Reducing Traffic Congestion through Ride Sharing in Bangladesh: A Case Study of Dhaka City

By

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A thesis submitted to the Department of Master of Arts in Governance and Development
in partial fulfillment of the requirements for the degree of
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Declaration

It is hereby declared that

1. The thesis submitted is my/our own original work while completing degree at Brac University.
2. The thesis does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The thesis does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I/We have acknowledged all main sources of help.

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Approval

The thesis/project titled "Reducing Traffic Congestion through Ride Sharing in Bangladesh: A Case Study of Dhaka City" submitted by

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of Summer, 2020 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of Masters of Arts in Governance and Development on April 10, 2020.

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Ethics Statement

The researcher has maintained the ethical issue properly and has submitted an ethical clearance to conduct the survey to the authority. A number of key ethical issues has been considered in the study for the protection of rights of respondents. First of all, no compulsion was enforced to participate in the interviews. Voluntary participation of the participants was ensured in the study. Therefore, the researcher confirmed assent from the respondent before starting an interview. All research participants were fully informed about the objectives of the study. Finally, secrecy was strictly maintained throughout the study.

Abstract/ Executive Summary

Adequate transport infrastructure and services are prerequisite for sustainable economic and social development. Ride Sharing Services is the innovation of private sector worldwide. It has been introduced in Dhaka by the recent years. Ride Sharing Services Policy, 2017 has been activated in March of 2018 in Bangladesh. The study aims to assess the contribution of Ride Sharing Services (RSS) for reducing traffic congestion through lessening private vehicles in Dhaka city and serving people by providing safe, comfortable and less costly transport services or mass transportation. The main policies regarding transport sector are National Integrated Multimodal Transport Policy, 2013; Revised Strategic transport Plan, 2015; Ride Sharing Policy, 2017; etc. Bangladesh Road Transport Authority (BRTA) is the regulatory body of road transport sector in the country. Coordination and planning among road transport stakeholders in the greater Dhaka area is done by the Dhaka Transport Coordination Authority (DTCA). Both of them are working under the Road Transport and Highway Division of the Ministry of Road Transport and Bridges. Bangladesh Road Transport Authority (BRTA) is responsible for registration of the motor vehicles and issuing licenses for drivers, approval of route permit, implementing the Motor Vehicles Ordinance 1983, after repeal of it; the Road Transport Act 2018 effected from 01 November 2019, Ride Sharing Policy 2017, Taxicab Policy, CNG run three-wheeler auto-rickshaw Policy and other related laws, rules, regulations, etc. Relevant literatures were reviewed in this regard but the information about the number of reductions of private vehicles due to commencement of Ride Sharing Services in Dhaka city could not be found. This is important to find the necessary information regarding reducing traffic congestion and convenience of people due to the operation of Ride Sharing Services in Dhaka city. In this case study, qualitative data collection approach has been followed under inductive method. Information mainly collected through Key Informant Interviews (KII), Focus Group Discussion (FGD) and secondary data for trend analysis. Ride Sharing Services (RSS) companies have created the opportunity of making the travelling services easier, safe, time saving and comfortable without creating burden on the road by increasing more private cars in Dhaka. They have utilized the existing facilities, vehicles population by connecting the vehicle owner and driver by using their mobile apps. Users are being satisfied by the opportunity of safe, comfortable, time saving and cost effective service provided by ride sharing service provider companies through their mobile apps and existing vehicles of the Dhaka city. Traffic congestion may not be reduced very shortly due to construction works of MRT, BRT, Elevated Expressway and other works in Dhaka but it would not be further aggravated by this Ride Sharing Services.

Keywords: Ride Sharing; Traffic Congestion, BRTA, RSS, Dhaka City

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List of Acronyms

BRTA	-	Bangladesh Road Transport Authority
BRT	-	Bus Rapid Transit
DMTCL	-	Dhaka Mass Transit Company Limited
DTCA	-	Dhaka Transport Coordination Authority
NIPORT	-	National Institute of Population Research and Training
NIMTP	-	National Integrated Multimodal Transport Policy
MRT	-	Mass Rapid Transit
RSTP	-	Revised Strategic Transport Plan
RSS	-	Ride Sharing Services
RTHD	-	Road Transport and Highways Division
STGs	-	Strategic Transport Goals
DTCA area	-	Dhaka Metropolitan Area, Gazipur Metropolitan Area, Dhaka, Narayanganj, Munshiganj, Manikganj District Area.

Glossary

Thesis:	An extended research paper that is part of the final exam process for a graduate degree. The document may also be classified as a project or collection of extended essays.
Glossary:	An alphabetical list of key terms This is an optional page and can be removed if not used. Use one table row for each item to allow sorting using Word's table tools. Apply the style **1_Para_NoSpace** to table rows as shown here.

Chapter 1

Introduction

1.1 Concept of Ride Sharing in Bangladesh

The concept of demand responsive transportation (DRT) services, commonly known as ride-sharing services, is comparatively new in Bangladesh. Although traditional forms of on-demand transportation system were always available in several forms like car or truck rental, Bangladesh didn't see ride-sharing services driven entirely by technology till 2016. By now, a few local and foreign ride-hailing services providers, namely Uber, Pathao, Shohoz Rides, Obhai, and PickMe etc. are operating in Dhaka and Chittagong city *(Star, 2019).*

Adequate transport infrastructure and services are prerequisite for sustainable economic and social development. Globalization now calls for more efficient transportation system to reduce travel time and costs. One of the integration strategies of National Integrated Multimodal Transport Policy (NIMTP), 2013 is to support more sustainable travel choices and reduce the need to travel through coordinated transport and physical planning at national, regional and local level *(NIMTP, 2013)*. Implementation of less expensive measures to solve traffic congestion that brings quick outcome is one of the main features of *(RSTP, 2015)*. It is also mentioned that the Government will improve current competitive conditions and expand project areas for private sector.

In a report of National Institute of Population Research and Training (NIPORT) it was estimated that about 130 million people are living in Dhaka which is increasing day by day. Population density is about 27,700 per square km. According to Bangladesh Road Transport Authority (BRTA), everyday more than a hundred vehicles are being added to the total. But the public transport was not increased accordingly. No Mass Rapid Transit (MRT) or Bus Rapid Transit (BRT) is yet established. Buses, Mini Buses, CNG run three-wheeler autorickshaw, Taxi Cab, Four-wheeler Human Leguna and Non-Motorized Transport (NMT) e.g. human pulled Rickshaws are being used as public transport. Traffic congestion is increasing day by day with unbearable condition. The Economist Intelligence Unit's Global Livability Index, 2018 describes Dhaka as one of the worst cities as livable. Traffic problems in Dhaka city are increasing as a consequence of both higher mobility and increasing car ownership of people. On the other hand, the supply of transport infrastructure and facilities

remains practically unchanged due to the high cost of land acquisition and construction of new roads.

According to Revised Strategic Transport Plan (RSTP) in terms of population, urbanization, scale of economic activities and household income levels, it has been rapid in Dhaka. It is unlikely to slow down due to the unique position of the city as the economic engine of the entire Bangladesh. The prospective population in RAJUK area will be 26.3 million by the year 2035 (RSTP, 2015). United Nations Sustainable Development Goal (SDGs) number 11 states to make cities and human settlements inclusive, safe, resilient and sustainable. People of Dhaka city are facing crucial problem regarding safe and comfortable transportation system. Public Transport System is inadequate for the city dwellers. According to Dhaka Mass Transit Company Limited (DMTCL)'s website it is found that first Mass Rapid Transit line-6 will be started operation in December, 2021. Other 5 (five) MRT Lines will be constructed by 2030. It is observed in the Dhaka Transport Coordination Authority (DTCA) website that Construction of Bus Rapid Transit (BRT) is also going on from Gazipur to Dhaka by Roads & Highways Department where Asian Development Bank (ADB) is Development Partner. The vehicles e.g Car, Jeep, Microbus, Motorcycle except Taxicab are usually registered with BRTA as non-hire use. Sometimes these types of vehicles are 'off-road' after completion of owner's private use. To use this 'off-road' vehicles for hire, there is a need for provision in existing regulation. To cope up this issue, a ride sharing policy is needed and Ride Sharing Policy, 2017 has been published. The main objectives of the Ride Sharing Policy 2017 are to reduce the tendency of increasing private vehicles and to ease the passenger services by using a mobile based application (mobile apps) software (Ride Sharing Policy 2017, p-1).

According to Websites of BRTA, from 1June 2019 BRTA launched a portal named BRTA Service Portal (BSP) to submit application through online for "Enlistment Certificate" to operate mobile-apps- based ride sharing business operation. There are 12 (twelve) mobile-apps- based ride sharing companies which have obtained 'Enlistment Certificates' as per Ride Sharing Policy2017 to operate ride sharing business within DTCA area including Dhaka city. Around 15000 cars, microbus, motorcycles etc. are allowed to operate ride sharing and the owner of these vehicles obtained 'Enlistment Certificates' also. Therefore, the aim of the study is to find the rationality of Ride Sharing Services in Dhaka city for reducing traffic congestion and fulfillment of the present transportation need of city dwellers.

