

ANALYSIS OF THE ADVERSE PEDESTRIAN BEHAVIOR IN DHAKA CITY

Based on the lack of public interest design strategies

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Abstract: In the era of rapid urbanization, motorized traffic dominates the streets in the cities, and streets, instead of being the spatial nexus of urban life, social interaction, and vibrant public performance, eventually turned into apathetic and overloaded corridors for transportation. In this shift, the significance of pedestrians, one of the primary stakeholders of streets, has been largely forgotten, despite the fact that they are the most vulnerable victims in terms of crash involvement. Generally, these walkways are constructed in accordance with city ordinances and rules without taking into account the reasons why commuters are reluctant to use them. Given the situation, it is critical to discuss the importance of the usage and understand the psychology of the ignorant conduct with regard to the use of designated walking areas. By evaluating verbal data from pedestrians who opted not to utilize footpaths and an online poll to gather public opinion on the matter, this article attempts to address and comprehend the negative attitude surrounding avoiding walkways in Dhaka city. Based on data collection and analysis, this research shows that ignoring public interest design practice is the root cause of the negative sentiments that underlie the reluctance to use footpaths in urban settings.

Keywords: *Pedestrian behavior, Footpaths, Public interest design, Dhaka city*

1. Introduction

A pedestrian footpath, also known as a pedestrian way, walking trail or nature trail, is a type of thoroughfare that is intended for use only by pedestrians and not other forms of traffic such as motorized and non-motorized vehicles. Walking has always been one of the primary modes of transport all over the world since citydwellers must walk as a part of their regular trip even if it is from their home to the public transit stop or the place of service, which makes the pedestrians an integral part of the urban streets. However, it is unfortunate that pedestrians have been the most vulnerable victims since the evolution of the urbanization era. According to WHO 2018, pedestrians represent 23% of all crash deaths around the world, and the problem is especially acute in low- and middle-income countries (WHO, 2018). One of the major causes behind the vulnerability and fatal cases are most of the pedestrians prefer to walk on the roads instead of using designated walkways or footpaths due to several infrastructural reasons and the users' perception.



Figure 1: Satellite image of, Mirpur 10, Dhaka with marked study area
(Source: Author)

Due to the extension of urbanization, cities across the world are expanding like an asphalt jungle with buildings tumbling upon each other leaving no breathing space for the citydwellers. In order to accommodate the growing population, streets along with adjacent footpaths are being considered as two-dimensional functional spaces ignoring the users' psychology and their needs. In addition, the footpaths of busy cities are being occupied with unnecessary infrastructures installed by the adjacent land-uses and the commercial activities as street vendors like the walkways with their illegal infrastructures. Consequently, pedestrians take roads instead of sidewalks and end up being the most vulnerable road victims in terms of

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crash involvement. For instance, research conducted in Mirpur, Uttara, Gazipur and Old Dhaka reveals that there are no footpaths in 44% area and 82% of the existing footpaths are in a bad condition in Dhaka city for which prioritized cars have been causing traffic congestion continuously. According to a study by the Dhaka Transport Coordination Authority (DTCA), 60 percent of the footpaths of Dhaka are illegally occupied. As a consequence, these situations create an adverse impact on the common pedestrians' mindset and refrain them from using the footpaths spontaneously. As a result, a huge amount of urban people take the street for their regular walking and the designated walking remains unused by the people it has been designed for, and turns into the illegal urban storage.

This paper investigates the adverse and reluctant behavior of pedestrians in Dhaka city, considering the existing condition of the footpaths and manifest the potential of incorporating the public interest approach into the design decision. For study purpose, the existing footpaths of Mirpur 10 (Block A, B, C) and the user group have been chosen to understand the pedestrian behaviour of the exceedingly populated areas of Dhaka city.

