STUDY ON TRAVEL DEMAND IN DHAKA CITY

By

. SAYEEM AHMED

EFAZ AHMED CHOWDHURY

TOWHID HASAN

MD RAFIQUL ISLAM RANA

TAHMEED AHMED

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

Department of Civil Engineering

Sonargaon University

147/I, Green Road, Dhaka-1215, Bangladesh

Section: 16E

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SAYEEM AHMED	ID: BCE1901016185
EFAZ AHMED CHOWDHURY	ID: BCE1901016249
TOWHID HASAN	ID: BCE1901016030
MD RAFIQUL ISLAM RANA	ID: BCE1901016037
TAHMEED AHMED	ID: BCE1901016029

Supervisor
DEWAN TANVIR AHAMMED
Lecturer
Department Of Civil Engineering
Sonargaon University

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1. DEWAN TANVIR AHAMMED — Chairman
   Lecturer
   Sonargaon University

……

2. Internal / External Member — Member

……

3. Internal / External Member — Member

DECLARATION

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STUDENT NAME	STUDENT ID.	SIGNATURE
SAYEEM AHMED	BCE1901016185	
EFAZ AHMED CHOWDHURY	BCE1901016249	
TOWHID HASAN	BCE1901016030	
MD RAFIQUL ISLAM RANA	BCE1901016037	
TAHMEED AHMED	BCE1901016029	

Dedicated

to

“Our Friends and Family and Honorable Teachers”

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ABSTRACT

Daily commutes have become nightmares due to traffic. According to a World Bank report, the average traffic speed in Dhaka has dropped from 21 kmph to 7 kmph in the last ten years, and it may drop to 4 kmph by 2035 (Traffic Jam: The Ugly Side of Dhaka's Development | The Daily Star), which is slower than walking speed. According to another study commissioned by the BRAC Institute of Government and Development, traffic congestion in Dhaka consumes approximately 5 million working hours per day and costs the country USD 11.4 billion per year (Dhaka Gridlock Costs Tk 1.53b a Day). According to the Passengers' Welfare Association, at least 87 percent of buses and minibuses violate traffic laws. Every day, at least 64 people are killed, and 150 others are injured across the country. Aside from the pain, suffering, and loss of life, road accidents have significant economic and social cost (rehabilitation, healthcare, material damages, and so on) that is difficult to quantify in monetary terms.

At certain times of the day, all the world's megacities experience traffic jams. Traffic jam in Dhaka city is a total traffic chaos and mismanagement. We looked at some major problems of Dhaka's transportation like unfit transport, imbalance fare, passenger harassment especially on women, increasing number of private automobile and NMV and find out some solution from the peoples by taking their opinion through field survey in Dhaka.

According to the study, several modifications should be made to Dhaka's transportation system for development. There should be more public transportation available. The government ought to take over the public transportation sector, lessen the personal vehicle and NMV, proper fitness of transportation, women's specific transportation, an equitable fare mode, and overall educated driver for safety measure.

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LIST OF ABBREVIATIONS

BRTA = Bangladesh Road Transport Authority
BTB = Bangladesh Tourism Board
DIT = Dhaka Improvement Trust
DITS = Dhaka Integrated Transport Study
DTCB = Dhaka Transport Coordination Board
DUTM = Dhaka Urban Transport Model
LDC = Least Develop Country
NMV = Non-Motorized Vehicle
UNDP = United Nation Develop Program
VAWG = Violence Against Women and Girls

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CHAPTER 1
INTRODUCTION

1.1 Background and Motivations

The population is growing all over the world. Due to this rapid population growth, the needs, and activities in the commercial, industrial, and many other sectors also developed. With the expansion of different needs, the demand for transportation and the generation and distribution of trips is also increasing day by day and cannot be met. Simply by improving supply due to economic and land inadequacies and because it is not a long-term solution to continuously increasing demand. For this reason, evaluation and engineering solutions become necessary, referring to traffic management approaches that can provide a solution to the growing need in the existing system economically and effectively. Many countries around the world have adopted traffic measures and managed to control the growing demand in their road networks under proper planning and management. Dhaka, the capital of Bangladesh, is a crowded city with minimal land use for its road network. As a result, traffic demand frequently outstrips supply with severe congestion on most roads in Dhaka, where the expansion of facilities and roads is difficult and expensive, requiring tools. low-cost traffic management to improve existing road capacity.

1.2 Development needs in the transportation industry

Dhaka is a mega city with a rapidly growing population and transportation. Every day the transportation sector is growing more and more but the roads and traffic management is unable to coup with this enormous transportation. The BRTA needs to find a way to optimize the traffic system to bear this enormous traffic inside Dhaka. To reduce traffic congestion BRTA needs to make a radical change in the traffic system.

1.3 Objectives of the work

To guide the future development of megacities, there will be a set of clearly defined goals. Adhering to the policies in this statement will ensure that the long-term vision doesn't lose sight of the details of day-to-day execution.

For this purpose, information, several questions were asked in a survey in different areas of Dhaka. Common people did participate in this survey and gave their opinion regarding the development of travel demand in Dhaka.

- To analyze the public transportation's existing condition
- To offer the views of public transportation passengers in order to improve service.

CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

In this chapter, a brief overview of the literature on evaluating public transport has been provided in terms of its relevance to this study. Exemplary performance evaluation studies conducted both in Bangladesh and abroad were conducted, some of them were summarized and conclusions were drawn based on the final reviewed literature.

2.2 Development of travel demand

2.2.1 Bringing the transport sector under the government

Transportation model of Luxembourg

Luxembourg has become the first country in the world to make all public transport free to use on 29th February 2020. All trips on standard plus public transport in European countries are now free compared to the previous €440 annual subscription. However, visitors can pay €660 per year for first class. Transport minister François Bausch said, "This is very important for people on low incomes and those on the minimum wage." In addition to Luxembourg 600,000 inhabitants, an estimated 214,000 people commute from Germany, Belgium, and France to work in the country. Most of them are cars which regularly cause major traffic congestion.

