SAFETY RISK OF MOTORIZED VEHICLES THROUGH THE LENS OF NON-MOTORIZED VEHICLE USERS

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A thesis submitted to the Department of Civil Engineering in partial fulfillment for the degree of Bachelor of Science in Civil Engineering

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Sonargaon University
147/I, Green Road, Dhaka-1215, Bangladesh
Section: (16-E Akepa)
Semester - (Fall-2022)

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It is hereby declared that this thesis is our own work and that, we declare that the work in this dissertation titled " Safety risk assessment of motorized vehicle through the lens of non-motorized vehicle users" has been carried out by. The information derivedfrom the list of references provided. No part of this dissertation was previouslypresented for another degree or any part of it has not been submitted elsewhere for theaward of any degree or diploma.

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Dedicated

TO

“MY MOTHER”

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ABSTRACT

Non-motorized transportation (NMT) is a form of transportation that provides effective, affordable, secure, and practical mobility. Promoting NMT usage lessens dependency on driving, which lessens global concerns including pollution and traffic jams. In various South Asian emerging nations, non-motorized vehicles have been crucial in supplying the demand for door-to-door transport services. Bangladesh's rickshaws, vans, and pullers are common non-motorized vehicles. In the absence of so-called mass transportation systems, these modes played a significant part in moving people and commodities in a safe, effective, and affordable manner. More than anywhere else in the world, 70 % of vehicle travels in the Dhaka metropolitan area involve non-motorized vehicles. Additionally, the rickshaws made for about 30%of the entire value added by the transportation industry. The total contribution of all motorized road transportation is more than doubled. The Highway Capacity Manual discusses how the presence of bicycles affects the capacity of crossings, the length of the roadway between them, and the capacity of designated cycling facilities. With particular reference to Bangladesh, this paper addresses the safety status of non- motorized vehicles in traffic streams and their role in traffic accidents. The existence of non-motorized vehicles is in danger due to economic development and a rise in non-motorization levels worldwide, despite the fact that they have many uses. Due to Bangladesh's fragile, varied, and complex transportation system as well as the noticeable speed disparities amongst non-motorized vehicles, accidents and difficulties linked to road safety are all too often. The non-motorized vehicle Walking, bicycling, and other forms of small-wheeled transportation, such as wheelchair travel, are all examples of non-motorized transportation, sometimes referred to as active transportation and human powered transportation. Drivers of non- motorized vehicles report that 53% believe that motor cars are not to blame for accidents on the road and 33% believe that they are. The maintenance of safety is the primary purpose of traffic laws and signs. On the road, there are lots of hazards and barriers that could hurt or endanger drivers. Traffic laws and warning signs serve to lessen this danger and the likelihood of occurrence of accidents. According to data on non-motorized vehicle drivers, 90% of them adhere to traffic laws, 5% don't, and 5% occasionally do.

CONTENTS

LIST OF FIGURES

LIST OF FIGURES

LIST OF FIGURES

LIST OF TABLE

CHAPTER 1
INTRODUCTION

1.1 Background and Motivations

All modes of transportation that are not propelled by an engine or motor are referred to as non-motorized transportation (NMT). This includes utilizing a wheelchair, small-wheeled vehicles like skateboards, push scooters, and push bikes, as well as walking and bicycling. These means of transportation can be used for both transportation and leisure. For instance, some people choose to bike or walk than driving because they find the exercise enjoyable. You can sum up the significance of non-motorized transportation as follows:

1. They offer door-to-door transportation, non- motorized infrastructure typically has a very high spatial penetration

2. Non-motorized do not result in waiting, as opposed to waiting at public transportation stops. Non- motorized have a favorable environmental performance.

3. Are inexpensive transport modes, are crucial links in multimodal transport chains, and are healthy activities. (Yazid, 2011)

Numerous research on non-motorized transportation in urban areas have been done all around the world. Non-motorized transportation in metropolitan areas was seen in a study in Dhaka. Non-motorized transportation refers to all means of transportation that are propelled by the physical energy of the user rather than an external source likean electrical or mechanical motor (NMT). It's also known as human-powered mobility. (hossain, august 1996).

Any wheeled passenger conveyance without an engine or motor is referred to as a non-motorized vehicle. This includes coasters, skateboards, in-line skates, and roller skates. Wagons, strollers, wheelchairs, and other aided transportation equipment are this. A non-self-propelled vehicle or piece of equipment that is used to transport people or property over land is referred to as a "non-motorized vehicle" or "non- motorized equipment." Equipment that relies on fixed rails, guideways, or tracks is notconsidered to be non-motorized. Non-motorized vehicles and non-motorized equipment do not have permanently or temporarily attached self-propelling power systems, however they may have powered equipment. (Marie Danielle V. Guillen Hussien S. Lidasan, 1991).

Any wheeled device, excluding a bicycle, that is operator-propelled by human power and that is used in, on, or by which any person may be transported on a street, highway, sidewalk, or public or private property used for vehicular or pedestrian travel or parking is referred to as a "non-motorized vehicle." However, a wheelchair, apersonal assistive mobility device, or any device that is used exclusively upon stationary rails or tracks is not considered a non-motorized vehicle. Roller skates, in- line skates, rollerblades, skateboards, unicycles, tricycles, quad cycles, and scooters are all considered non-motorized vehicles. Bicycles, unicycles, skateboards, longboards, Razors, roller blades, and similar non-motorized vehicles help ease parking and traffic congestion. (Ahsan1990)

Nonmotorized transportation users have a higher risk of being involved in accidents than car users, particularly in developing countries. In developed countries, the rates of walking and cycling correlate with the rates of cyclists and pedestrian in all cities ride bicycles everyday to go to work, run errands, peddle livelihoods. These are not the organized, loud-mouthed advocates or the spandex racers. Rather these are the urban poor who rely on affordable, accessible transport like walking and biking to meet their everyday needs. (Sufian, january 2014)

Everyone is familiar with the catchphrase in favor of non-motorized transportation (NMT): it's good for the environment, excellent for our health, makes for happy people and a happy world. These are the main advantages of abandoning our gas- guzzling automobiles and returning to our best source of energy, our own. NMT is approached as a right to mobility, which gives the agenda a new feeling of urgency. Designing communities so that people may walk and bike every day becomes a priority when it becomes a legal requirement, allowing us to better safeguard those who need it most. In the process, we will create stunning, environmentally friendly cities that will benefit all of us. (Yazid, 2011)

Walking, cycling, and variations such using a wheelchair, scooter, or handcart are all considered non-motorized transportation (NMT), also known as active transportation and human powered transportation. An effective transportation system depends on NMT in a significant and distinctive way. It provides access to motorized modes of transportation, basic mobility, economical transportation, physical fitness, and It provides a broad range of advantages, such as user gains, infrastructure upgrades, and a reduction in adverse environmental effects. November 2012; Vanderschuren. Walking and cycling account for anywhere between 19% and 60% of all journeys in medium-sized cities like Dhaka, Bangladesh, and the Netherlands. (Rahman, january 2003)

1.2 Research Objectives and Overview

The main objective of this study is to focus on the study of viewed from the perspective of non-motorized vehicle users and the safety risk of motorized vehicles. An attempt is taken to achieve the objective through following actions:

1. To investigate how non-motorized vehicle speed varies in relation to lane- based homogenous traffic composition and non-lane-based heterogeneous traffic composition.
2. To analyze the safety risk of non-motorized vehicles and using data.

1.3 Study Area

Both the space designated for non-motorized vehicle users and the safety risk posed by motorized vehicles are included in the research area. The entire area that was mapped the research area.

Area surveyed in Dhaka city Jatrabari (approximate location)

(Figure 1-1): Approximate location of the survey.

Area surveyed in Dhaka city Bashundhara city (approximate location)

(Figure 1-2): Approximate location of the survey.

Area surveyed in Dhaka city Komolapur (approximate location)

(Figure 1-3): Approximate location of the survey.