2. Literature Review

2.1. FOOTPATHS AS LINEAR PUBLIC SPACE AND THE BEHAVIOR OF THE PEDESTRIANS

Linear spaces, such as roads, streets or sidewalks, are crucial public areas in urban areas that connect multiple spaces and nodes, having a significant impact on the regular pedestrian movement and their exposure to the destination points. As a linear public, sidewalks or footpaths provide a space that is separated from the road for people to walk to and from home, a place of work, recreational facilities, schools, shops, and public transport, which make them an inseparable form of urban thoroughfare. By linking significant nodes and spaces, these linear walkways contribute to the walking experiences and the duration of such journeys are quite longer than the users feel while using the vehicles. The audio-visual environments and the perception of the users have a huge impact on the overall experience which influence pedestrian activities as well as urban connectivity. However, in rapidly growing population and densifying cities, it has become a daunting task to meet the basic needs of the dwellers let alone ensuring their comfort and betterment. As a consequence, these urban linear connections are being ignored that demotivate their most valuable users in this process.

Several studies over the decades have been carried out in order to comprehend the factors contributing to the pedestrian perception and behaviours regarding the reluctance on using the designated walkways and the consequential situations like chaos on the street and even collisions. It has been found that 41% of collisions involving pedestrians occur during the crossing of roads and 39% occur while walking on the road (Mahmud et al., 2009). According to the study of Lenard and Hill (2004), 30% of collisions occur due to the adverse road environmental conditions such as obstruction from parked car, vegetation, road slope, road surface, etc. and 'failed to look' behaviours, followed by 'inattention' (24%), 'looked but did not see' and 'in a hurry' (19%), and 'failed to judge other's path or speed' (18%). As a whole, pedestrian perception of the adjacent environment and their reactions have been intrinsically linked to the overall chaotic situation and collisions on the roads.

In addition to the previously discussed concepts, Neisser's (1976) perceptual cycle mode (PCM) posits that individuals hold mental templates about the world; this comes from past experience and is termed 'schema' in the language of the PCM. This theory demonstrates that when a person experiences an incident which is similar to one experienced previously, they encounter the current environment with their previous ones and during interaction, their mental template, or schema, of the situation gets modified based on the environmental information present, thus changing their interaction with the situation (Salmon et al., 2014), and modifying their perception of that situation (Plant and Stanton, 2016). In summary, this theory can shed light on the decision-making processes of the pedestrians, and explains the reluctant behaviours and adverse attitudes in terms of avoiding designated walkways in busy cities.

2.2. EXISTING CONDITION OF PEDESTRIAN BEHAVIOR IN DHAKA CITY

In Bangladesh, a least developed country (OECD, 2019), collisions involving pedestrians account for between 37% and 73% of all collisions in metropolitan areas, and around 56% in non-metropolitan areas. Dhaka, a city of over 23 million people in the metropolitan area as of 2025, already struggles with a lack of adequate accommodation and essential infrastructure for its people. Although sidewalks are designed for ensuring safe walking in an overpopulated and inadequate city, pedestrians are forced onto the congested roads as vendors have taken over Dhaka's footpaths. The existing footpaths are always busy with commercial activity as street vendors line the walkways, selling everything from fruits and clothes to mobile accessories and snacks. For many, these vendors are a lifeline, offering affordable goods and services, conveniently. According to a study by the Dhaka Transport Coordination Authority (DTCA), 60 percent of the footpaths of Dhaka are illegally occupied. Research has been conducted in Mirpur, Uttara, Gazipur and Old Dhaka which revealed that there are no footpaths in 44% area and 82% of the existing footpaths are in a bad condition in Dhaka city for which prioritized cars have been causing traffic congestion continuously. These situations make obstacles of walking smoothly for the common pedestrians in Dhaka city, and results in a chaotic mix of people and vehicles, increasing the risk of road crashes. It also creates difficulties for vulnerable groups such as the elderly, persons with disabilities, and children since navigating these cluttered spaces is not only inconvenient but can be life-threatening for them too. The studies and analysis revealed some of the factors that affected decision-making (for road crossing behaviour) at the different road sections. Many external factors (e.g., street sellers, rubbish blocking the path, lack of shade and poor pavement condition) prevented the pavement

from being used and contributed to riskier road crossing behaviour. Some safety implications and related recommendations are presented..

To sum up, pedestrians remain the most neglected road user group in terms of research and safety measures, even though they are involved in nearly 50% of all fatal collisions. In the Dhaka metropolitan area, this statistic rises to around 65%.