1.2 Statement of the Problem

Ride Sharing Services is the new innovation of private sector in worldwide by using mobile apps through digitalization. It has been introduced in Dhaka in the end of 2016. Ride Sharing Services Policy, 2017 has been activated in March, 2018. Because of easiness people are getting interested to use the services of Ride Sharing due to absence of adequate public transport and hassle free and smooth transportation in Dhaka city. The impact of using the RSS is not assessed in proper way and there is no such research evidence. The question raised in recent days is, have the private vehicles e.g. Car, Jeep, Microbus, Motorcycle reduced resulting in less traffic congestion after commencement of the Ride Sharing Services or not? The assessment of RSS smoothness regarding time, safety, money is not very much clear. Has RSS reduced journey time or ensured safety of users or saved/increased cost of transportation? Regarding these issues, this research is undertaken to assess the RSS in terms of effects on traffic congestion as well as user's safety, time and cost of transportation.

1.3 Objectives of the Study

The main objectives of this research are:

- To assess the contribution of Ride Sharing Services (RSS) for reducing traffic congestion through lessening private vehicles in Dhaka city.
- To find out whether RSS save time, money and ensures safety to the service recipients.

1.4 Research Questions

Based *on* the objectives the paper is aiming to investigate following issues:

- How Ride Sharing Services benefits citizens in terms of reducing traffic congestion?
- Why Ride Sharing Services is crucial in the context of smart transportation for, price, time and safety of recipients in Dhaka city?

1.5 Scope of the Study

This study has core intention to find out the RSS contribution for traffic congestion and user's safety, time and cost of transportation. To extent, the study has tried to examine the number of RSS users from both end, traffic volume of Dhaka city as well as RSS registered vehicle ratio, how the RSS contribute to traffic congestion and user's safety, time and spending on RSS.

The main objective of this study to assess the traffic congestion by introducing RSS and on the other hand the safety, time and cost on using RSS of users.

1.6 Methodology

Survey was used as the method for the research work. The users of RSS, transport analysts/experts and officers associated to RSS were asked to respond to a survey questionnaire. The found data from survey was analyzed by using different software and methods to abridge with the final objectives. Emphasis was given on qualitative method and quantitative method given tantamount quintessence.

1.7 Justification the Study

The objective of this research in partial fulfillment of the requirements for the degree of MA in Governance and Development. Traffic congestion is the daily manifestation and entails the inefficiency of transportation of Dhaka city. However, the RSS is introduced in Bangladesh in the year of 2016. This service is guided by private sector now. The main challenges of RSS are ensuring safety of users, time of travel and cost of transportation. In the sense of research, this study helps to find out and analyze the impact on traffic congestion of RSS and challenges of safety, time and cost of users. The result and recommendation could help the policy makers to think in new way and implement such kind smart system in transportation planning to build a smart transportation in Dhaka City.

1.8 Limitation the Study

The major limitations of the study were the schedule constraint along with the respondent's response due to change of schedule but they participated and gave answers spontaneously. Also detailed in-field survey by the researcher himself was not always feasible and for that some data were collected via other medium i.e. email, Skype, Google docs and other surveyors with proper training which could also be a limitation. The limitations are mainly as follows: This study has core intention on prospects on reducing traffic congestion through RSS. This study has tried to examine, how the RSS ensure safety, time and cost of users. Furthermore, the study has selected only mentioned population for survey.

1.8 Composition of Thesis

This research work is divided into five different chapters. Each chapter elucidate the features and bring out consequences of the research to compile the objective.
The first chapter is “Introduction” which provides an introductory discussion with statement of problem, objective of the study, research question, methodology, and justification of the study, limitation of the study and the structure of the dissertation.

The second chapter is the “Literature Review”. This chapter deals with existing literature on reducing traffic congestion through RSS and its pros and cons.

The third chapter is “Research Methodology”. This chapter primarily explains the method(s) of data collection along with the justification of using the method(s). This chapter puts forth research methods and techniques used for data collection and analysis.

The fourth chapter is “Data Analysis and Results”. This chapter blooms the analysis of collected data by using methods and techniques to meet up the objectives of this study.

The final chapter is the “Summary and Conclusion”. Based on results and discussions, this chapter completes with some recommendations with expert’s tacit knowledge to overcome the challenges of traffic congestion through RSS and ensures safety, time and cost of users of RSS.

Chapter 2

Literature Review

2.1 Introduction

Bangladesh is a southeast Asian Country and has the world's 39th largest economy in terms of market exchange rates and 29th largest in terms of purchasing power parity (PPP), which ranks second in South Asia after India. Bangladesh is also one of the world's fastest-growing economies and one of the fastest growing middle-income countries. The country has a market-based mixed economy. A developing nation, Bangladesh is one of the Next Eleven emerging markets. According to the International Monetary Fund (IMF), its per-capita income was US$1,906 in 2019, with a GDP of $317 billion. Bangladesh has the second-highest foreign-exchange reserves in South Asia (after India). The Bangladeshi diaspora contributed $15.31 billion in remittances in 2015. Bangladesh's largest trading partners are the European Union, the United States, Japan, India, Australia, China and ASEAN. Expat workers in the Middle East and Southeast Asia send back a large chunk of remittances. The economy is driven by strong domestic demand.

Dhaka is the capital of Bangladesh bearing 40 percent of the country economy and over 190 million peoples.

2.2 Transport Connectivity of Bangladesh

Transport is an important part of Bangladesh's economy. Since the liberation of the country, the development of infrastructure has progressed rapidly and a number of land, water and air transport modes came into existence. However, significant progress needs to be made for ensuring uniform access to all available transports. Rail transport – Ministry of Railways Bangladesh has a 2,706-kilometre (1,681-mile) long rail network operated by the state-

owned Bangladesh Railway (B.R). The total length of the country's road and highway network is nearly 21,000 kilometers (13,000 miles). Airways has grown rapidly, and is dominated by the flag carrier Biman Bangladesh Airlines and other privately owned airlines. Bangladesh has a number of airports including three international and several domestic STOL (short takeoff and landing) airports. The busiest, Shahjalal International Airport connects Dhaka with major destinations. Water transport in waterway with 8,046 kilometers (5,000 miles) of navigable waters, Bangladesh has one of the largest inland waterway networks in the world. The southeastern port of Chittagong is its busiest seaport, handling over $60 billion in annual trade (more than 80 percent of the country's export-import commerce). The second-busiest seaport is Mongla. Bangladesh has three seaports and 22 river ports. Airways and Waterways are also the main medium of transport in Bangladesh. The transport network described in figure-1 below.