1.4 Scope of the Study

This study talks specifically on Bangladesh and the current state of non-motorized vehicles in the traffic stream and their role in traffic accidents. Even though non-motorized vehicles have many uses, their existence is threatened by

economic progress and the increasing level of motorization around the world. Due to Bangladesh's fragile, varied, and complicated transportation system as well as the noticeable speed variations between motorized and non-motorized vehicles, accidents and challenges linked to road safety are common in this country.

This study is also limited by the fact that there is no official system for recording casualty data for of non-motorized vehicle users, the safety risk of motorized vehicles in Bangladesh. This was a major obstacle in assessing the nature of accidents in Bangladesh. Also currently there exist the safety risk posed by motorized vehicles to users of non-motorized vehicles.

1.5 Organization of the Thesis

To exemplify the process for reaching the aforementioned aims while coping with the study's scope, the overall thesis will be assembled with a total of six chapters. The order of these six chapters will be as follows.

Chapter 1: Introduction and Objective. Concisely illustrating an overview of the context

Chapter 2: Literature Review: The need for a thorough study of non-motorized vehicle users in Bangladesh was established after reviewing pertinent literature that is currently available.

Chapter 3: Methodology: Describing the thesis' methodology, selecting the best approach to achieve the goals, and describing the data gathering process used for this reason.

Chapter 4: Data Collection: collecting information with surveys and pictures and questionnaires.

Chapter 5: Results and Discussion: Using data analysis to provide examples.

Chapter 6: Conclusions and Future Work: Putting a conclusion to the entire thesis by making suggestion for upcoming research.

CHAPTER 2
Literature Review

2.1 Introduction

Literate review is a task that lasts the entire length of a research project. There has been a thorough review of the literature on non-motorized transports (NMTs), both in Bangladesh and elsewhere, and some of the results are addressed in this chapter. The review material offered here includes some direct questions. The Impact of Rickshaws at Crosswalks" in the city of Dhaka: The majority of people in Dhaka City commute mostly by rickshaw, and if rickshaws were ever outlawed, women and people from middle- and low-income groups would undoubtedly face discrimination. He gathered information from 200 data sources. Later, he created a model to determine if rickshaws at signalized intersections have no impact on the PCE of rickshaws, their surroundings, or particles. The green light duration, the intersection's breadth, and the presence of auto rickshaws, he said, were the factors determining the outcome. If there are more rickshaws, the impact is less, and vice versa. Effects of non-motorized vehicles on characteristics of urban road traffic. This paper's objective is to describe a traffic flow analysis process and to develop models of passing, exceeding, and lane usage for heterogeneous traffic flow. The vehicle movements were recorded using a portable video camera and the data was decoded using a time code reader software. The data were recorded in five- minute interval.

2.2 Barriers to the implementation of Non-motorized vehicle users, the safety risk of motorized vehicles.

The biggest obstacles are the perception of NMT's poor status and the current emphasis on planning that is car-oriented. mobility for quick practical trips in cities). limitations and repurposing of road space. Traditionally much of the research carried out in the field of non-motorized vehicle users the safety risk of motorized vehicles safety in the western world was focused. (Rahman january 2003) Although MTWs

account for a significant proportion of traffic crashes and the research conducted specifically for them was sparse. (Yazid, 2011)In the last few decades, however there has been an increase in awareness related to MTW safety. Therefore, numerous studies focused solely on the safety aspects of MTWs have been in some cities. But the studies have generated a variety of results based on the various safety risk factors considered by them. However, there is no comprehensive review which has beendone in the recent times, that encompasses all the considered safety risk factors and their results, contributions and limitations. This paper attempts to review those studies that focus on the safety aspects related to MTWs especially in non-motorized vehicle conditions. (JaikishanDamani February 2021).

2.3 Content

Non-motorized transport (NMT) is the most common vehicular mode as well as the largest source of employment in the transportation industry in overall Bangladesh, There are about 400000 rickshaws 10000 rickshaw vans 3000 pushcarts and over 40000 bicycles in Dhaka (DITS 1993) About 18-20% of Dhaka's workingpopulation are directly employed by the rickshaws (DITS, 1993) NMTs carry more passengers and goods than any other modes in metropolitan Dhaka According to DITS (1993) NMTs account for 56,7% of daily vehicle kilometer travelled (VKT) in metropolitan Dhaka NMTs thus playas significant role in metropolitan Dhaka's transport system Many policies towards NMTs especially regarding rickshaws were taken in the past to improve the traffic situation in Dhaka, But these policies were not based on extensive studies Actually a very few studies were performed on NMTs in metropolitan Dhaka as well as in other urban areas of Bangladesh, Review of related literature indicates that most transport and. traffic studies related to metropolitan Dhaka have been done to understand the traffic behaviors‟ of motorized vehicles and economic and social aspects of NMTs Therefore, this study intends to investigate the effect of NMTs on the performance of the road traffic in metropolitan Dhaka Information gathered from this study would not only provide avenues for further research but also help transport non-motorized vehicle planners and decision makersin taking steps towards solving existing traffic problems in metropolitans Dhaka and thus evolve a more efficient transport network. (hossain august 1996)

2.4 Summary

From the review, it appears that a very few studies have been done to study the mixed mode transport system in metropolitan Dhaka. Despite the important role of non-motorized transports (NMTs), a very few attempts have been taken to study the traffic behaviors of NMT in metropolitan.' Literature discussed in this chapter along with some more review in the following relevant chapters would act as guidance for the present research.

CHAPTER 3
Methodology

3.1 Introduction

The methodology is created to take into account the various characteristics of non-motorized vehicle users and the safety risk of motorized vehicles. The prior chapters covered the necessity of non-motorized vehicle users in Dhaka city, which prepared the ground for approach. As a result, this chapter will cover the research approaches that are available. Different techniques will be discussed, and the most appropriate one will be selected and used to do the research. As a part of the methodology overview the various methodology steps will also be covered.

3.2 Review of Potential methodologies

Methodology refers to the overarching strategy and rationale of your research project. It involves studying the methods used in your field and the theories or principles behind them in order to develop an approach that matches your objectives.

3.3 Qualitative methodology

To comprehend people's behavior and interactions qualitative methods are applied. It produces data that isn't motorized. Researchers from several disciplines are paying more attention to the integration of qualitative research into intervention studies. Open-ended questionnaires and interview questions are two of the most used methods for gathering qualitative data. Through first-hand experience, genuine reporting and quotations from real conversations qualitative research seeks to gain a deeper understanding. It tries to comprehend how participants interpret their environment andhow that interpretation affects their behavior.

3.4 Methodology Overview

We the conduct the survey non-motorized transportation for the research. After that, a motorized safety risk will be made for the right automobile. The following date and time will be chosenwhen the survey can be carried out correctly. A questionnaire survey will be done at a convenient time. Data from the survey will be produced for additional analysis. The results of the data analysis will then be provided for representation.

