

PEDESTRIAN PERCEPTION ON WALKABILITY IN THE ROYAL TOWN OF KLANG: A CASE STUDY OF JALAN TENGGU KELANA AND JALAN DATO HAMZAH, BANDAR KLANG

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Abstract

The Klang Local Draft Plan 2035 has identified accessibility issues in some tourist locations and inconsistent pedestrian walkways that hinder pedestrian movement. Therefore, this paper aims to assess the spatial characteristics of pedestrian networks and the walkability in Klang to enhance visitors' walking experience. A quantitative design using a structured questionnaire based on walkability criteria and measurement framework was employed to achieve this. The research findings provide four key recommendations for improving the pedestrian environment, pathway network, pedestrian infrastructure, and maintenance. The significance of this study lies in its contribution to planners' and architects' efforts to create better pedestrian network access in urban areas. Additionally, it aligns with the 11th Sustainable Development Goal of creating sustainable cities and communities by enhancing road safety and providing access to affordable, safe, sustainable transport systems. Furthermore, this research can guide future urban research, walking and accessibility initiatives, and evaluations of proposals to revitalize historic towns and prevent unused urban spaces.

Keywords: Walkability, Pedestrian comfort, Intelligible Space, User-Oriented Design.

1 INTRODUCTION

In recent years, the debate on the liveability of the built and urban environment has increased significantly. The city's key challenge is to enhance citizens' quality of life through safety, economic stability, and a sound transport system and network, which is opposed to the situation at the west capital of Kuala Lumpur, the Royal Town of Selangor. Klang has developed from a once essential and vibrant city in the past to today's socially decaying neighbourhood and community. In the study context, considering pedestrian connectivity and tourists' satisfaction and expectation while walking could help make the city of Klang an attractive and sustainable city.

Referring to Klang Local Draft Plan 2035, themed Klang Town Royal Heritage 2035, one of the plans aimed to turn Klang into a royal heritage town capable of attracting more tourists and visitors. Klang can help grow the state's economy and develop a few strategies to achieve, such as increasing the maritime industry, high technology industry, sustainable tourism, aquaculture, and farming industry. Highlighting the Klang 2035 strategies to promote sustainable tourism, one of the characteristics of sustainable tourism is the capacity to have enjoyable walking opportunities and influential networks for pedestrians to travel from one location to

another. (Ram, Y., & Hall, C, 2018; Goodland, 1995). In the context of the study, considering pedestrian connectivity and; pedestrians' satisfaction and expectation while walking could help make the city of Klang an attractive and sustainable city. Thus, this research aims to examine the pedestrian perception and satisfaction of the current pedestrian walkway in the city of Klang heritage area, which determines the pedestrians' walking experience in Klang that needs improvement.

2 RESEARCH BACKGROUND

2.1 The Issue

There are accessibility problems to some of the heritage locations, and the walkway is not consistent, connected and accessible for pedestrian movement. Srirangam & Kusumo (2019). Powell & Kusumo (2019) found out that the southern Klang heritage and historical part have poor and moderate pedestrian connectivity and accessibility. Walking on the city's sidewalk and the 5-foot walkway in front of the shophouses is usually hampered by street furniture, commercial activities and even vehicles. For example, steps instead of ramps cater to level changes and deep uncovered drains; these are significant reasons that cause pedestrians to find it more difficult to walk along the roadway.

Klang has significant traffic congestion problems in the town and contributes to the problem of walkability. Srirangam & Kusumo (2019) points out that there are substantial impacts on the pedestrian network and connectivity due to federal highways and the urban morphology changes. Klang heritage area needs to improve the pedestrians' connectivity and walking experience; separating vehicular movement from the public realm is one way to improve it (Bryan, Powell and Camelia, 2019). Besides, Kadir, Akmal, and Noriah (2012) observed that Klang has severe problems with pedestrians' accessibility and experience due to some pedestrian walkways and sidewalks, particularly in the heritage area, cracked and lifted caused by uncontrolled tree roots.



