

Assessment of the influence of walkability factors on corridor via VIII Febbraio and via Roma in Padova, Italy

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ABSTRACT

Planning and designing for walking are essential to encourage healthy public life, develop sustainable neighborhoods, and improve social life and the economy. In order to promote neighborhood sustainability and public life, this article outlines the elements and factors that lead to more excellent urban walkability. For the research to measure the sense of walkability, a case study was undertaken in the city center of Padova to evaluate pedestrian walking behavior in the city's most historical corridor. The existing Via VIII Febbraio & Via Roma, two famous pedestrian-dedicated streets which make up a long corridor in the heart of Padova, were chosen as the key case study for they serve an important role in the area, hosting many historic buildings in close proximity. The findings showed that the most critical elements influencing pedestrians' perceptions of walkability in the area were linked to convenience and visual attractiveness.

Key word: corridor; historical center; Padova; pedestrians; walkability.

INTRODUCTION

Walking is one of the simplest and cheapest forms of physical activity (Gehl, 2013). Walking keeps a person healthy; and can help prevent several diseases such as heart disease, diabetes, hypertension, and obesity (Gehl, 2013; Hass-Klau, 2014). Walking can also encourage social contact between individuals, thereby improving mental health and well-being (Shaaban, 2019). Ease of walking on the road is an indication of the suitability of the built environment for walking. Walkability on every road will increase if there is infrastructure that is safe, comfortable, and easily accessible for pedestrians (Litman, 2016). Proper design construction of the pedestrian environment is an important factor in promoting walking ability because it results in more attractive, comfortable, healthier and more efficient roads (Quednau, 2018).

Perception studies of city streets are very important in order to inform policy makers about what people think about roads; whether the street is fun and interesting, safe and lively, clean, and whether it encourages people to do activities they enjoy. Important factors that influence perceptions include pedestrian safety, aesthetics, and facilities. These factors are important regardless of the purpose of the pedestrian journey and have an impact on leisure time and other activities that go hand in hand with road use. Better aesthetics attract various activities other than street perception (Cho, Rodríguez, & Khattak, 2009; Bahari, Arshad, & Yahya, 2013).

The right indicator to assess the level of walkability of urban roads is to assess the use of roads by pedestrians. Improving foot safety, mobility and comfort is an important step to promote sustainable mobility in urban areas. This article examines several variables supporting aspects of walkability according to the Global Walkability Index (Krambeck, 2006) on the Via VIII Febbraio & Via Roma road corridors in Padua City. Finally, the results of this study will inform, improve, and assist the decision-making process regarding improving walkability, revitalizing historic parts of the city, as well as urban planning and environmental design of urban roads both in the case study area and as a reference for cities in Indonesia.

Pedestrians are protected by existing regulations in Indonesia, so that if there are motorized vehicles using pedestrian paths, they will be given a warning. So motorists must be very careful when using the pedestrian path. At this time the effects of the pandemic pedestrian paths have begun to be used by traders. Merchants use empty space to sell their wares (Syaiful S, 2017; Syaiful S et.al, 2022).

Walkability

A place is said to have an ideal level of walkability when “the built environment supports and encourages walking by providing pedestrian comfort and safety, connecting people to different destinations in a reasonable amount of time and effort, and offering visual interest in travel across the network. (Southworth, 2005). The concept of walkability was first developed by Holly Krambeck in 2006 as outlined in her master's thesis at the Massachusetts Institute of Technology entitled "The Global Walkability Index (GWI)". The term walkability can reflect the overall condition in any area, so it can be evaluated on the scale of locations, roads, and even environmental scales (Leather, 2011).

Walkability Components and Variables

There are several components and variables of walkability according to experts which have been described in the following table:

Table 1. Summary of Walkability Components and Variables

Variable	Component
Attractiveness and Comfort	1. Cleanliness of the pedestrian area
	2. Availability and quality of facilities for blind people and persons with disabilities
	3. Pedestrian amenities (shade, bench, public toilet)
	4. The presence/absence of objects blocking the road
Relationship with open space	1. Connected road with square
	2. Connected roads with places that have unique and interesting features
Security	1. True safety: road width, traffic safety
	2. Perceived security
Road quality	1. Road width
	2. Paving quality
	3. Street furniture
	4. Marking System
	5. Lighting
	6. Vegetation
	7. Road connection with public transportation jalur
Accessibility	1. Access to public transportation
	2. Parking
	3. Orientation
	4. Freedom of movement

(Sources: Crankshaw (2009), Krambeck (2006), Montgomery (1998), Southworth (2005))

Corridor

The corridor consists of two rows of masses (buildings or trees) that form a neutral space between two areas or areas of the city (Zahnd, 2012). Corridor in other terms is a space that connects two areas and displays the physical quality of space in the form of a square, street, or elongated hallway created by a series of buildings, trees, or street furniture.