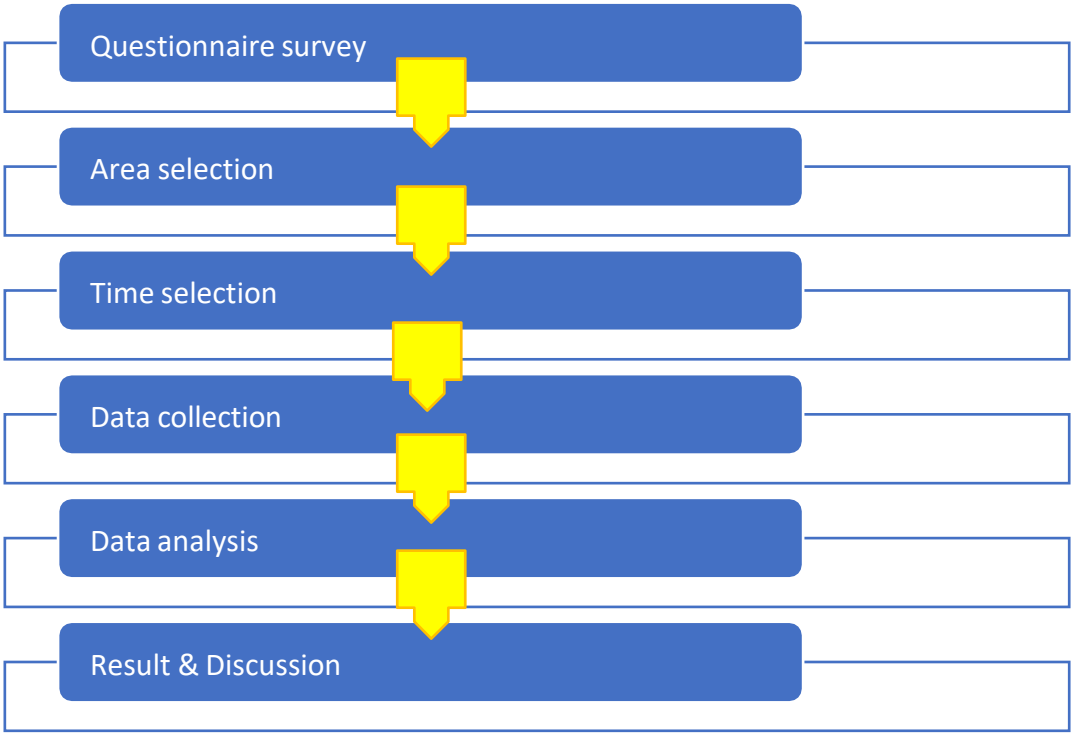

Figure 3-1. Flow chart of methodology of the research.

3.5 Summary

This chapter has presented the non-motorized vehicle users, the safety risk of motorized vehicles related research articles to discover study methodologies. Based on proper methodology, a questionnaire has been made for field survey which includes quantitative and qualitative data. Then the questionnaire is distributed and filled questionnaire is collected back from respondents.

CHAPTER 4

Data Collection

4.1 Data Collection

Data for 200 surveys on non-motorized vehicles is gathered. Data is collected on the basis of as well as questionary survey. For data record in non-motorized vehicle 180 rickshaws, 15 van, 5 cycle drivers. On the other hand, 9 questionnaire data is collected & 1800 questionaries answers is recorded for non-motorized vehicle drivers.

Survey data collection Table

Do you always follow traffic rules?	Yes	No	Maybe	
Response	180	11	9	
Should excessive burdens of passengers causes accident?	Yes	No	Maybe	
Response	57	91	52	
Is Motorized vehicle responsible for road accidents?	Yes	No	Maybe	
Response	126	47	27	
Do you get any space when changing the length from Motorized vehicles?	Yes	No	Sometimes	
Response	38	95	67	
Do you get any space when driving on the road from Motorized vehicles?	Yes	No	Sometimes	
Response	32	120	48	
Do you think that Heavy vehicles (BUS, TRUCK) should ban in the local street?	Yes	No		
Response	148	52		
Do you think that Non-Motorized vehicles should ban in the Highway?	Yes	No		

Response	117	83		
Monthly Income (BDT)	5-10k	10-15k	15-20k	20-25k
Response	41	123	35	1
How many times have you had an accident?	1	1-5	5+	
Response	140	46	14	

Table 4-1: Survey data collection

4.2 Field Audit and Inspection

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Figure 4-1. To transport people in the van over a distance that is too short.

Figure 4-2. An individual pulls a conventional rickshaw

Figure 4-3. To transport fruits, vegetables, and fish from wholesale markets to neighborhood markets.

Figure 4-4. In big cities, rickshaws are frequently employed for passenger transportation.

Figure 4-5. Although rickshaws are frequently associated with Asian nations.

Figure 4-6. To transport long, thin objects to several locations, such as large boxes, steel pipes, or rods

Figure 4-7. For the purpose of moving refrigerators, furniture, and other home goods.

Figure 4-8. Vans almost always convey bottled water.

Figure 4-9. It is easy to popularize bicycle because of its low initial and operating costs.

Figure 4-10. Officers great flexibility.

Figure 4-11. To carry long narrow items such as bamboo steel pipes soil to construction.

Figure 4-12. As a mode of transportation, a form of artistic expression, or a path to becoming a pro skateboarder.

Figure 4-13. Road bicycle is one of many bicycle classifications.

Figure 4-14. To carry materials in vehicles.

Figure 4-15. To carry wholesale boxes to local markets.

Figure 4-16. Many people use bicycles for transportation.

Figure 4-17. To carry the man in transportation.

Figure 4-18. To carry building materials to places inaccessible to heavy motorized vehicle.

Figure 4-19. To carry wholesale vegetables fruits to local markets.

Figure 4-20. To carry long roads to different places.

Figure 4-21. To carry oil tanker items.

Figure 4-22. To carry building materials (small amount).

Figure 4-23. To carry drum in transportation.

Figure 4-24. To carry sick people to nearby hospital.

Figure 4-25. To carry dead body to nearby graveyard.

Figure 4-26. Non- motorized vehicle Rikshaws or Van.

Figure 4-27. Vehicle in the road for non-motorized vehicle van or rikshaw transportation in sites.

Figure 4-28. To carry heavy materials.

Figure 4-29. To carry about rug.

Figure 4-30. To carry long narrow such as bamboo, wood roads to different places.

CHAPTER 5

Results and Discussion

5.1 Introduction

The study area is Jatrabari roundabout one of the busiest intersections in Dhaka. This study area was modeled in non-motorized vehicle. The input flow was given for every day in terms of vehicles per hour. The percentage of vehicles going straight in the tidal intersection is 80% and those taking left turn is 20%. Signal timings obtained from field were also input. The tidal intersection was simulated with modified driving and other parameters in non- motorized. Simulation was done for 9 random seeds each.

5.2 Data Analysis

Based on data collection following pie chart analysis is made. Following pie chart is made based on collected data for non-motorized vehicle.

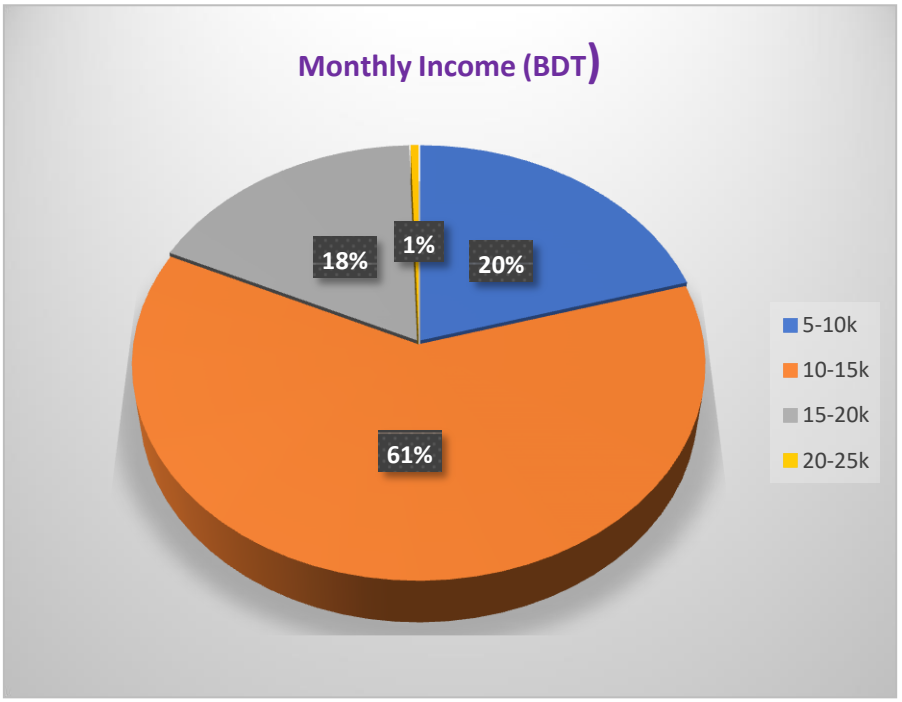

Figure 5-1. Monthly Income (BDT).