To cope with passenger's numbers and elimination of tariffs, Luxembourg plans to invest €3.9 billion in railways between 2018 to 2028, modernize the bus network and increase parking spaces, border transit parking. (Luxembourg Makes Public Transport Free – DW – 02/29/2020)

2.2.2 Fare survey of local public transportation

According to most of the citizens the fare of public transport is not balanced in Dhaka. But this problem is not only existed in Bangladesh. In South Asia, low income and high population density should support a viable population transit service. In practice this was not the case as it was contrary to public order. Serious side effects in most countries. Most commonly, failure first took shape. The unrealistic fare rules of conventional public bus services and the resulting. Exacerbated by poor regulation of the emerging private sector.
In Bangladesh, the combination of public service and fare control is also ruining conventional buses service. Public Sector Utilities BTB has found that operating in cities is not economically viable. Instead, they lease their vehicles to the private sector, which is often more profitable Operate them in the intercity market, not the city market. On the other hand, a private minibus. Market Share of Cycle Rickshaws Expands. Public transport costs €0.26 per km in Dhaka and

€0.13 in Delhi, almost twice as much as Delhi. (Bangladesh Raises Bus Fares as Much as 22% after Record Fuel Price Hike, 06/08/2022)

2.2.3 Reasons behind road accident

The main causes for the burden of road traffic accidents in South-Asia are the increase in the number of motor vehicles, poor observance of road safety rules, poor road and vehicle quality, and inadequate public health infrastructure

Country Name	Accident Percentage	World Ranking
Nepal	20.65%	72
Sri-Lanka	18.07%	82
Bhutan	17.35%	85
Bangladesh	16.74%	88
India	16.33%	90
Pakistan	15.18%	95
Maldives	1.85%	177

Fig 2.1: Accidents Percentage among South Asian Countries (ROAD TRAFFIC ACCIDENTS ASIA CAUSE OF DEATH)

In Bangladesh main reasons behind road accidents are untrained and ruthless driver, careless pedestrian, and loose traffic rules. Most drivers are illiterate, and many don't have driving license. Due to blind spots of traffic rules incompetent drivers get away with causing accidents because of weak administrative structures. Also, the pedestrians don't follow the signals and other traffic rules properly.

2.2.4 Wastage of time due to Traffic congestion

About 7 million people live in Dhaka City Corporation and more than 12 million people live in the capital Dhaka. In big cities, people spend an average of 2.35 hours in traffic, 1.30 of which is due to traffic jams. That means you lose 1.30 hours each day due to traffic jams. The resource loses 1.30 hours of work each day. This means more than double the shipping time required.(Mahmud et al., 2012)

2.2.5 Impact of NMV

Rickshaws, vans, and bicycles are common non-motorized transportation options. In the absence of a stable mass transportation infrastructure, these modes played a significant role in carrying people and goods. To address the need for door-to-door public transportation services for city dwellers, rickshaws, however, play a significant role. In this city, there is no designated lane for non-motorized vehicles. Field statistics show that NMV accounts for an average of 20% of all vehicles on practically all of the connection roads. The findings unequivocally demonstrate the detrimental effects of non-motorized vehicles on intersection capacity.((PDF) Effects of Non-Motorized Vehicles (NMV) on a Selected Intersection in Dhaka City for Non Lane Based Heterogeneous Traffic Using (VISSIM 5.3))

2.2.6 Women's safety in public transportation

Women's access to resources, confidence, and mobility are all impacted by sexual harassment. Women's human rights and ability to participate equally in city life are impacted by a lack of safety and security in public areas and on public transportation.

According to the study, the majority of respondents had been subjected to multiple acts of violence while utilizing public transportation. This demonstrates that VAWG in the transportation industry poses a severe threat to women's fundamental rights, safety, and security with regard to their access to education, employment, healthcare, and movement in cities generally. With scant data and few regulations, rules, and actions to prevent and address it, this subject is still mostly ignored. Traveling during rush hours has increased the violence experienced by women and girls compared to other times.(Kaske Kacharo et al., 2022)

2.2.7 Travel Demand for Dhaka city

Although Dhaka is a very old city, very few detailed traffic planning studies have been studied was conducted; but no one really achieves the basic goals of traffic system planning; This fact is clearly reflected by. The city's transport system has not been planned and developed. First research on the road network plan "Dhaka City Master Plan", prepared in 1959 Dhaka Improvement Trust (DlT) ((PDF) Summary of Dacca Master Plan, 1959 | Mowtushi Poit - Academia.Edu,), provides a blueprint for future construction urban road. Shankland Cox Partnership (1979) Research is an in-depth study of the development of transportation in the capital Dhaka, where emphasis on road network construction and management developed a traffic allocation model for Dhaka city, traffic optimization analysis option. Dhaka Greater Metropolitan Area Integrated Transport Study (DlTS) (1991-1993) was an initiative of the

Government of Bangladesh with the support of UNDP developed a transport model, named `` Dhaka Municipality. Transport Model` (DUTM)(Evaluation of Planning Options to Alleviate Traffic Congestion and Resulting Air Pollution in Dhaka City), to analyze current and future traffic congestion and leading to air pollution in Dhaka city. In this study, several alternative planning options evaluated, including eliminating trailers and auto-rickshaws, improving of the road network, the improvement of bus transport and the introduction of a rail transport system in Dhaka city.

Although some traffic planning studies have been done in Dhaka, most studies have been carried out by foreign consultants who have followed these approaches are most of the time suitable for developed countries and therefore faced with common challenges and constraints in developing countries. Shared specific problems of developing countries as well as the idiosyncrasies of Dhaka. Transportation is not handled efficiently enough, sometimes ignoring some major problems.

2.3 Summary

The literature reviews mentioned above were followed up to conduct our study. The study of Luxemburg free transportation shows low-income people need free public transport, beside it will encourage people to leave private vehicle and take public transport which will lower the traffic congestion. According to a survey based on public transportation fare in Dhaka , it was found that the fares in Dhaka city isn’t balanced at all. About 7 million people live in Dhaka City Corporation and more than 12 million people live in the capital Dhaka. In big cities, people spend an average of 2.35 hours in traffic, 1.30 of which is due to traffic jams. That means you lose 1.30 hours each day due to traffic jams. Sexual harassment has an effect on women's mobility, confidence, and resource access. Lack of protection in public spaces and on public transit has an influence on women's human rights and their capacity to participate equally in city life, according to a study. The majority of respondents reported having experienced numerous violent incidents while utilizing public transit. According to a survey Bangladesh ranks fourth in traffic accidents due to poor traffic management. The 1959 Dhaka Master Plan was not completed as planned and Dhaka became a city of traffic jams.