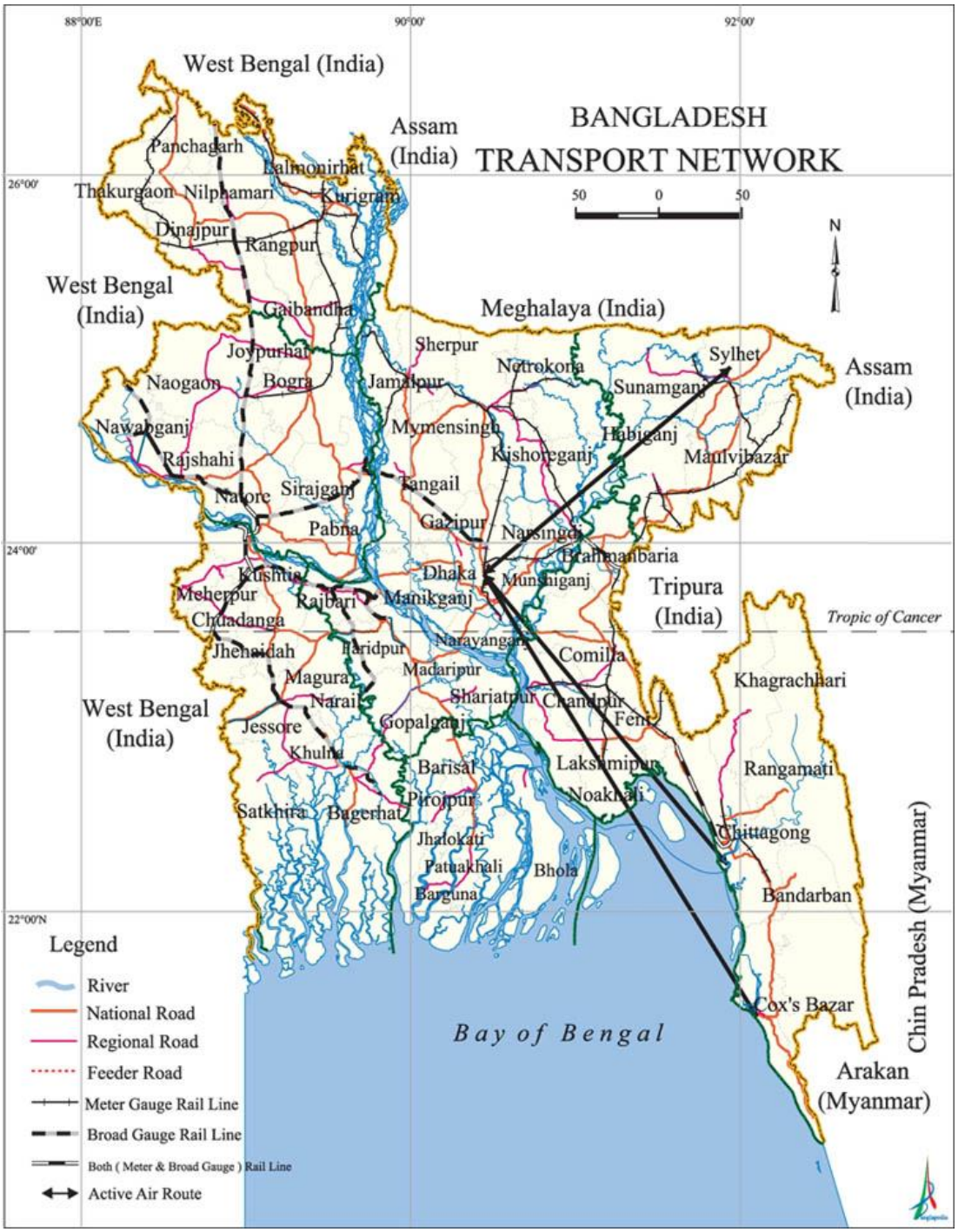

Figure 2.1: Transport Network of Bangladesh

2.3 Road Transportation of Bangladesh

BRTA is a regulatory body to control manage and ensure discipline in the road transport sector and road safety related areas in Bangladesh. It is an authority under the Road Transport and Highway Division (RTHD) of the Ministry of Road Transport and Bridges for carrying out the

purposes mentioned in the Motor Vehicle Ordinance, 1983 after repeal of it; the Road Transport Act 2018 effected from 01 November 2019, The Chairman is the chief executive of the authority. He exercises such power and performs such function as prescribed by rules and assigned by the government from time to time. BRTA is a body responsible for approving registration of vehicle in Bangladesh. The Roads and Highways Department (RHD) manages several categories of road. RHD has total length of 22,362.821 Km road under its control. On the other hand Local Government Engineering Department (LGED) is one of the road construction engineering agencies of the country. LGED has so far constructed a total of 133,514 km. BRTA approves all types vehicles in Bangladesh. The total number of registered vehicle has been approved by BRTA is given below in table-2.1.

Table 2.1: Number of Registered Transport Vehicles in Bangladesh

Type of Vehicles	Year				
	2015	*2016*	*2017*	2018	2019
Bus	2391	3833	3760	2755	3606
Minibus	323	472	492	436	837
Microbus	5224	5804	5575	4137	3683
Taxicab	88	44	15	161	11
Private Passenger Car	21062	20304	21959	18227	16783
Motorcycle	240358	332057	326550	395603	406897

The all registered vehicle moves all around the RHD and LGED road network in Bangladesh. The given figure-2.2 represents road network of Bangladesh.

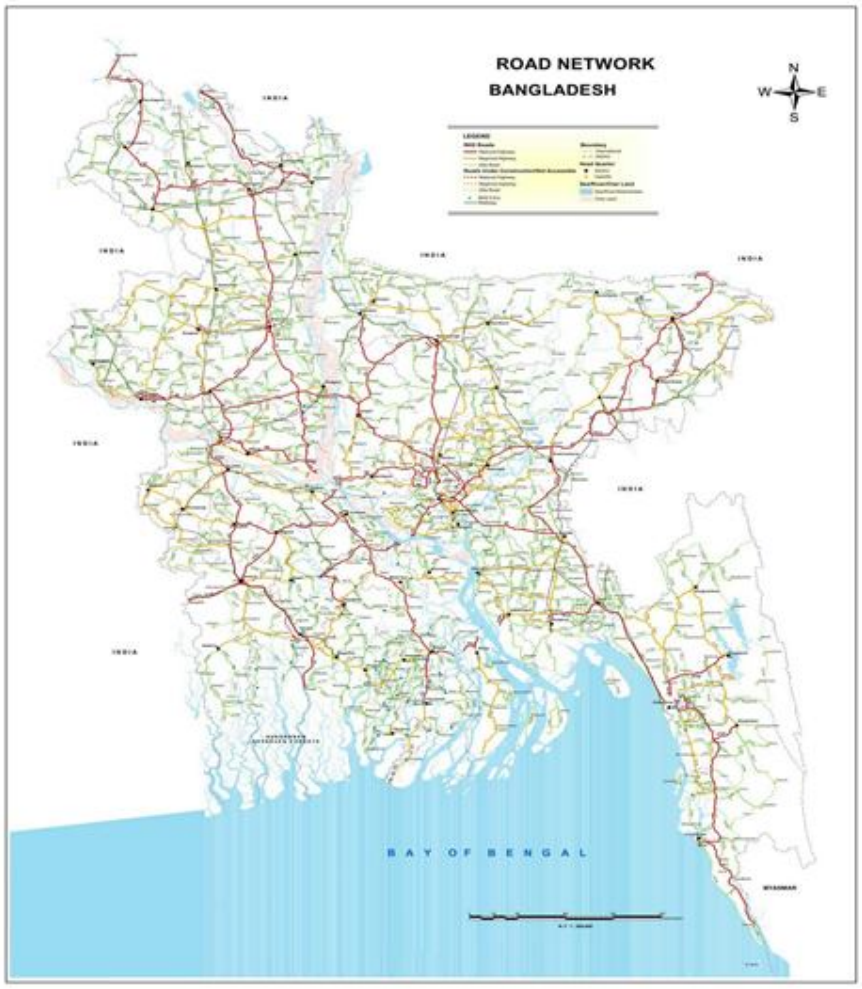

Figure 2.2: Road Network of Bangladesh by RHD

2.4 Road Transportation of Dhaka City

The road network of Dhaka has been suffering from a lack of continuous functional and accessible roads, high quantity of narrow roads, and deficiency in road alignment based on both geometric and regulatory measures, according to a research. It has only 2,200 kilometers of street, or only 6 percent of the city area, whereas the demand is 6,000 kilometers. To make things worse, almost 1,500 new motor vehicles are registered in the Dhaka city every month.

Figure 2.3: Road Transport Network of Dhaka City

2.5 Traffic Congestion in Dhaka City

With continued economic development, Dhaka (Bangladesh's capital) is beginning to experience severe traffic congestion. This is impacting the quality of life for inhabitants of the metropolitan area, the nation's largest. Many government and public-transport agencies drafted policies, undertook projects and implemented programs to solve the problem. The Dhaka Integrated Transport Studies (DITS), conducted by the Ministry of Planning in 1991–1994, found that the uncoordinated activities of Dhaka City Corporation (DCC), Rajdhani Unnayan Kartripakkha (RAJUK) and the Bangladesh Road Transport Authority (BRTA) did not alleviate the problem and there was no one organization responsible for improving the city's transport and traffic problems. With financial assistance from the World Bank, the government of Bangladesh created the Dhaka Transport Coordination Board in 1998. An urban transport plan was commissioned with the US consultant Louis Berger Group and Bangladesh Consultant Ltd (BCL). Introduced in 2008, the comprehensive transport plan for the Greater Dhaka City and its adjoining areas (such as Tongi ,Gazipur, Savar, Narayanganj

,Keraniganj, Narshingdi and Manikganj) covered around 1,530 square miles (4,000 km^2). The plan looked at 15 key policy issues, including safety, pedestrian preferences, public transport, non-motorized transport, travel demand management and mass transit systems, and almost 70 policy recommendations were made. Ten comprehensive transport strategies were evaluated, using a baseline of no Bus rapid transit (BRT) or metro service, and a number of alternatives were explored. The adopted plan included roads, a three-line Mass Rapid Transit (MRT) and three-line BRT. It included provisions for 54 new roads in and around the city, three-part elevated expressways and a circular waterway programme.

With more than 250,000 vehicles in Bangladesh and the country's population and infrastructure, traffic congestion wastes fuel and time and makes travel difficult. It also makes existing public transport inefficient, adding unsafe levels of noise and air pollution. Noise and pollution are stressful, and lead to medical conditions such as cardiovascular disease and hypertension.