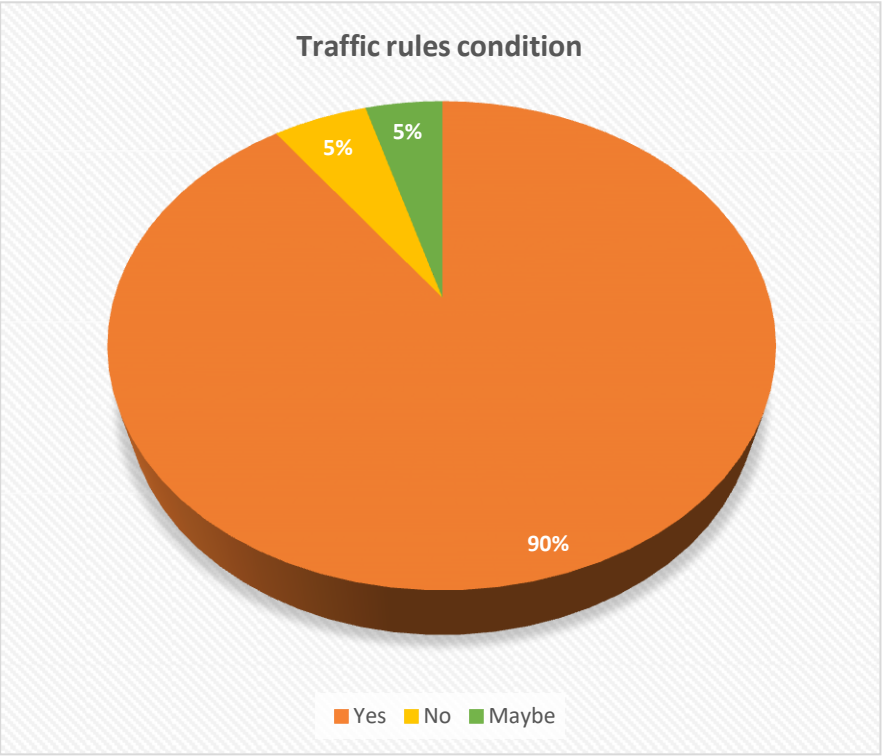

Figure 5-2. Traffic rules condition.

The key importance of traffic rules and signs is to maintain safety. There are many obstacles and dangers on the road that can cause harm and put drivers at risk. Traffic rules and safety signs help to mitigate this risk and reduce the possibilities of accidents happening. Based on the data of non-motorized vehicle drivers we can say that, 90% of them follow traffic rules, 5% don't and 5% sometimes do.

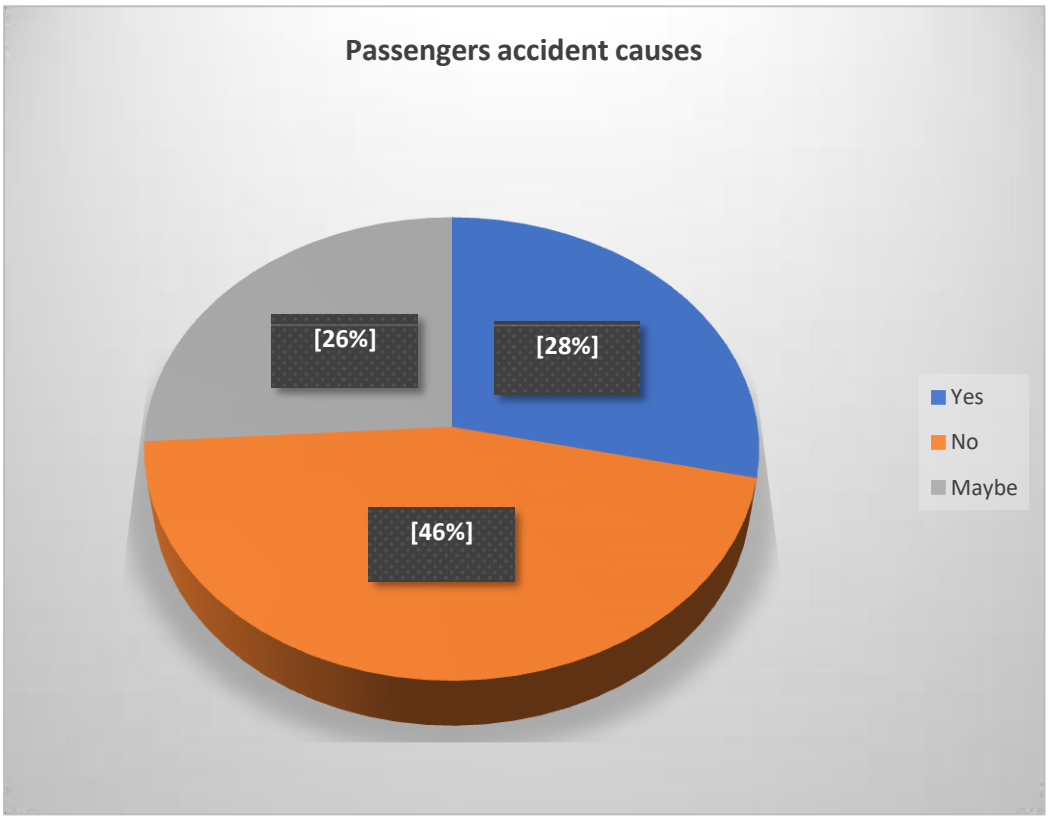

Figure 5-3. Passengers accident causes.

Most of the fatal accidents occur due to over speeding. It is a natural psyche of humans to excel. If given a chance man is sure to achieve infinity in speed. But when we are sharing the road with other users we will always remain behind some or other vehicle. According to non-motorized vehicle drivers, 46% of people say that overloading of passengers does not cause accidents, and according to them, they get into accidents because they are not careful while driving. According to 28% of people overloading of passengers is a cause of accidents, and 26% of people say that overloading of passengers sometimes causes accidents.

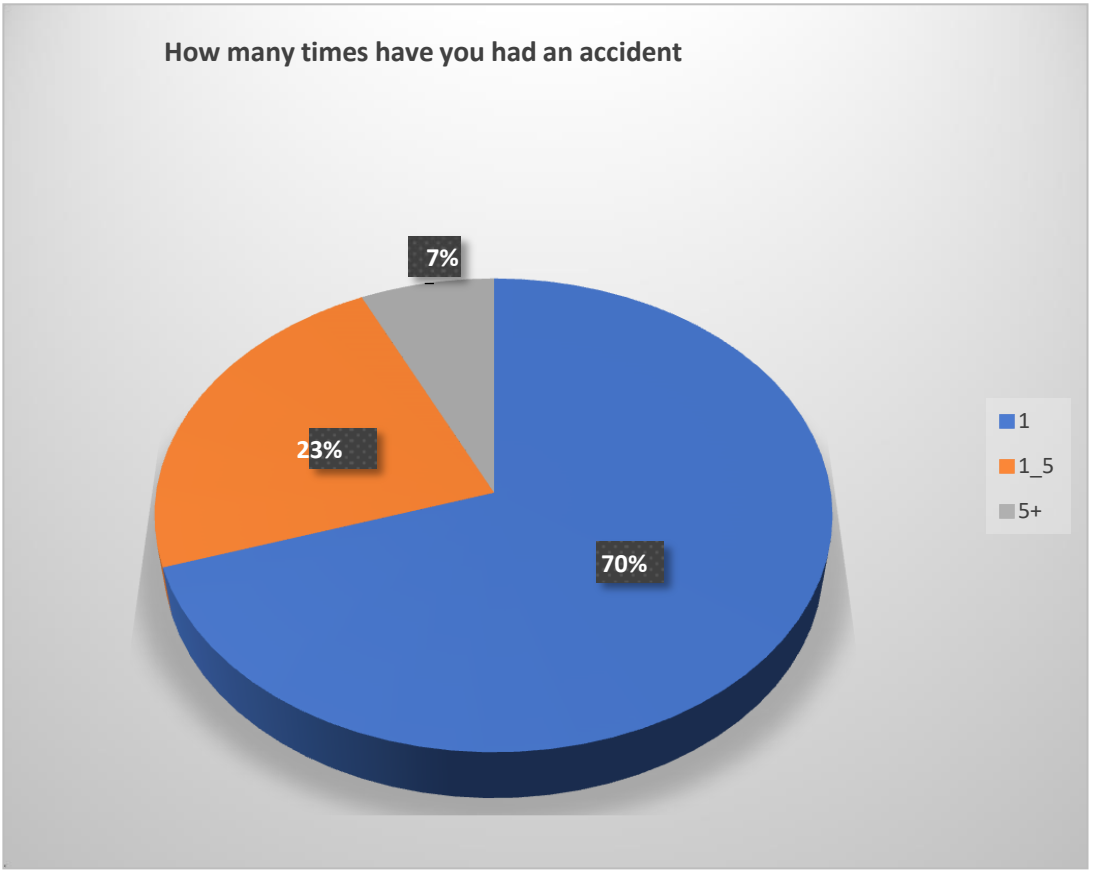

Figure 5-4. How many times have you had an accident.

