Assessment Bus Service Quality Across Multiple Locations in Dhaka City Through Questionnaire Surveys.

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



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Section: 21A, Semester: Spring

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DECLARATION

It is hereby declared that this thesis/project or any part of it has not been submitted elsewhere for the award of any degree or diploma.

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to

Our Family,

Friends & Respectable Supervisor

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ABSTRACT

In Dhaka City, public buses play a vital role as the main form of transportation. Most of the city's residents, who are primarily from the middle and lower classes, rely largely on bus services because they are reasonably priced. People are generally unsatisfied with the quality of bus services, despite this strong reliance. Nevertheless, people still primarily utilize buses for transportation because there aren't any good alternatives. It is imperative to evaluate the current service and work toward raising its quality given the circumstances surrounding bus services both now and in the future.

Overall passenger satisfaction will be analyzed, and important factors impacting the standard of bus service will be investigated. Using a simple methodology, a questionnaire survey was utilized to gather data for analysis. An organized questionnaire with 29 service attributes was used for the survey, which was conducted at nine key Dhaka City locations. Participants' opinions on various issues relating to bus service quality were solicited in addition to demographic information. Data pertaining to 152 respondents were analyzed after a comprehensive review.

According to the report 54% of respondents thought the quality of the service was low or very poor, indicating that overall passenger satisfaction with bus services was inadequate. The study's findings will be very helpful to service providers in determining what has to be changed in order to improve the quality of bus service. They can increase user satisfaction, draw in new users, and keep hold of current ones by taking care of these issues.

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LIST OF ABBREVIATION

Acronym	Definition
PTS	Public Transportation System
PT	Public Transport
SQ	Service Quality
BSQ	Bus Service Quality
OPS	Overall Passenger Satisfaction
OSQ	Overall Service Quality

CHAPTER 1

INTRODUCTION

1.1 General

Improving living standards in both cities and nations requires the Public Transportation System (PTS). It is a characteristic shared by both industrialized and developing countries. An efficient PTS enhances economic and social prospects by improving accessibility to markets, job opportunities, and other sectors, so contributing to the growth of a nation. It is important to note that more developed nations and cities typically have PTS that is higher. Cities with extremely effective PTS systems include London, New York, Tokyo, Berlin, Singapore, and Hong Kong, to name a few. Their advancement is visible to the whole globe.

The term "service quality" (SQ) describes the process of comparing the service that customers, on average, perceive to the service that they expect. Parasuraman et al. (1988) defined service quality as an organization's capacity to either meet or surpass the expectations of its clients. According to Zeithaml et al. (1990), it's the discrepancy between what customers think they received and what they expected from the service. Since client happiness and service quality are closely linked, service quality is very important. According to Kumar et al. (2010), satisfied customers are the result of high-quality services. Since any change in service quality has a big impact on customer satisfaction, measuring SQ is crucial. It is crucial to remember that everyone has various standards for feeling satisfied, hence each person's SQ rating differs from person to person. According to Kumar et al. (2010), satisfied customers are the result of high-quality services. Since every change in service quality has a big influence on customer satisfaction, measuring SQ is crucial. It is crucial to remember that everyone has various standards for feeling satisfied,hence each individual's SQ rating differs from person to person. Cats et al. (2015) have observed that improving the quality of public transportation services has been found to increase customer satisfaction. Eboli and Mazzulla's (2008) research emphasizes the importance of service quality as raising standards can draw in more customers. SQ becomes a crucial statistic to take

into account when evaluating bus service quality because of the relationships it has with other elements that impact bus service quality.

There are many different types of public transportation, such as passenger trains, fast transit, buses, and trams. Cities and regions have differing levels of popularity for various forms. In Dhaka, since the majority of the transportation network is built on roads, bus service is an especially well-liked mode of transit.

1.2.**The Present Situation of Dhaka City**

Bangladesh's main city, Dhaka, is a megacity that is home to over 23.94 million people over 306.4 square kilometers (https://www.macrotrends.net/global-metrics/cities/20119/dhaka/population). Increase of 3.13% over 2023. Due to its dense population, Dhaka draws people from all over the nation who are looking for better chances and improved financial circumstances, especially those from lower socioeconomic backgrounds. The city's population is constantly increasing due to this constant influx of migrants.

