IDENTIFY POSSIBLE CAUSES AND SOLUTIONS OF TRAFFIC JAM OF DHAKA CITY AND THEIR IMPACT ON HEALTH

Submitted by

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APPROVAL

The title of the thesis is **"Identify Possible Causes and Solutions of Traffic Jam of Dhaka City and Their Impact on Health"** presented by Faysal Ahmed Shuvo ID: 181-47-701, Sadman Sakib ID: 181-47-699. The Department of Civil Engineering at Daffodil International University has acknowledged that, in terms of incomplete fulfillment of the requirement for the degree of Bachelor of Science in Civil Engineering (Transportation), it has achieved optimal results.

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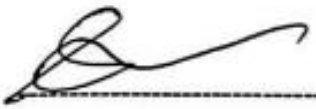

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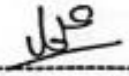

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ABSTRACT

The capital of Bangladesh is Dhaka, bears the title of being the world's most densely populated city. As of 2022, the population of Dhaka was 10.2 million, and Greater Dhaka has about 22.4 million citizens. Dhaka faces the constant challenge of escalating congestion, particularly in its roadways. The city’s infrastructure struggles to cope with the increasing vehicles, resulting in extensive traffic jams. Contributing factors include faulty traffic signaling systems, insufficient personnel, limited road space, and aggressive driving habits. These traffic congestions adversely affect our health. To address this issue the government could consider various solutions such as constructing roads to improve east-west connectivity within Dhaka, putting in place a system of grade-separated roads, launching a BRT system, and creating a Metro-Rail system. By alleviating traffic congestion, Dhaka can play a significant role in enriching a healthier environment free from noise and pollution, thereby enhancing the quality of life for its residents.

TABEL OF CONTENTS

LIST OF CHARTS

Chapter 1
INTRODUCTION

1.1 Introduction

One of the most disorganized traffic systems is thought to exist in Dhaka. The people endure financial losses in the form of lost man-hours from missed workdays as well as physical discomfort. Print and electronic media have chronicled the miseries of Dhaka city commuters due to the persistent traffic issue for some time. Despite significant efforts to improve the capital city's traffic condition, supported by a multilateral lender, In the short- to medium term, there is no visible solution to the problem. Previous administrations attempted to lessen the severity of the traffic issue through special meetings with relevant agencies, promising noticeable changes as soon as feasible, yet nothing substantial has occurred. Traffic cops continue their regular duties without complaint, while rickshaw pullers, bus drivers, and truck drivers remain as belligerent as before. Political figures were formerly held partially responsible for disorderly traffic patterns due to their involvement in billions of taka toll collection from bus and truck operators and bus terminals. It was believed that the caretaker government's advisors were morally upright, but the state of traffic did not improve.

Public buses in Dhaka disregard designated bus stoppages, picking up and dropping off passengers anywhere, even in the center of the road. Bus drivers often park their vehicles haphazardly at these stoppages, causing disruptions to normal traffic flow. Additionally, buses frequently overtake other vehicles from the wrong side. A vast majority (over 95%) of buses operating in Dhaka fail to comply with regulations outlined in the Motor Vehicles Act (MVA), lacking essential features such as indicators and backlights. Traffic sergeants, for reasons known to them, either intentionally or unintentionally overlook violations of MVAs and other traffic laws. In light of these issues, a recently released report suggests that the Dhaka City Corporation (DCC) is considering expanding the electronic signaling system to alleviate congestion.

Traffic congestion is a significant issue in the city, exacerbated by the malfunctioning of many traffic signaling devices for almost a year. The Dhaka Metropolitan Police (DMP) traffic division relies on these signals for facilitating smooth traffic movement, while the Dhaka City Corporation (DCC) is responsible for their installation and maintenance. However, the effectiveness of electronic traffic lights is questionable. At most intersections equipped with these systems, on-duty traffic policemen manually

control vehicle movement, arguing that the technology is ineffective during peak traffic hours. This inefficacy may stem from the lack of synchronized operation across the entire electronic traffic signaling system.

However, the primary issue with the city's traffic infrastructure is the overwhelming number of cars on the roads, surpassing the capacity to accommodate them. Therefore, simply adding more traffic enforcement officers or installing electronic signals won't suffice. While they may provide short-term relief if implemented effectively, they won't offer a long-term solution. The key to addressing this issue lies in implementing comprehensive solutions such as multi-layer flyovers, elevated expressways, and subways. It's evident that one of the top priorities for the next government will be to take significant action to alleviate Dhaka's ongoing traffic problem. Additionally, the discrepancy between the number of registered and unregistered rickshaws further complicates the situation. Efforts to regulate their numbers have been gradual and often ineffective. Various measures, including circular waterways, flyovers, and bridges, have been experimented with by the government, but they require careful planning. Illegal parking also contributes significantly to traffic congestion, with vehicles obstructing roads in various areas. Factors such as insufficient manpower, narrow roads, aggressive driving behavior, and malfunctioning traffic signals exacerbate the problem, causing prolonged jams and inconvenience for commuters. The resulting gridlock has negative psychological, physical, and financial impacts on the residents of Dhaka. Therefore, it is imperative to conduct thorough research on this pressing issue, identify its root causes, propose feasible solutions, and evaluate the financial implications for the people of Dhaka.

1.2 Background of The Study

Bangladesh faces significant overcrowding, particularly in its capital, Dhaka, which is one of the most densely populated cities globally. Given the country's size and population density, maintaining a seamless transportation infrastructure is crucial for facilitating communication, which is essential for progress. To gain insights into the current traffic situation and ways to enhance it, conducting a Traffic Volume Survey, Traffic Flow Survey, or simply a Traffic Survey becomes imperative. This underscores the potential need for investment in transportation infrastructure. However, to maximize the benefits of such investments, comprehensive planning for need-based development is essential. This includes determining the necessary capacity growth, expanding road infrastructure as needed, enhancing existing roads, prioritizing different development phases, and conducting forecasting, all of which rely on data collected through traffic surveys. Such need-based expansions aim to alleviate bottlenecks in both international and local inter-urban road transit, leading to a more efficient and effective road transportation system.

Forecasting future road network usage in terms of traffic loads and flow is a widely recognized practice globally, adopted by both emerging and developed countries. The accuracy of traffic data collection and subsequent predictions is crucial for effective road network planning, design, maintenance monitoring, and management.

1.3 Objective of The Study

The objective of the study is to identify the potential causes of traffic congestion in Dhaka City and propose viable solutions.

- Identify possible causes of the traffic jam in Dhaka City only.
- Analysis of the problems due to traffic jams based on health-related issues.
- Recommend potential remedies for the Dhaka city traffic jam.

1.4 Limitations of The Study

Chapter One provides an overview of the research, including its background, objectives, report structure, and a summary of the research. Chapter Two delves into the role and function of guidelines in traffic data collection and analysis, covering traffic count types, basic standards, and data quality assurance. In Chapter Three, detailed guidelines are provided for acquiring traffic statistics, starting with an overview of current practices and then explaining the necessary methodologies for conducting traffic flow/volume studies. This chapter also outlines procedures for selecting counting locations, vehicle classification, and configuration, tailored to the data's intended use. Chapter Four discusses common count conversions and reference curves, as well as the layout, data entry, analysis, and reporting of the analysis. Chapter Five addresses safety concerns throughout the traffic statistics collection process, including the sighting of counting locations and the provision of road signs and markings. Additionally, this chapter outlines the preferred architecture for traffic data analysis, data entry, and presentation, though the recommended procedures are not exhaustive.