Head-on collisions, rear-end collisions, and side-impact collisions are the three types of accidents. When a driver turns in the wrong direction on a one-way street, an exit ramp, or when they cross the median on a highway, head-on crashes frequently result. According to non-motorized vehicle drivers 7% people have had more than five accidents, 23% people have had accidents 1 to 5 times and 70% people have had accidents like once.

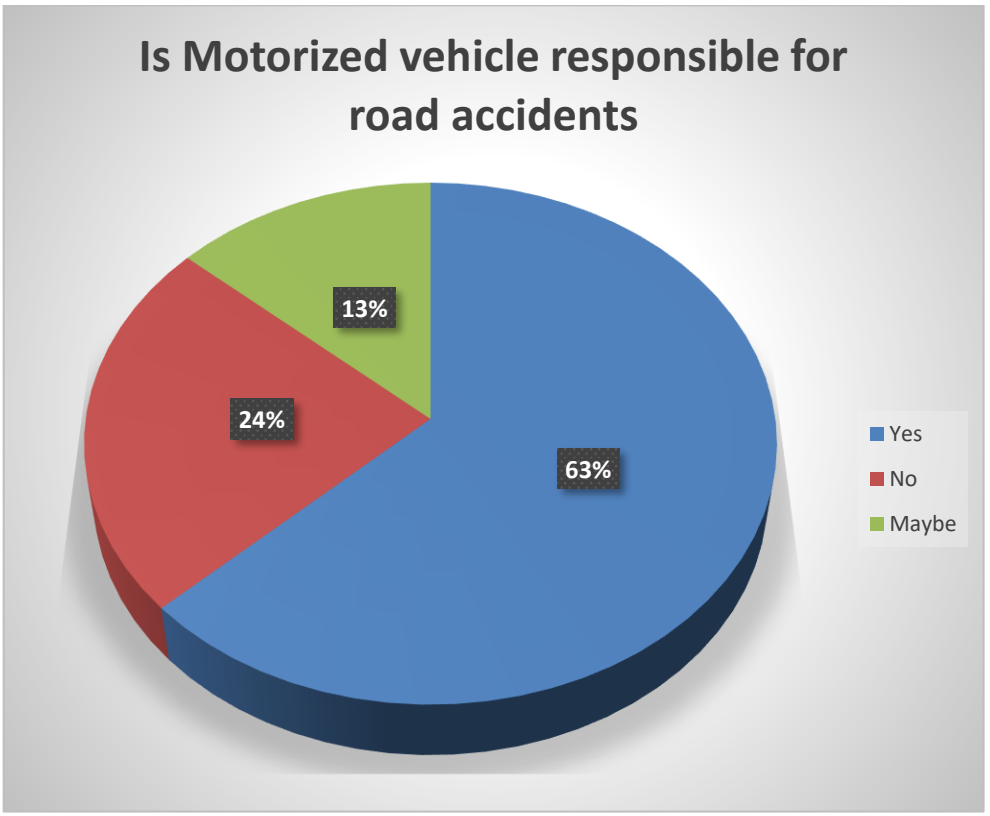

Figure 5-5. Is Motorized vehicle responsible for road accidents.

According to non-motorized vehicle drivers, 13% people say that motor vehicles are not responsible for road accidents and 63% people say motor vehicles are responsible for road accidents.

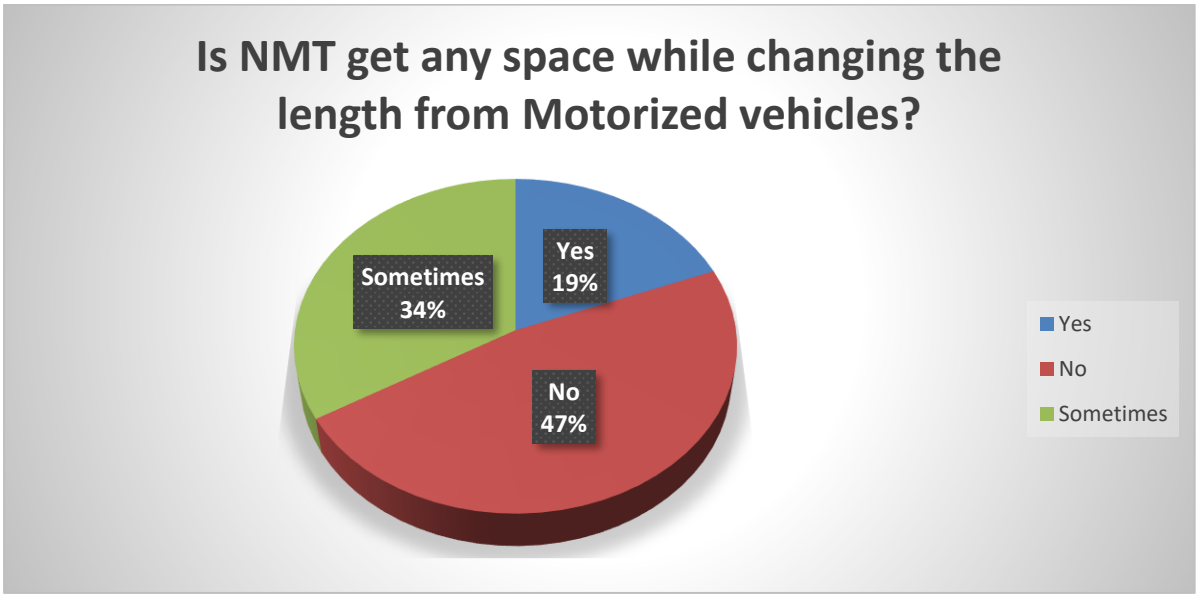

Figure 5-6. Changing the length from Motorized vehicles.

According to non-motorized vehicle drivers, 47% people get places, 34% people don't get places and 19% people sometimes get places.