Buses are becoming a common mode of transportation in Dhaka, where the majority of people are middle-class. On the other hand, public transportation offers noticeably subpar and poor service quality. The commuters are not happy as a result of this circumstance. Consequently, private automobiles are becoming a more popular choice for individuals

who can afford them. As a result, there are a rising number of private cars on Dhaka's roadways.

All things considered, even while buses are quite popular with Dhaka's middle-class citizens, their very poor quality and limited availability have caused those who can afford them to move toward owning own vehicles.

Table 1.1 Number of Registered Motor Vehicles in Dhaka City (year wise)

Bangladesh Road Transport Authority

NUMBER OF REGISTERED MOTOR VEHICLES IN DHAKA (YEARWISE)s

Sl. No	Type of Vehicles	Upto-2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Up To Jan-24	Grand Total
1	Ambulance	1277	137	114	188	253	355	284	399	456	548	599	614	435	171	12	**5842**
2	Auto Rickshaw	6571	112	110	59	56	428	582	42	5637	6839	114	112	174	42	1	**20879**
3	Auto Tempo	1405	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**1406**
4	Bus	15018	1498	1217	968	1363	2219	3487	3294	2322	2951	1792	1213	2233	1887	123	**41585**
5	Cargo Van	3123	477	278	675	600	396	999	1286	1224	3	1	0	0	0	0	**9062**
6	Covered Van	4505	2033	1250	1916	2422	1940	2673	4068	4386	2529	1688	3350	3845	1638	125	**38368**
7	Delivery Van	11070	869	601	754	949	1531	1928	2207	1884	1292	967	1269	1032	354	37	**26744**
8	Human Hauler	2097	568	145	115	109	502	786	217	211	0	2	0	0	0	0	**4752**
9	Jeep(Hard/Soft)	17839	1699	1242	1105	1582	3110	4217	4712	4863	5038	4450	6927	9350	7175	697	**74006**
10	Microbus	44015	3526	2630	2220	3833	4563	5162	4926	3583	3241	2407	4455	6695	4525	485	**96266**
11	Minibus	8293	135	103	83	136	103	155	158	185	186	133	186	164	122	16	**10158**
12	Motor Cycle	210879	34707	32808	26330	32891	46758	53718	75251	104051	99252	78551	99810	120848	90403	8544	**1114801**
13	Pick Up (Double/Single Cabin)	18688	7128	5069	4814	7185	7711	8370	10248	9598	8748	8024	8514	7753	5451	365	**117666**
14	Private Passenger Car	160170	11421	8179	9232	12972	18423	18013	19570	16318	15016	11150	14321	14946	9687	946	**340364**
15	Special Purpose Vehicle	525	59	28	78	50	66	224	233	500	410	144	123	83	24	6	**2553**
16	Tanker	737	151	85	133	162	143	203	187	323	235	177	157	269	191	18	**3171**
17	Taxicab	29551	52	43	3	301	53	30	3	94	6	0	0	0	0	0	**30136**
18	Tractor	7109	4168	2841	1634	1443	1637	2510	2754	3359	2503	2445	2556	1589	1403	89	**38040**
19	Truck	23836	4078	2740	3390	5704	4334	4306	7010	8725	6228	3327	4336	3267	1818	157	**83256**
20	Others	8793	786	666	651	961	1300	2559	3145	3593	3382	2283	2618	2129	960	119	**33945**
TOTAL		**575501**	**73605**	**60149**	**54348**	**72972**	**95572**	**110206**	**139710**	**171312**	**158407**	**118254**	**150561**	**174812**	**125851**	**11740**	**2093000**

Table 1.1 shows that just 2.46% of all registered motor vehicles are buses and minibuses, despite being the primary mode of transportation for most people in Dhaka City. In contrast, 19.79% of all registered motor vehicles are private passenger cars and jeeps.In contrast, 53.26% of all registered motor vehicles is Motor Cycle. This shows that the number of private automobiles, which are utilized by a small percentage of the population for personal and commuting purposes, exceeds that of buses and minibuses by a factor of more than seven. The quantity of private automobiles has been rising over time.