Chapter 2

LITERATURE REVIEW

2.1 Background of The Literature Review

In the article "When We Should Address Traffic Congestion of Dhaka City?" published in the Daily Star on October 20, 2007, Md. Asadullah Khan discusses the severe traffic congestion plaguing Dhaka city (Khan, 2007). According to Khan, the situation has reached alarming levels due to the large number of automobiles, buses, and other vehicles often stuck near rail gates or road intersections for up to 30 minutes at a time. This congestion has led to fear among residents about leaving their homes, as commuting to offices or business centers consumes valuable working hours. Besides causing delays at workplaces and appointments, the congestion also results in mental stress, exhaustion, and a loss of productive hours, thereby draining the nation's resources. Key intersections such as Mohakhali-Tejgaon, Bishwa Road, Bijoy Sarani, Panthapath- Sonargaon Hotel crossing connecting Tejgaon Industrial area and Farmgate crossing, New Market, Hatirpool, Gulistan, Bangladesh Bank, and Hatkhola crossing near the Ittefaq office are particularly notorious for congestion. According to sources from the Dhaka City Corporation (DCC), in addition to the approximately one lakh licensed rickshaws in the city, there may be an additional four lakh unlicensed rickshaws operating on the streets, though this information is unofficial. Since most roads lack designated lanes for rickshaws, they occupy entire lanes, obstructing motorized vehicle traffic and reducing speeds to as low as 15 to 20 km/h.

According to Md. Masud Karim (1997), transportation issues are prevalent in nearly all urban areas of Bangladesh due to inadequate traffic management schemes, a high number of non-motorized vehicles, increasing transportation demand, and insufficient resources allocated to transportation facility development, including infrastructure and vehicles. Given the worsening state of street traffic congestion and the adverse effects of vehicle emissions on the local population, further research in this area is imperative. Nasrin Khandoker and Jonathan Rouse (2004) note that Dhaka's traffic congestion has become a more significant concern over the past 15 years**.** A study funded by the United Nations Development Program, completed by the government of Bangladesh in the early 1990s and named "The Greater Dhaka Metropolitan Area Integrated Transport Study," proposed both short-term and long-term plans to enhance the transportation system in the Dhaka Greater Metropolitan Area. Consequently, the government sought support from the World Bank to fund the Dhaka Urban Transport Project (DUTP). Currently in implementation, this project aims to address urgent policy challenges, improve infrastructure, enhance capacity building, and facilitate the relocation of displaced individuals.

During rush hour in Dhaka, familiar scenes of traffic jams are not uncommon, albeit occurring infrequently. However, for many Dhaka residents employed in government offices, schools, and other workplaces, going to work during the morning peak hours is inevitable. To witness the extent of this congestion, one can ascend to the overpasses near Farmgate, Karwan Bazaar, or Bangla Motors and observe the extensive traffic jams stretching along the avenues near bustling intersections. The prevalence of numerous intersections near Farmgate underscores the lack of planning in Dhaka's road system from its inception.

Shuichi and Hironao (2003) conducted a study demonstrating how improving traffic signaling techniques could enhance street automobile traffic conditions. They suggest that their proposed signaling approach can improve traffic conditions for street automobiles. Dhaka City can potentially adopt the same signaling system to enhance its traffic arrangement**.**

Syed Saiful Alam Shovan (2008) presented interesting research on fuel usage and the environmental effects of prohibiting rickshaws in Dhaka City. Most journeys in Dhaka cover distances between one and five kilometers, which are well-suited for rickshaws. Rickshaws serve as an affordable and popular mode of transportation for short distances, requiring no fossil fuels and offering safety and environmental benefits. The approximate monthly income of rickshaw pullers in Dhaka alone is 20 million taka**.** Despite occupying minimal road space, rickshaws can carry a considerable number of passengers, making them ideal for urban environments. According to 1998 data, rickshaws transported 54% of all people in Dhaka while occupying only 38% of the available road space. This statistic does not include the space occupied by parked cars on Dhaka's roads, which would significantly increase private car occupancy. Rickshaws contribute to saving 100 billion taka annually in environmental damage in Bangladesh.

Despite efforts by the administration to alleviate traffic congestion in Dhaka, banning rickshaws from major roadways has not yielded the anticipated results. Traffic congestion has remained unchanged due to rickshaws were forbidden on major roads.

Prskawetz, Leiwen, and O'Neill (2004) suggest that household demographics significantly influence the overall demand for automobiles. This influence stems from variations in automobile demand based on household type and future changes in population composition also based on household type. Both car ownership and use follow a similar pattern concerning the head of the household, increasing until middle age and then declining thereafter. Household size directly impacts automobile ownership and use, with age also influencing this relationship.

Considering the insights from these studies, it becomes evident that traffic congestion in Dhaka has become a major concern due to inadequate planning and attention to the matter. Comprehensive investigation and implementation of various strategies may offer hope and clarity in resolving Dhaka's traffic issues.

1.2 Causes of Dhaka City Traffic

Bangladesh's capital city Dhaka is dealing with a serious traffic problem brought on by the country's rapid growth in cities and increasing number of people. The total number of inhabitants of the city increased from 4.4 million in 1980 to nearly 21 million in 2021, as reported by Hossain and Rahman (2019), which led to a significant rise in the number of personal automobiles on the roads. Severe traffic congestion is the result of an increase in the number of vehicles, inadequate roadways, and poor traffic management.

Researchers also underscore the role of inadequate road infrastructure in exacerbating Dhaka's traffic issue. Alam et al. (2019) contend that the city's roads are ill-equipped to accommodate the increasing volume of traffic, resulting in gridlock during peak hours. Moreover, the scarcity of public transportation options in Dhaka is identified as another significant cause of traffic congestion. The existing public transportation system primarily relies on buses, which are insufficiently developed to cater to the demands of the city's expanding population.

The literature extensively documents the adverse impacts of traffic congestion in Dhaka. Hossain and Rahman (2019) emphasize the environmental pollution resulting from congestion, leading to compromised air quality and associated health hazards for the populace. Furthermore, the economic ramifications of congestion are notable, encompassing lost productivity, fuel wastage, and heightened transportation expenses.

Researchers have proposed various solutions to address the traffic challenges in Dhaka. Enhancing there are many alternatives to public transit acknowledged as an effective measure to decrease the reliance on personal vehicles (Alam et al., 2019). Implementing efficient methods for managing traffic, Intelligent traffic monitoring systems, in example, can improve flow of traffic and reduce congestion. To improve the city's road network, it is also advised to invest in road infrastructure and maintenance (Hossain and Rahman, 2019). Promoting the use of non-motorized modes of transportation like rickshaws and bicycles is another way to cut down on the number of private cars on the road.

According to the Dhaka City Corporation (DCC), there are around 100,000 licensed rickshaws in the city. However, unofficial estimates suggest that around four lakh rickshaws are currently in operation on the city's roads. The lack of dedicated lanes for rickshaws on most roads leads them to occupy the entire road space, impeding the movement of motorized vehicles. Consequently, traffic congestion caused by rickshaws sharing lanes with other vehicles results in slow-moving traffic, with speeds averaging between 15 to 20 kilometers per hour. This underscores the urgent need for the development of separate lanes for rickshaws and the implementation of effective traffic management schemes.

Research indicates that the combination of limited resources allocated for transport facility development, such as transportation and infrastructure, alongside A significant increase in demand for transportation, inadequate implementation of proper traffic management schemes, and the high presence of non-motorized vehicles on roadways are causing serious transportation problems in Bangladesh's towns and cities. The growing issue of street traffic jams and the harmful impact of car emissions on the general population highlight how important it is for in-depth research in this area to find workable solutions.

In the end, research shows that a variety of reasons, including Dhaka's rapid population growth and inadequate roadways, are responsible for the city's traffic problems., restricted options for public transit and inadequate traffic control. There are significant negative effects of traffic jams on economic growth, ecology, and the general public. Several strategies have been proposed to address these issues, such as improving mass transit, implementing efficient traffic control measures, funding road construction and maintenance, and encouraging non-motorized forms of transport.

2.3 Problem Statement

Dhaka, the capital of Bangladesh, holds the distinction of hosting the world's densest population, as of 2022, the population of Dhaka was 10.2 million, and Greater Dhaka has about 22.4 million citizens. Consequently, severe traffic congestion plagues the majority of Dhaka, leading to prolonged traffic jams attributed to malfunctioning traffic signaling systems, inadequate personnel, narrow driving lanes, and aggressive driving behavior. For residents, navigating through the city's relentless traffic congestion has become an everyday ordeal, painting Dhaka as an overcrowded and highly polluted urban center.