The existence of the corridor as an architectural form of urban areas will not be separated from the elements that make up the image of the corridor (Krier, 1979: 61), namely a) the shape of the building in the form of a face or appearance and the shape of the buildings along the corridor. The face and shape of the building is the entire footprint of a corridor that can embody the identity and architectural image of an area; b) figure ground is the relationship between land use for building masses and open space, and c) Street and pedestrian ways are vehicle and pedestrian traffic lanes, equipped with parking lots, street furniture, signage and vegetation devices so that they blend with the environment. Road corridors and paths are linear space for movement as a means of circulation and human activity on a dense scale. Comfortable conditions are also created by the creation of

security and legibility aspects of the corridor created by the signage element. This signage can be in the form of public information boards or billboards (Laskara et.al, 2020).

City of Padova

The city of Padova, which is claimed to be the oldest city in Northern Italy, is one of the historic cities on the Italian peninsula. The city of Padova is twice named on the UNESCO World Heritage Site list, first for its 14th-century frescoes, and the Orto Botanico di Padova which is the oldest botanical garden in the world. Located 40km from the city of Venice, Padova is a religious as well as scientific center. There is the Basilica of Saint Anthony of Padua (built 1232) which is one of the pilgrimage destinations for Catholics around the world, and the University of Padua (1222-present) which is known as the second oldest university in Italy and the sixth in the world. Some of the secular landmarks found in Padova City include Piazza Garibaldi, Palazzo Bo, and Prato della Valle. These three historical places are connected by a corridor consisting of four road segments that make up the corridor, namely Via Cavour, Via VIII Febbraio, Via Roma, and Via Umberto. As a link to several historical landmarks, the walkability aspect of this corridor is interesting to study in order to measure the effectiveness of the road for pedestrians.

RESEARCH METHODS

This article aims to draw a theoretical framework on the issue of public corridor walkability to achieve a livable environment in the historic city center. A series of criteria for measuring the walkability level of urban corridors is taken from the Global Walkability Index (Krambeck, 2006). This research uses a case study approach, and examines the Via VIII Febbraio and Via Roma corridors in the historical city center of Padova. Both roads are important public spaces and special city pedestrian streets with social, cultural and economic functions, as well as cultural and historical heritage values. The problem of the walkability of these streets, which widely affects people's daily lives, the economic, social and cultural life of the city, as well as the identity of the city, deserves to be investigated to provide policy and practical solutions to the design of these public spaces, as well as to improve the quality of urban life and feasibility. live in the historic city center. The research method consists of the following points:

1. Literature review to gain an understanding of walkability and to determine walkability indicators.
2. Primary observations in the historic center of the city of Padova to determine the positive and negative factors that contribute to, or reduce the quality of walkability. Direct observations were made with several visits to the Via VIII Febbraio and Via Roma corridors accompanied by documentation or taking photos. Surveys and observations help analyze pedestrian facilities and road elements and provide a primary data set on walkability level indicators.
3. Questionnaire; The questionnaire was used to reveal the perception of road users in the corridor of the object of observation. With a Likert scale, respondents can choose the option Strongly Agree (weight 5) to Strongly Disagree (weight 1).

In-depth analysis was conducted to assess the level of walkability in the case study object. The study of the quality of walkability was reviewed through a collection of data obtained through direct observation and questionnaires.

