

Improving Traffic Management and Pedestrian Safety in Urban Bangladesh: Insights from Rangpur City Corporation

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ABSTRACT

Rapid urbanization has led to various problems in Bangladesh, especially in urban areas like Rangpur, where traffic management and pedestrian safety have become significant challenges. This study intends to explore the current stage of traffic management and pedestrian safety in Rangpur City and to bring out some suggestions for improvement. A mixed method approach was employed to gather data by integrating a quantitative survey with 200 pedestrians and a qualitative Key Informant Interview with 10 academicians, government officials, and urban planning experts. Descriptive analysis for the quantitative data and thematic analysis for the qualitative data were carried out to analyze the collected data. The results indicate significant deficiencies in pedestrian infrastructure, for example, bad sidewalk conditions, absence of pedestrian crossings, and very low presence of traffic police during peak hours. Furthermore, low public awareness of pedestrian safety was found to be a significant factor in worsening pedestrians' risks. The study suggests a wide range of infrastructural development, such as well-constructed roads, foot over bridges, and a higher number of traffic police on the streets, in addition to public awareness campaigns and stricter enforcement of traffic laws. Implementing the suggested measures could significantly improve pedestrians' safety and traffic management in Rangpur, leading to a safer urban environment per global safety standards.

Keywords: Traffic Management, Pedestrian Safety, Urban Planning, SDG 11, Rangpur, Bangladesh

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INTRODUCTION

Traffic management and pedestrian safety have become crucial issues in urban planning with the rapid increase in metropolises worldwide. The growth trend of the metropolitan population has come with specific transportation problems, including motor vehicles and pedestrian traffic. As stated by the International Transport Forum (2019), urban road security is among the top causes of death in all corners of the world, with traffic accidents causing most of the deaths. This issue is felt most in developing countries since, besides

rapid urbanization, they usually cannot keep the needed infrastructure up. As a result, dangerous conditions for road users still prevail. One of the most pressing reasons traffic issues are seen as an even worse problem in the South Asian region is the cities with high population density that contribute to unmanageable vehicle congestion and the lack of infrastructure. As per the WHO's Global Status Report on Road Safety 2023, the Southeast Asia Region was responsible for about 28% of the total road traffic deaths worldwide, and some 330,222 deaths were recorded in 2021 (WHO, 2023).

Additionally, the countries of India, Nepal, and Bangladesh are experiencing not only traffic deaths but also a fast pace of urbanization with infrastructure that is not investing in road safety. The importance of pedestrian safety has been emphasized in global policy frameworks such as the United Nations Sustainable Development Goals (SDGs), specifically Goal 11, whose focus is to "build cities and human settlements that are inclusive, safe, resilient, and sustainable" (United Nations, 2015). The target to ensure roads are safe is listed explicitly as a key point under this goal, and the road is stated to be the way to the future. It is about the strengthening of infrastructure and the installation of traffic management systems that give priority to pedestrians. Bangladesh remains facing these SDG issues, even being a signatory to them, due to the existing obstacles to policy implementation and infrastructure development. With its growing population and metropolises, such as Dhaka, Chittagong, and Rangpur, Bangladesh also faces high risks.

According to the Passenger Welfare Association of Bangladesh reports, more than 82861 people died in the last 11 years due to road accidents in Bangladesh, which also injured over 140,649 individuals (Passenger Welfare Association of Bangladesh, 2024). Although some changes to road infrastructure and traffic law have been implemented to lessen the number of accidents over the years, local authorities have not taken the necessary steps to ensure pedestrian safety. Urban areas like Rangpur city do not even have such a basic facility for pedestrians as overpasses, crossings, and lanes, which makes the situation for those on foot even more dangerous. Rangpur City, one of the central urban regions in Bangladesh, forms an extensive case of the traffic and pedestrian safety problems of the city in its growth. Being set up as a City Corporation in 2012, Rangpur is going through the process of urbanization at a highly rapid pace, and the city has a swollen number of vehicles and a high pedestrian traffic volume, especially during rush hours. The city's traffic management system is relatively neglected, and the available pedestrian facilities are insufficient to prevent frequent accidents. The present situation makes it necessary to immediately implement a comprehensive traffic management strategy that is tailor-made for the city, and it carries with it the safety of pedestrians and control of the vehicular traffic flow. According to the Rangpur City Corporation (RCC), the current critical issues of local municipalities are related to the power of the traffic and the protection of pedestrians. The city's insufficient infrastructure to cope with the population increase has been the primary cause of pedestrians being put at risk despite the efforts to set up traffic signals and foot-over bridges. Furthermore, it has been observed that traffic laws (e.g., The Road Safety Act of 2018 and The Motor Vehicle Ordinance of 1983). However, they are regulatory and have not yet been fully employed locally in Rangpur (Solaiman & Algie, 2022).