This predicament is a culmination of years of neglect, poor governance, inadequate planning, and political instability. The prolonged hours spent navigating congested

streets have a detrimental indirect impact on the economy, while exacerbating environmental degradation through significant air and noise pollution.

Dhaka's transportation sector offers a diverse range of motorized and non-motorized travel options, yet they frequently share the same road space, resulting in inefficiencies and operational chaos. Despite Dhaka's extensive road network of nearly 3,000 km, with 200 km designated as key routes, a mere 7% of the total land area is allocated for transportation infrastructure. Additionally, over 400 km of pedestrian walkways exist, of which 40% are unlawfully encroached upon. The absence of designated bicycle lanes further complicates the situation.

The city's ongoing traffic congestion has prompted various measures to alleviate the issue, including restricting truck entry during the day, banning rickshaws on certain roads, lane reorganization for public and private transportation, and infrastructure development such as foot over bridges, flyovers, and overpasses. However, despite assigning blame to buses, trucks, rickshaws, trains, and pedestrians, the congestion level persists even after imposing restrictions. Hence, understanding the underlying causes and identifying effective mechanisms to alleviate congestion remain critical challenges for Dhaka

Chapter 3

METHODOLOGY

3.1 Methodology

Traffic congestion is a prevalent issue across nearly every city in Bangladesh, reaching critical levels. One of the most frustrating challenges faced in Bangladesh is indeed traffic congestion, a problem widely acknowledged yet often underestimated in its severity. While the detrimental effects of traffic congestion are widely understood, articulating the extent of misery it causes remains a daunting task.

We require data from all stakeholders involved in addressing traffic congestion. According to our plan**,** we have already engaged with

a) People who are facing traffic jams,
b) Researcher's papers who worked on it.

3.2 Data Collection

We're working with two types of data sources.

a) Primary Sources and
b) Secondary Sources.

3.2.1 Primary Sources

- Questionnaire survey,
- Direct observation,

3.2.2 Secondary Sources

- Relevant publications and articles,
- Articles from websites,
- Earlier research on the relevant topic.

3.3 Data Collection Mechanism

- We have designed a structured questionnaire survey aimed at individuals who experience daily traffic congestion.
- We have studied interviews with high-level government officials to get knowledge about their perspectives and plans.

Chapter 4

DATA ANALYSIS

4.1 Current Scenario

Dhaka is the capital of Bangladesh and the main city of Dhaka District, historically recognized as Dacca and Jahangir Nagar. Dhaka stands as one of the largest cities in South Asia, often referred to as a megacity. As of 2022, the population of Dhaka was 10.2 million, and Greater Dhaka has about 22.4 million citizens, Dhaka and its metropolitan area rank as the largest urban centers in Bangladesh, situated along the banks of the Buriganga River (Statistical Pocket Book, 2008). Dhaka boasts a rich heritage as a prominent producer of muslin fabric. This multicultural metropolis has long been a nexus of Western and Persio-Arabic cultural influences in the eastern subcontinent of South Asia. Today, Dhaka serves as a prominent hub for commerce, education, and cultural activities in the region.

With nearly 400,000 rickshaws operating daily, Dhaka boasts the largest fleet of rickshaws in any city worldwide, according to Lawson (2002). However, the municipal government issues licenses for only approximately 85,000 rickshaws (McGee, 2006; Laskar, 2007). Despite being relatively affordable and environmentally friendly, cycle rickshaws significantly contribute to traffic congestion and are restricted in many parts of the city.

Both private enterprises and the government-owned Bangladesh Road Transport Corporation (BRTC) manage public bus services. Dhaka's expanding middle class is increasingly turning to scooters, taxis, and privately-owned cars for transportation. The government mandates the use of "Green taxis," also known as CNG, to replace taxis with two-stroke engines.

4.2 Transportation System in Dhaka City

According to our survey the main modes of transportation in Dhaka City:

- Public Bus,
- Rickshaw,
- Taxi,
- Private Car, and
- Motorcycle.

Figure 4.1 This indicates that public buses are highly regularly used. Mode of transportation, accounting for 40% of the total. Following closely behind, rickshaws are the second most popular mode, utilized by 25% of individuals. Three-wheel taxis

and regular taxi cabs are also utilized, albeit less frequently. Additionally, a small percentage, only 12%, of individuals opt to drive their own cars. The usage of bicycles as a mode of transportation is relatively low in Dhaka.

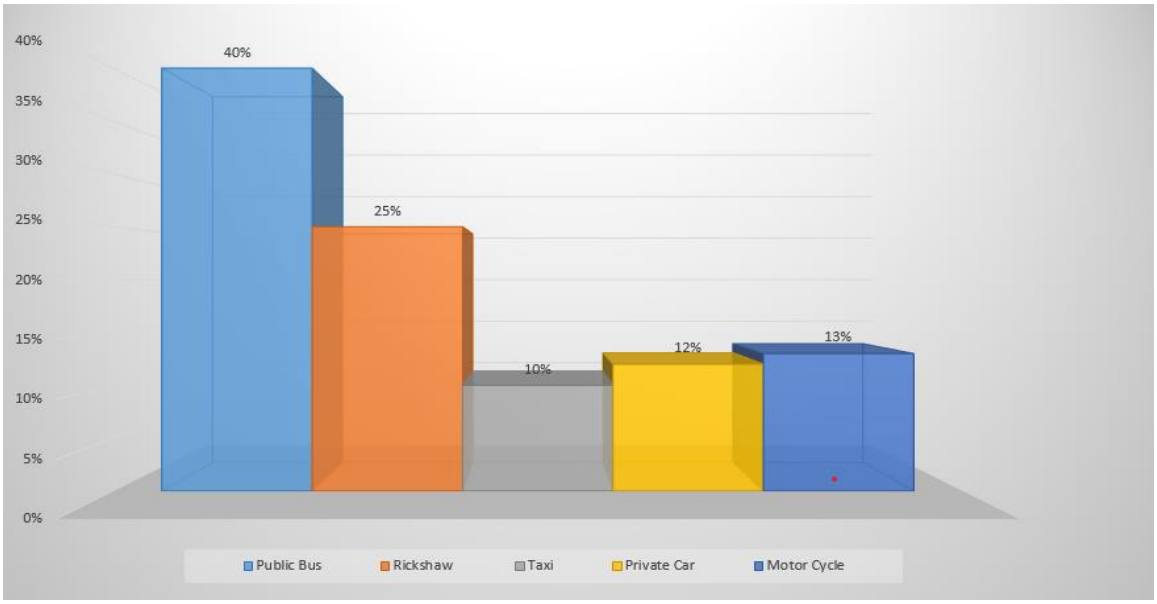

Figure 4.1 Transportation System in Dhaka City

4.3 Delay Time

In the Dhaka City Corporation, as of 2022, the population of Dhaka was 10.2 million, and Greater Dhaka has about 22.4 million citizens. Individuals in this megacity spend an average of 2.35 hours daily in traffic, with 1.30 hours of that time being spent stuck in congestion. Consequently, they lose 1.30 hours each day due to traffic jams, resulting in a loss of 1.30 man-hours of resources daily. This suggests that travel time is more than doubled due to congestion. People are losing 57% of their travel hours while stuck in traffic, as Figure 4.2 illustrates. They can turn idle leisure into productive labor that could boost the economy.