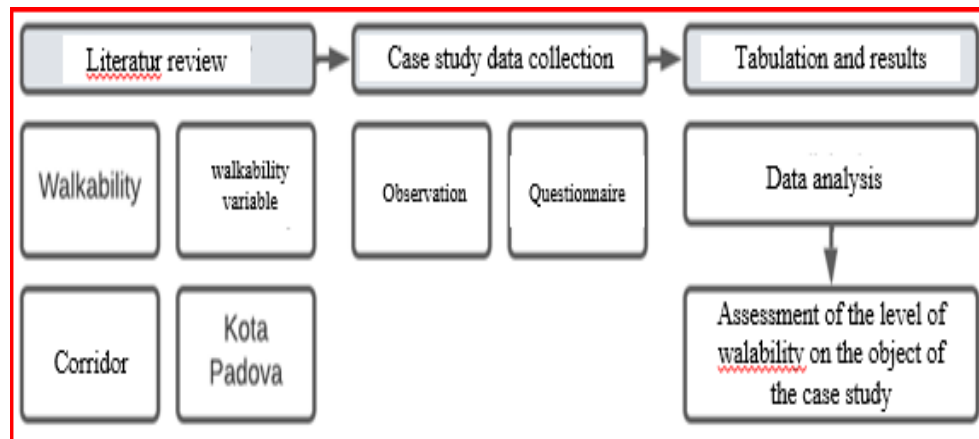


Figure 1. Diagram of research stages (Source: Personal Analysis, 2022)

RESULTS AND DISCUSSION



Figure 2. Via Roma & Via VIII Febbraio Corridors (Source: Google Earth, 2022)

Case Study Object Profile

Location: Via Roma & Via VIII Febbraio, 35122 Padova PD, Veneto, Italy

Corridor Length: 565.12 meters

Questionnaire Questions & Statements

A questionnaire on the walkability of the city was conducted to identify the forms, factors and elements of walkability that affect the walking experience of the citizens of Padova. Respondents were asked about their walking experience, satisfaction with walking, attachment to places and problems walking in the Via Roma & Via VIII Febbraio Padova corridor. The statement is adjusted to the previously identified walkability variables, as follows:

Table 2. Walkability Questionnaire Statement

Component	Statement by variable
Security and safety	Pedestrians are safe for the elderly, disabled, children and parents with young children
	The road is wide enough for pedestrians and cyclists
	I feel safe from evil while walking on this road
	I feel safe from catastrophic accidents when walking on this road
	There is clear lighting along the road at night
	I can cross the road easily
Comfort and attractiveness	Streets are clean and free from trash
	Roads have utilities that help the blind

Relationship with open space	Roads have utilities that help people with disabilities
	The road has shade from the wind/rain/hot sun in the form of a canopy
	There are interesting places along the way
	Nice looking corridor
Road quality	The road has a relationship with the nearest square
	The road has a relationship with an interesting place
	There are interesting landscape views along the way
Accessibility	Available street furniture on the street
	Placement of street furniture does not hinder the movement of pedestrians
	Shop signage on the street does not interfere with pedestrians
	There are adequate traffic signs on the road
	The road has adequate lighting at night
	Vegetation on the road does not interfere with the freedom of walking
	The road has connection with public transportation
	Parking for bicycles and motorized vehicles does not interfere with the movement of pedestrians
	Corridors are easily accessible from other places on foot
	There are adequate road facilities for persons with disabilities
	Pedestrians can easily reach the bus/tram stop or train station from the corridor

This section discusses the Via VIII Febbraio & Via Roma Padova Corridors in the context of the walkability indicators defined in the previous section in detail. Each indicator is discussed with its variables. First, the results of the questionnaire are presented to get the overall context of the user's perception of the object of study. After that, each walkability indicator was analyzed quantitatively and descriptive observations defined in the research method. In the specified context, indicators of walkability, security and safety, comfort and attractiveness, relationship to open space, road quality, and accessibility are evaluated in detail.

Questionnaire Results

A total of 54 respondents as pedestrians in the study object area (67% female and 33% male) with a majority age range of 18-24 years participated in filling out the questionnaire. The following table shows the results of the questionnaire in the discussion of the Likert scale percentage.

Table 3. Results of the Walkability Questionnaire on Via VIII Febbraio & Via Roma Padova

Component	Statement according to variable	Score
Security and safety	Pedestrians are safe for the elderly, disabled, children and parents with young children	71.1%
	The road is wide enough for pedestrians and cyclists	67.7%
	I feel safe from evil while walking on this road	72.2%
	I feel safe from catastrophic accidents when walking on this road	71.1%
	There is clear lighting along the road at night	70%
	I can cross the road easily	82.2%
Comfort and attractiveness	Streets are clean and free from trash	74.4%
	Roads have utilities that help the blind	57.7%
	Roads have utilities that help people with disabilities	62.2%
	The road has shade from the wind/rain/hot sun in the form of a canopy	70%
	There are interesting places along the way	85.5%
	Nice looking corridor	86.6%
Relationship with open space	The road has a relationship with the nearest square	85.5%
	The road has a relationship with an interesting place	84.4%
	There are interesting landscape views along the way	65.5%
Road quality	Available street furniture on the street	65.5%