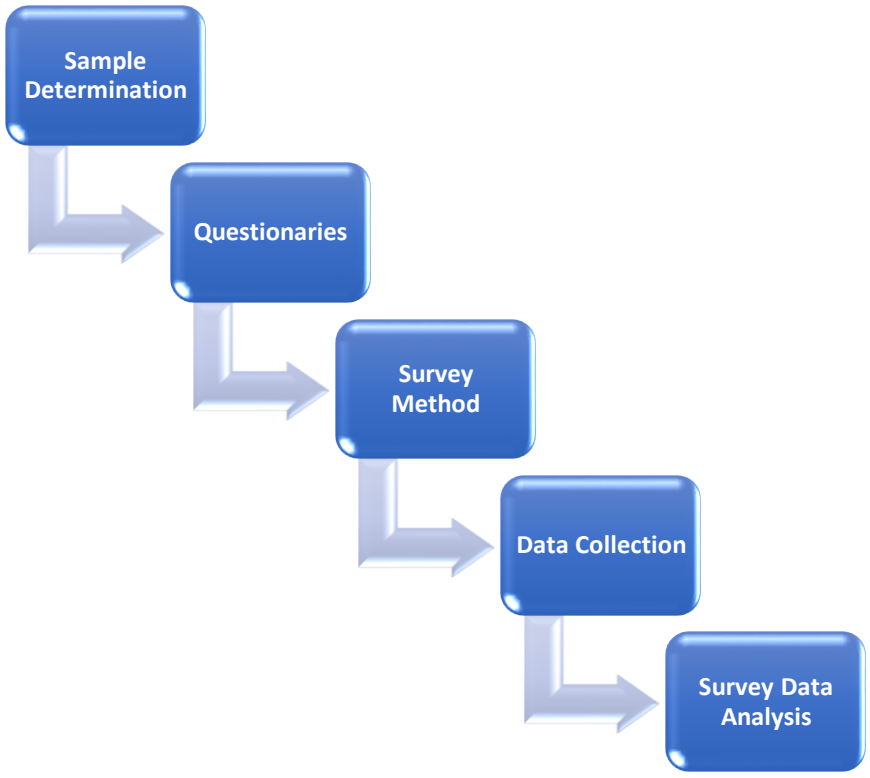
CHAPTER 3
METHODOLOGY

3.1 Introduction

To do the survey on public transport for model Dhaka we elected 10 questions to ask randomly chosen people. For the survey we elected some high congestion like Shewrapara, Farmgate, Azimpur, Dhanmondi 15, Gulshan, Mohakhali and Gulistan. The survey was conducted on 200 people. The data was all authentic answer chosen by the people. The questions were multiple choice question from where one must pick an individual answer among four options. The final result of the survey was later converted into percentages.

3.2 Characteristics of methodology:

The survey was conducted in 5 steps. Here is a flow chart for the survey steps.



3.2.1 Sample Determination

Determining Sample Size

The sample of our study was determined randomly across Dhaka city, we didn't break down the sample into sub groups by age, gender, location or occupation. The outcome of the survey was random as we chose to do it randomly on the streets of Dhaka city.

3.2.2 Questionaries

Any survey and, by extension, any research project, depend on useful questions to be successful.

The characteristics of the survey questions are as follows:

- **Data collection**

  Our survey questions and their types are the only factor that consistently affects how successfully we can get accurate and comprehensive replies, regardless of whether we are using an email, SMS, web intercept, or mobile app.

- **Fundamental levels of measurement scales**

  Making a multiple-choice survey question requires four measuring scales. No multiple-choice questions can be made without the fundamentals of nominal, ordinal, interval, and ratio measurement scales. Consequently, it is crucial to comprehend these levels of measurement in order to develop a solid study framework.

- **Question format**

  The most prevalent survey question type is the multiple choice one, so we chose multiple choice question to conduct the survey.

- **Conducting the survey**

  Planning the type of survey is crucial to obtaining the ideal number of responses needed for your study. A questionnaire or a combination of questions and interviews may be used. Interviews may be conducted over the phone, in person, or online, and questionnaires may take the form of web surveys or personal intercepts.

3.2.3 Survey Methods

Face-to-Face Survey

We used face-to-face survey method to conduct our survey. This survey method allowed us the investigation of complex problems. This is to allow us to fully explain the question, ask the respondents to clarify the answer and identify non-verbal cues such as body language.

3.2.4 Data Collection

We are aware that Bangladesh is a developing nation with little technological advancement, and that its residents are still adjusting to these changes, So, we went to people directly and asked them to complete the survey questionnaire, adhering to the traditional method of data collection.

Fig 3.1: Respondents filling the survey paper

Fig 3.2: Convincing random pedestrian to do the survey.

3.2.5 Survey Data Analysis:

Cross-tabulation

One of the simplest statistical analysis methods, cross-tabulation uses a simplistic tabulation framework to make sense of data Although organizing survey data into a table makes it easier to draw comparisons across various study factors, raw survey data might be intimidating. It involves information that is mutually exclusive.

3.3 Summary

Ten important issues concerning Dhaka's public transportation were posed to 200 residents. While some outcomes were foreseeable, others were less so. Most significantly, this poll contains lessons for our traffic authority. We made every effort to maintain randomness among the responders. Our options include streets, bazaars, malls, traffic signals, and a variety of other locations.

The people who responded to our survey were helpful. However, occasionally people were agitated and rude toward us without understanding the reason for our study. We carried out this independently, but at certain locations we had to deal with security and police, who questioned us about our motivations and the political party from which we were member. None of us had any impact on the respondents since they provided their own points of view in their responses. Some of them were uncertain about the answer alternatives to the inquiry. To

assist them in responding, we explained the question and its possibilities to them. It would have been much better if we had polled the senior BRTA officers.

CHAPTER 4
RESULTS & DISCUSSIONS

4.1 Introduction

Most of the Dhaka's transportation is road-based, and rickshaws account for a sizeable portion of the non-motorized mode share. There are not many other connecting roads in Dhaka's almost 3,000 km (of which 200 km are principal) road network. Only 7% of the total land area is used for roads and other transportation infrastructure. There are 400 km of pathways that are accessible to pedestrians, but 40 km of those are being used unlawfully by merchants and others (Rahman, 2008). Bicyclists share the road with other motorized and non-powered vehicles because there are no designated bicycle lanes. Despite the fact that all major crossroads are equipped with traffic lights and signal controllers, the majority of traffic movements at crossings are still managed manually by traffic police. There are several different motorized and non-powered modes of transportation in Dhaka.

They frequently use the same road space, which causes major operational disorder and severely lowers the efficiency and efficacy of the current transportation services. In Dhaka, there are 840583 registered motor vehicles (BRTA, 2014). According to data from the Bangladesh Road Transport Authority (BRTA) (see Figure 1), motorcycles make up 39% of the vehicle mix, followed by passenger cars (24%), Jeep and microbuses (10%), buses (3%), taxis (4%), pickup trucks (5%), and trucks (5%). Over 500,000 rickshaws, in addition to these powered vehicles, may be seen operating on Dhaka's streets (DTCB 2005).

A quick glance at Dhaka's streets on any given weekday will reveal that the traffic situation is at an all-time low. Long lines of stationary cars on major thoroughfares that stretch over a mile are not uncommon, nor are delays of 10 to 15 minutes at crossroads. During rush hour, a 5-km travel normally takes 45 minutes. According to recent research, all of the city's major junctions run at levels substantially beyond their capacity for the most of the time between the hours of 8:00am and 9:00pm (Siddiquee, 2010).

4.2 Results

We analyzed the responses to the survey we conducted and discovered the following findings.