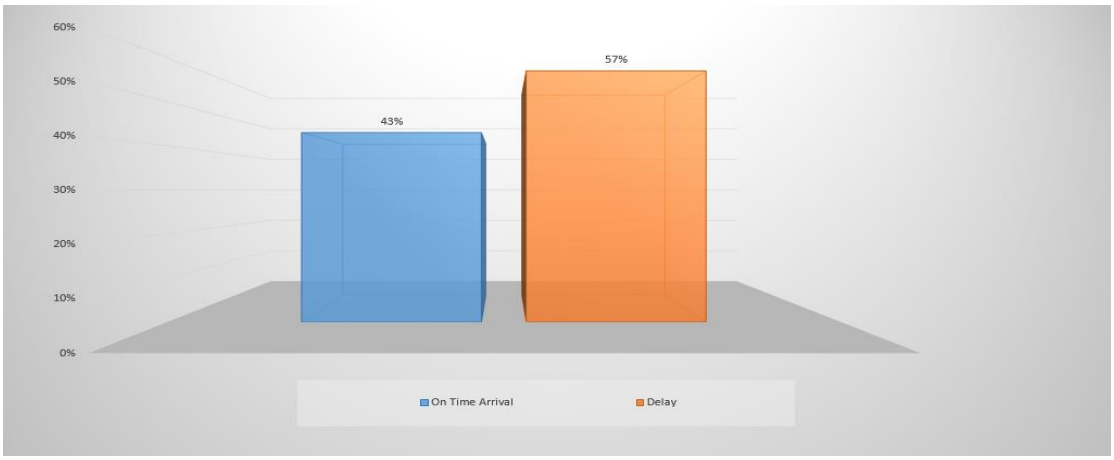

Figure 4.2 Delay Time of General People

The same way, drivers are experiencing significant time losses due to traffic congestion, amounting to over three hours daily. On average, they work slightly more than 12 hours each day. In essence, this means they are losing over 35% of their work. This is depicted in Figure 4.3

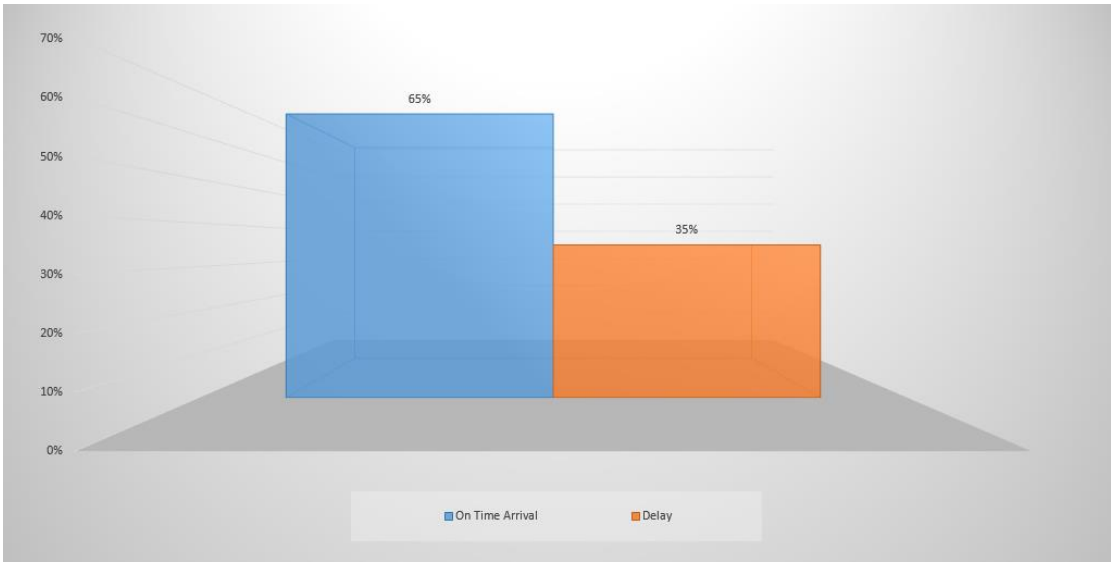

Figure 4.3 Delay Time of Vehicle Operators

4.4 Possible Causes of Traffic Jams

This part will be explored from three perspectives.

1. The general public's perspective,
2. According to the vehicle operator,
3. Expert's point of view.

4.4.1 The General Public's Perspective

By the general public's perspective there are 12 main reason of traffic congestion in Dhaka City.

1. Violation of traffic rules,
2. Poor road planning,
3. Insufficient road space,
4. Unplanned parking or stoppage,
5. Vehicles with different speeds,
6. Overpopulation,
7. Private car,
8. Rickshaw,
9. Narrow road,
10. The absence of legal enforcement,
11. Important establishments in Dhaka,
12. Lack of training and driving sense.

In the view of the general public, who are seemingly the primary sufferers of traffic congestion, the prevailing belief is that violations of traffic rules constitute the primary cause of traffic jams. Subsequently, factors such as insufficient city planning, inadequate road capacity, unplanned halts or parking, the coexistence of vehicles with varying speeds on the same roads, and overpopulation are also perceived as contributors to the occurrence of traffic congestion in Dhaka City.

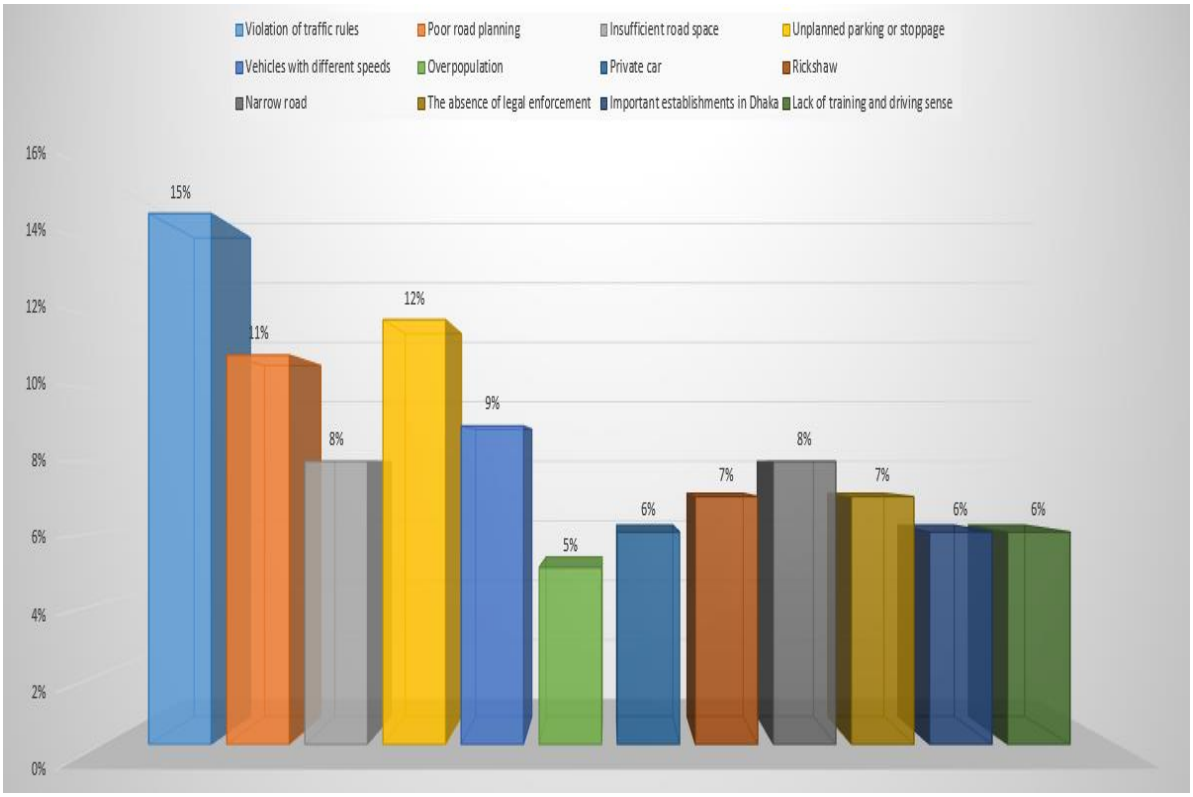

Figure 4.4 The General Public's Perspective

4.4.1.1 Violation of Traffic Rules

A concerning aspect is that only 65% of the population is aware of traffic rules. This knowledge gap, coupled with a reluctance to adhere to these rules, leads to violations and subsequently contributes to traffic jams. Figure 4.5 illustrates that a mere 20% of individuals strictly adhere to traffic rules, while 45% moderately follow them, and 35% never do. It is evident that the violation of traffic rules is a significant factor responsible for the occurrence of traffic jams in Dhaka City.