In this context, the research is carried out to identify the status of traffic management and pedestrian safety in Rangpur City and suggest ways to enhance road protection. Concentrating on Rangpur, the study highlights the problems encountered by medium-sized cities in Bangladesh, where urbanization is growing faster than infrastructure development. The results of this work will significantly help the local executive bodies and

policymakers of Rangpur and the cities where the situations are similar in their ongoing efforts to make the urban space safer and more efficient for all road users.

METHODOLOGY

The study used a mix of qualitative and quantitative research to describe a thorough investigation of traffic management and pedestrian safety in Rangpur City. The analytical design required a complete understanding and expertise on the issues involved in the process of using both the quantitative and qualitative methods of collecting data. According to Creswell and Creswell (2018), the mixed-method approach is particularly relevant to this topic as the researcher wanted to present diverse viewpoints by including numbers and narrative data for complex research questions. This method allowed the researcher to measure the issue and, at the same time, delve into the causes of accidents.

Quantitative Data Collection: Survey

A survey was conducted to collect the diverse experiences and viewpoints of 200 pedestrians at least 18 years old. The respondents were chosen using a simple random sampling method as it afforded every member of the target population (pedestrians in Rangpur City) an equal opportunity to be selected, allowing the results to represent the whole population. By using a random sample, the study was able to minimize biases and improve the external validity of the findings. Thus, the results were more general and applicable to a broader pedestrian community. The survey questionnaire consisted of structured close-ended issues, employing a Likert scale to evaluate pedestrian perceptions of road safety, the state of traffic infrastructure, and overall satisfaction with traffic management measures in the city. Descriptive analysis was conducted to analyze the collected quantitative data using Statistical Package for the Social Sciences (SPSS) 25 as descriptive stats constitute the most appropriate way of studying the quantitative data by SPSS (Pallant, 2013).

Qualitative Data Collection: Key Informant Interviews (KII)

To obtain qualitative data for comprehending the intricacies of traffic management in Rangpur, 10 Key Informant Interviews (KII) were conducted. The respondents of KII were urban planning experts, traffic management officials, and academicians with knowledge of urban development and road safety. As suggested by (Patton, 2015), key informants were selected using purposive sampling techniques, ensuring the participants possessed specific knowledge and at least 10 years of experience relevant to the study's objectives. The KIIs have brought comprehensive and detailed insights regarding the problems of pedestrian safety and traffic management system and their way-outs in Rangpur City. Thematic analysis was conducted to analyze the collected qualitative data. This method effectively recognizes recurring themes and patterns across interviews, giving a more profound insight into road safety and traffic management in Rangpur City (Braun & Clarke, 2006).

Ethical Considerations

The study followed ethical guidelines for social research (Babbie, 2013). The researcher obtained written consent describing the survey and informing the respondents that researchers would not reveal their names and that all the data collected would be kept confidential. Respondents were free to skip questions or withdraw from the survey at any point in the data collection process.