Fig. 1: Example of Pedestrian walkways with curbs that end abruptly without curb cuts at zebra crossings. No tactile paving was installed for the blind. Confusing Zebra Crossing. (Source: Author)

Improving pedestrian access and connectivity creates a liveable and sustainable urban environment (Lennard, 2008). Walkability in Klang would enable tourists and locals to visit for commercial and recreational purposes, significantly benefiting both government and residents (Gehl 2007, and Forsyth & Southworth, 2008). Besides, tourism can play an essential role in the economy. It will provide jobs in all community segments, revenue and business opportunities and help provide countless benefits to locals through beautification, pedestrian programmes, conservation and the hosting of magnificent events. (Albalate, Daniel, & Germa, 2010)

2.2 Klang, the Royal Town of Selangor

Klang occupied over 2,000 years ago, making it one of Malaysia's oldest cities. Klang is rich in history and became one of the prominent cities in Selangor due to its rapid expansion of tin mining activities in the early 1820s. Ever since, Klang 'organically' evolved from a jungle by the river to a village in 1872, to a centre for agriculture in 1880, a port city in 1898 to a manufacturing centre in 1920. Besides, constructions like the Connaught Bridge, railway network, Port Swettenham and others significantly altered Klang's urban morphology from 1870s to 1920s (Gullick J. M., 1983, Kim, K. K., 1989).

Klang is rich in history that predates back to the Malay Sultanates of Malacca (Kim, K. K., 1989). Klang became one of the prominent cities in Selangor due to its rapid expansion of tin mining activities due to the high demand for tin from the West in the early 1820s. Ever since, Klang 'organically' evolved from a jungle by

the river to a village in 1872, to a centre for agriculture in 1880, a port city in 1898, to a manufacturing centre in 1920. Also, constructions like the Connaught Bridge, railway network, Port Swettenham, and others significantly altered Klang's urban morphology throughout the year of 1870s to 1920s (Gullick J. M., 1983, Kim, K. K. , 1989).

The transfer of the state capital from Klang to Kuala Lumpur, a strategically placed Kuala Lumpur, marked the beginning of the Malaysians' impression of Klang which the place heard plenty of but elicited little excitement. The government initiated the Federal Highway extension in 1959 from Kuala Lumpur to Klang as one of the efforts to further rejuvenate the city's development through its accessibility. Today, the city's walkability has decreased due to more road and highway construction, less space for pedestrians and poor pedestrian infrastructure, which affects the pedestrian walking experience. In short, this literature on walkability in Klang suggests that there is a concern about problems caused by the physical pattern changes of Klang into a non-pedestrian friendly. It is one of the forgotten historical cities.

2.3 Walkability

The definition of walkability simply refers to comfort regarding both the physical and psychological of walking in space. Walking becomes impossible if the physical barriers are absolute and gangs of 'others' threaten the danger of aggression or death (Wong, 2018). Walkability can be categorised into two viewpoints by different fields of practice; 1) a means of transportation. 2) A socialconstruct. (Abbot, 2008; and Moura, Cambra & Gonçalves, 2017). Walkability as a means of transportation incorporates a flow capability in which an unimpeded flow is valued as good pedestrian activity. The social viewpoint is various other reasons for travel: exercise, social interaction, spiritual rejuvenation, recreation, shopping, or charity. Wong (2011) defined walkability as a mode of transport that facilitates walking. One of the benefits of walkable cities is that residents can walk enjoyably and reach their destinations without difficulties besides increasing physical activity to maintain their health. Improving walkability may be one of the options for improving the current modal share of public-private transport. This alternative could also help reduce environmental, social, and economic tensions in cities, particularly congested cities. (Gehl et al. 2007, Forsyth and Southworth 2008).