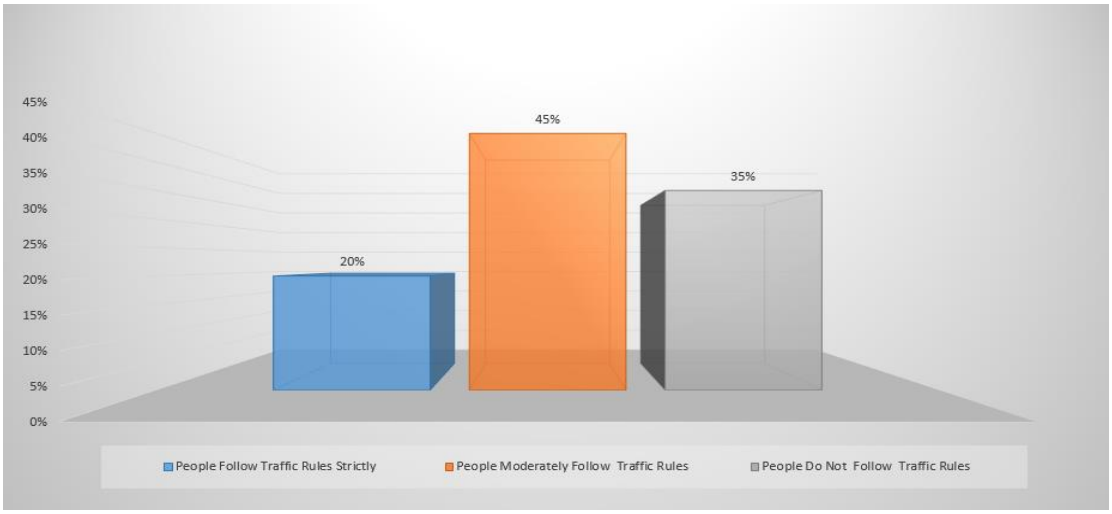

Figure 4.5 Violation of Traffic Rules by General People

4.4.1.2 Poor Road Planning

The road infrastructure in Dhaka City lacks pre-planning; roads are constructed as needed without a comprehensive plan. This absence of pre-planning contributes to the ongoing issue of traffic congestion, as the city's development lacks a systematic and organized approach.

4.4.1.3 Insufficient Road Space

Unplanned parking and the presence of construction materials placed alongside the road reduce the available road space. Consequently, the limited road space results in fewer vehicles being able to pass through, leading to common occurrences of traffic congestion.

4.4.1.4 Unplanned Parking or Stoppage

Dhaka City lacks a systematically planned parking infrastructure. As a result, vehicle operators tend to park their vehicles wherever convenient, leading to haphazard parking and contributing to the occurrence of traffic jams.

4.4.1.5 Vehicles with Different Speeds

The coexistence of slow-moving and fast-moving vehicles on the same road contributes to traffic congestion, as the slower vehicles impede the flow of faster ones. This interaction is a significant factor leading to the occurrence of traffic jams.

4.4.1.6 Over Population

The substantial population in Dhaka City results in a significant traffic load. The high population necessitates the movement of people from one location to another, leading to a widespread and substantial traffic load.

4.4.1.7 Private Car

The presence of private cars on roads contributes to traffic congestion, as a single private car, accommodating only 2 or 3 people, occupies a significant amount of space.

4.4.1.8 Rickshaw

Certain individuals believe that rickshaws are a primary cause of traffic congestion. The design and mobility characteristics of rickshaws are also considered contributing factors to the occurrence of traffic jams.

4.4.1.9 The Absence of Legal Enforcement

An important grievance regarding traffic concerns is the inadequate implementation of laws, which further promote illegal parking. Therefore, there is a need for stringent law enforcement.

4.4.1.10 Narrow Road

The insufficient availability of space in Dhaka City, relative to its population, has resulted in a limited capacity for road infrastructure. This is primarily due to the extensive utilization of land by buildings and offices, leaving a minimal allocation for road space to accommodate the burgeoning population.

4.4.1.11 Important Establishments in Dhaka

The concentration of crucial offices, renowned schools, and colleges in Dhaka City necessitates frequent visits by individuals. This influx of people to Dhaka contributes to a substantial transient population, thereby increasing the overall population of Dhaka. Consequently, this surge in population leads to an escalation in traffic congestion.

4.4.1.12 Lack of Training and Driving Sense

Lastly, the absence of adequate driver training and a deficiency in driving awareness contribute to traffic congestion. These factors, identified through our survey, contribute to the prevailing traffic jam.

4.4.2 According to The Vehicle Operator

The vehicle operators have identified six main causes, which are as follows:

1) Violation of traffic rules,
2) A high number of vehicles on the road,
3) Lack of traffic police,
4) Public bus,
5) Aggressive driving,

6) Rickshaw.

According to vehicle operators, the primary cause of traffic congestion is traffic rule violation, with 28% of them holding this belief. Similarly, the presence of too many vehicles on the road and issues arising from inefficient traffic police are also considered significant contributors to traffic jams. Additionally, the presence of rickshaws, reckless driving by some drivers, and the operation of public buses are cited as causes of traffic congestion.

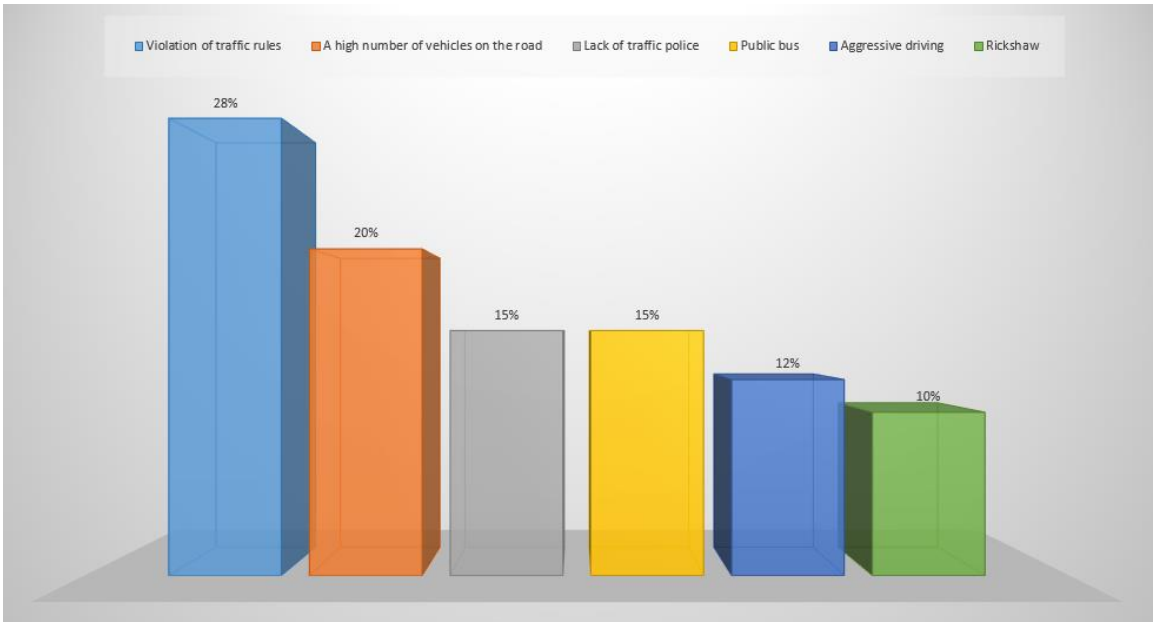

Figure 4.6 According to Vehicle Operator

4.4.2.1 Violation of Traffic Rules

Among vehicle operators, 90% are aware of traffic rules. However, only 30% of them strictly adhere to these rules. A majority, comprising 60%, moderately follow traffic rules, while 10% never comply with them. This situation is concerning, as depicted in Figure 4.7