2.3. PUBLIC INTEREST DESIGN

Public interest design can be defined as a community-based approach to designing products, environments and systems that expands disciplinary boundaries and professional practices and relevance of planning and design disciplines in the 21st century. In the 1960s, participatory design and planning began to develop based on concepts such as equity, social justice and the right to the city. Mostly, public interest design practice is working to find out ways to provide architecture and urban design services for communities who cannot otherwise afford them but their opinions and needs are intended to be incorporated into the design decision. .

Since the mentioned method is a “human-centered and participatory” design practice that places emphasis on the “triple bottom line” of sustainable design that includes social, economic, and environmental issues while creating spaces, it intends to take the users’psychologies into account and incorporate their opinions, acceptance and willingness into the decision making process. For instance, humans tend to avoid narrow corridors due to psychological factors such as the need for personal space and control, and a reduced sense of security in confined, potentially inescapable environments. This avoidance can also be influenced by the negative psychological state caused by feeling crowded and the anticipation of potential obstacles, which can be exacerbated by confusing or lengthy corridors. A human-centric design approach can mitigate the rate of such avoidance and reluctance by incorporating these acting factors during placemaking. On the other hand, in windowless spaces (including underground malls or buildings with closed doors and sealed windows), the absence of an external view may cause some occupants to experience claustrophobic symptoms, such as feeling trapped and uneasy, losing a sense of control over their environment, or cardinal directions (Ringstad, 1994; Lee et al., 2017), which may lead to wayfinding difficulties (Yokoi et al., 2015). Under these conditions, pedestrians prefer wider spaces like streets to ensure their visual comfort and make their daily commute easier and more comfortable. Additionally, environmental psychological studies have revealed the navigational function of spatial information (Arthur and Passini, 2002), as they suggest that well-designed spaces provide efficient cues inherent to the environment, which can guide people subconsciously while guaranteeing a smooth experience of wayfinding (cf., Raubal and Egenhofer, 1998; Apelt et al., 2007).

Public interest design perceives architecture as a practice pursued in partnership with communities, not just as a professional service. In fact, it is believed that design is not a privilege but a public right (Moore, 2017) because all these infrastructure and strategies are meant to serve the stakeholders in their favor without imposing those on the users and force them to adapt to the newly intervened environments. Such practices can establish engaging equity in urban life by addressing critical social, communal and political marginalization (Anderson, 2014b). Moreover, it shifts the focus of architectural practice from product to process and widens the scope of the projects that designers can participate which enables the pedestrians in cities to incorporate their materialistic and psychological needs into the decision-making frameworks leading the way to moving away from individual work at a drawing board or computer to a collective (Anderson, 2014b).

3. Methodology

To comprehend the adverse situation and the pedestrians' attitude towards it as well as the knowledge gap of the studies, both online and face-to-face surveys have been conducted in an extremely chaotic urban area through which the data including the perception and instant reactions of the people have also been collected and examined.

3.1. STUDY ROUTE SELECTION

To conduct the study rationally, the Mirpur area, one of the densely populated residential areas of Dhaka city, with highly observed reluctance of using footpaths and violation of rules by the pedestrians, is chosen for a thorough study. The study area is located in Mirpur 10 (particularly block A,B,C), which includes primary, secondary, tertiary and local roads. In order to compare the existing situation regarding the use of footpaths, four different types of roads and their adjacent footpaths or sidewalks with distinguished physical features and context have been chosen for observation and analysis.

3.2. SELECTION OF PARTICIPANT GROUPS

Since the study aims at extracting the actual perception and attitudes of individuals regarding the use of footpaths considering their age, gender, and different times of the day, two groups of participants have chosen for the study. Firstly, the group of people not using footpaths at different times a day in the study area have been chosen for the one-to-one interview for understanding their reluctant behavior on using or not using footpaths. Secondly, an online questionnaire

survey has been conducted incorporating individuals from different areas with diverse context in order to comprehend the psychology of individuals from diverse backgrounds.

Table 1: The selection details of the two distinct participant groups

Participants	Participant Selection Criteria	Data Collection Platform	Data Collection Method	Total number of participants
Group I	Interested participants only	Online	Online questionnaire (15 Questions)	63 (Male 29 & Female 34)
Group II	Pedestrians not using footpaths	Offline	Observation and one-to-one interview with the interested ones (Anonymously)	394 (Male 268 & Female 126)

3.3. SURVEY DESIGN AND DATA COLLECT

A well-structured questionnaire with 15 questions regarding the frequency of walking, the rate of using foots and their tendency to avoid using footpaths regarding age, gender, time, road types, and distinct contexts have been prepared for both online platforms through a google form and face-to-face questionnaire survey.