Furthermore, Gehl et al. (2007) suggested that cities' walking experience should be a safe, comfortable, and enjoyable one. Besides, Forsyth and Southworth (2008) point out that most recent research on walking with a focus on well-being in relation to enhancing people's physical fitness has deflected the most basic definitions of 'walkable spaces.' They come out with five other walkability meanings that mainly relate to the physical conditions - close, barrier-free, safe, full of pedestrian infrastructure and destinations, and upscale, leafy, or cosmopolitan. Thus, walkability is not only about taking care of physical provision but also about the environment of walking conditions.

2.4 Walkability Criteria and Measurement

There are several walkability criteria and measurements that need to be concerned;

Table 1: Walkability criteria and measurement (Source: Author)

Walkability Criteria	Summary	Author
Connectivity	A system that uses an arrangement of paths that brings the pedestrian network together by creating a connection from the sidewalk to the street.	Weng, et al (2019), Tal and Handy (2012)
Accessibility	Provide sufficient access to the surrounding area for the pedestrian to maneuvers multiple locations without needing to interrupt the rhythm of walking,	Keyvanfar, et al (2018), Litman (2008)
Clarity	Pedestrian environment is obvious; clear; discernible; distinct; perceptible.	Fallahranjbar, et al (2019), Blečić, et al (2015)
Conviviality	The extent to which the pedestrian environment is entertaining; lively; pleasant; sociable.	Mansouri and Ujang (2016)
Safety	Exists engagement, liability and responsibility towards the pedestrian environment	Mansouri and Ujang (2016)

Comfort	Pedestrian environment is easy; pleasant; protected; relaxed; sheltered; untroubled.	Shammas & Escobar (2019), Mouada, Zemmouri&Meziani Zemmouri&Meziani (2019)
Convenience	The extent to which the pedestrian environment is appropriate; useful; proper; suitable; time-saving.	Shammas & Escobar (2019)
Coexistence	The extent to which the pedestrian and other transport modes can exist at the same time and place with order and peace.	Moura, et al (2017), Blecic et. Al (2015),

These factors can be grouped into three, namely; 1) Intelligible Space; Connectivity, Accessibility & Clarity; 2) Comfort & Conviviality; and 3) Spatial Organization; Convenience & Coexistence.

The intelligibility of pedestrian walkways is a significant measure indicative of wayfinding and environmental cognition within the urban setting (Haq & Sara, 2003). Continuity of pedestrian networks and directness to the destination may achieve intelligible space (Southworth, 2005). Intelligibility Space highlights the ease and the comfort with which pedestrians can access the layout and the road design to explore new places and cities at their convenience (Pandit &Knöll, 2019).

User-oriented design involves all the vital parameters from the presence of amenities and landscape elements along walkways, traffic lights, safety and maintenance of pavement and walkway structure. Visibility is also crucial in determining and framing pedestrian perception while accessing new roads or places. Pedestrian-oriented transportation is the recently emerged concept gaining much more significance to enhance transportation mode as a medium to diminishing road accidents. It provides pedestrians with all the necessary safety and security. According to Battista & Manaugh (2018), User-oriented design involves all the vital parameters from the presence of amenities and landscape elements along walkways, traffic lights, safety and maintenance of pavement and walkway structure.

Convenient facilities and the land utilisation parameters involve commercial usage and aesthetic aspects of the roads and streets that provide the pedestrian with the comfort and ease of accessibility (Sabir Abdullah, 2020 and Conticelli *et al.* 2018). The pedestrian ambience, when well-constructed and maintained, enhances pedestrian safety. The width of roads determines the safety and comfort associated with pedestrian walking. As Wimbardana, Tarigan & Sagala (2018) stated, Obstructions in the streets and sidewalks, for instance, parked cars, garbage cans, out-of-place poles, often hinder the pedestrian and rises pedestrian conflict. Sidewalk Construction acts as a disturbance to the smooth pedestrian flow. Ja'afar (2018) stated that the construction zone poses serious safety issues by obstructing sidewalks with machinery and creating alternative routes and sidewalks that are often less comfortable for the pedestrian.