RESULT AND FINDINGS

Demographic Information of the respondents:

Table 1: Demographic Information

	Variable		frequency	Percentage
Survey Respondents	Gender	Male	100	50%
		Female	100	50%
	Age	18-24	48	24%
		25-34	69	35%
		35-44	37	19%
		45-54	29	15%
		<55	17	9%
	Occupation	Student	40	20%
		Shopkeeper	21	11%
		Day laborer	17	9%
		Businessman	19	10%
		Teacher	17	9%
		Housewife	48	24%
		Rickshaw Puller	26	13%
		Farmer	12	6%
	Education	No formal Education	26	13%
		Primary Level	54	27%
		Secondary Level	46	23%
		Higher Secondary	41	21%
		Higher Education	33	17%
KII Respondents	Gender	Male	7	70%
		Female	3	30%
	Occupation	Academician	4	40%
		Govt. Officials	3	30%
		Urban Planning Experts	3	30%

Table 1 presents the demographic characteristics of respondents in the survey and Key Informant Interview (KII). The survey sample includes an equal gender distribution, with 50% male and 50% female participants. Age-wise, the largest group falls within the 25-34 years category, representing 35% of the respondents, followed by 24% in the 18-24 years range. Most respondents are students (20%) and housewives (24%), while smaller groups include rickshaw pullers, shopkeepers, and day laborers. Educationally, 27% of the respondents have primary-level education, while 23% have secondary-level education. In contrast, the KII respondents, comprising experts in urban planning, government officials, and academicians, are predominantly male (70%) and have higher education qualifications. The average experience of the KII respondents in their relevant area was 15.8 (± 3.68). This demographic data highlights the diversity of perspectives and experiences among the respondents, which is essential for understanding traffic management and pedestrian safety in Rangpur City Corporation.

Pedestrian's Knowledge of Traffic Management and Pedestrian Safety:

Table 2 presents the mean scores for various aspects of pedestrian knowledge about traffic management and safety. The Awareness of Traffic Laws and Regulations had a moderate mean

of 2.85, indicating some knowledge but room for improvement. The Knowledge of Pedestrian Safety Rules (mean = 2.96) reflects a slightly better understanding, while Awareness of Traffic Signals (mean = 3.98) shows a higher level of recognition. However, the Understanding of Road Safety Awareness Programs (mean = 2.36) was the lowest, highlighting a gap in knowledge about road safety initiatives. With an overall average mean of 3.03, the results suggest that while there is a basic level of awareness, significant efforts are needed to improve public education on pedestrian safety and traffic regulations in Rangpur City.

Table 2: Knowledge about Traffic Management and Pedestrian Safety

Issues	Mean	Average
Awareness of traffic laws and regulations	2.85	3.03
Knowledge of pedestrian safety rules	2.96	
Awareness of traffic signals and their importance	3.98	
Understanding of road safety awareness programs	2.36	

Pedestrian's Perception of Traffic Management Infrastructures and Initiatives:

Table 3: Perception of Traffic Management Infrastructures and Initiatives

Issues	Mean	Average
Availability of pedestrian footpaths	2.20	2.43
Presence of sufficient pedestrian crossings	2.78	
Availability of foot over bridges in key areas	2.12	
Safety measures for pedestrians during night-time	2.61	

Table 3 presents the mean scores for various pedestrian perceptions regarding traffic management infrastructures and initiatives in Rangpur City. The Availability of Pedestrian Footpaths (mean = 2.20) and Foot Over Bridges in Key Areas (mean = 2.12) received low scores, indicating significant deficiencies in infrastructure. The Presence of Sufficient Pedestrian Crossings (mean = 2.78) reflects moderate satisfaction, but there is still room for improvement. Safety Measures for Pedestrians during Night-time (mean = 2.61) shows concerns about pedestrian safety after dark. With an overall average mean of 2.43, the findings suggest a need for substantial improvements in pedestrian infrastructure and safety measures in Rangpur City. As one KII respondent noted,

“The lack of pedestrian bridges and proper footpaths in key areas makes it difficult for people to walk safely, especially during the morning and evening hours. Infront of schools, colleges, and University as well as in the busy markets, government should build some foot over bridges to ensure enough pedestrian safety”.