For the online survey, 63 respondents have participated and their feedback has been considered to understand the general attitude regarding the regular pedestrian behavior as well as the reluctance of using footpaths. On the contrary, the offline survey aimed to identify and understand the attitude of the particular set of reluctant individuals who chose not to use footpaths while walking. At three different times a day, the pedestrian behaviour of the individuals who walked on the road instead of using footpaths have observed and the number of such individuals on four different types of roads (Type I, II, III, IV) for at a stretch 10 minutes have been counted each time for ten days (From June 09, 2025 to June 18, 2025) in order to understand the rate of violation of pedestrian rules. Besides, individuals avoiding footpaths including both male and female have been interviewed with the same set of questions in order to comprehend their psychology and reasons behind avoiding the footpaths at that moment.

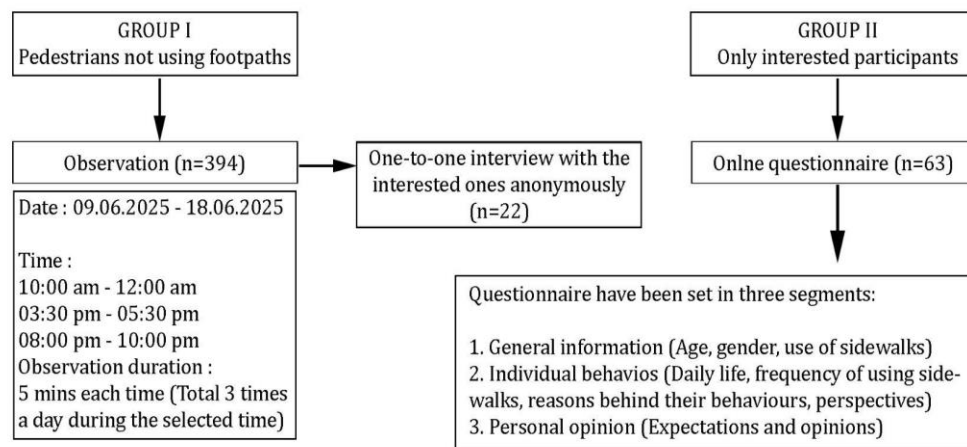


Figure 2: Satellite image of, Mirpur 10, Dhaka with marked study area (Source: Author)

4. Findings

4.1 THE EXISTING CONDITION OF THE PEDESTRIAN PATHS OF THE STUDY AREA

The study area is located in Mirpur 10 (particularly block A, B, C), Dhaka, which is one of the highly dense urban areas where buildings tumble upon one another with no breathing space. For instance, the total study area occupies 32.5-acre area providing a strong street network that connects the whole community in spite of having insufficient sidewalks and the associating infrastructure.

For study purposes, the existing sidewalks have been categorized into four types according to their adjacent roads and a distance of 300m from each category have been chosen to observe the behavior of the pedestrians for the data collection and analysis. To understand the differences among the four types of paths, their distinct features have been determined initially and the further study has been conducted later.