Traffic congestion varies during the day, necessitating planning and longer trips; this impacts productivity, cutting across social and economic status. Although walking is a major travel mode of the low-income majority, pedestrian needs are ignored in transport planning. As a result of traffic congestion, more people walk and bicycle; however, both may be dangerous. Almost 80 percent of traffic fatalities in Dhaka are pedestrians struck by a fuel-based vehicle. Although private cars are four percent of total vehicles, they occupy about 70 percent of road space. Public transport must be stressed in any future policy. The change to compressed natural gas (CNG) cars saved over 4,000 premature deaths in 2009, but their low cost has increased the number of cars on the roads (although CNG price increases may have tempered the increase) and decreased the amount of natural gas available for other purposes.

Passenger's and pedestrian's safety in the roads is currently a burning issue in Dhaka city as well as Bangladesh. Death counts in the highways are rising every day in an alarming rate. Although the government is undertaking a number of significant steps addressing the issue, situations in the highways don't seem to get much positive change too soon. Public unrest and riots demanding safe roads tend to occur in quite an unpredictable manner as both the authority and the highway section of the police prove to fail in bringing discipline in the road transportation system. Alternative ways of mass transit system in public basis have been taken and lots are still undergoing, but the source of all problems is said to lie with untrained drivers and inadequate maintenance of the highways.

According to Revised Strategic Transport Plan (RSTP) in terms of population, urbanization, scale of economic activities and household income levels, it has been rapid in Dhaka. It is unlikely to slow down due to the unique position of the city as the economic engine of the entire Bangladesh. The prospective population in RAJUK area will be 26.3 million by the year 2035 (RSTP, 2015). United Nations Sustainable Development Goal (SDGs) number 11 states to make cities and human settlements inclusive, safe, resilient and sustainable. People of Dhaka city are facing crucial problem regarding safe and comfortable transportation system. Public Transport System is inadequate for the city dwellers. According to Dhaka Mass Transit Company Limited (DMTCL)'s website it is found that first Mass Rapid Transit line-6 will be started operation in December, 2021. Other 5 (five) MRT Lines will be constructed by 2030. It is observed in the Dhaka Transport Coordination Authority (DTCA) website that Construction of Bus Rapid Transit (BRT) is also going on from Gazipur to Dhaka by Roads & Highways Department where Asian Development Bank (ADB) is our Development Partner.

2.6 Traffic Congestion and RSS

San Francisco-based Uber is one of the fastest-growing companies in the world functioning in over 600 cities. Uber's growth in Dhaka has been among the most rapid. What Uber basically presented was a way to take a proven product/technology that worked in the US and to get it up and running in a completely different set up. Uber is not alone in Bangladesh. There are at least sixteen ride-sharing services in the country's market each of these is trying to carve out its own niche. It is certain that more players will be joining the market. Ride share provides a largely seamless door to door service, and is a blessing to many consumers. However, there is no doubt that Uber-Pathao-Shohoz is a 'middle-class urban solution', one that is yet to serve the larger masses.

The tagline of Uber is, "We ignite opportunity by setting the world in motion" (Website of Uber).What started as a way to tap a button to get a ride has led to billions of moments of human connection as people around the world go all kinds of places in all kinds of ways with the help of Uber's technology. Uber has the facility in 700+ cities and covering 500+ airports. Their theme is safer journey and get help with the tap of a button; millions of riders and drivers who share community guidelines and depend on one another to do the right thing.

A Step to Reduce Congestion (A Case Study of Delhi – Published on 12 Feb 2007) by KumKum Dewan and Israr Ahmed states that as is the trend worldwide, India is undergoing

rapid urbanization. This means not only that more people than ever before will be living and working in cities, but also that more people and more goods will be making more and longer trips in urban areas. The costs of increasing dependence on cars is resulting in expensive road building and maintenance, clogged and congested roads, high levels of energy consumption along with its economic and environmental costs, worsening air and noise pollution, traffic accidents and social inequities that arise, when the poor find transportation services increasingly unaffordable. The most widely used mode of conveyance of public transport in Delhi is "buses". Thus, buses form a backbone of the transportation system in Delhi and serve about half of the travel demand while it constitutes less than 1 % of the total vehicle fleet of Delhi. In spite of this, it does not receive any preferential treatment in terms of traffic management, dedicated lanes, and better upkeep/ maintenance of vehicles resulting in that common man who can afford even slightly is shifting from buses to their own vehicles. It may be two-wheelers or four wheelers or even bicycles because of which the number of vehicles on the roads are increasing which is leading to further lowering of speed, congestion, increase in pollution level etc. Strategies to combat these problems would include reducing the emissions per vehicle kilometer traveled and the total number of kilometers traveled. Road congestion may be reduced by the use of good public transport management, traffic management and car pools etc. In this paper, we have conducted a survey based on a structured questionnaire for carpooling. By the analysis of the data collected, we found that if there is no carpooling, the amount required for 968316 Kiloliter petrol for 1289231 cars is Rs. 4213.14 crores per annum while by carpooling, this amount reduces to Rs. 4213.14-1310.98 =2902.16 crores. Thus, revenue of Rs. 1310.98 crores can be saved by saving 301307 Kiloliter petrol by carpooling in Delhi.

The Website "Grab On save on everything" states that "the idea of carpooling is pretty simple – to reduce the horrendous traffic especially in metropolitans like Delhi, Bengaluru, and Hyderabad. A lot has already been written and said about carpool apps in India in the past 2-3 years. With the ever-increasing traffic, cab service companies like Uber and Carma in the US came up with this idea of carpooling as a super accessible and economical venture. This peer-to-peer business model has already become a massive hit in western countries. While the same initiative was taken in India as well, there is still a long way to go for carpool apps in India to become as popular as in the US. Talking about one of the developed cities in India – Bengaluru. The traffic scene in this city is too bad. The rapid increase in vehicles in

Bengaluru has caused an enormous parking spot crunch. Multi-level car parking construction in major IT parks, shopping malls, and other public places haven't addressed the parking issues of the city. Randomly parked vehicles along the roadside leading to more traffic issues. The situation in residential areas isn't any better either. A recent study stated that 90 percent of Bengaluru households do not have parking space and are forced to park their vehicles on the road or footpaths. Such a situation calls for a carpooling service, as it seems to be the only viable option to avoid such a rapidly growing issue. Top 10 Carpool Apps in India for 2019 are 1. BlaBlaCar, 2. SRide, 3. UberPool, 4. Ola Share, 5. Ridely, 6. ToGo (Together We Go), 7. Quickride, 8. ZIFY, 9. Ryde by Ibibo, 10. Carpool by Meru.

A report on the daily newspaper named "the Prothom Alo" on May 08, 2019 states that although around 125,000 motorbikes and cars are providing ride sharing services in the city at the moment, the sector is yet to get formal legal recognition. It has been almost a year since the government has spoken about a policy, but that has not been implemented yet, leaving the service providers to operate in their own ways. Uber first introduced app-based ride sharing services in Dhaka in the year 2016. BRTA initially declared it illegal, but amid public demand tabled a ride sharing policy soon. In March last year, the policy was formulated on pen and paper. It says the companies have to get registered with BRTA and get 'enlistment certificates'. So far 16 companies have applied for that, but there has been no progress to that end. Since there is no registration, the users cannot call 999 for emergency help. If the vehicles were registered, law enforcement could access the information of the driver and the location. Since the information has not yet been tagged with the national identity card database, this cannot be done at this moment. With a view to finding a solution, Pathao Limited, Sohoz Limited and Uber Bangladesh on 14 February wrote a letter to State Minister for ICT Division Zunaid Ahmed Palak. They urged for his intervention to address five issues. They are (a) a car may only be registered with one company (b) a car has to be more than a year old to join the ride sharing platforms (c) ride sharing services cannot charge higher fares than the taxi cabs (d) there has to be a ceiling determining how many vehicles a company can register (e) vehicles registered outside Dhaka cannot offer ride sharing services. The state minister wrote a letter to the BRTA chairman on 24 April and then on last Monday they sat together with the companies. Sources in the meeting said they could not reach an agreement over the second, third and fourth issues. But the companies agreed to stop using vehicles registered outside Dhaka while BRTA seemed to have moved away from the position that a car may only be registered with one company. The state minister said they would sit again

with police to solve the issues. When asked, Sohoz Limited managing director Maliha Kadir told Prothom Alo, "Everyone wants this sector to thrive. No significant development had been seen in a year, but they are now working to address the issues." A clause in the policy says a car may only be registered with one company. The service providers say this is contrary to the spirit of entrepreneurship. The riders say this clause will let the companies a monopoly over them as they won't have the chance to go to other service providers. Whereas if they can choose as per their wish, there will be a competition in the market. The policy says a car has to be more than a year old to join the ride sharing platforms. But the companies argue that the customers want new vehicles. They also want to determine the fare as per demand and think it should not have anything to do with the fare of the taxi cabs. On 10 February, the Dhaka Metropolitan Police wrote a letter to the BRTA, saying that vehicles more than 10 years old should not be in the ride sharing platforms. They also said there has to be a ceiling determining how many vehicles a company can register and vehicles registered outside Dhaka cannot offer ride sharing services in the capital. Police say old motorbikes and cars are coming to Dhaka from different parts of the country, which is causing traffic congestion while inexperienced drivers are causing road accidents. BRTA officials, however, said the decision to put a tab on the number of CNG-run auto-rickshaws has resulted in a situation where the commuter's demands are not being met. As a result, there has been anarchy in this sector. There are 104389 motorbikes on the streets besides 18,253 cars offering ride sharing services. Mozammel Huq Chowdhury, secretary general of Bangladesh Jatri Kalyan Samity, said, "The ride sharing services have been popular with the commuters. But there have also been some complaints, which the government cannot address because there are no legal frameworks. It has led to anarchy in this sector. If it is not addressed immediately, this ride sharing sector will soon collapse."