Accessibility	Placement of street furniture does not hinder the movement of pedestrians	64.4%
	Shop signage on the street does not interfere with pedestrians	71.1%
	There are adequate traffic signs on the road	73.3%
	The road has adequate lighting at night	72.2%
	Vegetation on the road does not interfere with the freedom of walking	75.5%
	The road has connection with public transportation	75.5%
	Parking for bicycles and motorized vehicles does not interfere with the movement of pedestrians	66.6%
	Corridors are easily accessible from other places on foot	80%
	There are adequate road facilities for persons with disabilities	60%
	Pedestrians can easily reach the bus/tram stop or train station from the corridor	76.6%

(Source: Questionnaire, 2022)

RESULTS AND DISCUSSION

Security and safety

Creating a walkable environment can be achieved by providing safe and comfortable walks. Road safety definitely plays an important role in bringing people to the streets. Life and the people themselves make cities more inviting and safe in terms of the security they experience and feel (Gehl, 2010).

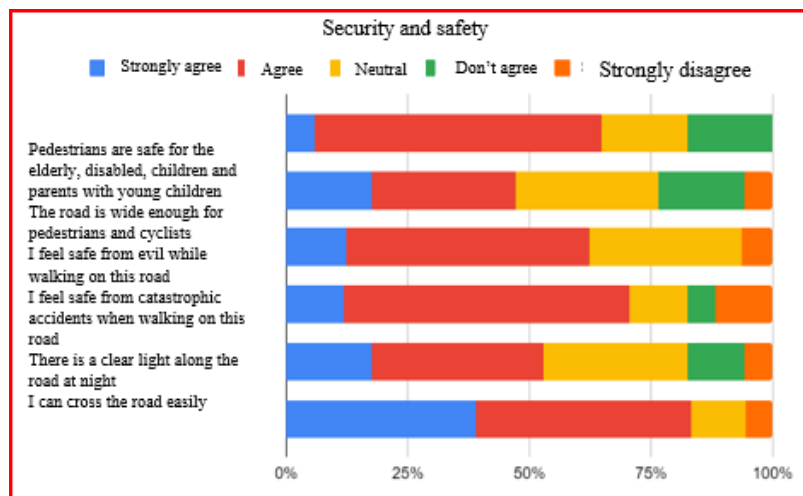


Figure 3. The results of the security & safety aspect survey (Source: Questionnaire, 2022)

The variable aspects of security and safety on foot on Via VIII Febbraio & Via Roma mostly have a fairly good score as a supporting factor for road walkability. The factor “the road is wide enough for pedestrians and motorists” gets the lowest score compared to other factors. This shows that some pedestrians feel uncomfortable with the presence of vehicles on a road which in fact is a pedestrian-only street, especially Via VIII Febbraio.



Figure 4. Parked vehicles (Source: Field observations, February 2022)

Some respondents admitted that they did not feel safe from accidents when walking in the corridor of the study object. The disaster in question is most likely in the form of a collision with a cyclist passing freely in the study object area, which can interfere with walking comfort.

Nonetheless, most pedestrians agree with the statement that they can cross the road easily. This also supports the safety and security of pedestrians in the study object.



Figure 5. The number of cyclists on the road (Source: Field observations, February 2022)

Comfort and attractiveness

In accordance with the theoretical review, attractive and comfortable roads should provide an appropriate road network, pedestrian facilities and facilities for vulnerable groups (handicapped and elderly people, the elderly with young children and infants and young children), regular maintenance and cleanliness of pedestrian paths. walking distance, planting, interesting city views (including historic street views, nice and well-maintained shop fronts) and variety and diversity of activities in land use.