Pedestrian's Perception of Traffic Management System

Table 4: Perception of Traffic Management System

Issues	Mean	Average
Adequate traffic police presence during peak hours	2.75	2.57
Effective traffic management at busy intersections	2.78	
Enforcement of speed limits in high-risk zones	2.12	
Proper handling of traffic violations by authorities	2.61	

Table 4 presents pedestrian perceptions of traffic management in four key areas. The highest mean score (2.78) is for effective traffic management at busy intersections, suggesting that pedestrians perceive this aspect as relatively well-managed. The adequate

traffic police presence during peak hours also received a positive score of 2.75, indicating that pedestrians feel somewhat secure in these conditions. In contrast, the enforcement of speed limits in residential, school, and hospital areas scored the lowest at 2.12, reflecting concerns over pedestrian safety in these critical zones. The proper handling of traffic violations by authorities had a moderate score of 2.61, indicating room for improvement in addressing traffic-related offenses. The average score of 2.57 suggests moderate dissatisfaction with the traffic management system. A KII respondent remarked,

“While traffic management has improved in some areas, there are still significant concerns, particularly when it comes to enforcing speed limits in high-risk zones. Authorities need to take a more proactive role in managing traffic violations to ensure pedestrian safety and public well-being”.

This highlights the perceived gaps in the system, particularly regarding enforcement and proactive management.

Overall Perception of Pedestrian Safety

Table 5: Overall Perception

Issues	Mean	Average
Overall pedestrian safety in Rangpur City	2.73	2.70
Perceived risk of pedestrian accidents in Rangpur	2.76	
Public perception of pedestrian-friendly urban infrastructure	2.54	
Level of concern for pedestrian safety on busy roads	2.78	

Table 5 presents pedestrian perceptions of overall pedestrian safety in Rangpur City, focusing on key concerns. The highest mean score (2.78) concerns pedestrian safety on busy roads, indicating that pedestrians feel most concerned about their safety in high-traffic areas. The perceived risk of pedestrian accidents in Rangpur also received a relatively high score of 2.76, suggesting that pedestrians know the risks associated with walking in the city. However, public perception of pedestrian-friendly urban infrastructure scored the lowest at 2.54, indicating dissatisfaction with the available infrastructure for pedestrians, such as sidewalks, crossings, and other facilities.

The overall average score of 2.70 suggests moderate concern about pedestrian safety in Rangpur City. A KII respondent observed,

“While the public is increasingly concerned about safety on busy roads, it’s clear that there is a lack of pedestrian-friendly infrastructure that could help alleviate these concerns. Until we see better urban planning, the risk of accidents will remain high”.

This reflects the general sentiment about the lack of infrastructure and the growing concern over pedestrian safety.

Improving Traffic Management and Pedestrian Safety in Rangpur City:

Table 6 outlines the prominent problems and worries about walking and road safety in Rangpur City based on the Information from 10 Key Informant Interviews (KIIs). The answers carry many themes, and the covered topics are widespread, from the availability of traffic management authorities to the conditions of pedestrian infrastructure and the requirement for public Information and urban planning improvements.