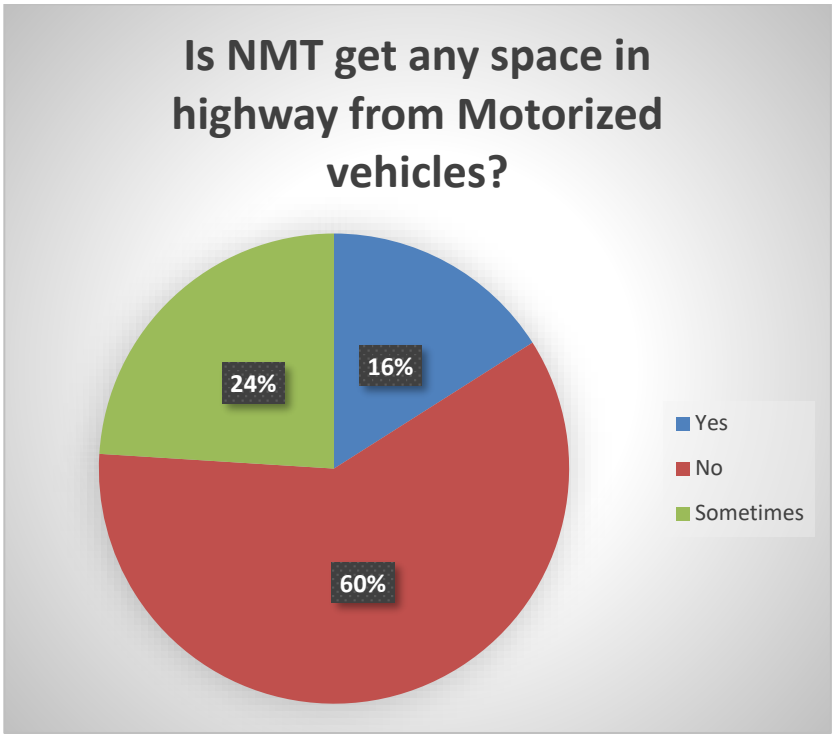

Figure 5-7. Road from Motorized vehicles

According to non-motorized vehicle drivers, 16% people get places, 60% people don'tget places and 24% people sometimes get places.

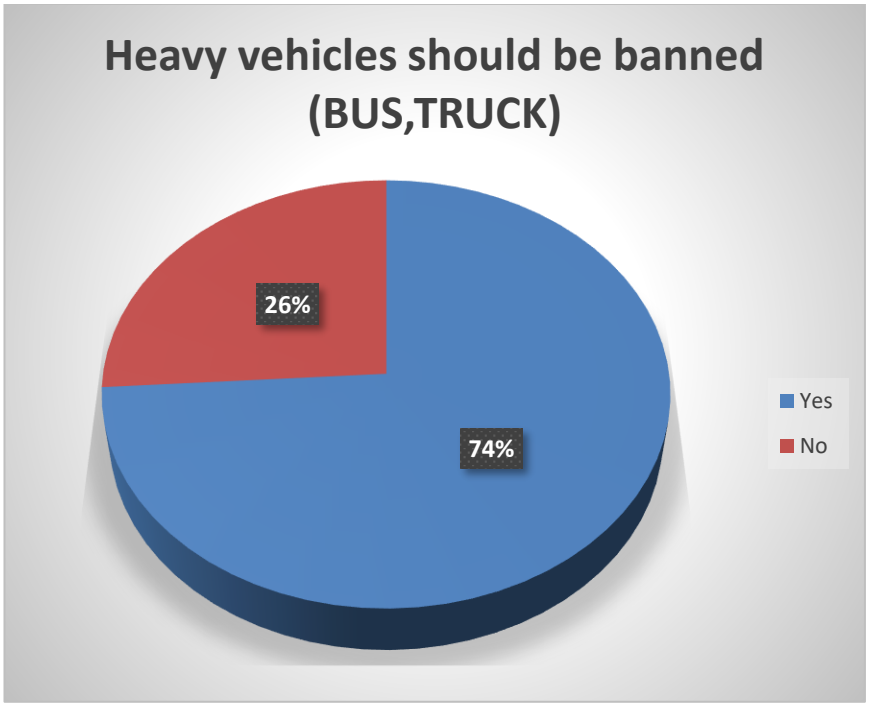

Figure 5-8. Heavy vehicles (BUS, TRUCK)

According to non-motorized vehicle drivers, 74% people say that heavy vehicles should ply and 26% people say that heavy vehicles should not ply. Because it causes alot of damage to the roads and creates traffic jams on the roads.

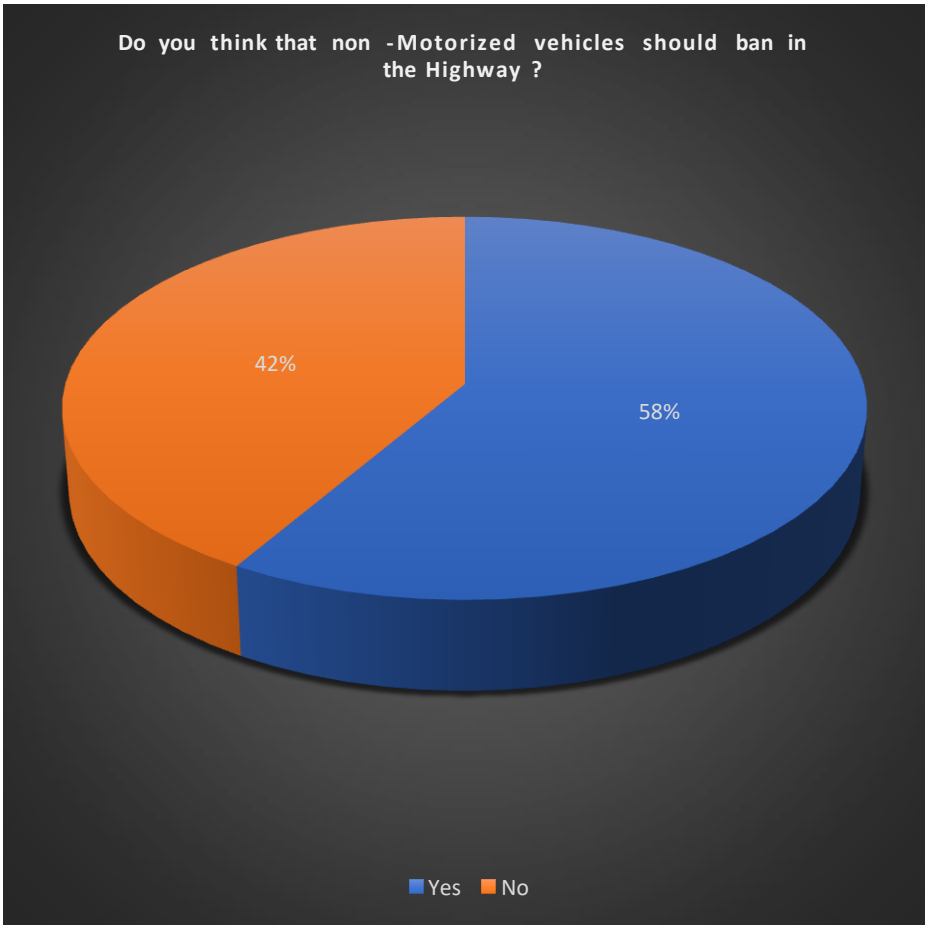

Figure 5-9. Highway non-motorized vehicles.

According to non-motorized vehicle drivers, 58% people say that non-motorized vehicles should be banned on highways and 42% people say that non-motorizedvehicles should not be banned on highways.

5.3 Summary

Analysis included in this chapter reveals that accidents involving NMTs are less frequent in Dhaka compared to motorized transports but they are more severe in nature. Most of the fatalities experienced by slow moving NMTs are caused bycollision with fast moving motorized transports. However, while fatality rates (per ten thousand vehicles) are considered it is seen that fatality rates of motorized transports are much higher in the metropolis than that of NMT. Regression equation derived here with number of accidents in one year as dependent variable shows that accidents increase as ratio of motorized to non-motorized transport speed increases and decrease as the effective road width increases. (hossain, august 1996).

CHAPTER 6
Conclusions and Future Recommendations

6.1 Conclusions

In this thesis, we used approximate non-motorized vehicle representations to tackle the issue of recognizing structures in photos. One of the key contributions of our workis to formulate this task as a constraint-laden combinatorial optimization problem and to provide approaches for its solution that rely on EDAs and their parallelization.