Do you Think the number of public transport should be increased?	Yes	No	Maybe	No Comment
Response	122	50	16	12
Do you think public transport will do good if the government takeover it?	Yes	No	Maybe	No Comment
Response	108	32	54	6
How much time do you think is consumed by traffic usually?	1 Hour	2 Hour	More than 2 Hours	
Response	58	40	102	
Is it possible to reduce private transport?	Yes	No	Maybe	No Comment
Response	92	28	64	16
Should the non motorized vehicle be banned?	Yes	No	Maybe	No Comment
Response	58	96	23	23
In your opinion how much transport has fitness?	Fitness 15%	Fitness 20%	Fitness 35%	Fitness 50%
Response	74	54	49	23
Should there be a totally different transport only dedicated to women?	Yes	No	Maybe	No Comment
Response	96	48	34	22
Is the fare balanced?	Yes	No	Maybe	No Comment
Response	38	116	24	22
Who is responsible for this enormous number of road accident?	Driver	Pedestrian	Traffic Authority	Others
Response	74	12	76	38
Do you think the overload of passengers should be prohibited?	Yes	No	Maybe	No Comment
Response	166	6	23	5

Table 4.1: Cross Tabulation of Survey Data

4.2.1 Do you Think the number of public transports should be increased?

Megacity Dhaka has a rising population. The present transportation infrastructure cannot support this population. As a result, people have to wait longer for public transportation. Therefore, we polled the populace to determine their preference for more public transit. These are the answers provided to this question by the general population.

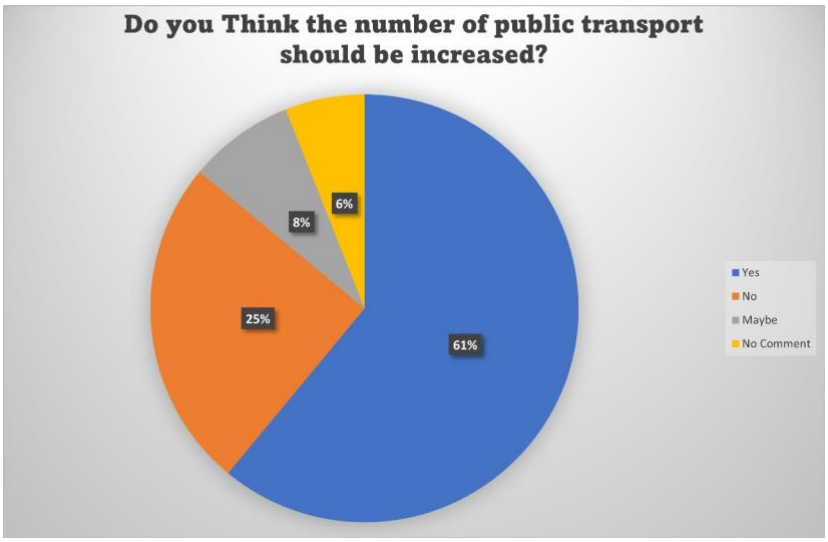


Fig 4.1: Response of "Do you Think the number of public transports should be increased?"

According to the pie chart, 61% of respondents favor expanding public transportation, 26% oppose doing so, 8% are unsure whether they favor expanding public transportation or keeping it at its current level, and 5% declined to comment on the topic. We can tell from the statistics that the average person has lost a significant amount of their working hours waiting for public transportation and that they are looking for a workable alternative. In order to lessen suffering among the populace, it appears that the authorities should increase the availability of public transportation.

4.2.2 Do you think public transport will do good if the government takeover it?

Bangladesh is a developing nation with little in the way of resources and a sizable populace. And the country's business, industrial, and employment sectors are all oriented toward Dhaka. But there are staffing issues and other issues with Dhaka's public transportation. As is common knowledge, most modes of public transit are private. We thus questioned the general population if they thought the government should take over transportation and address the issues the industry is now experiencing.

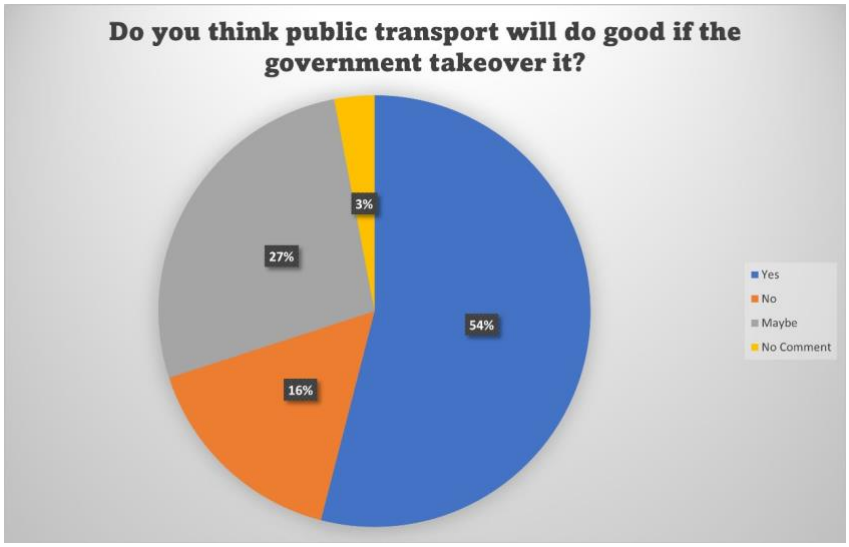


Fig 4.2: **Response of "Do you think public transport will do good if the government takeover it?"**

In the pie chart above, we can see that 55% of respondents want the government to take over the transportation industry, 16% disagreed, 27% weren't sure, and 2% didn't respond to the question at all.The results indicate that the majority wants the government to take control. However, 45% of people are unsure or disagree with this suggestion. We believe that additional study is necessary to examine whether or not government control is appropriate in this situation.

4.2.3 How much time do you think is consumed by traffic usually?

Common people lose a significant amount of time on the roads because of traffic congestion. We thus questioned the populace how much of their daily time was typically taken up by traffic.

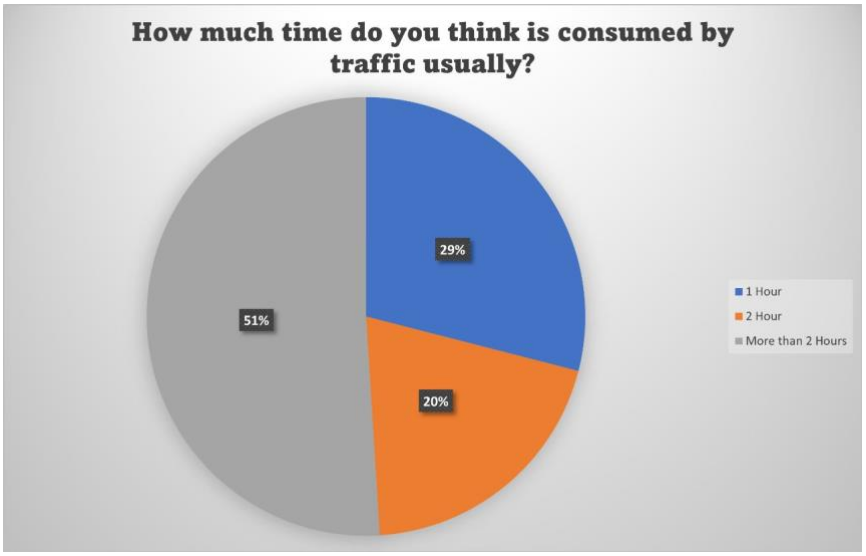


Fig 4.3: Response of "How much time do you think is consumed by traffic usually?"