3 METHODOLOGY

This research adopted a survey as the inquiry strategy. The population was taken from the Klang residents and visitors who had explored foot (walking) as their mode of transportation on the selected site. The question is fixed for all respondents so that the data collected can be easily organised into one unit. The structured questionnaire will be based on the walkability criteria and measurement framework. The questionnaire will be divided into three sections, which are a) Perception of Intelligible Space, b) Spatial Organisation, and c) User-Oriented Design. The first part will be based on the respondents' attributes and information. For sections A, B and C, 5 points Likert scale measurement was used. Therefore, the scores will be calculated, and weights will be allocated based on the respondents' walking experience in Jalan Tengku Kelana and Jalan Dato Hamzah. Each measure of the perception will be established based on the research framework made thoroughly by literature review.

60 questionnaires were distributed; however, only 50 were used after incomplete or unreliable questionnaires were excluded. The study areas are chosen in the city's historical area, which is located in the southern part (figure 2) along Jalan Tengku Kelana and Jalan Dato Hamzah; where they have tourist attractions such as heritage buildings, religious places, shophouses, streets, etc.



Fig. 2: Jalan Tengku Kelana and Jalan Dato Hamzah.

4 RESULTS AND DISCUSSION

4.1 Demographic

The questionnaire was given using a sampling method, referring only to the respondent connected to the location and has experienced the following walkway regardless of their residency status. 50 samples from the questionnaire have been collected for this finding. Half of the respondents (50 percent) aged between 25 to 35 years old, followed by (32.5 percent) aged 36 to 45 years old. The remaining respondents were age between 45 to 65 years old (10 percent) and 18 to 24 years old (7.5 percent). Most of them are male (60 percent) and female (40 percent). In terms of frequency of the respondents visited Jalan Tengku Kelana and Jalan Dato Hamzah; 50 percent of the respondents visited more than 3 times, followed by 2 times (25 percent). The remaining respondents visited this area is 3 times (15 percent) and once (10 percent). Regarding visiting purposes, most of the respondents visit this area for sight-seeing, recreation and shopping. The rest were coming for work, religious purposes, and meeting friends.

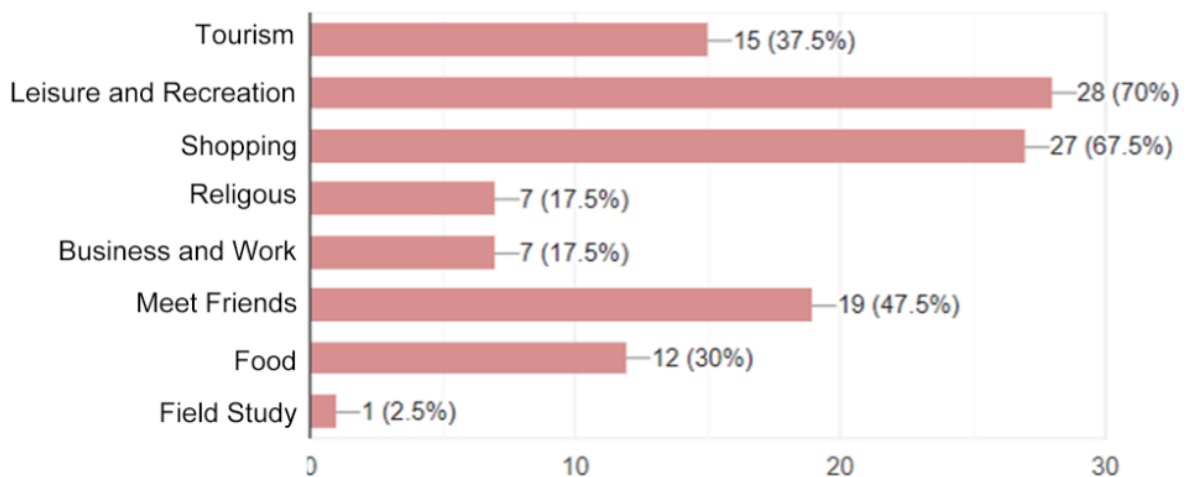


Fig. 3: Respondents' Demography

4.2 Space Intelligibility

The findings on respondents' perception of intelligible space in Bandar Klang are shown in Fig 4. The results show that most of the respondents (63 percent) agreed that they are not quickly listed while walking, as they are more than 50 percent agreed that there are clear signage and landmarks along the walkway.