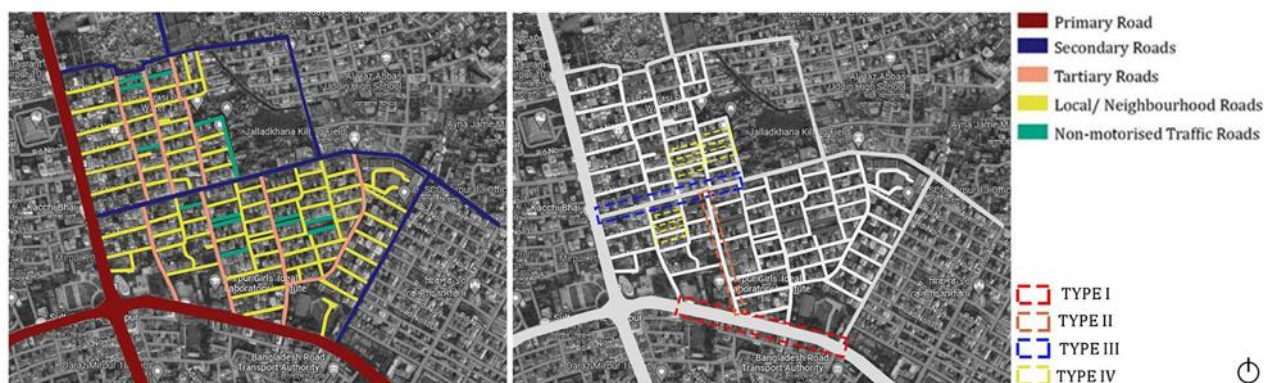


Figure 3: Existing road network and the selected types of the sidewalks (Source: Author)

Table 2: The distinct features of the chosen types of the sidewalks

Variables	TYPE I	TYPE II	TYPE III	TYPE IV
Road types	Primary	Secondary	Tertiary	Local
Road width	35 - 40 m	15 - 22 m	10 - 12.5 m	7 - 10 m
Sidewalk width	3.1 - 3.66 m	1.82 - 2.5 m	1.5 - 1.82 m	1.22 - 1 m
Vehicles	Bus, truck, cars, motorcycle	Minibus, cars, pickup vans, motorcycles, rickshaws	Rickshaw, cars, motorcycles, pickup vans	Rickshaws, bicycle, cars, motorcycle
Adjacent landuse	Commercial, Institutional, recreational uses	Commercial, Institutional and residential uses	Commercial, and residential uses	Commercial, and residential uses
Supporting facilities	Street lights, Trashbin, Trees, Portable public toilets	Street lights at the nodes	Street lights after a certain distance	Street lights at the nodes, planter boxes
Surface	Tactile paving tiles	Tactile paving tiles	Tactile paving tiles but not continuous	Tactile paving tiles but not continuous



Figure 4: Existing situation on the selected types of the sidewalks (Source: Author)

From the table, the existing condition of the footpaths of the study area and the lack of the supporting infrastructure can be presumed. The existing features and insufficient facilities for the citydwellers explicitly show the possibility of the reluctance of the pedestrians to use sidewalks and the chances of choosing non-motorized roads for their daily commutes. Additionally, the photos below clearly indicate the reluctance of pedestrians to choose sidewalks for commuting while they are more comfortable with walking on the streets.

4.2 PEDESTRIAN BEHAVIOR IN THE STUDY AREA

In order to comprehend and examine the perceptions and the spontaneous behavior of the pedestrians as well as their reluctance on availing the footpath facility, four different times of a day have been chosen and the regular behavior of the commuters have been observed in the study areas during those particular times for two weeks. The number of commuters who violated traffic rules and avoided using sidewalks have been observed every 10 minutes to calculate the rate of violation and their diverse behavioural pattern in terms of their age and gender has been taken into consideration for better understanding.

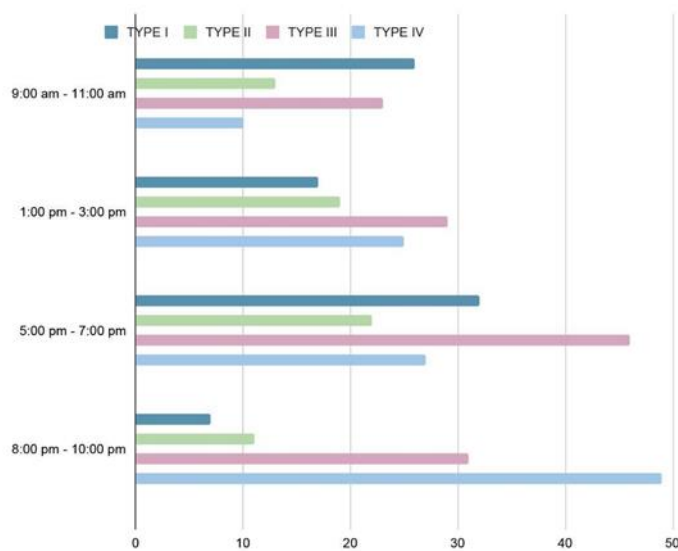


Figure 5: The reluctance rate of using footpaths in the different study area in a particular time