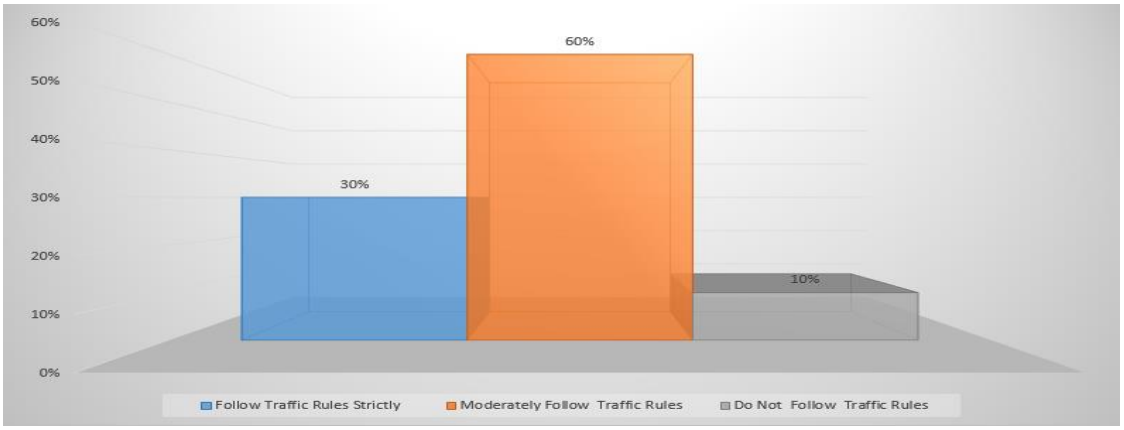

Figure 4.7 Traffic Rules Violation by Vehicle Operators

4.4.2.2 A High Number of Vehicles on The Road

According to vehicle operators, there is an excessive number of vehicles on the roads, surpassing the capacity they can bear. This is identified as a major cause of traffic congestion.

4.4.2.3 Lack Traffic Police

Traffic police are perceived as inefficient in managing traffic flow. Due to their ineffectiveness and inefficiency, people endure traffic congestion.

4.4.2.4 Public Bus

It is noteworthy that vehicle operators attribute the creation of traffic jams to public buses. They perceive the drivers of these buses as reckless and indifferent to traffic rules, contributing significantly to congestion.

4.4.2.5 Aggressive Driving

They also acknowledge that reckless driving by some drivers not only leads to accidents but also contributes to traffic congestion. Such reckless behavior induces panic among other drivers, exacerbating the situation.

4.4.2.6 Rickshaw

The presence of rickshaws is also cited as a factor contributing to traffic jams. Rickshaws slow down fast-moving vehicles, and their movement patterns are conducive to creating traffic congestion.

4.4.3 Expert’s Point of View

According to experts, there are several causes for Dhaka City's traffic congestion. These are the primary causes of them:

1) Insufficient length of road in Dhaka City,
2) Unexpected urban growth,
3) Overpopulation,
4) Poor Traffic Management,
5) Poor utilization, and
6) Hawkers occupy the footpath.

4.4.3.1 Insufficient Length of Road in Dhaka City

As mentioned before, Dhaka City is short of sufficient road length to accommodate all of its traffic.

4.4.3.2 Unexpected Urban Growth

Yes, Dhaka City is expanding. However, there has been no planning for this expansion. Consequently, marketplaces are created and buildings develop, but nobody is paying attention to the road space.

4.4.3.3 Over Population

This is a common reason. We are experiencing increased traffic as a result of our large population.

4.4.3.4 Poor Traffic Management

People have stated similar reasons. An improvement in traffic management is required. Traffic jams are becoming more common as a result of ineffective control management.

4.4.3.5 Poor Utilization

One of the major causes of traffic jams is the proliferation of traffic regulatory authorities in Dhaka City, as well as a lack of integration among them.

4.4.3.6 Hawkers Occupy the Footpath

Hawkers occupying the footpath force other people to walk by the road, reducing vehicle space and causing traffic jams.

4.5 Solutions to Traffic Jams in Dhaka City

It is not simple to solve Dhaka City's traffic problem. We'll talk about three different perspectives on the solutions.

1. The general public’s perspective,
2. According to vehicle operator,
3. Expert’s point of view.

4.5.1 The General Public’s Perspective

The principal suggestions proposed to the general population are –

1. Raising consciousness,
2. Public transport,
3. Implement strict traffic laws,
4. Flyovers,
5. Scheduling office and school hours,
6. Subway/ Metro,
7. Reducing rickshaws,

Thus, the majority of individuals believe that raising awareness can help to lessen traffic congestion. Apart from that, tighter law enforcement, additional flyovers, and increased public transit can all help to lessen traffic congestion.

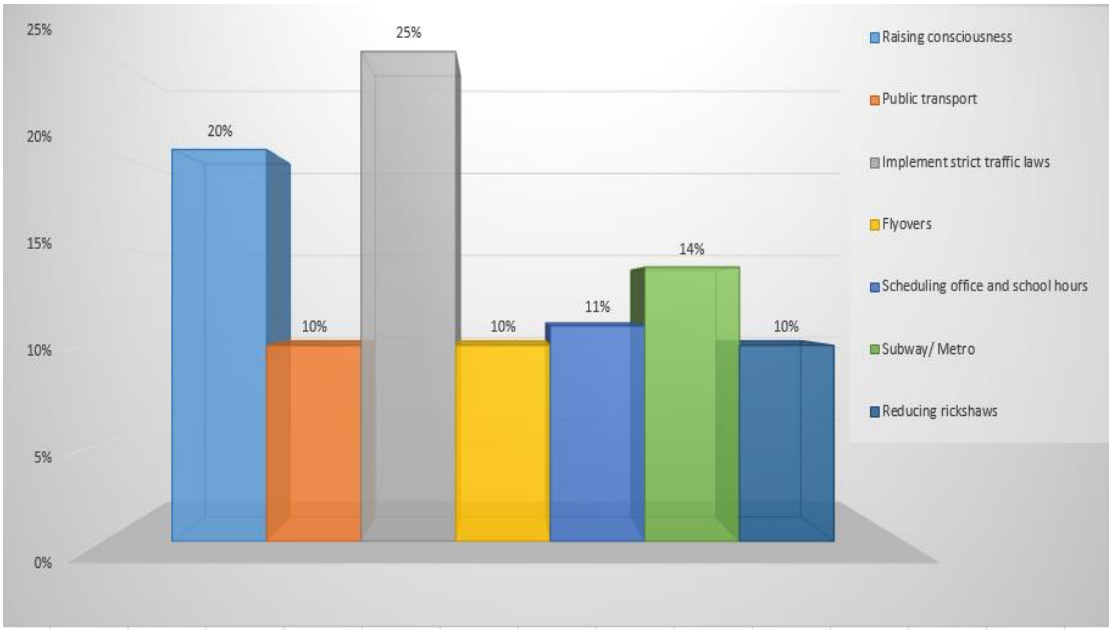

Figure 4.8 The General Public's Perspective

4.5.1.1 Raising Consciousness

Thus, a significant portion of individuals (20%) believe that raising awareness can help to lessen traffic congestion. Apart from that, tighter law enforcement, additional flyovers, and increased public transit can all help to lessen traffic congestion.

4.5.1.2 Public Transport

If adequate public transit is available, (10%) more individuals will be willing to use it than their vehicles. Many believe that public transportation, such as buses, can accommodate a large number of passengers at once, saving them money and time.

4.5.1.3 Implement Strict Traffic Laws

According to (25%) of respondents, enforcing traffic laws strictly can help to minimize traffic jams in Dhaka City. The existing situation can be improved and the traffic burden on the roads can be reduced if drivers of all kinds of vehicles obey the traffic laws.

4.5.1.4 Flyovers

A portion of the population (10%) believes that flyovers could be a viable way to alleviate Dhaka's traffic problems. Vehicles may go simultaneously on the main roads

and flyovers if flyovers are permitted to be built there. That will undoubtedly lighten traffic on the congested highways.

4.5.1.5 Scheduling Office and School Hours

Schools can also have staggered start times. For example, primary schools could start at 7:30 AM, middle schools at 8:00 AM, and high schools at 8:30 AM. By having different sectors or companies start and end work at different times, the rush hour can be spread out over a longer period. For instance, some offices could start at 7:00 AM, others at 8:00 AM, and so on.11% of respondents believe that it will lessen traffic on the roadways during business and school hours.