Data accumulated through the survey report highlighted that almost 40% agreed that the roads and sidewalks were appropriate conditions to be explored. However, 60% of the participants agreed that the absence of the barrier in Malaysia's royal town positively influences road accessibility and visibility among the pedestrian.

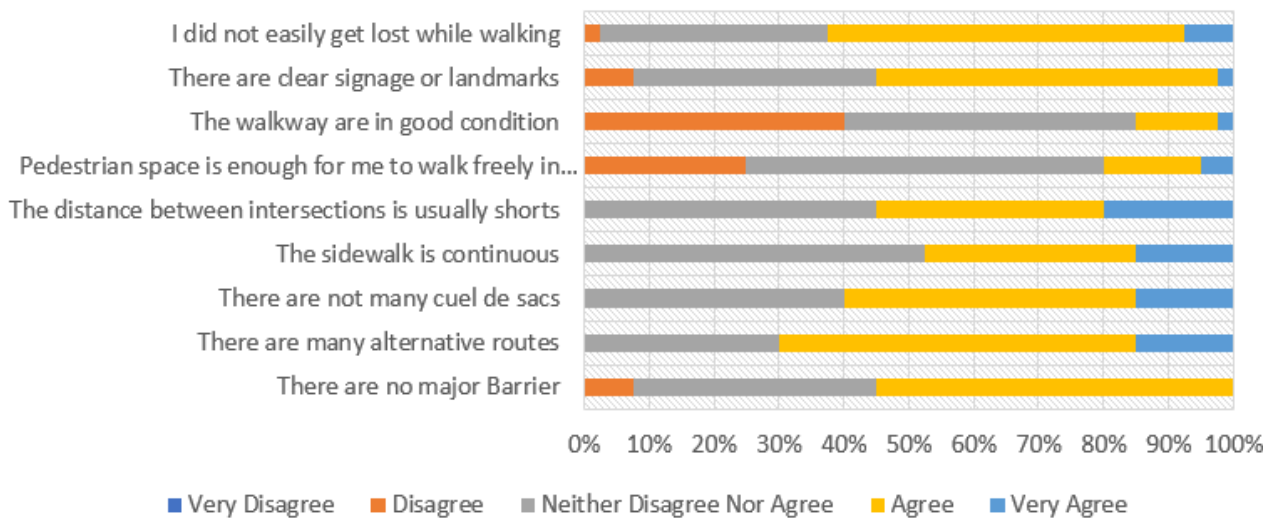


Fig. 4: Perception of intelligible space

4.3 User Oriented Design

The survey methodology conducted on the local pedestrian and visitors in Bandar Klang highlighted that more than 50% of the participants agreed on the absence of landscape elements along the walkways, thus allowing them to walk freely without crossing any barrier. Based on safety issues, nearly 40% agreed that they feel safe while walking along with Malaysia's cities. In comparison, almost 20% of them stated that they feel unsafe walking along the streets of Bandar Klang in Malaysia. Safety parameter highlights the strategic design associated with the integration of street lights and commercial utilisation to provide safety to the pedestrian by preventing crime and at the same time enhancing walk safety awareness among the individuals. However, the survey data highlight that only 10% of the participants supported pedestrian lighting during the night.