According to Website's of BRTA, from 1 June 2019 BRTA launched a portal named BRTA Service Portal (BSP) to submit application through online for "Enlistment Certificate" to operate mobile-apps- based ride sharing business operation. There are 12 (twelve) mobile-apps- based ride sharing companies which obtained 'Enlistment Certificates' as per Ride Sharing Policy, 2017 to operate ride sharing business within DTCA area including Dhaka city. Around 15000 cars, microbus, motorcycles etc. are allowed to operate ride sharing and the owner of these vehicles obtained 'Enlistment Certificates' also. The main objectives of the Ride Sharing Policy, 2017 are to reduce the tendency of increasing private vehicles and to ease the passenger services by using an application-based software *(RSP, 2017)*.

2.7 Outline of Literature and Research Gap

Search to find related books on the research issue was done but no book on it was found. The related study is very rare. This is why the study requires finding the current issue of ride sharing and its impact on traffic congestion and the users.

Chapter 3

Research Methodology

3.1 Structure of this Chapter

The chapter briefs the methodology that has been used in this research study. It contains the research approaches and method, instrumentation, data presentation, organization of the paper and ethical consideration.

3.2 Research Approaches and Method

Mixed method was used as research approaches in this study. The use of qualitative and quantitative approaches and mixing of both approaches inhere of this study. Qualitative research was used widely for exploring and understanding the meaning of individuals or groups' opinion of Ride Sharing Services and regarding traffic congestion. The other one was quantitative method that means for testing subjective theories by examining the relationship among variables. Based upon these broad approaches to information gathering, data was categorized as: primary and secondary data were used in this research. The primary data was collected through closed and opened questionnaires and interview schedules. Therefore, primary data was collected from Ride users of both end, transport analyst and officers of BRTA through questionnaires and interview.

Secondary data was collected by review of Transport and Ride Sharing related materials, policies, documents, articles, books, and different types of reports from rules and regulations regarding BRTA, RHD, Dhaka City Corporation, DTCA, DMTCL, BUET etc. Furthermore, in secondary data analysis, the study outlined the plan versus performance of the year 2017, 2018 and 2019 of Vehicle registration data from BRTA, to demonstrate the performance level, and the frequency of each method of RSS and analysis of Traffic volume, many articles, journals and periodical news was used. The purpose of the study is to find the

reduction of traffic congestion after initiation of RSS and use of objective questions to assess, examine and analyze each question through questionnaire and interviews research tools.

Descriptive research studies were used in the study. It has entailed to finding what described situations actually sounded. Survey method was a medium to collect raw data from respondents of RSS Users, Transport analyst and associated officers.

3.3 Sample Design

The target population was selected from RSS Users, Transport Analysts and associated officers linked with policy, RSS process, Traffic and vehicle registration associated tasks. As it is difficult to carry out the research study on the entire population, to select a target population from total population, stratified random sampling and simple random sampling techniques were used.

In this study sampling frame was the list of selective 3(three) categories groups of respondents were selected. Grouping system was under selecting respondents, a stratified random Sampling technique was used. The three groups were RSS Users and RSS drivers from RSS, Transport analysts who are associated with traffic relevant works and officers of different sectors linked with the preparation and making of regulatory and legislative framework, support the functioning and bookkeeping the rules and regulations have been processed. The result in table 2, from the target populations enumerated (1-3) from RSS users 200 in numbers; Transport analysts/experts 20 in numbers, 50 officers associated with RSS were sampled from the target population. Sample of this research is showed below.

SL No.	Description of target categories	Target Population	Response Rate	Proportion	Simple random sampling
01	RSS users	200	100%	100%	
02	Transport analysts/experts	20	100%	100%	
03	Officers associated with RSS	50	100%	100%	

Table-2: Description of Population

3.4 Instrumentation

To address the objective of the study, close-ended and open-ended questionnaires and interview questions were established. The questionnaires were five parts: part (A) deals with the profile of respondents, part (B) deals with the frequent usage of RSS that reduce time, save money and ensure safety and, part (C) challenges/problems of RSS, part (D) recommendation and traffic related objective questions, part (E) target organization and open-ended questionnaires ask any other issues deals with making rules/implementation of RSS planning/ effectiveness of RSS process which could reduce traffic congestion. The potential answers to the questionnaires were subjective along with objective and explained with inner experiences.

3.5 Data Presentation

The study presented the data by using different types of software and represented the value through percentage, tables, and bar graphs, maps, text, and the origination of the study area.

3.6 Ethical Consideration

As a result, to secure the consensus of the research, the study was communicated with detailing and selected aims of the study. The study has stated to the participants that they had to participate in the research willingly. Moreover, the study has ensured to the respondents, their personal information was not be disclosed.

Chapter 4
Data Analysis and Result

4.1 Introduction

The ride-sharing industry is worth about Tk 2,200 crore, which is 23 percent of the transportation sector of the country, according to media reports (Star, 2019).

The general people of Bangladesh gladly welcomed this new transportation model because of their utter frustration and inconvenience with the existing transportation models of the cities. People also has addressed this RSS as smart transportation system in Dhaka city as well as Bangladesh. This RSS is mainly app-based transportation services providers for carrying

passengers as well as food delivery, parcel delivery, motorbike, car, truck, CNG hailing services etc.

In case of RSS, no doubt, are offering tremendous economic benefits to both customers and providers. However, they may add safety, social, smart transportation and environmental challenges for Dhaka city.

A minimum of 500,000 people have registration with one of the Ride Sharing Services, including car, bike, or CNG hailing services, whereas the number was only 10,000 in November 2016. Technological advancement consisting of both hard and soft advancement acted as the main catalyst (IDLC, 2018).

Modern RSS systems run only through global positioning system (GPS)-enabled smartphones with high speed internet. Half of these users surveyed are within the age of 18 – 24 years. The increased use of social media, especially by the young people gradually reduces the level of distrust towards strangers. This consequently also complemented the heightened use of ride-sharing services. The use of digital payments, including digital payment gateways (e.g. debit/credit card) and mobile financial services (e.g. bKash, Rocket, Nagad) for ride-sharing services can further boost its uses. Most of the users commented that the payment system of RSS comprehensively comfortable.

Despite the barriers, people have accepted Ride Sharing Services models very well but the safety and security issue remain a concern like before. Every day, lots of complains about the rude or fraudulent behaviors of the drivers are raised. Several sexual harassment and rape attempts by riders and drivers towards women commuters are also reported to both the services providers and the law enforcement agencies. These occurrences created more challenges against safety, security and social advancement.

Local companies are suffering from inadequate expertise, experience, investment, management, and policy support to ensure quality service. It seems that the sole focus of the providers is on increasing the number of riders and commuters even by pursuing non-sustainable discount-based competition. The fundamentals of the ride-sharing business have been built on the notion of transparency and accountability. However, such issues are hardly reiterated and addressed by both the facilitators and regulators. A lack of exemplary disciplinary actions, drivers' and customers' safety education, and limited technological guard against misconducts are a few of the many obstacles standing in the way of ensuring reliable RSS (Star, 2019).

Another challenge for the RSS services providers is to get them under a legal framework. Sixteen companies have already applied to the Bangladesh Road Transport Authority (BRTA) for enlistment. Surprisingly, all of them have failed to meet the existing guidelines, according to reports. The government published the Ridesharing Service Policy, 2017, effective from March 2018, but the companies are accused of finding loopholes in the policy and breaching the rules.

Although the policy clearly states that a vehicle must have one-year old registration to provide ride-sharing service, a one-day old registered vehicle is on the street providing the service. Over-speeding, breaking signals, not wearing helmet while providing service, and accidents are some highly echoed complaints against RSS services providers.

There is no denying of the fact that RSSs offered increased personal mobility not available from existing public transportation. Against this fact, the government needs to think about the long-term communal interest, especially whether the RSSs are solving the mobility problem or adding to the existing ones.

The huge gap between demand and supply of road network forces us to think about the capacity of Dhaka to meet the increased flow of vehicles on the back of the escalation of DRT services providers.

The sales of motorbikes rose 44 percent and, on an average, 40 new cars hit the street of Dhaka city every day, which together testify the continuous rise of DRT services providers. During a discussion to celebrate the "World Car Free Day, 2019, it is reported that 7 lakh motorbikes and 2.87 lakh personal cars are commuting in Dhaka city.