Further research revealed some more facts regarding of non-motorized vehicle use: the safety risk of motorized vehicles in Dhaka city.

i. There has been discussion on various portrayals of people. We specifically suggested representations for both discrete and continuous domains. Certain restrictions placed on the matching could be included directly to the representations.
ii. Various fitness-related functions have been presented. Here, we have two things to offer. First, their behavior was compared experimentally, and then new fitness functions based on probability theory were created.
iii. Our thesis put a lot of emphasis on the optimization process itself.
iv. This contribution can undoubtedly be used in additional non-motorized combinatorial optimization problems with safety requirements, expanding the scope of possible applications.
v. Depending on their size or their unique significance in relation to the recognition process, the regions in the model and data images may be given varying degrees of prominence. This non-motorized vehicle, for example,would help to identify in exceedingly complex situations the regions that must be located, the ones that occasionally emerge, and the ones that infrequently do.
vi. The method by which the model is built could also be altered. Rather than relying on a single standard image (which is not motorized), it might be built using a variety of images in order to convey some information about the variability among the various images and incorporate it into the attributes. Unfortunately, building a model from each image in the kind of photographs

we used as real-world examples is a laborious operation, therefore no additional research in this area could be done.

6.2 Limitations and Recommendations for Future Works

This research was relied primarily on qualitative research methods due to the nature of the research topics and the limited use of alternative non-motorized in Bangladesh. The majority of the results from the survey used in this study were not statistically significant. Instead, the survey provided the group with a sample of numerous case studies from which to draw generalizations. The results are constrained by the case study sample size even if the case studies were thoroughly completed and confirmed. As a result, the research found that non-motorized vehicles currently have the following safety difficulties.

i. The inclusion of extra non-motorized vehicles in this study is conceivable as the sector grows more accustomed to using alternative survey techniques and accepting greater responsibility.
ii. Non-motorized vehicle users, the danger posed by motorized vehicles, and the intricacy of the subject.
iii. The research was hampered by this complexity. For instance, inconsistent use is commonplace.

The limitations of this research point towards topics to be addressed in the future

iv. Research non-motorized vehicle users, the safety risk of motorized vehicles.

Recommendation for Future Study.

v. The performances of all the fitness functions have not been compared on a same non-motorized.
vi. The main reason was that some fitness functions are very complex to compute and require a considerable execution time to evaluate each individual.
vii. Initial findings from the tests can be used don't seem to be adequate, and further research is still needed to comprehend and enhance the behavior of these two fitness functions.
viii. We may also anticipate that the results for both applications (non-motorized vehicle) will be enhanced by the addition of a figure with more properties.

ix. The objective of the conclusion is to bring everything together. section, all outcomes should be first presented and described in detail.

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APPENDIX A

Survey Questionnaire

Section A : Respondent‟s & Constructions site‟s Demography

Please tick (✓) in the appropriate space blow.

1. Location of the Survey Site
    A. Jatrabari
    B. Farmgate
    C. Kamlapur
2. Type of Non-Motroized Vehicle
    A. Rickshaw
    B. Van
    C. Bicycles
    D. Pusheart

APPENDIX B

Questionnaire

SAFETY RISK OF MOTORIZED VEHICLE THROUGH THE LENS OF NON-MOTORIZED VEHICLE USERS.

N.B. There are 9 multiple choice question, put (✓) to answer

1. Monthly Income (BDT)

☐ 5-10k ☐ 10-15k ☐ 15-20k ☐ 20-25k ☐ 25-30k

2. Do you always follow traffic rules?

☐ Yes ☐ No ☐ Maybe

3. Do instead of should cause burdens of passengers causes accident?

☐ Yes ☐ No ☐ Maybe

4. How many times have you had an accident?

☐ 1 ☐ 1-5 ☐ 5+

5. Is Motorized vehicle responsible for road accidents?

☐ Yes ☐ No ☐ Maybe

6. Do you get any space when changing the length from motorized vehicles?

☐ Yes ☐ No ☐ Sometimes

7. Do you get any space when driving on the road from motorized vehicles?

☐ Yes ☐ No ☐ Sometimes

8. Do you think that heavy vehicles (BUS, TRUCK) should ban in the local street?

☐ Yes ☐ No

9. Do you think that non-motorized vehicles should ban in the Highway?

☐ Yes ☐No

APPENDIX C

Non-motorized vehicle users, the safety risk of motorized vehicles Scenario of Surveyed Dhaka city