According to the graph, 29% of people lose at least an hour of productive time due to traffic, 21% lose at least two hours, and 50% lose two or more hours of their important time.

Fig 4.4: Traffic jam of Dhaka city((PDF) Traffic Flow Interruptions in Dhaka City: Is Smooth Traffic Flow Possible?)

We may observe that people spend a lot of time stuck in traffic. and this has had a significant negative impact on our financial and economic situation. The government needs to act responsibly to resolve this issue.

4.2.4 Is it possible to reduce private transport?

Since Dhaka is the center of the economy, many wealthy people reside here and own one or more private automobiles. As is well known, private transportation helps to reduce traffic congestion. We thus ask the public if the government should limit the number of private vehicles on the road.

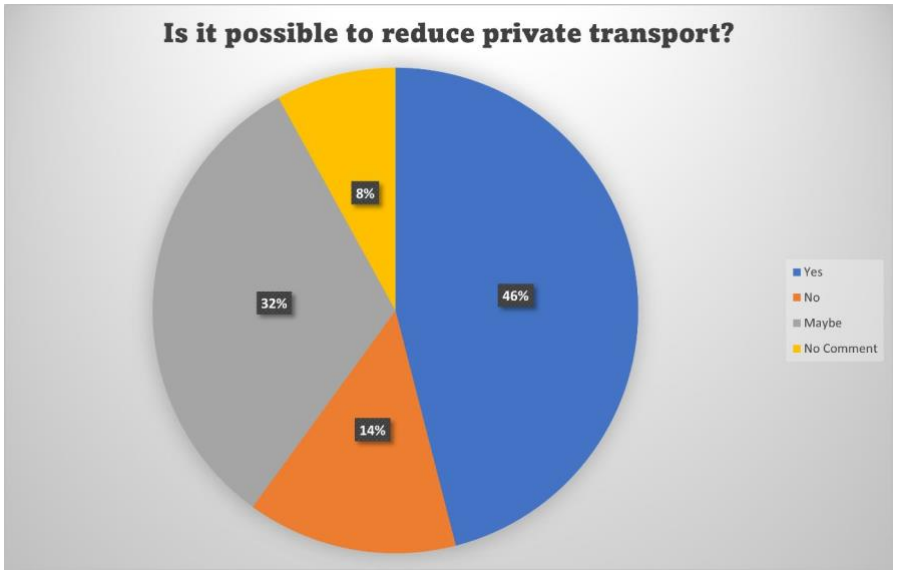


Fig 4.5: Response of "Is it possible to reduce private transport?"

In this graph, we can see that 47% of respondents agreed with the suggestion, 15% of respondents disagreed, 32% of respondents are unclear whether the use of private transportation should be reduced or not, and 6% of respondents had no opinion.

Fig 4.6: Enormous amount of private vehicle on street (Dhaka Traffic's Reconditioned Car Problem | Dhaka Tribune)

We believe the government should either find a way to reduce the number of private vehicles on the road or reduce their overall use. This proposal might be an alternative course of action. Private transportation for odd and even numbers will be permitted on various days. However, improving public transportation should be the top priority.

4.2.5 Should the non-motorized vehicle be banned?

The streets of Dhaka are overrun by rickshaws. A rickshaw is a vehicle that moves slowly. It cannot keep up with other motorized vehicles' speeds. As a result, moving quickly poses issues for motorized vehicles, which in turn produces traffic congestion. We thus questioned the public if they wanted the government to outlaw rickshaws or other NMVs.

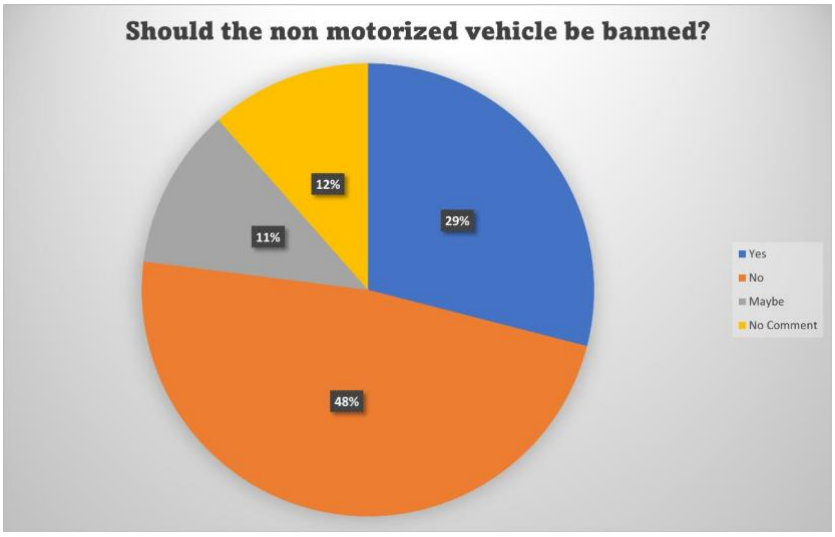


Fig 4.7: Response of "Should the non-motorized vehicle be banned?"

According to this pie chart, 29% of respondents support banning rickshaws and other non-motorized vehicles off the road, while 49% oppose the idea, 11% are undecided, and 11% did not respond to the question.

Fig 4.8: Rickshaw on street of Dhaka (Hundreds of Rickshaws Are Stuck in a Jam on Dhanmondi Road-1 in the Capital. Every Year This Very Street Sees a High Number of the Non-Motorized Vehicles Ahead of Eid When the Number of Illegal Rickshaws on City Streets Increases Stock Photo – Alamy)

This information led us to the conclusion that most people oppose the concept of banning rickshaws from public roads. The mobility of the rickshaw is mostly to blame for this response. This vehicle may travel through allies to escape traffic, as buses don't stop at every location. Therefore, in order to go where they're going, folks must hire rickshaws. Another emotive reason to disagree with this idea is that this vehicle is like a tradition to the people of Dhaka.

4.2.6 In your opinion how much transport has fitness?

Buses in Dhaka are extremely unfit; they appear as though an accident will occur at any time and damage passengers. however, they do possess a fitness certificate. So, we poll the general population to find out what they believe about the public transportation system's proportion of fitness.