Currently, the city is undergoing a huge infrastructural change due to the addition of metro rail and elevated expressway. This is expected to make the existing road even narrower which consequently will deepen congestion, decrease mobility and accessibility, and increase social problems as by-product. The Ridesharing Service Policy, 2017 does not seem to worry about these problems as there is no mention of the ceiling of the highest number of vehicles that a company can have to serve. Non-inclusion of background check of drivers as a requirement in the policy is also signaling towards non-prudential thought process of related stakeholders.

There is a strong need to have contextual ridesharing policies that accommodate not only the road infrastructure but also the possible social and economic impact.

Unless a good understanding of DRT schemes, legal framework, social trends, and infrastructure-related sustenance factors is achieved, it is almost impossible for the service

providers to design a service that is competitive, sustainable, efficient, and suitable for Bangladesh.

A public private partnership in policy decision and awareness both from companies and customers end is a must to transform DRT services into a healthy and sustainable business in Bangladesh.

According to the website of BRTA, 12 Ride Sharing Companies are enlisted for doing ride sharing services. The name of the companies are Pathao Limited, Sohoj Limited, Chaldal Limited, Akash Technology Ltd, Obhai Solutios Ltd., Uber Bangladesh Ltd., Pikme Ltd., Easier Technologies Ltd., Akij Online Ltd., Computer Network System Limited, Buddi Limited and Sejasta Limited (BRTA, http://www.brta.gov.bd/, 2019).

4.2 Assessment of Traffic Congestion Reduction for RSS

4.2.1 Assessment of Effectiveness of Policies Regarding RSS

For reducing traffic congestion of Dhaka city many factors are responsible. Among them dense population, less road infrastructure, less public transport, less coordination of related departments are the main issues. The transport experts/specialists were asked subjective questions for assessment traffic congestion factors in Dhaka city transportation network. The identified factors are given below:

1. Policy coordination within metropolitan area;
2. Integration of urban development M/P and urban transport M/P;
3. Development of hierarchical road network and road classifications to guide design and parking provision;
4. Promotion of integrated urban and transport development, particularly Transit Oriented Development (TOD);
5. Guidance for ideal urban development

The structured transportation policies for controlling RSS are followed

- CNG/Petrol driven 4-stroke three wheeler service policy, 2007.
- Taxicab Service Guideline, 2010.

- Ride Sharing Services Policy, 2017 (BRTA).

The Ride Sharing Services policy, 2017 was made not only for RSS in Dhaka City, but also for whole country. However, operation of this service is now limited to DTCA area only. One of the experts from transport analyst commented that RSS policy, 2017 was the primary guideline for ride sharing service in Dhaka city as well as Bangladesh. Moreover, the policy inflicts the conditions of RSS inclusion of service institution or company, responsibilities of RSS enlistment RSS Company, certificate issuing authority, system of certificate issuance, fare rate of RSS, Commitment of RSS, action against illegality and regarding any changes/addition/reduction of policy system authorization.

A question was asked to the RSS user and transport analysts/experts, whether the policy regarding RSS is helpful to control RSS in Dhaka city. The surveyed result showed that 65 percent of total respondents responded positively while 35 percent disclosed a massive manifestation on RSS in Dhaka city. One of the respondents claimed that there was huge anomaly between system and reality. The following figure-4.1 shows the respondents statistics.

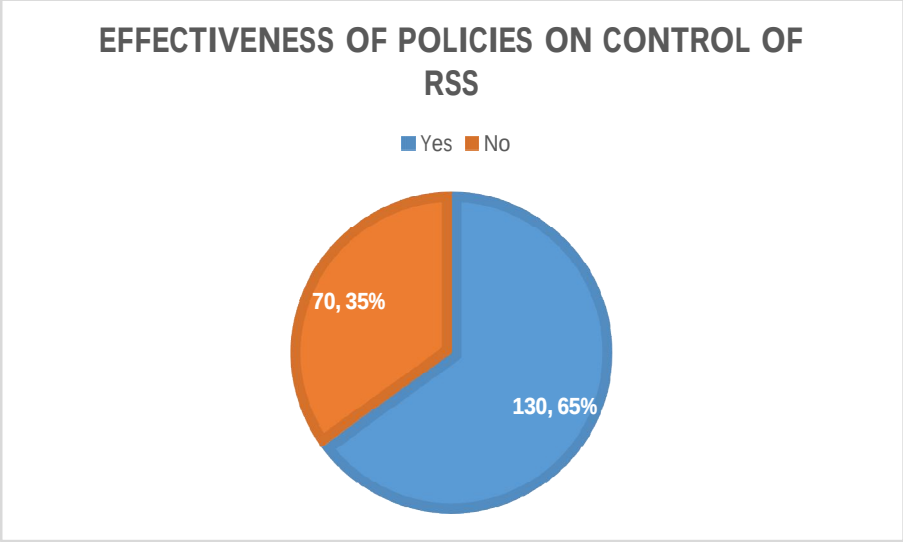

Figure 4.1: Effectiveness of Policies of RSS in Dhaka City.

Another respondent of a RSS company responded that they have more than thousand vehicles including car and motorbikes using their app for ride sharing but BRTA Service Portal is accepting a very few number of it. The causes behind it are not accepting of company vehicles, one owner can't enlist more than one vehicle, though tax token is updated but it's rejected by the portal. He mentioned that these are the obstacles of operating RSS and requested to modify the RSS Policy.

4.2.2 Assessment of Reducing traffic congestion Regarding RSS

It is observed from the above table that though trend of registering public transport Bus, Microbus is decreasing from 2016 to 2019, registering of private car has been increased in 2017 from 2016 but it has been decreased in 2018 and 2019. But the number of motor cycle is increased a lot in 2018, 2019 from 2017. After starting of Ride Sharing Services in 2018, the trend of registering motor cycle has been increased and it's reverse in case of private car and Microbus. The given figure-4.2 shows trends of the general registering probability due to RSS after 2016.

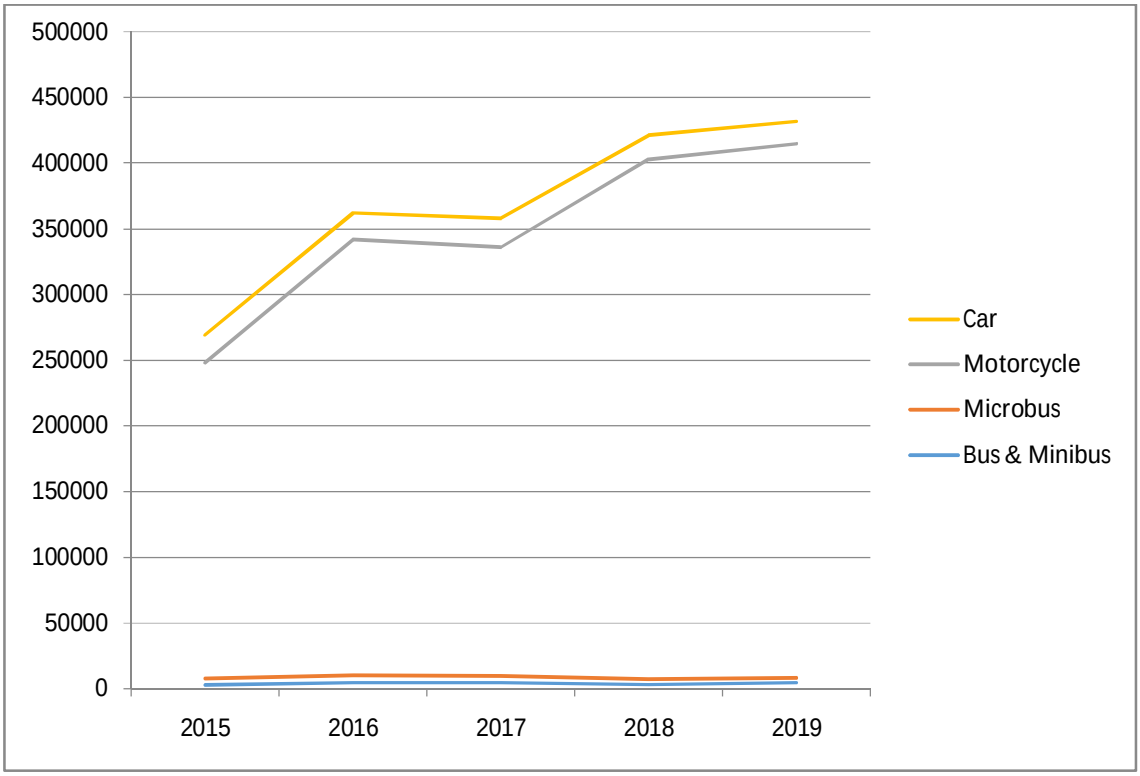

Figure 4.2: Trends of vehicle Registration Due to RSS

However, the data of number registered transport vehicles in Dhaka from BRTA website shows that despite the RSS bus registration increased in general. The table-4.1 described the all types of public transport registration trends except non-motorized vehicle.