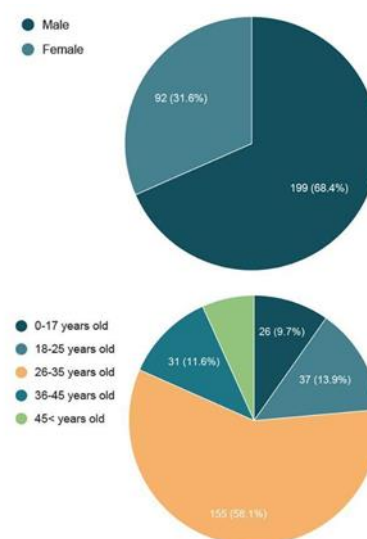


Figure 6: Percentages of people not using footpaths regarding their gender and age

From the survey, the major purposes of walking on a regular basis as well as the particular type of footpaths while commuting have been observed. The study reveals that the rate of using sidewalks adjacent to primary and secondary roads are comparatively higher while the tendency to use footpaths along with the local and neighborhood roads are quite narrow due to the lack of traffic rules and the presence of less motorized vehicles. In addition, people using sidewalks during daytime is quite high compared to the evenings and nights. It is also observed that the reluctance rate on using footpaths increases over time and the rate is higher after evening.

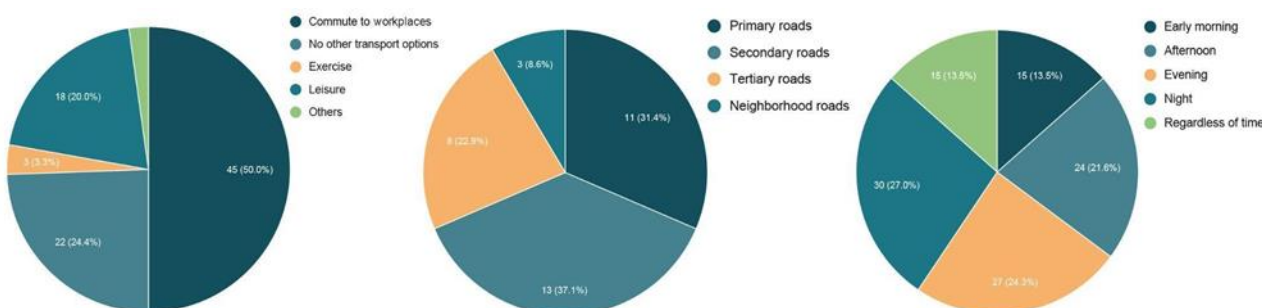


Figure 7: The percentages demonstrates the reasons behind using footpaths, the mostly occupied sidewalk types regarding the road types, and the maximum use of sidewalks regarding the time respectively (Source: Author)

4.3 FEEDBACK FROM THE RESPONDENTS

On the basis of the online questionnaire survey and the face-to-face interviews with the commuters in the study area, the opinion and perception of the respondents have been gathered and examined. The respondents have disclosed multiple causes for their ignorance and adverse attitudes regarding the use of the designated walkways, among which the reasons associated with poor conditions of the footpaths and the illegal establishment of encroachments are highly responsible. Some also claimed that the walkways with repeated height

variation and less width also demotivate them to avail this public facility. In contrast, commuters who avail this facility on a daily basis revealed that safety measures are their major motivation for taking these walkways including protection from dust and rainwater.