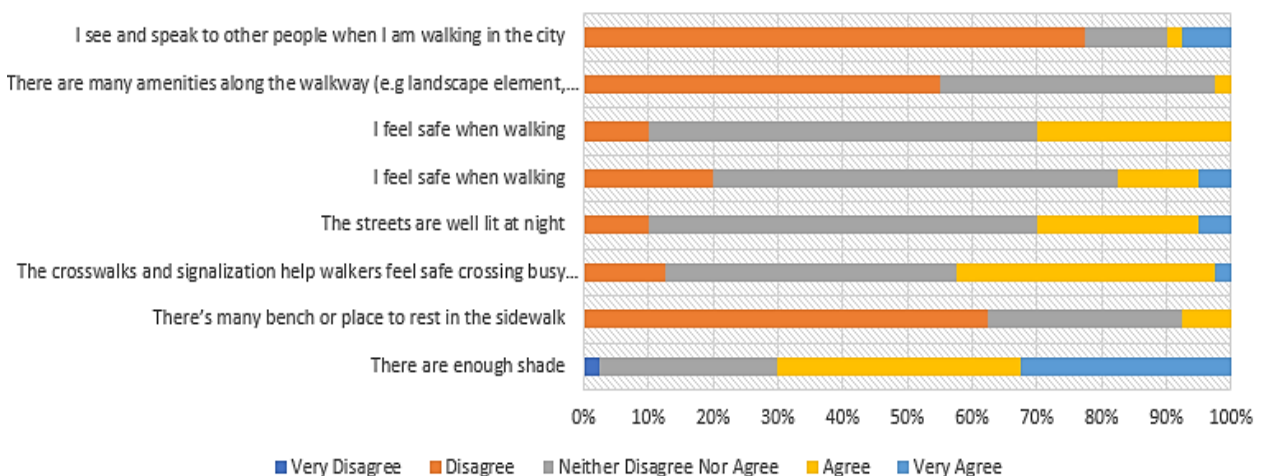


Fig. 5: Perception of user-oriented design

From Fig. 5, street design plays a significant role in framing the pedestrian perception and the safety associated with the walkways. The presence of a clean ambience or public seating near sidewalks provides the elderly pedestrian with the comfort to sit and relax in their leisure time. However, the survey result further stressed that roads and sidewalks in Malaysia require further improvement. More than 60% of the participants agreed on the absence of benches near sidewalks, thus preventing them from accessing and enjoying the walk in their leisure time.