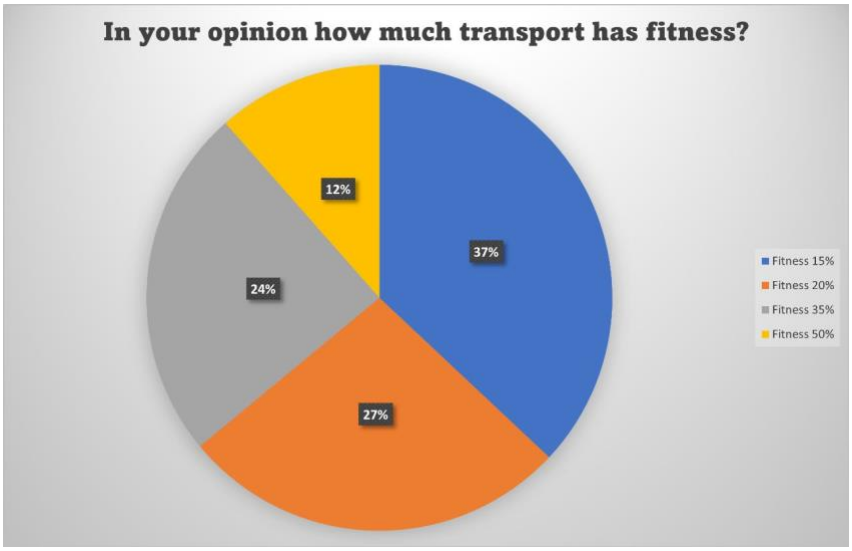


Fig 4.9: Response of "In your opinion how much transport has fitness?"

37% of respondents believe that 15% of transportation is fit, 28% believe that 20% are fit, 24% believe that 35% are fit, and 11% believe that 50% are fit.

Fig 4.10: Unfit public transport (Six per Cent Car Users Occupy 76pc Dhaka Streets

As we can see from the chart, the public is divided in its thoughts. According to the BRTA, almost 38,000 buses are licensed, but another report from the Dhaka Tribune claims that 1600 buses are unsuitable. However, these statistics do not help us to understand the problem any

better. Authorities should identify these unsafe buses and take the necessary legal measures against the owners.

4.2.7 Should there be a totally different transport only dedicated to women?

On recent years, crimes against women have increased in public transportation, including rape, attempted rape, eve teasing, and character assassination. so that there is some risk for ladies using public transportation. So, we polled the populace to see if having a separate public transportation system just for women would be beneficial.

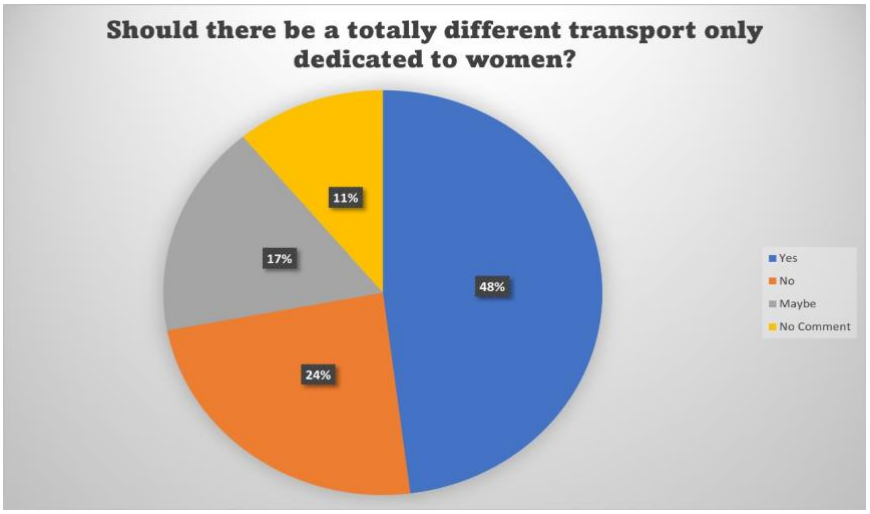


Fig 4.11: Response of "Should there be a totally different transport only dedicated to women?

48% of respondents believe there should be a specific form of transportation for women, 24% disagree, 18% think there might be such a vehicle, and 10% are undecided. As we've already mentioned, the number of crimes against women on public transportation is increasing daily. Therefore, in modern times, a woman is not entirely safe on public transportation. Therefore, it could be a good idea if the authority really launches a transportation service that is just for women, and the graph back up our argument.

4.2.8 Is the fare balanced?

The per-kilometer fare for buses within of Dhaka is 2.5 BDT, under the BRTA regulations. However, a lot of bus companies disregard this law and charge their customers more. We thus questioned respondents if they believed the menu was balanced or not.

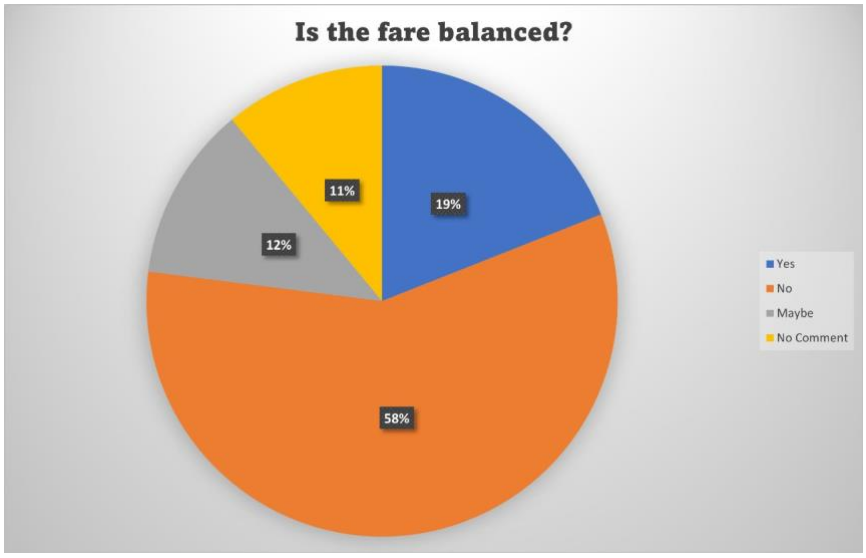


Fig 4.12: Response of "Is the fare balanced?"

58% of individuals believe that the fare is unbalanced, 19% believe the fare is balanced, 13% are unsure about their claim, and 10% have no idea.

Like the majority, we believe that the fare is completely unbalanced. Even though the authorities have established the fare at a fair cap, the bus firms do not abide by this and charge whatever they like. The authorities need to be stricter and ensure that the enterprises follow the regulations and maintain fair fares.

4.2.9 Who is responsible for this enormous number of road accident?

In 2021, there were at least 5,088 fatalities in 5,472 traffic accidents, up 30% from the year before, according to the police. The BPWA statistics presents a grimmer picture: in 5,629 traffic accidents last year, there were 7,809 fatalities and 9,039 injuries. We enquired about who is to blame for this massive number of accidents and received responses from.