Table 4.1: Number of Registered Transport vehicles in Dhaka

Type of Vehicles	**Year**					**Total**
	2015	**2016**	**2017**	**2018**	**2019**	
Bus	2221	3479	3294	2322	2951	14267
Minibus	103	164	159	185	186	797
Microbus	4569	5169	4927	3585	3241	21491
Motor Cycle	46764	53738	75251	104064	99256	379073
Private Passenger Car	18422	18010	19573	16319	15016	87340
Taxicab	30	30	4	94	6	164

Source: BRTA Website

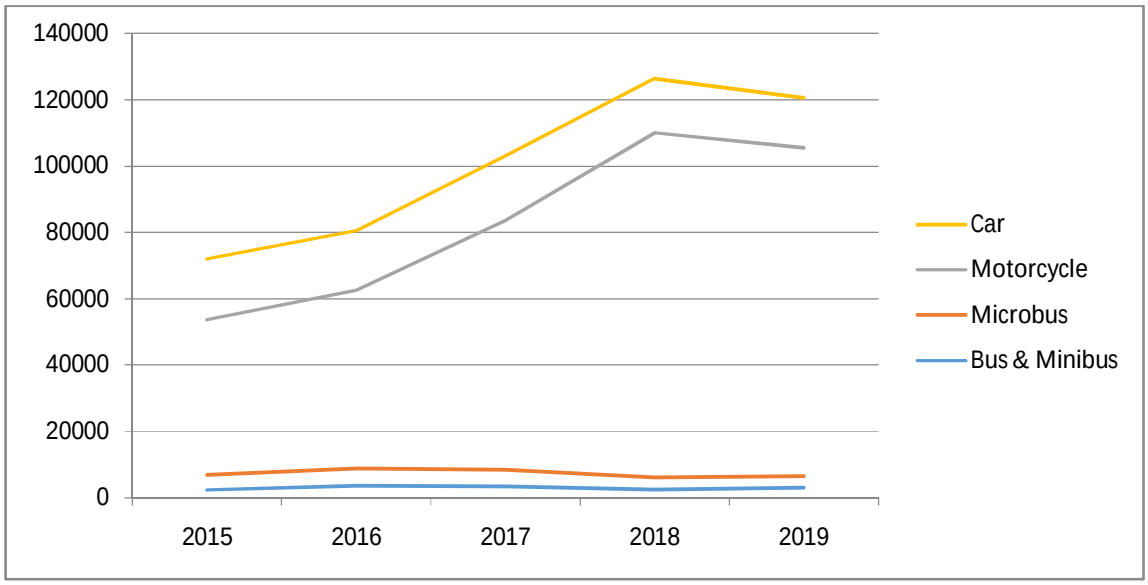

Figure 4.3: Changes of Vehicles registration in RSS

In the figure-4.3, the registration of vehicle in RSS for urban transport user increased in 2018 but sharply declined in 2019. The table-4.2 displays the number vehicles operated by apps for RSS.

Table-4.2: Number of Registered vehicles for RSS

SI. No.	Name of Company	Motor Cycle	Motor Car	Jeep	Microbus	Ambulance
1.	Pathao Limited	20,000	2,000	-	-	-
2.	Sohoj Limited	30,822	1,653	-	-	-
3.	Chal Dal	4,386	-	-	-	-
4.	Akash Technology Ltd.	969	20			
5.	OBhai Solutions Ltd.	26,110	1,161			
6.	Uber Solutions Ltd.	11,784	8,853	-	-	-
7.	Picmi Ltd.	7,707	601	-	-	-
8.	Easiers Technologies Ltd.		30		30	43
9.	Akij Online Limited	70	35	5	5	5
10.	Computers Network System Limited					
11.	Buddi Limited	100	0	0	7	0
12.	Sejasta Limited	154	65	-	12	-
	Total	**102,102**	**14,418**	**5**	**54**	**48**

To explain the reality of traffic congestion a questionnaire survey was done and 75 percent respondents believed that the traffic congestion reduced after RSS enterprising. The above two table shows that both in Dhaka registering of private car, microbus vehicles are reduced. But we found that in 2019, among registered 16783 private cars in Bangladesh, 15016 registered in Dhaka. The number is more than 2.5 times of total number of Bus, Microbus and Minibus in 2019 in Dhaka. Though the requirement for public transport is more but it is being reduced gradually. One user respondent replied “People are being disinterested to use

private cars due to availability of Ride Sharing Services on the roads of Dhaka city. It's convenient, comfort, safe, comparatively attractive rent, and user friendly."

4.3 Assessment of Safety, Money and Time due to RSS to Make Smart Transportation in Dhaka City

4.3.1 Assessment of Safety of Users of RSS

To assess the safety of RSS user as well as RSS system in reality in Dhaka city, an objective question was asked by giving option yes, no and others. The surveyed data analyzed that 70 percent among the respondents believed that the RSS is safe for use in Dhaka city. On the other hand, 20 percent i.e. a significant portion of users gave feedback with factious experience that could lead the RSS to be more rampant for Dhaka city users. He also added that the drastic crime happened frequently. The surveyed data shows in given figure-4.4 below.

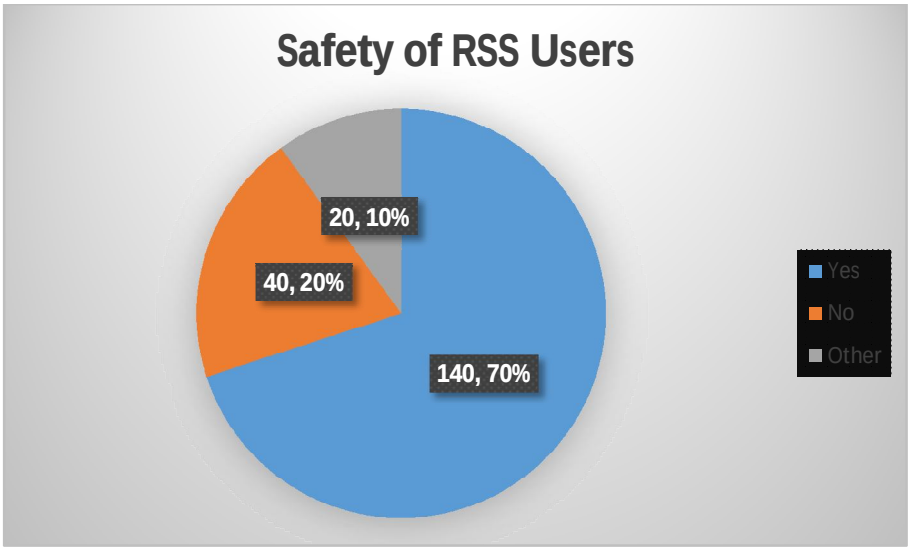

Figure-4.4: Safety of RSS Users and Drivers

Moreover, more than 50 percent people are using motor cycle for travel in and around Dhaka city. One KII informed that accident happened mainly for reckless driving and driver's

unawareness. The acquaintance of users and the apprehension are structured based on social moralistic. In Dhaka city, people are classed based on earnings from struggle/fountain source.

4.3.2 Assessment of Time spent on travel of Users of RSS

One KII informed that he used to use bus and other mode of transports earlier for going from Mohammadpur to Uttara for going to his office from residence, and required two and half hours, but now he is using RSS bike which requires only forty to fifty minutes. He is very much happy by using the RSS apps. However, the primary data shows that 80 percent agreed that the travel time was reduced by using RSS. Due to urgent scenario urban users basically opted in the motorcycle. After assessing the primary data, the result shows that motor cycle, car and other types of vehicle are much easier to get in and due to availability vehicle users are getting vehicle instantly after requesting desired and agreed vehicle by maintaining terms and conditions given by RSS Company and government through apps. Analysis shows that 60 percent of the RSS users take 11 to 20 times in a month. The figure-4.5 shows the analyzed data of frequent user's characteristics.