That being said, a megacity such as Dhaka cannot benefit from the ongoing increase in the number of private automobiles. Traffic congestion is exacerbated by this surge because of space constraints. Traffic congestion is mostly caused by private automobiles, even when there aren't many buses on the road.



Figure1.1Gulshan-1,Dhaka
[Date: FEB 08,2024]

Except for the buses owned by BRTC (Bangladesh Road Transport Corporation), there were no passenger buses running throughout the country on December 20, 2023. Passenger buses were not present, but traffic congestion persisted, demonstrating that private automobiles on their own had the capacity

to create traffic congestion. Figure 1.1 provides good evidence for this claim by showing how private automobiles contribute to traffic congestion. These numbers also show that Dhaka's present transportation system is ineffective.

Bangladesh is losing 6 to 10 percent of its GDP due to traffic congestion, with Dhaka traffic delays accounting for 3 (2.9%) [Apr 3, 2024]of this loss. This information is reported by the Dhaka 4Tribune. An estimated 5 million working hours were lost in Dhaka as a result of traffic congestion, costing the economy $4.35 billion a year and $6.5 billion in 2020, according to BUET's 2020, Accident Research Institute (ARI). Another research by the BRAC Institute of Government and Development estimated that Bangladesh lost 11.4 billion dollars annually in 2018 as a result of traffic delays.

This figure was determined by adding together the additional operational costs of cars and human labor. In 2020, traffic congestion alone costs Tk 137 crore in lost working hours per day, while lost working hours due to accidents during peak hours, excess fuel consumption, and environmental impact added up to a daily loss of 153 crore BDT for Bangladesh, according to ARI's study. Establishing a reliable transportation infrastructure is therefore essential to removing this obstacle and ensuring the nation's overall prosperity**.**

Shahbagh:

The location of Banga Bandhu Sk. Mujib Medical University is at Shahbagh. Figure 3.1 shows this. Shahbagh's lively atmosphere is further enhanced by the fact that it is the location of several business headquarters. Interestingly, Bardem Hospital is among Bangladesh's most illustrious and established medical facilities.



Figure 1.2 Survey location of Shahbag

1.3The Bus's Space Efficiency

Achieving an efficient transportation system requires making optimal use of the road space. A reconstructed snapshot taken in Canberra, Australia, in Posted 7 Feb 2020 provides an illustration of how diverse means of transportation—bus, bicycle, and private vehicle—utilize space efficiently. Ninety volunteers participated in the shot, which shows how much room each type of transportation needs to carry the same amount of passengers.Buses are the most space-efficient method of transportation out of the three, as Figure 1.3 makes abundantly evident. While taking up comparatively less space on the road, they may carry more passengers. However, because they take up a lot of room and add to traffic congestion, private automobiles are the least efficient kind.

Given the limited amount of accessible road space, this comparison highlights the need of promoting and emphasizing bus transit as a more sustainable and efficient choice. We can lessen traffic congestion and build a more effective transportation system by promoting the use of buses and decreasing reliance on private automobiles.

https://9gag.com/gag/a2RG6Be



Figure 1.3 Space efficiency of bus

A popular transportation image was replicated in Canada in April 2020 with the help of ninety volunteers. The purpose of this image was to show how much room is needed for the same number of people by various forms of transportation, including a bus, a bicycle, and a private automobile. Buses are more efficient as a mode of transportation than bicycles and private automobiles, as seen in Figure 1.3, which presents a clear representation of the findings.

Out of the three modes of transportation, buses are the most space-efficient, as the photo plainly shows. They take up less space on the road and can carry more passengers. Private automobiles, on the other hand, are the least efficient type; they need a lot of room and frequently add to traffic jams.