Table 6: Themes derived from KIIs

Themes	Sub-themes	(f)	Examples of Narrations
Traffic Management and Police Presence	Police presence during peak hours	7	"The number of traffic police in peak hour is not sufficient and sometimes it becomes harder for them to control the traffic and accidents are more likely to happen." (KII 1)
	Traffic control at intersections	6	"During rush hours, intersections are chaotic, and there is no clear management. This creates a lot of confusion for pedestrians and vehicles." (KII 3)
	Use of technology for traffic monitoring	5	"Introducing more surveillance cameras and traffic sensors could help us manage congestion better, especially at intersections where accidents are frequent." (KII 7)
Infrastructural Development	Sidewalk availability and condition	8	"Condition of the sidewalks is poor, posing a real threat to the pedestrians. Vending stalls are often placed right on pavements thus forcing people to walk on the streets" (KII 4)
	Pedestrian crossings in high-traffic areas	6	"Just a few crosswalks for pedestrians are there at very busy road junctions, and these too are mainly not visible to the drivers as well as pedestrians." (KII 6).
	Accessibility for disabled pedestrians	5	"Sidewalks are not designed for people with disabilities. It's hard for anyone using a wheelchair to get around." (KII 5)
	Building Foot Over Bridges	6	"Building more foot over bridges would make it safer for pedestrians, especially at busy intersections where crossing is a constant challenge." (KII 8)
Public Awareness and Education	Pedestrian safety education in schools	6	"There is a necessity for a practical lesson in schools in which children should be taught about traffic rules, pedestrians' safety and be aware of traffic dangers." (KII 9)."
	Community-based awareness campaigns	7	"Community campaigns can inform citizens about their pedestrian rights. They should be aware of when and where it is safe to walk, especially in populous urban areas." (KII 10)
Urban Planning and Policy Development	Policy for pedestrian-friendly planning	7	"Urban Planning should focus on pedestrian infrastructure including dedicated lanes, proper crossings, and benches to make walking more comfortable." (KII 1)
	Collaboration between government and NGOs	6	"NGOs and local authorities can play vital role in awareness building. Hence, collaboration between government and NGOs will be fruitful to improve pedestrian safety" (KII 2)
	Strengthening pedestrian-related legislation	5	"More stringent laws are needed to ensure pedestrians' safety. Fines for speeding, wrong parking, and sidewalk occupations by the vendors should be strictly enforced." (KII 4)

Respondents expressed their concerns in the traffic management and police presence segment, saying that traffic police were not sufficiently present during peak hours, which made people navigate the roads chaotically. Furthermore, the pedestrians' lives were in danger. A participant commented, "The absence of traffic police during the time cars are very busy is, in fact, the main reason why walking the streets becomes a hazardous process for pedestrians and, thus, causes accidents to rise." Another issue mentioned was the lack of the right kind of traffic control at main intersections. Because of the ill-coordinated flow of vehicles, pedestrians often get stranded in the middle and cannot cross the street, resulting in increased danger. The technology integration was also mentioned by a few people who said that the traffic flow and pedestrian safety would be significantly improved if the technology, including cameras and traffic monitoring systems, could resolve the problems instantly.

Concerning the development of infrastructure, the KII participants prioritized the deteriorating situation of the sidewalks, as these are commonly the places where the street vendors sell or are in a state of being not walkable and thus make pedestrians walk on the roads. The situation of the sidewalks was described as a significant source of pedestrian injuries, especially in the areas with a high density of people. Touching the issue of the sidewalks, it was found that the pedestrian paths were often cluttered or damaged, posing the inevitable danger of crashing with moving vehicles, the respondent complained. Among the participants, there was also a general agreement about the insufficient number of pedestrian crossings, mainly at the larger crossroads; neither are, even if they exist, mostly properly marked, and, differently from the pedestrians, the vehicle drivers often neglect to stop. The problems connected with the mobility of the city for people with disabilities were also outlined as a significant problem. "The way the infrastructure is now, its configuration is such that it remains unresponsive to the needs of the disabled people, which, therefore, implies that they have to move in the city not depending on themselves or be hit," according to one of the respondents. It was pointed out that installing footbridges at high-traffic intersections was the right thing to start with improving pedestrian safety, as they would serve as protected paths for pedestrians across the major streets.

The theme of Public Awareness and Education has also been brought up as another critical issue. According to the participants, "the education of the youth should include safety tips and tricks for walking, and the practice should start at an early age. One of the respondents suggested." that "a practical lesson on pedestrian safety should be obligatory in schools to teach children all the aspects of road safety and how to properly cross streets". Other things that could be done are to conduct awareness campaigns that would also serve as a source of Information to the pedestrians about their rights and the safety measures at their disposal. Such activities could also educate the community members on the necessity of respecting the space used by pedestrians, especially in cities with a high population.