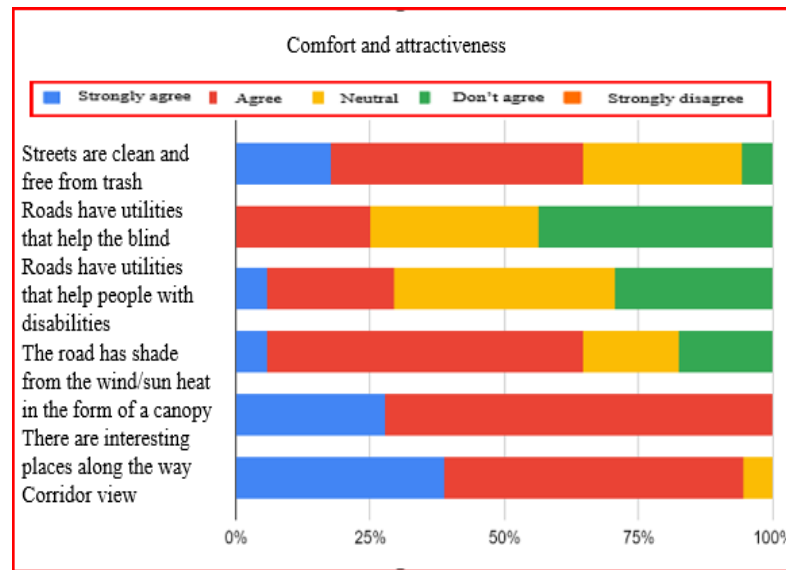


Figure 6. The results of a survey of comfort & attractiveness aspects (Source: Questionnaire, 2022)

Most pedestrians in the study area agree that the corridors are pleasing to the eye and there are many points of interest along the way. These two things are the main points that trigger the walkability factor in terms of comfort and attractiveness on Via VIII Febbraio & Via Roma Padova. On the other hand, many pedestrians feel that the facilities for the visually impaired and persons with disabilities in the study object are still inadequate. This needs to be considered in the future in order to support the needs of all pedestrians in an inclusive manner.



Figure 7. Via Roma, Padova (Source: Field observations, February 2022)

Relationship with open space

Open space is a place where residents can interact, meet, stand, or talk. A walkable environment can be realized by providing a place for social interaction between the public and a place for social interaction in open spaces. As mentioned in the theoretical review, the relationship variables with open space are the relationship between the road network and the nearest interesting place, square or square, and landscape elements as green space.

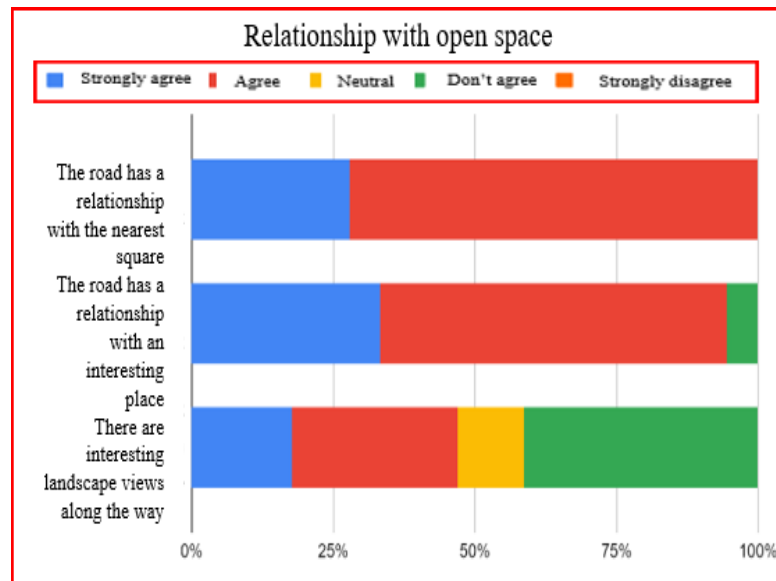


Figure 8. The results of the survey on the aspect of the relationship with open space (Source: Questionnaire, 2022)

Judging from the survey results, the statement that the road has a relationship with the nearest square gets a fairly high score with a figure of 85.5%. In addition, most pedestrians also admit that the object of study has a relationship with an interesting place, as evidenced by a score of 84.4%. There is a square or square called Piazza Cavour which is a public communal space near Via VIII Febbraio as a place to gather and interact casually. Unfortunately, there are not many landscape views along the promenade, and the majority of respondents agree with this statement. It can be concluded that the road does not have sufficient green open space, but its relation to the square and interesting objects also contributes to the walkability factor of the study object.



Figure 9. Piazza Cavour (Source: Field observations, February 2022)

Road quality

As noted in the review, improving road quality is an important aspect of regulating a pedestrian-friendly environment. The width of the sidewalk, the quality of paving, road furniture, road signs, street lighting and trees are some of the factors to test the quality of the road.