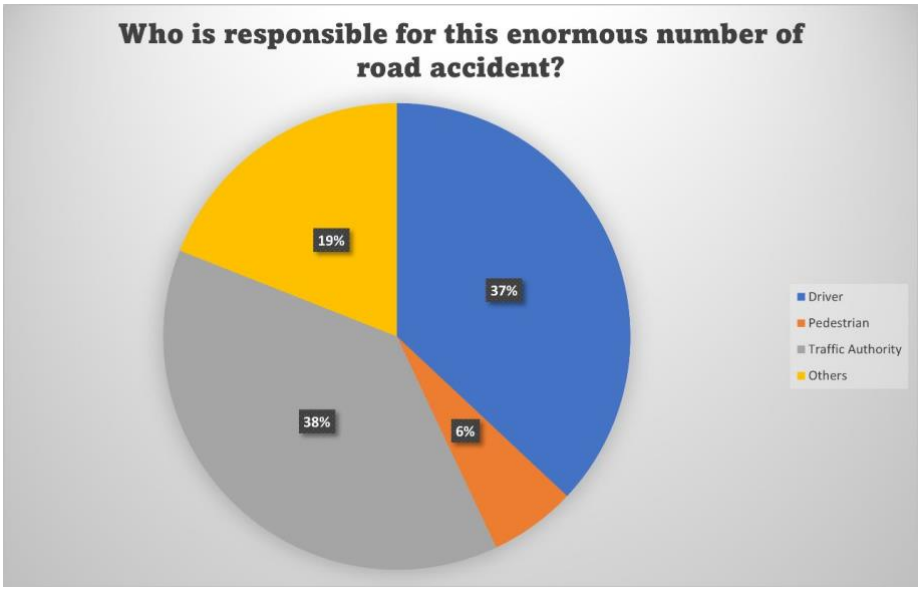


Fig 4.13: Response of "Who is responsible for this enormous number of road accident?"

In this graph, 37% of respondents believe that drivers are to blame for accidents, 39% believe that traffic authorities are to blame, 18% believe that other factors, such as natural disasters or animals crossing the road, are to blame, and 6% believe that pedestrians are to blame.

Fig 4.14: Road accident (Road Accidents Claim 4,628 Lives in 2019 | Dhaka Tribune)

Fig 4.15: Accident due to authorities' fault (Initial Probe Finds Proof of Negligence in Dhaka BRT Girder Crash That Killed 5)

From this point on, it becomes clear that there are two main causes of these collisions: first, careless and inexperienced drivers; second, the authority itself. Because of the recklessness of the drivers, we lost a lot of lives every year. Lack of zebra crossings, inadequate traffic signals, and a footbridge are examples of government negligence. The authorities need to uphold the traffic laws and be more covert about them.

4.2.10 Do you think the overload of passengers should be prohibited?

We frequently observe crowded public transportation. The car becomes unbalanced from the excess passengers, and the passengers themselves become irritated. We thus asked the populace if they wanted it to end.

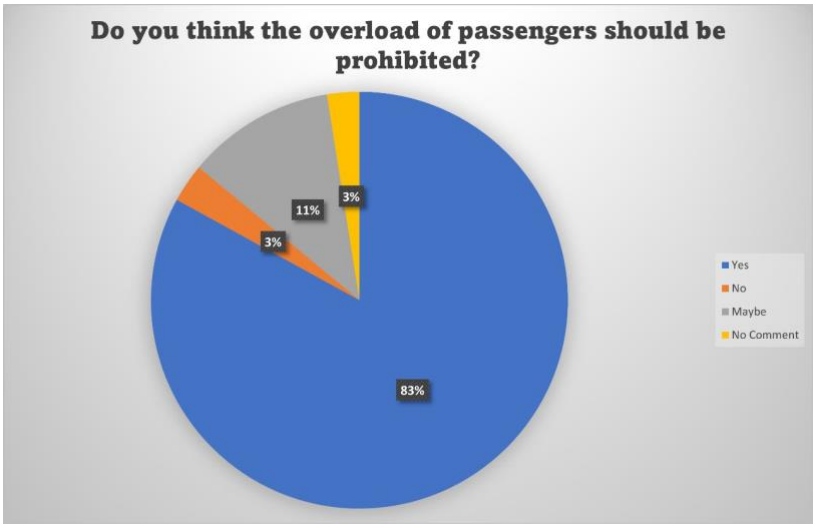


Fig 4.16: Response of "Do you think the overload of passengers should be prohibited?"

84% of respondents believe that this should be illegal, 11% are just marginally in agreement, 3% believe it should continue, and 2% have no opinion.

Fig 4.17: Overload of passengers in public transportation ((PDF) Traffic Flow Interruptions in Dhaka City: Is Smooth Traffic Flow Possible?)

As we can see, the majority of people believe that having too many passengers is a bothersome issue that needs to be fixed since it might cause the automobile to become unbalanced and cause an accident. The ride is worsened by the overburden standing passengers who tumble on each other as the bus abruptly brakes. Like the majority, we believe that the government should forbid overcrowding of passengers on public transportation.

4.3 Summary

We identified 10 primary causes of traffic congestion in Dhaka City based on the results of our study, and we explored both the issue and potential solutions. We could see that individuals are frequently snarled in traffic. and the results have been disastrous for our financial and economic status. To tackle this problem, responsible government action is required.

The typical individual has wasted a sizable amount of working time waiting for public transit, and we can infer from the data that they are seeking for a practical substitute. It indicates that the government should expand the availability of public transportation to decrease hardship among the people.

Based on the results of the study, we concluded that most people are against the idea of barring rickshaws from using public roadways. The rickshaw's mobility is mostly to blame for this reaction. Buses don't stop at every spot; therefore, this vehicle may employ allies to avoid traffic. People must thus rent rickshaws to get where they're going. The fact that this vehicle resembles a Dhaka tradition is another compelling argument against the concept. We agree with most respondents in the poll that the fare is wholly imbalanced. Even though the government has set the fare at a reasonable level, bus companies charge whatever they want. The government needs to enforce the rules more strictly and make sure that the businesses continue to offer fair prices.

From this point on, it is evident that two factors, the first being irresponsible and unskilled drivers and the second being the authority itself, are mostly responsible for these incidents. We lose a lot of lives each year because of the drivers' irresponsibility. A footbridge, insufficient traffic lights, and the absence of zebra crossings are all examples of government neglect. The government needs to enforce the traffic regulations and be more discreet about doing so.

CHAPTER 5
CONCLUSIONS & FUTURE WORKS

5.1 Conclusion

There are other important problems that must be resolved before the travel demand for Dhaka can be developed, but we made an effort to focus on a few of them. By adhering to a basic, modular, and flexible framework, the complexity of the travel demand scenario in Dhaka is addressed and each model element may be improved, developed, and used with ease.

We conducted our survey using a cross-sectional design. This process is carried out in five phases. We first decide on a sample of questions to pose to regular people. then we finalized our sample and started our field investigation. We chose several major areas in Dhaka to carry out this survey. We pick individuals at random, ranging in age and profession. We began the survey by asking participants if they would want to take part. people who consented to participate were given survey forms to complete. the respond without our involvement, autonomously. Some of their responses were expected, while others were unexpected. Following the field survey, we cross tabulated and examined the data.

This survey provides information on the city of Dhaka's traffic congestion. Such as the amount of time individuals spend on the road stuck in traffic or waiting for a ride. Even though NMV appears to be an issue on the traffic scene, many individuals favor it. and it is past time to expand Dhaka's public transportation. We also heard from those who believe that authorities and drivers are to blame for most incidents. The poll also reveals that the public transportation fare is completely unbalanced.