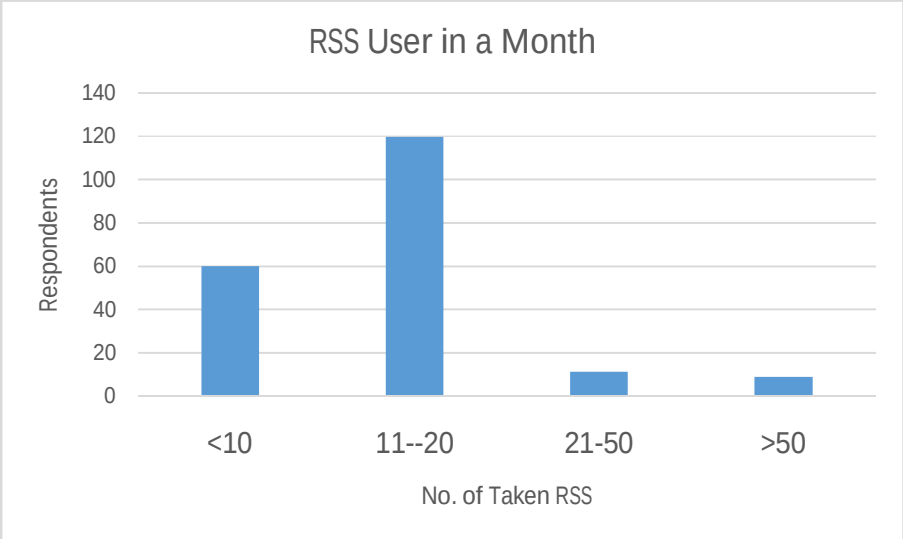

Figure-4.5: Number of Travel of Frequent users of RSS

4.3.3 Assessment of Money spent on travel of Users and Earnings of RSS Company including Drivers

One young man works in a company and is the owner of a vehicle. He enlisted his vehicle in the RSS Company and is using the app for carrying passenger. During his going and coming he takes one passenger and earns money which helps to buy his fuel and spend additional money for his family.

Another respondent of RSS Company told that they are providing training to the drivers for obeying traffic rules, maintaining the vehicle regularly, behaving well with the passengers, following parking instructions properly. If drivers do not follow it, passenger can complain against them and their points will be deducted. If the violations are frequent, driver's enlistment will be cancelled. It will ease the way of establishing road safety and maintaining traffic discipline rather than enforcement of Traffic Police.

On the other hand, users of RSS claimed that cost of travel increased on an average 10 times than public transport usually fare. One of the KII informed that the RSS Company frequently make changes to the base fare of travel due to many reasons. At the time when schools, offices mainly open and close, the RSS Company demanded on an average two three times than normal fare or base fare. So, there is an issue that has been identified to control by making sustainable policy.

One study shows that there is added mileage between trips as drivers wait for the next dispatch and then drive to a pickup location which causes more mobility of cars and as consequence more cars in the road.

In RSTP, from the screen line survey, it has been observed that 46.7% of the passengers use bus and 18.8% of the passengers use car and motorcycle. Remaining passenger trips are met by non-motorized transport (NMT) or by intermediate public transport (IPT). Difference between the share of public transport mode in outer cordon line survey (69.3%) and screen line survey (46.7%>) shows that intra-city traffic was more dependent on private mode (18.8%)) and IPT mode (nearly 35%>)(RSTP, 2015).

Chapter 5

Summary, Conclusion and Recommendation

According to the views of the respondent of KII and FGDs regarding effective results from RSS for reducing traffic congestion of Dhaka city the following measures are required to be taken:

1. BRTA Service Portal (BSP) to be upgraded for easing the process of enlistment;
2. One owner can enlist only one vehicle for RSS to be changed, one owner should have option for more vehicles;
3. Vehicles under bank loan and company registration will not be able to get enlisted as RSS vehicles; it's required to change in the RSS policy. Because hundreds of vehicles are being used in the RSS at present the companies;
4. Separate lane or space is required for motor bikes. Till now near about seven lacs bikes are registered in Dhaka city, more than one lac is under RSS;
5. Coordination between BRTA, RSS and Traffic Police is required for encouraging the RSS for reducing private car registration in Dhaka city;
6. Parking policy should be urgently introduced and to be implemented for increasing the mobility of vehicles;
7. Trend of private vehicles registration is reduced; it should be continued and public transport to be increased;
8. MRT and BRT to be introduced earlier so that traffic condition can be *improved* from construction hazards;
9. Time and cost of travelling has been reduced and satisfaction of users due to RSS;
10. Traffic congestion may not be reduced but it is not increased due to RSS operation,

the causes of it are increases of population, much construction of mega projects like MRT, BRT, and others;

11. Due to training and obligation of drivers from the RSS Companies' road safety and discipline established.

To minimize the identified issue, the recommendation from users, drivers, experts and policy makers and assessed data are given below:

Participant	Comments
RSS	• Bike owners do extra income by Ride Sharing. It serves his fuel cost and other purpose; • Demand of users and intention of vehicle owner and drivers for ride sharing; • After policy formulation enlistment of RSS and vehicle owners is going on Police is viewing opinion against RSS; • More coordination required with police for smooth implementation of the policy; • BRTA can mediate with Traffic Police regarding RSS Using of private vehicle reduced and traffic jam reduced; • Though mobility of the vehicles increased due to ride sharing, parking is less; • The cause of increasing traffic jam due to adding more people in Dhaka and construction works of Metro Rail, BRT, Elevated Expressway and others. So, construction of MRT and BRT should be completed earlier; Driving license issued before 2012 not holding smart card can't enter into BRTA Service Portal (BSP); • Sometimes users dissatisfied with the drivers due to their poor education; • Rent of bikes near to Rikshaw Training for the drivers done; • Incentives for safe driving and suspension for frequent violations of codes; • Though Tax token are okay but BRTA portal not accepting it; • One drive one app is not agreeable though BRTA accepts to change it, but yet not working; • BSP should have a help line; • Extra lane is required for bike and cycle driving; • Tremendous service is being got by the users; • Due to updating of document for vehicles for RSS, revenue earning increased; • Radical change in transport sector but interested groups are opposing it Policy is not friendly one owner one vehicle, company's vehicle not accepted;

	• A new vehicle can be used in RSS after one year of purchase Maximum time rent is same but due to waiting time and alternate way of tour rent be higher; • Parking area required for some people who don't have internet access can find the RSS vehicles easily, they usually *ride* by *oral* contract Enlistment certificate received by four companies out of 12. Rest are on process in BRTA.
Driver, RSS	• Traffic police checks documents if ail are okay but found RSS they become more arrogant; • Parking is not defined in many places, they can't identify the parking areas, required to identify the parking areas.
Users	• RSS is user friendly, convenient, safe and rent is reasonable Sometimes rent may be higher but everything is resolved through apps.
BRTA	• In case of pending issues *regarding RSS* BRTA will take necessary measures for solving the issue BRTA will update the BSP; • BRTA will draw attention of amending Ride Sharing Policy, 2017 in relevant issues.

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Appendix-A: Questionnaire Survey for RSS User

Research Topic: **Reducing Traffic Congestion through Ride Sharing in Bangladesh: A Case Study of Dhaka City**

Researcher: Md Lokman Hossain Mollah (19372003), MAGD-10, BIGD, BRAC University.

[This is a survey questionnaire for conducting a study to find out the challenges of public procurement in Bangladesh. It is a part of academic necessity for the Masters in Governance and Development in the BIGD, BRAC University. Your response is valuable for the researcher. The researcher assures you that the information given by you will be kept confidential and will be used only for the academic purpose. We solicit your support and cooperation for providing information.]

Part A: Demographic Information/Respondent's Profile

1. **Name (Optional)** :
2. **Length of Using RSS** :
3. **Age** :
4. **Sex** :
5. **Occupation** :

Part B: Assessment of RSS User Prospectus on safety, Time and Cost

[Please tick (✓) in the respective boxes]

1. Do you hear about Ride Sharing Service in Dhaka City?
   - □ Yes
   - □ No
   - □ Other
2. Have you used the Ride Sharing Service?
   - □ Yes
   - □ No
   - □ Other
3. How frequently do you use RSS in a month?
   - □ <10

□ 11-20
□ 21-50
□ >50

4. Which type of Vehicle do you use?
   □ Motorcycle
   □ Car
   □ Truck
   □ Others

5. Which RSS Apps do you use?
   □ Uber
   □ Pathao
   □ Shohoz
   □ Others

6. Do you think RSS Safe for journey?
   □ Yes
   □ No
   □ Others

7. Do you think RSS reduce your travel time?
   □ Yes
   □ No
   □ Others

8. Do you think RSS is costly than public transport?
   □ Yes
   □ No

9. How much costly than public transport?
   □ <1x
   □ 2x-4x
   □ 5x-8x
   □ >9x

Part C: Challenges of RSS

10. Do you know any key factors which may create problem?
    □ Yes
    □ No
    If yes,

    Please explain.....

11. Are the Policies helpful to control RSS?
    □ Yes
    □ No

If no, Please explain.....

12. Have you received Ride due time when you make request?
    - □ Yes
    - □ No

Part D: Assessment of reducing traffic congestion through RSS

13. Do you think RSS reduce traffic congestion in Dhaka city?
    - □ Yes
    - □ No

14. Do you have personal Vehicle which you don't use for RSS?
    - □ Yes
    - □ No
    - □ Others…….

15. Do you think RSS makes smart transportation in Dhaka city?
    - □ Neutral
    - □ Strongly disagree
    - □ Disagree
    - □ Strongly agree
    - □ Agree

Part E: Recommendation from respondents

16. Do you think RSS needs improvement? Explain with your experience and give recommendation how to implement?