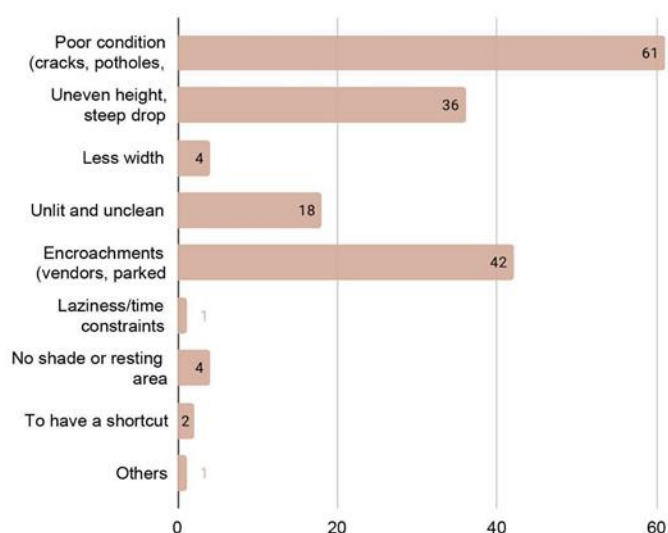


Figure 8: The reasons causing the reluctance on using footpaths

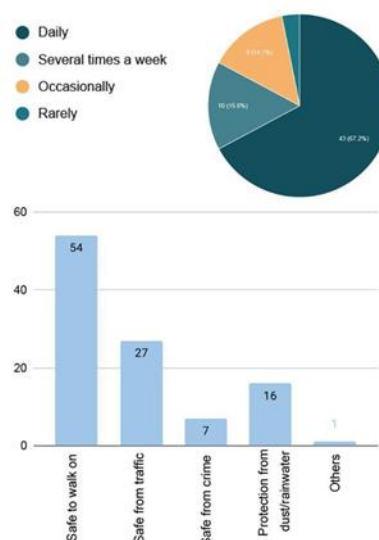


Figure 9: The rate of using footpaths and the major reasons behind this decision-making

Table 3: The causes inducing ignorance mentioned by the respondents in terms of genders

Distinctive reasons behind the reluctance	Study area	Male	Female
Reasons behind the reluctance (In terms of infrastructure)			
No traffic or pedestrian Signal / Disrespect for rules	Type I	28	11
Parking of vehicles on/around the footpath	Type I	7	2
Illegal establishment or structures on footpath (Street vendors)	Type I, II, III	33	30
Uneven, neglected and cracked surface	Type III, IV	37	27
Heavily crowded footpath	Type I,II,III	22	27
Shortcut attitude of pedestrians	Type I, II, III	5	0
Parking of vehicles on/around the footpaths	Type I	3	2
Uncomfortable surface materials	Type I	6	18
Adjacent landuse functions such as shops or foodstall	Type I, II, III	9	15
Random poles, banners, trees and planter boxes as repeated obstacles	Type II, III, IV	3	7
Protection from dust and rainwater during rainy season	Type I,II,III, IV	2	8
Unstable height (Not continuous) and steep drop due to the adjacent buildings' ramps	Type I,II,III	10	18
Dumping of construction materials on foots	Type III, IV	8	2
Too narrow for more than one person	Type IV	17	14
Wet and slippery footpath due to the residential AC's outdoor water outlet / Ignored rooftop drainage system	Type IV	0	3
Reasons behind the reluctance (In terms of individual perception)			
Easier to take a bus while walking on the road	Type I	13	5
Shortcut attitude of pedestrians	Type I, II, III	5	0
Mental discomfort due to congestion	Type II,III, IV	21	26
Unlit and unclear	Type IV	11	19

From the table above, the possible causes mentioned by the respondents can be observed and it clearly indicated the major issues that are causing the reluctance to use the walkways in the highly populated urban areas in Dhaka city. Besides, the varying reasons also reveal the psychological diversity of the user groups and the consequential behaviors in public places. According to the survey, the major issues inducing the adverse attitudes towards using walkways revealed in the

study are illegal establishment or structures on footpaths, mental discomfort due to the heavily crowded footpaths, as well as the uneven, neglected and cracked surface.

The respondents also shared their thoughts and opinions on how the mass people can be influenced and inspired to use the designated walkways and they have mentioned a number of facilities that they expect to be met while designing the spaces. In their opinion, a positive approach in terms of their needs and preferences can simultaneously encourage them to avail these public facilities and ensure a better public environment. According to their responses, considering their needs can ensure their cooperation to mitigate these chaotic situations and they look forward to well-designed walkways considering their requirements and perceptions.