4.5.1.6 Subway/ Metro

A significant portion of the population (14%) believes that for a crowded city like Dhaka that is unable to provide broader roads for cars, the subway/metro system may offer a workable answer. Vehicles can access the city's subterranean tunnels through the subway, which also helps to relieve traffic congestion.

4.5.1.7 Reducing Rickshaws

Out of the total number of rickshaws in Dhaka, most of them are legal. Before Eid, A significant number of people are reportedly planning to join them. Even yet, getting a rickshaw during rush hour becomes quite challenging. The rickshaw drivers are unwilling to go where the passengers anticipate them to go. They simply stand in one spot and wait to move to another, creating traffic jams and serious issues for the passengers. According to 10% of respondents, the removal of rickshaws from major highways would be a good way to improve the current state of traffic. They also believe that other actions might be taken to lessen traffic congestion.

4.5.2 Solutions Provided by Vehicle Operators.

Vehicle operators are offered the following primary solutions:

1) Strict traffic law implementation,
2) Flyovers,
3) Separate roads for vehicles, and
4) Decentralization.

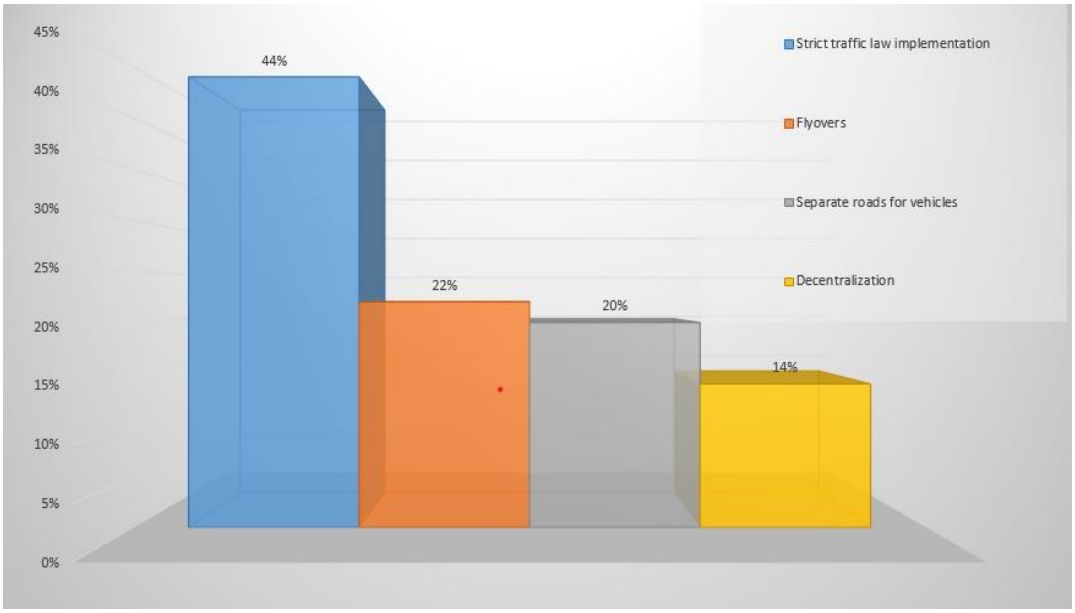

Figure 4.9 Solutions Provided by Vehicle Operators

4.5.2.1 Strict Traffic Law Implementation

44% of drivers believe that enforcing traffic laws strictly will lessen traffic congestion in Dhaka City. The existing situation can be improved and the traffic burden on the roads can be reduced if drivers of all kinds of vehicles obey the traffic laws.

4.5.2.2 Flyovers

A significant portion of drivers (22%) believe that flyovers could be a viable remedy for Dhaka's traffic problems. Vehicles may go simultaneously on the main roads and flyovers if flyovers are permitted to be built there. That will undoubtedly lighten traffic on the congested highways.

4.5.2.3 Separate Road for Vehicles

There are a variety of cars in Dhaka. Nothing remains on the Dhaka roads a human puller to the newest model car, motorize to non- motorize, slow to quick going. Because each of these vehicles has a distinct speed limit, controlling them all on the same road can be rather challenging. Different kinds of vehicles should have their own designated roads.

4.5.2 4 Decentralization

The drivers said that individuals typically go from their homes to places of business, educational institutions, factories, and marketplaces. Insufficient road infrastructure exists in Dhaka to support all of these activities. According to 10% of drivers, in order

to lessen traffic on the roads, significant businesses and industries like tanneries, cantonments, etc. should be relocated from the bustling metropolis of Dhaka.

4.5.3 Solution by Experts Opinion

Experts typically recommend solutions on a long-term basis. There should be dedicated roads for various types of vehicles. They think it should be –

1) Short term basis (less than 5 years),
2) Midterm basis (5 to 10 years), and
3) Long-term basis (more than 10 years).

4.5.3.1 Short-term Basis (less than 5 years)

The short-term solutions are stated below:

1) Increasing pedestrian facilities,
2) Maximum use of road width,
3) Banning unauthorized parking,
4) Controlling roadside activities,
5) School bus,
6) Time rescheduling.

4.5.3.1.1 Increasing Pedestrian Facilities

Based on the surveys, approximately half of Dhaka residents prefer to move on foot. However, the roadside conditions are not ideal for walking. By improving pedestrian facilities, the government might decrease automobile congestion and encourage people to walk to surrounding locations.

4.5.3.1.2 Maximum Use of Road Width

The road systems in the city of Dhaka are very insufficient. Only 7.5% of Dhaka's entire area is made up of roadways, compared to at least 25% in a typical city. In order to minimize traffic jams, the entire width of the road should be used.

4.5.3.1.3 Banning Unauthorized Parking

A city should have 25% of its space dedicated to vehicle movement and parking, but Dhaka only has 7% of that space, resulting in a natural traffic jam. Practically, the city does not have enough space for vehicles to move freely. The city ought to ban parking without permission.

4.5.3.1.4 Controlling Roadside Activities

Just 7.5% of Dhaka's total land area is made up of roadways, whereas a standard city requires at least 25%. Hawkers, salesmen, and shopkeepers occupy 30% of the 7.5% road. The City Corporation's construction materials and waste containers take up a

significant portion of the area. Vehicles are unable to move about with enough room. Such roadside activities that cause traffic problems should be controlled.

4.5.3.1.5 School Bus

Students will need to have transportation provided by all schools and universities. When a large number of students travel to colleges and educational institutions via private vehicles or rickshaws, around the institutions, there is severe traffic congestion that affects the adjacent areas. Every day, hundreds of guardians stand beside the road with their children, requesting rickshaws and CNGs as the school gates close. During the exams, the situation worsens.

4.5.3.1.6 Time Rescheduling

During the commute, hundreds of thousands of commuters are left pushed in different parts of the town. Laws must be enacted to improve passenger facilities while also reducing traffic congestion. Office and school hours should be rearranged to reduce traffic congestion on the roads.

4.5.3.2 Mid-Term Solutions

Expert-recommended mid-term fixes are listed below:

- **Elevated Express Highway**

Dhaka city lacks the capacity to provide road facilities for excess vehicles, resulting in frequent traffic jams. Roadside constructions such as buildings, offices, and markets make it impossible to widen the roads. One possible solution is to build elevated expressways to allow vehicles to avoid congested roads and travel through these highways.

- **There is Only One Authority in Dhaka City to Regulate Traffic**

Several organizations can work and regulate traffic in the town. They frequently run into issues and get stuck about what their roles are. There need to be just one authority responsible for developing laws and policies as well as controlling traffic in Dhaka.

- **Adequate Parking Facilities**

In Dhaka, there should be plenty of parking spots av. A town needs to have 25% of its space dedicated to vehicle movement and parking, but Dhaka only has 7% of that space, resulting in a natural traffic jam. Practically, the city does not have enough space for vehicles to move freely. Unauthorized parking should be banned throughout the city.

