacle) on the pedestrian way (B1) Perfect space or dimension to move (A1) |
| Elderly | They have a weak body, low energy, slow movement, sometime must some help from others (Sari, et al 2020) | Elderly people need some place for break in pedestrian way, The way should not slippery when it is rain | Proper pavement material (A4) Proper slope or gradient (A3) There is a seating place for break (A11) There is a helper (handrails) (B2) |
| Pregnant women | Heavy weight, Slow movement, High risk of falling, easy to be tired (Sari, et al 2020) | Need some place for break in pedestrian way, The way should not slippery when it is rain | Proper pavement material (A4) Proper slope or gradient (A3) There is a seating place for break (A11) |

From (Table 3.8), it is evident which architectural elements must be well-designed to ensure they are properly usable by people with disabilities. The placement of guiding patches is not technically well-designed; there are discontinuities and inappropriate placements of guiding paths, which means the Perceptible Information principle is not fulfilled. As a result, blind users may be at risk of accidents while using the pedestrian way. Using smooth plaster material (Table 3.5) at specific points can also lead to accidents for users.

Furthermore, the varying dimensions of pedestrian facilities (Table 3.5) and the absence of proper pedestrian structures (such as dirt paths) will make it difficult for wheelchair users and individuals using crutches to navigate. In addition, there are obstacles such as holes (open drainage channels) or obstructions, as well as damaged pedestrian facilities (Table 3.6). No sloping has been made at some transfer points and in front of building doors, making it impossible for wheelchair users and people with crutches to pass (Table 3.6). Additionally, the lack of seating will make it difficult for elderly users, pregnant women, and individuals using crutches. Moreover, handrails are not installed in certain areas, especially those with level changes. Based on these findings, the results of the feasibility test on whether the pedestrian facilities fulfill the universal design principles are as follows.

Table 3.8. Feasibility Test based on the Universal Design Principle

| Criteria | General People | Kids | Elderly and Pregnant Women | Crutch and Wheelchair user | Deaf and Speech impaired | People with Low Vision |
|----------|----------------|------|----------------------------|----------------------------|--------------------------|------------------------|
|----------|----------------|------|----------------------------|----------------------------|--------------------------|------------------------|

| | | | | | | |
|-------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Size and Space for Approach and Use | compliance | compliance | compliance | non-compliance | compliance | compliance |
| Perceptible Information | compliance | compliance | compliance | compliance | compliance | non-compliance |
| Simple and Intuitive Use | compliance | compliance | compliance | non-compliance | compliance | non-compliance |
| Low Physical Effort | non-compliance | non-compliance | non-compliance | non-compliance | non-compliance | non-compliance |
| Tolerance for Error | compliance | non-compliance | non-compliance | non-compliance | compliance | non-compliance |
| Flexibility in Use | compliance | compliance | non-compliance | non-compliance | compliance | non-compliance |
| Equitable use | non-compliance | non-compliance | non-compliance | non-compliance | non-compliance | non-compliance |

Table 3.8 shows the feasibility test on universal design with the Size and Space for Approach and Use principle. For general users, children, the elderly, pregnant women, the deaf, and those with speech impairments, compliance is achieved. However, for crutch users and wheelchair users, there is non-compliance. The second aspect, Perceptible Information, is compliant for general users, children, the elderly, pregnant women, crutch users, wheelchair users, and the deaf and speech impaired. However, for individuals with low vision, Perceptible Information is non-compliant. The third aspect, Simple and Intuitive Use, is compliant for general users, children, the elderly, pregnant women, and the deaf and speech impaired, but non-compliant for crutch users, wheelchair users, and individuals with low vision. The fourth aspect, Low Physical Effort, is non-compliant for all users. The Tolerance for Error aspect is compliant for general users and the deaf and speech impaired, but non-compliant for others. The sixth aspect, Flexibility in Use, is compliant for general users, children, and the deaf and speech impaired, but non-compliant for the elderly and pregnant women, crutch and wheelchair users, and individuals with low vision. Lastly, the Equitable Use principle, which encompasses all the other principles, is non-compliant for all users.

Additionally, the test shows that the Equitable Use principle is non-compliant for all users. However, for general users and the deaf and speech impaired, the pedestrian way can still be used, although users must exert more effort at certain locations. For children, the elderly, pregnant women, and individuals with low vision, it is not recommended to use the facilities without supervision, as this may lead to accidents.

Crutch and wheelchair users also struggle to use the pedestrian facilities due to non-compliance with the first principle, Size and Space for Approach and Use.

CONCLUSION

In conclusion, several issues hinder the overall accessibility and functionality of Cilegon City's pedestrian facilities, particularly along Lines 1 (yellow) and 2 (blue), which are designated as major arterial roads. The pedestrian experience is compromised by uneven sidewalk widths, misaligned pedestrian routes, and improper slopes at crossings. These issues are further exacerbated by obstacles such as street vendors occupying sidewalk spaces, damaged drainage covers, and uneven pavement materials, all of which pose risks to pedestrians, especially those with mobility impairments.

The assessment indicates that while some aspects of pedestrian infrastructure, such as seating and guiding paths, have been considered, their implementation does not meet the required standards. The irregular arrangement of guiding walkways, lack of sufficient seating, absence of shade, and inadequate green space highlight the need for improved design and planning. Moreover, pedestrian safety is further jeopardized by the absence of bollards, safety rails, and speed control devices, particularly on high-traffic roads. Additionally, the underutilized bus stop facilities, due to the lack of an official public transportation system, further detract from the overall pedestrian experience.

There are also significant challenges for individuals with disabilities, stemming from the design and construction of pedestrian facilities. Wheelchair users and those with mobility impairments struggle with uneven surfaces, discontinuities in guiding paths, and improper slope transitions at various points. The lack of appropriate handrails, seating, and resting areas makes it even more difficult for elderly pedestrians, expectant mothers, and others requiring additional support. These issues are worsened using smooth plaster, which becomes slippery when wet, violating universal design principles.

Overall, Cilegon City's pedestrian facilities fully align with universal design standards, which aim to create an environment accessible to all users, but some criteria are not adhered yet, especially low physical effort and equitable use criteria. Improvements in accessibility, safety, and infrastructure continuity are essential to meet the needs of all pedestrians, particularly those with disabilities. Recommendations include better alignment of pedestrian paths, installation of proper safety measures, and provision of seating and shade in accordance with required standards. Addressing these issues will ensure that Cilegon City's pedestrian facilities can be safely and comfortably used by all, regardless of physical ability.

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