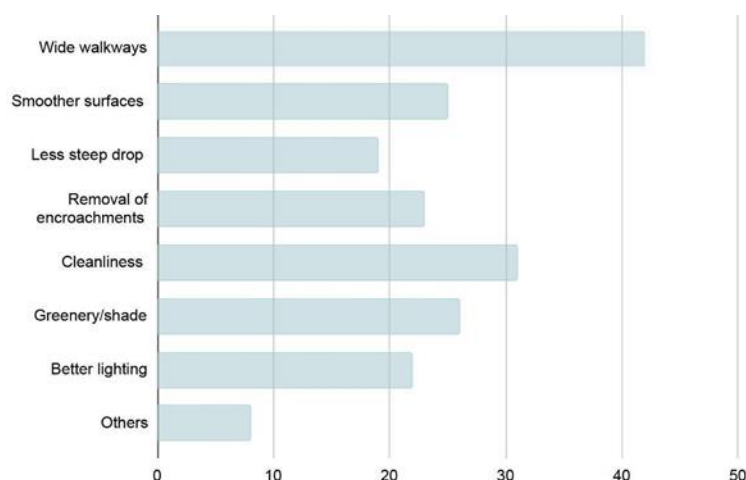


Figure 10: Measures suggested by the pedestrians in order to ensure the maximum uses of footpaths

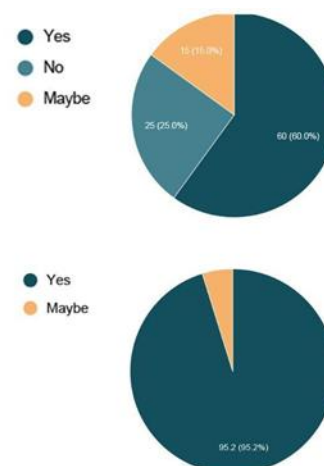


Figure 11: Percentages of the possibility of using footpaths if facilities provided

5. Discussion

The study conducted with the participation of the commuters and the interpretation discussed in this paper have come up with some insights in terms of public preferences and the design process. Based on the responses, some key observations emerge that include the diverse psychological aspects of the pedestrians and the significance of public interest design.

The study reveals a variety of conflicting viewpoints and reasons for the pedestrians' actions through numerous interviews with various respondents. Different people's perspectives on urban congestion and adverse circumstances lead them to respond differently to comparable instances, which ultimately results in a distinctive urban climax. Even well-designed walkways with precise measurements cannot satisfy urban dwellers because stakeholder perceptions have not been taken into account. Eventually, they alter the spaces to suit their needs, such as by putting up temporary seating or planter boxes, thinking of roads as wider walkways, using them for walking for visual comfort, etc.

The potential existence of resolving such urban issues is greatly impacted by a community-based strategy that involves residents and other stakeholders. This is because of their involvement and contribution to control over the major and minor aspects in the urban context. By incorporating the idea of public interest design, it is possible to understand the psychological patterns of the stakeholders and guarantee their active involvement in design decisions. This may additionally influence how pedestrians make decisions when they are strolling through urban areas. It has the capability to improve the quality of urban life by incorporating social, economic, and environmental issues while creating spaces, since the process intends to take the users' psychologies into account and incorporate their opinions, acceptance and willingness into the decision making process.

6. Conclusion

The development of a successful placemaking strategy and the expansion of the community are greatly influenced by the interdependence and correlation between the stakeholders and the intended space. A public space's success is solely dependent on the involvement of its stakeholders and how they feel about it. In this sense, a vast majority of our public areas, including pathways, remain unsuccessful as spaces, and the primary causes of the situation are the incorrect placemaking methodology as our public areas are not seen as collaborative processes and people-centric products. By incorporating the varied perspectives and ideas of the public, a public interest design method may guarantee the highest level of community engagement, while widening the door for a variety of options and creative exposure.

In conclusion, pedestrians serve as both linking routes and an integral aspect of urban life. By taking into account the psychological traits of pedestrians, they can establish a multifaceted network among community members. Meanwhile, this research highlights the problem of urban walkways being neglected since their users have been disregarded from the start, making them an underutilized resource in crowded cities. Nonetheless, in an urban environment such as Dhaka, pedestrian behavior and decision-making should be considered to guarantee placemaking and the effective utilization of these metropolitan areas. A better urban environment and pedestrian safety can be guaranteed by comprehending the circumstances and the repercussions. The overall conclusion of this article is that the idea of public interest design, which takes into account the psychology and behavior of pedestrians, may guarantee pedestrian safety and appropriate usage of walkways with many options for people walking in crowded areas like Dhaka.

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