

are young people, students, having high school education level, have low income per month; walking purposes are exercise and studying. Some others being pedestrians because there is no other choice and it is cheaper to reach the destination, walking 1-4 times per week to their destination, and walking to/from car and public transportation stops, and walking only as the walking pattern.

Characteristics of respondents influence the Importance Rate (IR) value and Priority Rate (PR) value. It can be seen in Table VI that, based on respondents' opinion, IR values and PR values of most indicators are more than 3.5 out of 5.0, except one indicator, i.e. public phone in walking distance with IR value is 2.83 and PR value of 2.65. This condition shows that most respondents are satisfied with the existing pedestrian facilities condition, although some indicators are not yet implemented as required in the regulation.

TABLE VI
IMPORTANCE RATE AND PRIORITY RATE OF PEDESTRIAN FACILITIES ON THE TWO MAJOR ROADS IN BANDUNG, INDONESIA

Indicators of Pedestrian Facilities		Average Value of Importance Rate (IR) and Priority rate (PR)			
		Diponegoro Street		Suria Sumantri Street	
		IR	PR	IR	PR
1	≥ 2.0m sidewalk width ≥2.5m vertical clearance ≤ 8% longitudinal grade	3.94	3.92	4.05	3.89
2	≥ 0.6m road furniture width	3.78	3.68	3.95	3.72
3	≥ 0.75m lane width in front of a building	3.57	3.54	3.71	3.57
4	≥ 1.5m green lane width	4.00	3.93	4.23	4.03
5	Street lighting every 10m with 4m pole height	4.14	4.12	4.36	4.30
6	Seat with a size of 1.5m x 0.4m every distance of 10m	3.63	3.55	3.65	3.61
7	Safety fence with a 0.9m height	3.66	3.60	3.75	3.60
8	Trash bin every 20m length	4.08	4.03	4.17	4.10
9	Signage	4.07	4.06	4.21	4.12
10	A bus shelter in walking distance	3.68	3.54	3.78	3.67
11	Public phone in walking distance	2.88	2.65	2.78	2.64
12	Crosswalk at grade	4.08	4.07	4.25	4.21
13	Pedestrian bridge	3.53	3.31	3.81	3.65
14	Ramp for disability	3.99	3.81	4.24	4.13
15	Guiding block for disability	4.06	3.79	4.22	4.15
16	CCTV	4.12	4.03	4.28	4.16
17	Bicycle lane	3.88	3.75	4.11	3.89
18	Bike racks	3.54	3.30	3.79	3.55

TABLE VII
IMPORTANCE RATE AND PRIORITY RATE ACCORDING TO ALL RESPONDENTS' DEMOGRAPHICS

Characteristic	Pedestrian Facilities Indicator	
	Importance Rate	Priority Rate
1 Gender Male Female	Street lighting Signage, CCTV, Crosswalk	Street lighting Signage
2 Age (year) < 25 26-35 36-45 46-55 > 55	Street lighting Crosswalk, CCTV Crosswalk Green lane Trash bin	Street lighting Crosswalk Crosswalk Green lane Trash bin
3 Occupation Student Employee Employer Others	Street lighting Crosswalk Crosswalk, trash bin Street lighting, Crosswalk, CCTV Guiding block	Street lighting Crosswalk Crosswalk Street lighting, CCTV Guiding block
4 Education < High School High School Undergraduate/ Graduate	Street lighting, Crosswalk Street lighting, CCTV Street lighting, Signage, Green lane	Street lighting, Crosswalk Street lighting Street lighting, Signage, Green lane
5 Income/month (Rp) < 2,500,000 2,500,000- 5,000,000 > 5,000,000	Street lighting, Crosswalk Street lighting, Crosswalk Signage, Green lane	Street lighting, Street lighting, Crosswalk Signage, Green lane
6 Walking Purpose Working Studying Exercise Shopping Others	Street lighting Street lighting, Crosswalk Street lighting Street lighting, CCTV Street lighting, CCTV	Street lighting Street lighting, Crosswalk Street lighting Street lighting, CCTV Street lighting, CCTV
7 Reason of Walking Faster Cheaper More convenient More secure Have no vehicle No other choice	Street lighting, Signage Street lighting Crosswalk, CCTV Street lighting, CCTV Street lighting, Crosswalk Street lighting, Ramp	Street lighting, Signage Street lighting Crosswalk Street lighting, CCTV Street lighting, Crosswalk Street lighting, Ramp
8 The frequency of the Walking/ Week 1-2 3-4 5-6 7	Street lighting, Crosswalk Street lighting, Signage Street lighting, Trash bin Street lighting	Street lighting, Street lighting, Street lighting, Street lighting
9 Walking Pattern Walking Only Walking to/ from parking area Walking to/ from car and public transportation stops	Street lighting, CCTV Street lighting, Green lane Street lighting Signage	Street lighting, CCTV Street lighting, Green lane Street lighting Signage

Furthermore, Figure 4 presents that indicators that have high priority rate and high importance rate are street lighting, crosswalk, signage, CCTV, trash bin, green lane, ramp and guiding block for the disabled. These indicators have to be implemented as soon as possible by local government as required in the regulation in Indonesia. Whereas indicators that have low priority rate, but high importance rate, are bicycle lane, road furniture, bus shelter in walking distance, safety fence, lane width in front of a building, pedestrian bridge, seat, and bike rack. These indicators have also to be implemented by local government because they are required in the regulation in Indonesia, but are included in the next priority to do.