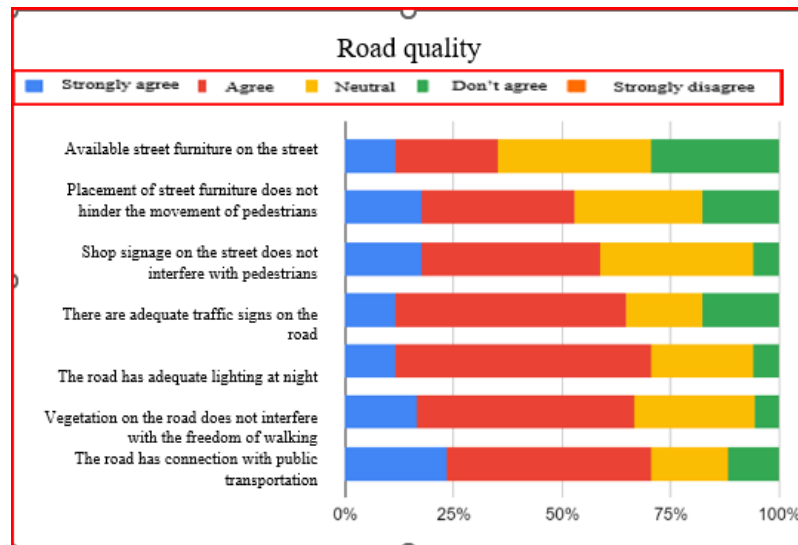


Figure 10. Survey results on road quality aspects (Source: Questionnaire, 2022)

The road quality aspect survey shows quite varied results. The road has several factors that are quite good to support the walkability of the object of study, although not all pedestrians have the same opinion. One of the factors found to be lacking in the aspect of road quality is the availability of street furniture along the road. Along the corridor, street furniture is only found in a small part of Via VIII Febbraio. This can be a consideration for stakeholders to increase the number of street furniture along the road in order to improve the quality of the road in the perception of pedestrians.



Figure 11. Bench on Via VIII Febbraio (Source: Field observations, February 2022)

Accessibility

Accessibility refers to the ability to achieve the desired goods, services, and activities (Litman, 2003). Accessibility has a significant effect on walking ability by encouraging pedestrians to move easily. The accessibility of urban facilities, transportation facilities and amenities helps to create a pedestrian-friendly and pedestrian-friendly environment in equality. Access to public transportation, parking, and unrestricted movement are some of the measures to assess accessibility indicators.

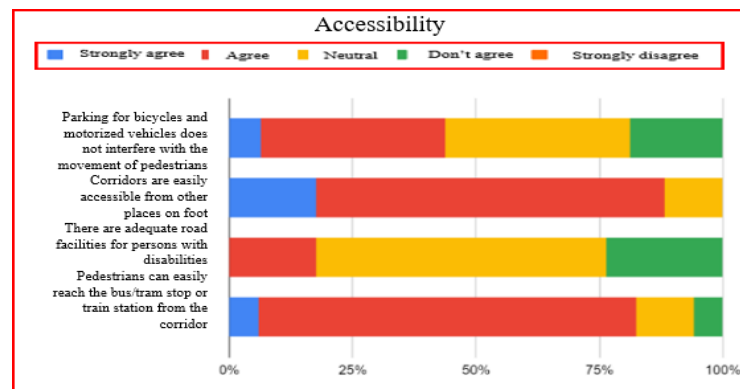


Figure 12. Accessibility aspect survey results (Source: Questionnaire, 2022)

Along the corridor, there are several bicycle parking points on the roadside. The road is also equipped with a bike lane on both segments. According to the survey results, some pedestrians feel disturbed by the existence of bicycle parking on the side of the road which also reduces the pedestrian area to be able to walk with full freedom. There are also several bicycles and cars parked on the side of the road. This is expected to be reduced in the future, in order to improve the walkability aspect in the study object area.



Figure 13. Bicycle parking (Source: Field observations, February 2022)

CONCLUSION

Based on the analysis that has been done, it can be concluded that there are five components that support the walkability of a corridor, namely attractiveness and comfort, relationship with open space, security, road quality, and accessibility. In the case study the Via VIII Febbraio & Via Roma corridor in Padova, Italy has fulfilled all five aspects of walkability with an average satisfaction score of 72.6%. From the analysis of all these aspects, it was found that the supporting factors for the walkability of the Via VIII Febbraio & Via Roma corridors with the highest score were visual corridors that were comfortable to look at.

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