- **4.5.3.3 Long Term Solutions**

➢ MRT (Mass Rapid Transit):

To rely solely on one system (the BRT system), which has limited capacity, could endanger the city. As a result, a combination of BRT and Metro is preferred over a single system based solely on BRT. As system capacities are exceeded, the ultimate system will require a METRO system. The priority is to maximize existing resources through a robust traffic management system. This should be supplemented with an appropriate MRT system. It is also recognized that, in the long run, BRT will not be the ultimate solution for Dhaka, which will have a population of more than 36 million.

➢ Grade Separated Road Network:

Dhaka city cannot provide adequate road infrastructure for its large population. The government may provide alternative modes of transportation for residents to traverse the urban area. For this, a network of roads that are overpassed can be constructed. It is possible to enhance the state of the roads now by building flyovers, elevated highways above the roads, subways, and METRO beneath the roads. These three types of road facilities can be implemented to alleviate the current traffic congestion by providing additional transportation routes.

4.6 Analysis of the problems due to traffic jams based on Health:

1) Health-related issues.

4.6.1 Impact on Health

The main sufferers due to heavy traffic jams are:

1) General People,
2) Vehicle Operators.

4.6.1.1 Suffering of General People

1. Headaches,
2. Mental Stress,
3. Breathing problem,
4. Hearing problem,
5. Eye problem,
6. Tiredness,
7. Unexpected sweating.

The majority of people (30%) are experiencing headaches as a result of the traffic bottleneck. Following that, a significant proportion of people suffer from breathing problems (25%) and tiredness (19%). Long-term traffic jams can cause hearing problems, unexpected sweating, fatigue, and vision issues.

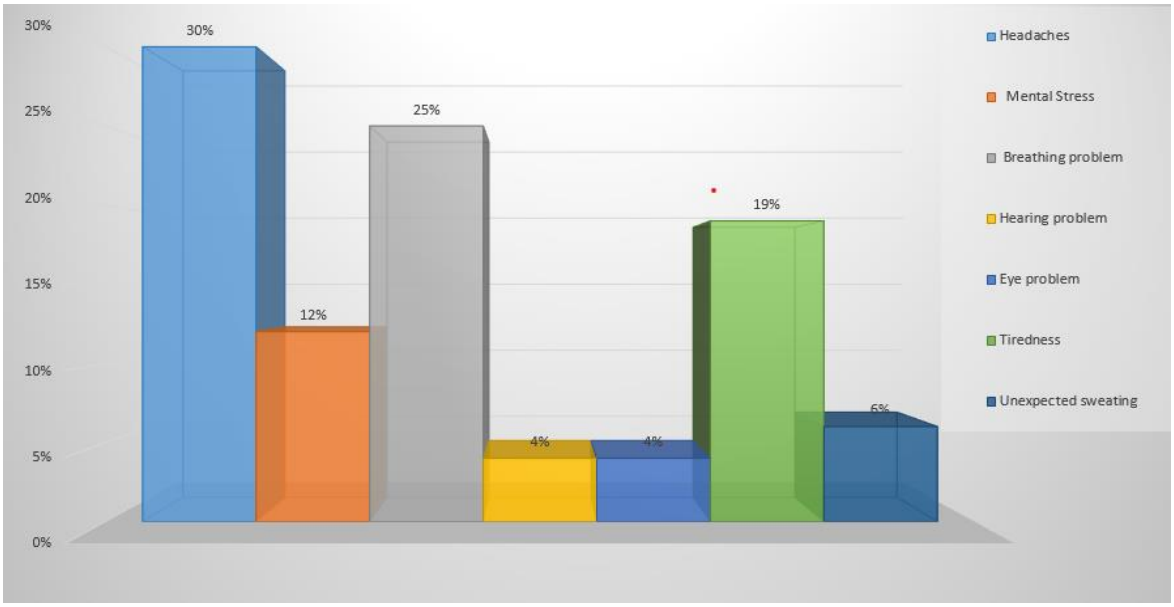

Figure 4.10 Suffering of General People

4.6.1.2 Suffering of Vehicle Operators

1. Headaches,
2. Body Pain,
3. Sweating.

The majority of Vehicle Operators (50%) are experiencing Headaches as a result of the traffic bottleneck. Following that, a significant proportion of Vehicle Operators suffer from Excessive Sweating (30%).

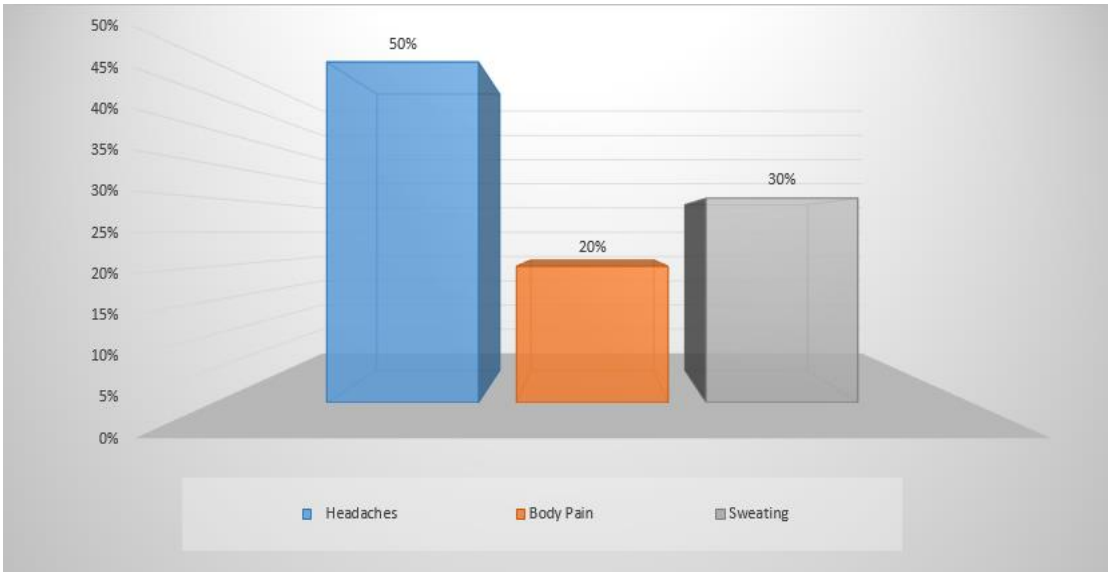

Figure 4.11 Suffering of Vehicle Operators

Chapter 5

CONCLUSION AND RECOMMENDATION

5.1 Recommendation

The capital of Bangladesh, the least developed nation, is Dhaka City. As of 2022, the population of Dhaka was 10.2 million, and Greater Dhaka has about 22.4 million citizens. This city must play a significant part in Bangladesh's economy. However, the traffic congestion in this city is currently causing Bangladesh's economy to suffer greatly.

- Conduct comprehensive studies to pinpoint the primary causes of traffic congestion in Dhaka, including factors such as inadequate road infrastructure, rapid urbanization, population growth, traffic rules violations and poor traffic management etc.
- Analyze the impact of vehicular emissions on air quality and public health, considering factors such as pollution-related respiratory illnesses, headaches, mental stress, eye problems and sweating etc.
- Upgrading and expanding road infrastructure, including the construction of new roads, flyovers, and efficient public transportation systems like metro or bus rapid transit.
- Implement smart traffic management systems, such as intelligent traffic signals, real-time monitoring, and congestion pricing, to optimize traffic flow and reduce gridlock.
- Raise awareness about the adverse health effects of traffic congestion and air pollution through public health campaigns, educational programs, and community outreach initiatives.
- Various solutions are available, with some focusing on long-term outcomes and others on short-term relief.
- Therefore, it's advisable to refrain from implementing the Metro option.
- Less traffic congestion is essential for ensuring a healthy generation.

5.2 Conclusion

Dhaka is the key source of Bangladesh's economic growth. The study is critical to reducing the city's traffic jam. In this paper, I discussed the general difficulties in Dhaka as well as prospective solutions. Dhaka city can be rendered less congested by further looking into and implementing the software model shown here. To address the main problems facing the city, citizens must be informed. The Dhaka municipal

administration must implement several measures to lessen the city's traffic congestion. In theory, the actions outlined in this plan will assist in reducing the amount of unnecessary traffic in Dhaka.

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