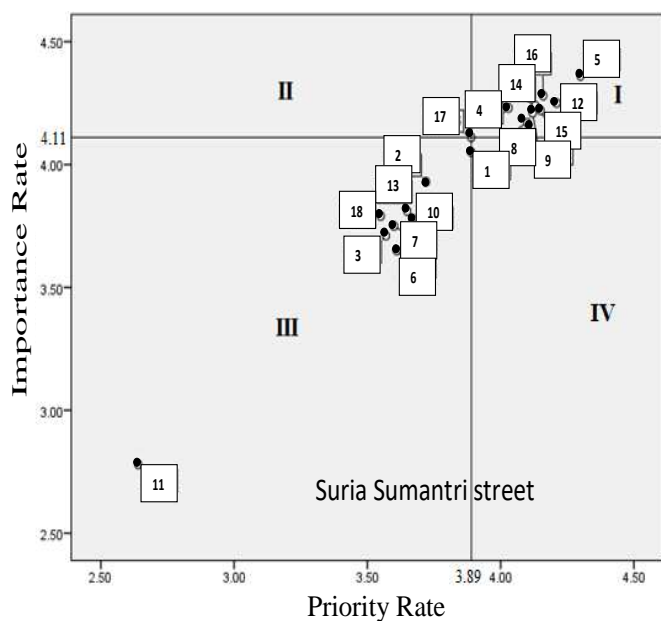
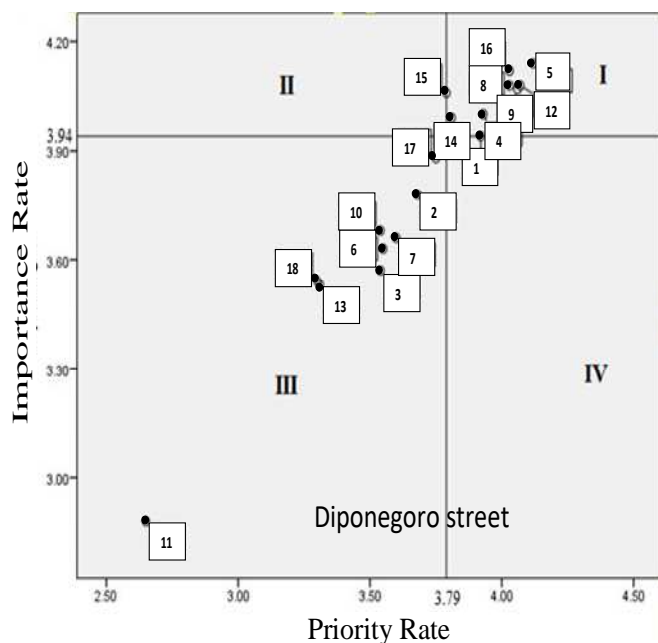


Fig. 4 Quadrant of important performance analysis between priority rate and importance rate of pedestrian facilities

Moreover, Table 7 presents that, based on respondent characteristics, the most important, and the highest priority indicators of pedestrian facilities that have to be implemented as soon as possible are street lighting, crosswalk, CCTV, signage, and pedestrian ramp for the disabled. Fulfillment of all pedestrian facilities as required in the regulation will increase road infrastructure resilience through reduction of casualty in normal condition with no disaster and reduction risk during evacuation if disaster occurs.

Based on the detailed discussion above, recommendations to fulfill the regulation and then increase the road infrastructure resilience are as follows:

- Identification of availability of pedestrian indicators/facilities as required in the regulation.
- Identification of challenges of implementation of the facilities not yet available, including financial support, the commitment of local government to implement the facilities and then maintain them continuously, the responsibility of society to always preserve the pedestrian facilities while using them.
- Dissemination of regulation to the society about pedestrian facilities that have to be available and implemented as their right as a pedestrian to be safe and secure during walking.
- Implementation the pedestrian facilities are not yet available by local government.
- An effort to make government and society realize that fulfillment of pedestrian facilities as required in the regulation will be very beneficial for people to reduce casualty risk during normal condition and reduce damage and lost life risk during evacuation and the reconstruction process if a disaster happens.

IV. CONCLUSIONS

Disaster could occur anytime and anywhere on the risk location. Up to this moment, there is no knowledge or science which can accurately determine where, when, and how large the disaster. Therefore, road infrastructure resilience as an essential part of disaster resilience is critical to implement, especially in locations where many people live, like large cities. If a disaster happened, not only roadway is used as a facility for evacuation and rescue of the people, but the pedestrian way as well. The pedestrian way that fulfills the regulation has a huge role to support road infrastructure resilience. Based on pedestrians' opinion in the large city of Bandung, Indonesia, as a case study, the most important, and the highest priority indicators that have to be implemented soon are street lighting, crosswalk, CCTV, signage, and pedestrian ramp for the disabled. The pedestrian way that fulfills all indicators as required in the regulation in Indonesia will reduce casualty risk in normal condition and increase road infrastructure resilience if there is a disaster so that the society can recover as fast as possible.

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