The government and traffic authorities need to be more tactful, cautious, and tough regarding these issues, and they need to take all necessary actions to maintain our roads safer.

5.2 Limitations and Recommendations for Future Works

While conducting the poll, we ran into several issues. We lacked the resources to conduct a more extensive poll that may have provided us with additional information. Additionally, we lacked enough personnel to carry out a bigger poll. Additionally, we encountered some security challenges in several locations since the local authorities there failed to comprehend the goal of our poll. Few individuals agreed to take part in our poll. Some of them were annoyed, while others questioned us.

As we previously mentioned, due to a lack of resources (both financial and human), a larger-scale study could not be carried out. We would discover additional information and issues relating to traffic congestion if the study were conducted on a wider scale in the future, which would aid in the development of traffic laws and the national traffic scene.

We want to give some suggestions in order to improve the transportation in the city of Dhaka-

i. To balance the fee not only in terms of laws but also in terms of effect.
ii. We suggest adding more buses equipped with fitness certificates to the road.
iii. We suggest hiring bus drivers who have at least passed the Junior School Certificate Exam so that they will have a more thorough understanding of traffic regulations.
iv. Strict laws for pedestrian and drivers are recommended to avoid such large-scale accidents on a daily basis.
v. Although they play a significant part in reducing traffic congestion, flyovers are not a long-term fix.
vi. The government's brand-new metro rail plan may be the next major tool for reducing traffic.
vii. Along with that, the city of Dhaka must be designed for urbanization, which includes expanding roadways and putting buses on certain roads.

REFERENCES

Bangladesh raises bus fares as much as 22% after record fuel price hike. Retrieved December 7, 2022, from https://bdnews24.com/bangladesh/32s1anf2v7

Dhaka gridlock costs Tk 1.53b a day. Retrieved December 7, 2022, from https://thefinancialexpress.com.bd/economy/bangladesh/dhaka-gridlock-costs-tk-153b-a-day-1608257836

Dhaka traffic's reconditioned car problem | Dhaka Tribune. Retrieved December 7, 2022, from https://archive.dhakatribune.com/bangladesh/dhaka/2017/06/14/imported-reconditioned-cars-flooding-dhaka

Evaluation of planning options to alleviate traffic congestion and resulting air pollution in Dhaka city. Retrieved January 16, 2023, from http://lib.buet.ac.bd:8080/xmlui/handle/123456789/921

Hundreds of rickshaws are stuck in a jam on Dhanmondi Road-1 in the capital. Every year this very street sees a high number of the non-motorized vehicles ahead of Eid when the number of illegal rickshaws on city streets increases Stock Photo - Alamy. Retrieved December 7, 2022, from https://www.alamy.com/hundreds-of-rickshaws-are-stuck-in-a-jam-on-dhanmondi-road-1-in-the-capital-every-year-this-very-street-sees-a-high-number-of-the-non-motorized-vehicles-ahead-of-eid-when-the-number-of-illegal-rickshaws-on-city-streets-increases-image411543532.html

Initial probe finds proof of negligence in Dhaka BRT girder crash that killed 5. Retrieved December 7, 2022, from https://bdnews24.com/bangladesh/j7qbw6josp

Kaske Kacharo, D., Teshome, E., & Woltamo, T. (2022). *Safety and security of women and girls in public transport*. https://doi.org/10.1080/21650020.2022.2027268

Luxembourg makes public transport free – DW – 02/29/2020. Retrieved December 7, 2022, from https://www.dw.com/en/luxembourg-makes-public-transport-free/a-52582998

Mahmud, K., Gope, K., & Chowdhury, S. M. R. (2012). Possible Causes & Solutions of Traffic Jam and Their Impact on the Economy of Dhaka City. *Journal of Management and Sustainability*, *2*(2). https://doi.org/10.5539/JMS.V2N2P112

(PDF) Effects of Non-Motorized Vehicles (NMV) on a selected Intersection in Dhaka City for Non lane based heterogeneous traffic using (VISSIM 5.3). Retrieved January 15, 2023,

from https://www.researchgate.net/publication/337323728_Effects_of_Non-Motorized_Vehicles_NMV_on_a_selected_Intersection_in_Dhaka_City_for_Non_lane_based_heterogeneous_traffic_using_VISSIM_53

(PDF) Summary of Dacca Master Plan, 1959 | Mowtushi Poit - Academia.edu. Retrieved December 7, 2022, from https://www.academia.edu/32675240/Summary_of_Dacca_Master_Plan_1959

(PDF) Traffic Flow Interruptions in Dhaka City: Is Smooth Traffic Flow Possible?. Retrieved December 7, 2022, from https://www.researchgate.net/publication/264932701_Traffic_Flow_Interruptions_in_Dhaka_City_Is_Smooth_Traffic_Flow_Possible

Road accidents claim 4,628 lives in 2019 | Dhaka Tribune. Retrieved December 7, 2022, from https://archive.dhakatribune.com/bangladesh/2020/01/02/road-accidents-claim-4-628-lives-in-2019

ROAD TRAFFIC ACCIDENTS ASIA CAUSE OF DEATH. Retrieved December 7, 2022, from https://www.worldlifeexpectancy.com/asia/road-traffic-accidents-cause-of-death

Six per cent car users occupy 76pc Dhaka streets. Retrieved December 7, 2022, from https://thefinancialexpress.com.bd/national/six-per-cent-car-users-occupy-76pc-dhaka-streets-1505575829

Traffic jam: The ugly side of Dhaka's development | The Daily Star. Retrieved December 7, 2022, from https://www.thedailystar.net/opinion/society/traffic-jam-the-ugly-side-dhakas-development-1575355

APPENDIX

Appendix A

Questionnaire

Development of travel demand for model Dhaka

Name:
Age:
Occupation:
Monthly Income:
Educational Qualifications:

N.B. There are 10 multiple choice questions, put ( ) to answer

1. Do you think the number of public transport should be increased?
   O Yes O No O Maybe O No comment
2. Do you think public transport will do good if the govt takeover it?
   O Yes O No O Maybe O No Comment
3. How much time do you think is consumed by traffic usually?
   O 1 Hour O 2 Hour O More than 2 hours
4. Is it possible to reduce private transport?
   O Yes O No O Maybe O No Comment
5. Should the non-motorized vehicle be banned?
   O Yes O NO O Maybe O No Comment
6. In your opinion how much transport has fitness?
   O 15% O 20% O 35% O 50%
7. Should there be a totally different transport only dedicated to women?
   O Yes O No O Maybe O No Comment
8. Is the fare balanced?
   O Yes O No O Maybe O No Comment
9. Who is responsible for this enormous number of road accidents?
   O Driver O Pedestrian O Traffic Authority O Others
10. Do you think the overload of passengers should be prohibited?
    O Yes O No O Maybe O No Comment

Sample of Questionnaire

Appendix B

Conducting survey on study of travel demand