Urban Planning and Policy Development was where the city residents said that urban planning in Rangpur must first and foremost focus on pedestrian safety. A repeated statement that "the city planning needs to deal with pedestrians through the infrastructure—with designated lanes, signalized intersections, and proper signage," was the most prevailing one. There was also a unanimous opinion that the partnership between the government and NGOs would be crucial for pedestrian safety promotion. NGOs were suggested to help raise awareness and raise funds to develop a pedestrian-friendly environment. Beyond that, strict measures, in the form of legal compliance, against pedestrian-related offenses were fervently demanded. "We have to strictly enforce the laws against speeding and the parking of vehicles randomly around the city to reduce accidents and ensure the pedestrians' safety," a participant stressed.

DISCUSSION

The results of this research demonstrate that the problems with traffic management and pedestrian safety in the city of Rangpur are quite pressing and are the same difficulties seen in many cities of South Asia, which have rapidly been growing. Several critical matters, including the absence of the police force during the rush hours of the day, poor pedestrian infrastructure, and the lack of public awareness of pedestrian safety, were all pointed out by the survey respondents. One of the significant reasons for this situation is that urbanization has been so rapid that the development of transportation infrastructure has not been able to keep up with the rate at which the number of people and vehicles has grown. Not only Rangpur but several South Asian cities also suffer from the same problems with urbanization as seen in Dhaka, Kolkata, and Mumbai, like traffic congestion and poor planning issues that fail to address the needs of pedestrians (Ali et al., 2023; Chakrabartty & Gupta, 2014; Salunke & Bang, 2024).

Many respondents have voiced strong concern about the scarcity of traffic police on the roads during peak hours, which is alleged to be one of the main contributors to the chaotic traffic and increased pedestrian accidents. This issue is pervasive not only in Rangpur but also in many South Asian urban cities where the traffic and pedestrian volume typically outnumbers the traffic police. For example, the situation is seriously alarming in Dhaka due to the shortage of traffic police on duty during rush hours, which is regarded as one of the leading causes of accidents, particularly at the intersections where the traffic is so heavy (Ali et al., 2023). Another problem was the absence of efficient traffic control at junctions. People complained that roads were a nightmare to cross due to the lack of proper arrangements for the traffic. Here, some survey respondents advocated reinforcements with the use of advanced technology for traffic control as a great way to fix the problem. The smart use of cameras and sensors is also an effective way proposed by those involved to manage traffic flow and protect pedestrians, as done in Delhi and Bangalore. It has brought out positive outcomes (Sharma et al., 2019).

Participants of this study also raised the issue of infrastructure, particularly the bad condition of pavements in many cases and the absence of pedestrian crossings, especially in places with dense traffic. Not only are these problems common in Rangpur, but they also expose a much broader issue in developing countries, where pedestrian safety is ignored in the wake of quick urbanization in the region. Furthermore, in Rangpur, street vendors frequently occupy the pavements, or they are so dilapidated that pedestrians have no choice but to run the risk of being knocked down while walking on the roads. Such a problem can also be witnessed in Karachi, for instance, where awful pavements and lack of walking facilities bring about the danger of pedestrians. In addition, the lack of pedestrian bridges, mainly in significant places, i.e., near the busy intersections in the city, tends to worsen the perils pedestrians face. Conversely, there have been some reasonable attempts to avoid such problems in the capital cities of countries Colombo and Kathmandu through the installation of foot-over bridges at risk points, though the progress is slow (Ameresekere, 1993; Durga et al., 2020; Shilpakar & Shahi, 2022).

The study findings illustrated public knowledge and ignorance of pedestrian safety. Although individual pedestrians are usually informed of traffic regulations, their understanding of pedestrian safety regulations and road safety awareness campaigns is limited. This knowledge deficit is not only typical of Rangpur, but it also characterizes road safety education in many developing and neighboring countries. As an illustration, in Nepal, the lack of a complete pedestrian safety education program is the cause of most pedestrian

accidents (Khatiwada, 2024; Poudel-Tandukar et al., 2007). Respondents proposed introducing pedestrian safety education as part of the school curriculum; students would establish good habits of safety from an early age, similar to what has been happening in Japan, where road safety education is a part of the national school curriculum (Gavari-Starkie et al., 2021; Imamura et al., 2013; Koshi, 1986; Oguchi, 2016; Ohtani et al., 2015). In addition, awareness campaigns organized in local communities could be an effective way to help people become more aware of their pedestrian rights and safety measures, especially in urban areas where traffic jams represent a significant hazard.