4.4 Spatial Organisation

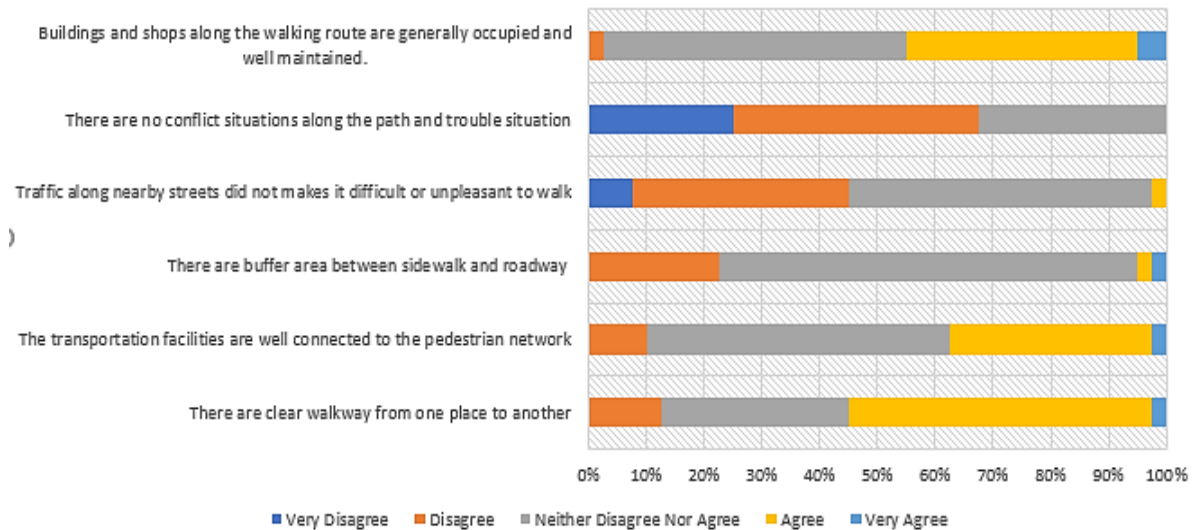


Fig. 6: Perception of Spatial Organisation

The survey report based on spatial organisation further accentuates in fig.6 that more than 40% of the participants agreed on the well-maintenance of buildings and shops along the side of the roads, thus enhancing the visual perception and aesthetic ambience of the place. More than 40% of the participants agreed on conflicting surroundings; traffic hindered their walk. More than 40% of the participants agreed on the transportation facilities' well-connectedness with the pedestrian network. More than 60% of the participants accepted clear walkways that facilitate safe walking for the participants.

5 CONCLUSION AND RECOMMENDATIONS

Creating a supportive pedestrian environment should be prioritised and enhanced to provide pedestrians with the ease and comfort to explore places. Sidewalk Design should be appropriately constructed by maintaining the width. Provision and maintenance of edge, furnishing, frontage and throughway zone provide easy accessibility for the pedestrian.

Pedestrian pathway networks should also focus on the convenience level that helps the pedestrian to explore other places via roadways according to their convenience and usage. Government authorities should also construct the **road design**, keeping in mind the disabled and elderly persons.

Sidewalks should be well constructed and maintained by encouraging public seating to comfort the walker. Wide streets are often intimidating and can be perilous for the pedestrian. Strategies for construction and road design should prioritize reducing the shortening distances, thus providing a safer transition to shared right-of-way and developing strong visual connection for the pedestrian.

On the other hand, Pedestrian infrastructure highlights the presence of building design, landscaping, paving should be constructed in a way that provides visual interest and is of human proportion. Pedestrian safety and security are crucial as lightning's intensity, amount, and quality mostly influence it. Governments and the local authorities should focus on transportation and road design by maintaining the lighting system and the ambience quality.

Maintenance of air and sound quality during walking is vital. It is responsible for creating an ambience that allows visitors and pedestrians to explore places and sidewalks according to their conscience. Efficient parking design and facilities reduce negative consequences on the pedestrian realm and provide vehicular access to the community. Buffers should be set-up between the roadway and sidewalks to minimise harsh sounds that create disturbances and conflict for the pedestrian.

City planning and transportation highlight the concept of sustainability and conservation in harmony has been significant elements of urban planning. The innovative planning paradigm highlights integrating high-density cities with intricate land usage patterns and transportation systems. Therefore, the study based on pedestrian perception of Walkability incorporates various aspects of safety, security, and ambience that help the pedestrian and visitors explore the places and the roadways without any hindrances.

In conclusion, creating a pedestrian-friendly environment is essential for a sustainable and accessible city. The design and construction of sidewalks, pathways, and roadways must prioritize the safety and comfort of pedestrians, especially the elderly and disabled. Governments and local authorities should focus on maintaining the quality of air and sound, efficient parking design, and proper lighting systems to ensure a pleasant ambience for visitors and pedestrians. Urban planning should consider integrating high-density cities with intricate land usage patterns and transportation systems, emphasizing sustainability and conservation. The study on pedestrian perception of walkability provides valuable insights into the aspects of safety, security, and ambience that affect the pedestrian realm. By prioritizing the needs of pedestrians and promoting pedestrian-friendly infrastructure, cities can become more accessible, sustainable, and livable, benefiting both the residents and visitors alike. It is crucial to recognize that pedestrians are a vital part of the urban ecosystem and that their needs should be considered equally in urban planning and transportation design. Implementing pedestrian-friendly infrastructure will create a vibrant, healthy, and prosperous urban environment for all.

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