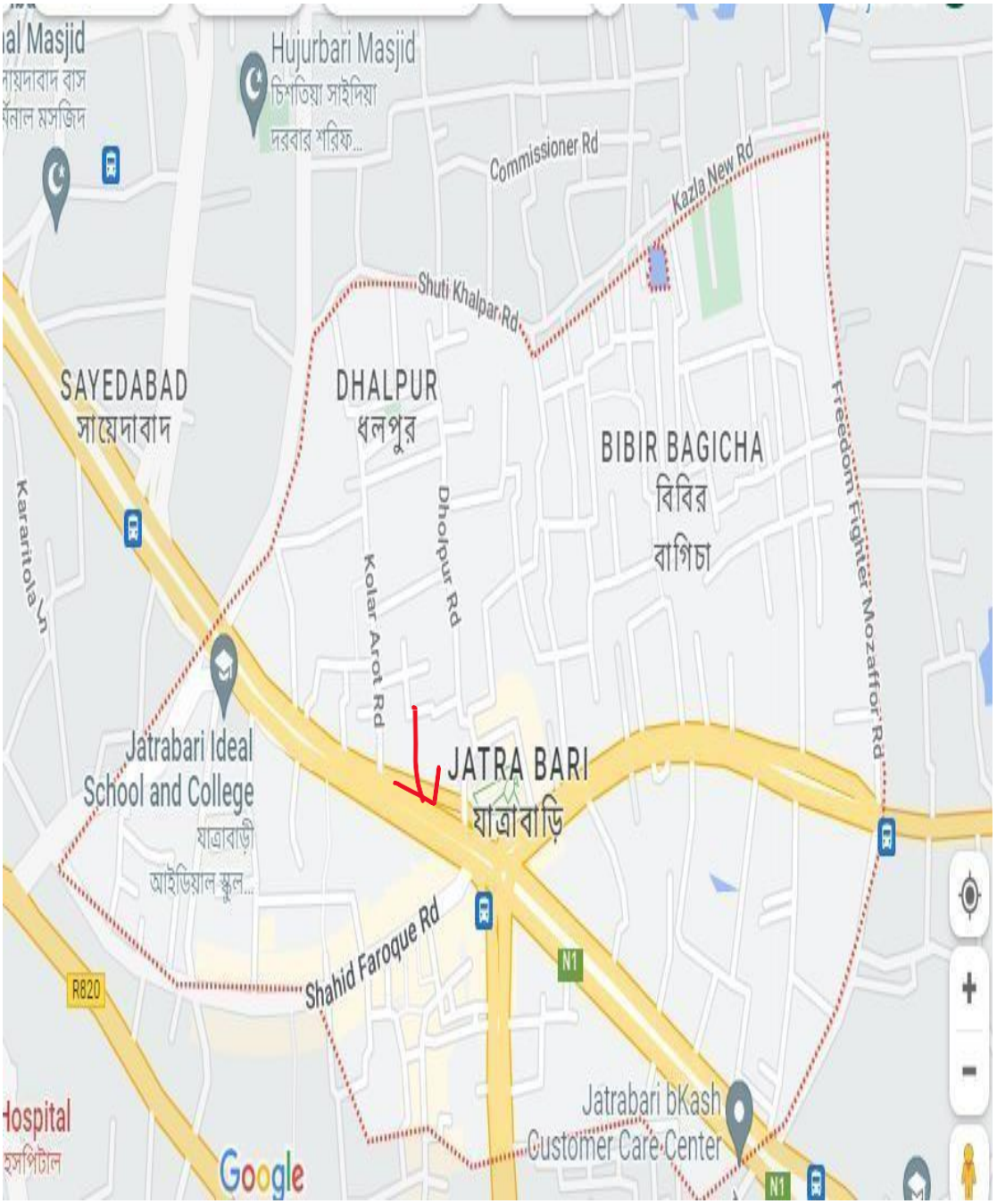

Dutch-Bangla Bank
N. MOHAMMAD DOORS


জামিআ ইসলামিয়া ঢাকা


SANITARY GARDEN

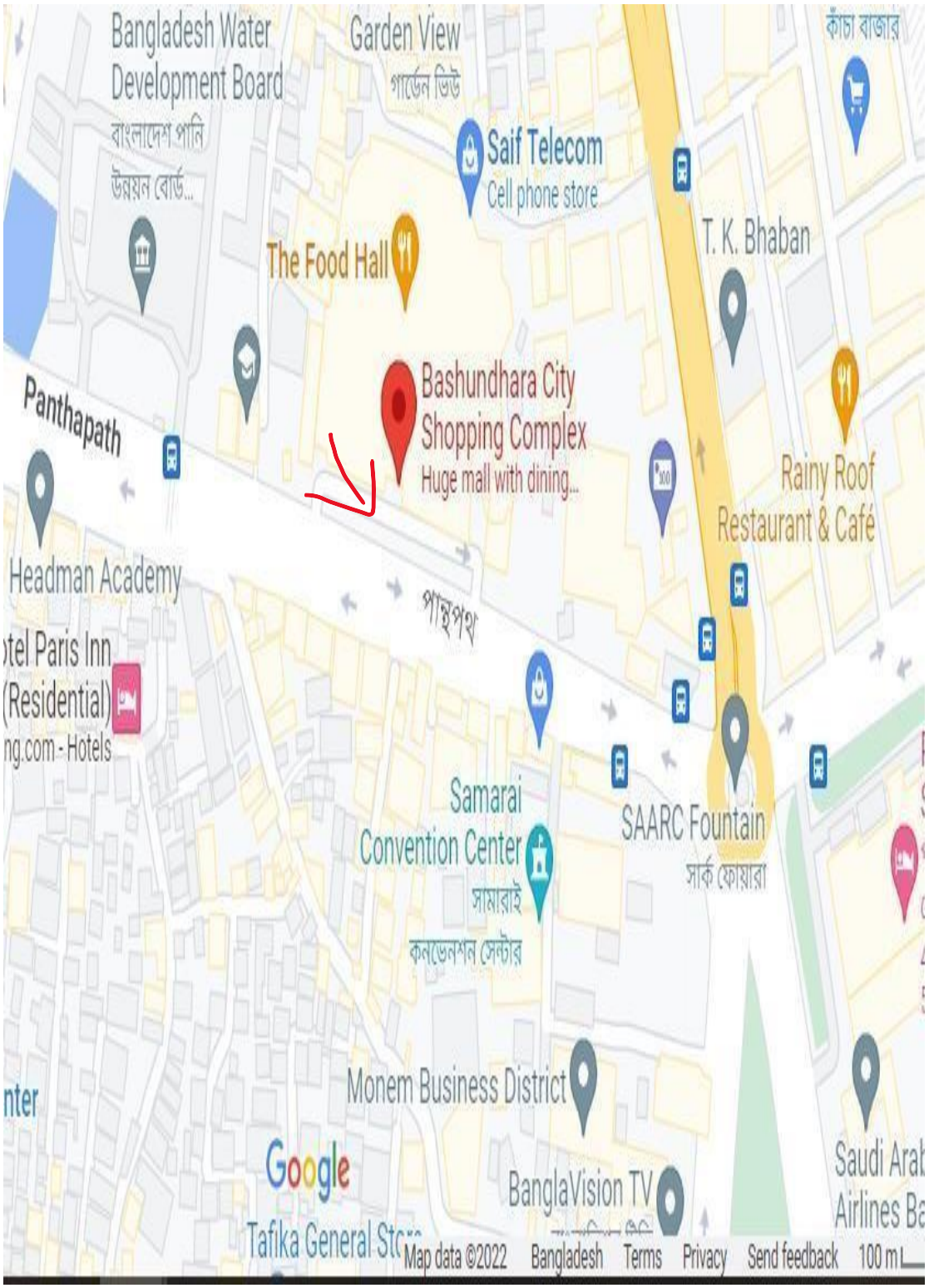
APPENDIX D

Area surveyed in Dhaka city Jatrabari (approximate location)



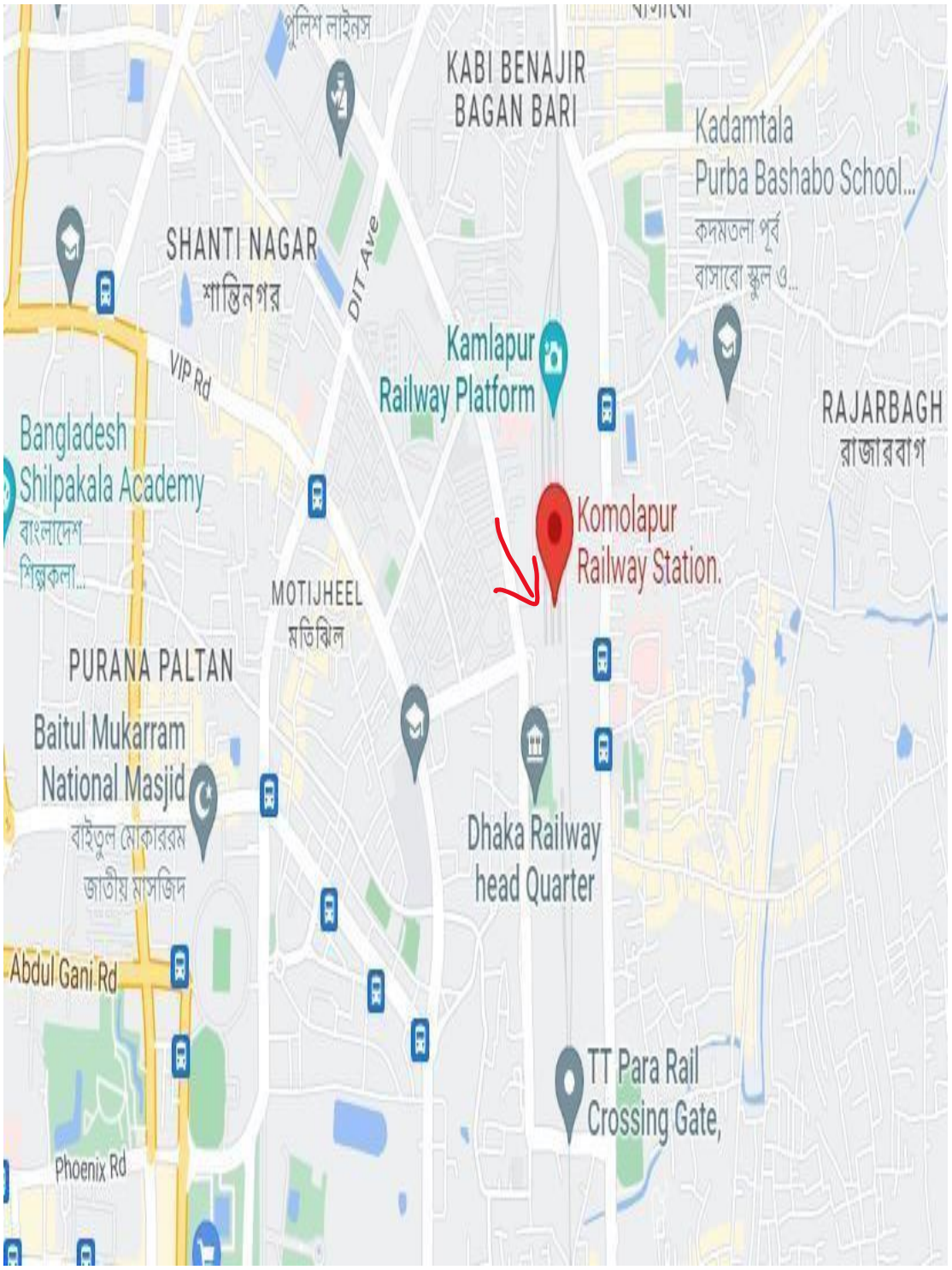
Approximate location of the survey

Area surveyed in Dhaka city Bashundhara city (approximate location)



Approximate location of the survey.

Area surveyed in Dhaka city Kamalapur (approximate location)



Approximate location of the survey.