The study also underlined the importance of urban planning and policy development for better traffic management and pedestrian safety in Bangladesh. The respondents believed that, besides other areas, the city's transportation design needs to be pedestrian-friendly. According to them, the city's physical structure often prioritizes cars, which in turn sacrifices the safety of the pedestrian. Cities like Bogota and Copenhagen, where walkways are incorporated into urban planning, have experienced a substantial increase in pedestrian safety (Carvajal et al., 2020; Cervero et al., 2009; Hidalgo et al., 2020; Valderrama & Jorgensen, 2008). Following such strategies, Rangpur could benefit from improved pedestrian safety, e.g., by setting pedestrian-exclusive lanes, creating safer crossings, and constructing bridges for pedestrians in the busiest areas. The respondents also insisted on the necessity of the government and non-governmental organizations collaborating to increase public awareness and increase funds for infrastructural development. The NGOs are the leading players in pedestrian safety improvement in all the countries, including Uganda, Nigeria, South Africa, and Guatemala, where they have had a joint venture with the government to make the roads safe for pedestrians (Pervin, 2008).

Moreover, the research pointed out the necessity of more powerful pedestrian-related laws in Rangpur. Implementing existing laws like the Road Safety Act of 2018 is unsatisfactory. Interviewees repeatedly stated that police strictness about speed limit compliance, especially in risky zones such as schools and hospitals, is insufficient. This problem is also widely observed in other countries, where traffic regulations are frequently violated, resulting in a dangerous area for pedestrians (Emenike & Akpu, 2017; Laoula et al., 2023; Mesfin & Kenea, 2022; Moyano Diaz, 2002; Shabir et al., 2014). The reinforcement of these laws is capable of bringing about a pronounced decrease in pedestrian accidents and improving the general road safety situation in Rangpur.

CONCLUSION

This study described the necessity for traffic management and pedestrian safety reforms in Rangpur City, which are also general challenges faced by Pacific urbanized cities in South Asia. The city's lack of safe pedestrian infrastructure, such as broken pavements and the nonexistence of overhead bridges across major junctions, are the most significant factors in pedestrian accidents. Additionally, the presence of inadequate traffic police during rush hour not only fails to solve the issue but significantly increases it. As a result, there is more likely to be congestion and accidents. The research has also pointed to the absence of behavioral change campaigns on pedestrian safety as an essential cause of public ignorance in this area, which implies that even though there is little awareness of the issue of pedestrian safety among the public, the much-awaited transformation is not still enough to change the current condition.

An effective measure to mitigate these problems is the planned development of pedestrian infrastructure in Rangpur City. This entails making the sidewalks of high quality, designing and implementing additional pedestrian crossings, and building foot over-bridges, especially in high-density zones. On the other hand, city planners should put universal design principles into practice to achieve accessible features that are fully introduced for disabled people. Furthermore, the work of public education, both through school-based programs on pedestrian safety and community-level campaigns for high public awareness, will be a vital success factor. Rangpur should be encouraged by the example of Colombo and Kathmandu, which are cities having reinvented pedestrian infrastructure and are becoming more environment friendly in the process, to change their landscape, too.

Additionally, stricter reinforcement of traffic rules should be implemented to protect pedestrians, primarily in high-risk areas, such as schools and hospitals. The outcomes of the research indicate that local authorities should set up more traffic police units when traffic flow is at a peak, and they should also take more preventive action in controlling law violations. Collaboration among government agencies, urban developers, and civil society organizations can comprehensively solve these problems. Through the development of infrastructure, building awareness among the general public, and strict adherence to traffic rules, Rangpur City can change into a more secure and pedestrian-friendly urban center, thus fulfilling the broader goal of sustainable and inclusive urban development in Bangladesh.

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