This restored image is a powerful illustration of the value of encouraging bus travel and lowering dependency on personal automobiles. We can better manage road space, reduce traffic congestion, and build a more sustainable transportation system by giving buses priority over other forms of transit.

1.4 Reliance on Public Transportation

As one of the most populous cities in the world, Dhaka is notable for having a large proportion of middle-class residents. These people mainly depend on public bus services since they are affordable, and it is their preferred form of transportation because of their low financial resources. As a result, there's a demand for using public buses.

Objectives

The objectives of this study are-

. To investigate the key service factors affecting bus service quality.

. To explore the overall passenger satisfaction on bus service quality.

CHAPTER 2

Literature Review

2.1 Introduction

Since it makes it easier for people to move around on a daily basis, public transportation is an essential component of both industrialized and developing nations. It fulfills several functions, one of which is to offer passengers economical, safe, effective, and convenient transportation services [1]. When traveling to different locations, including places of employment, educational institutions, retail establishments, and leisure facilities, public transportation is essential [2]. Effective use of public transportation advances a nation's overall growth. As a result, using public transit more often has gained importance on everyone's agenda[3]. It's difficult to draw in new consumers, especially those who drive their own cars. Delays, dirty and unappealing stations, a lack of safety and security, lengthy wait times, a lack of proper travel information, unprofessional staff conduct, and a lack of facilities for people with disabilities are some of the reasons behind this. Modern transportation consumers anticipate services that are quick, cozy, economical, dependable, secure, and safe [4]. For this reason, providing excellent customer service is crucial to meeting and satisfying consumer demands in public transit. [5] The capacity of a company to meet or exceed the expectations of its clients is referred to as service quality. It symbolizes the discrepancy between the expectations of customers and how they see the services provided by providers.(5a). Customer discontent arises from perceived quality that is not up to par when performance falls short of expectations [6]. Since it favorably affects passengers' attitudes and intentions regarding their behavior, service quality has been found to be a factor of customer loyalty [7]. It has been discovered that increasing satisfaction levels requires improving the caliber of public transportation services.[8] Measuring customer satisfaction involves contrasting the perceived performance or result of a good or service with the expectations of the customer. If the performance does not live up to the expectations, the clients are not happy. Customers are happy when a performance lives up to expectations; when it does not, they are extremely happy or thrilled [9].

In conclusion, a crucial indicator of whether a good or service has met the demands and expectations of its users is customer satisfaction. While matching or surpassing expectations produces pleasure or even joy, failing to do so results in unhappiness[10]. Thus, it is essential to deliver excellent public transportation services that live up to client expectations if you want to increase customer happiness and loyalty. In order to do this, it is vital to make sure that public transportation is comfortable, safe, dependable, and meets the needs and preferences of today's commuters. Public transportation providers may enhance overall customer happiness and promote increased service utilization by tackling challenges pertaining to both service quality and consumer satisfaction. Assessing user satisfaction is seen to be the best method for determining how well public transportation services are doing. Customer expectations, perceptions, and experiences provide the foundation for evaluating the quality of services.[11]. The best people to judge the level of service that transportation organizations offer are its users [12]. The SERVQUAL scale, often referred to as the gap model, was created by researchers as a tool for measuring service quality. It enables the evaluation of several aspects that affect consumers' overall impressions of quality. Customers score these characteristics on a five-seven-point Likert scale[13] and include communication, security, competence, responsiveness, and reliability. Numerous studies have modified and applied the SERVQUAL model to assess passenger satisfaction with public transportation in various locations throughout the globe.14] Researchers have questioned the conceptual connection between customer happiness and service quality, despite the fact that they may appear comparable as performance metrics. Research has indicated that there is a conceptual difference between these two notions [15].

2.2 Literature Review Overview

The following succinctly describes the distinctions between customer satisfaction and service quality:

1. Judgment nature: While customer satisfaction evaluations are subjective and emotional, service quality judgments are cognitive and analytical.

2. Specificity of judgment: While customer happiness evaluations are more comprehensive, service quality judgments are more focused on important characteristics.

3. Price Influence: While service quality is typically not affected by price, pricing does have an impact on satisfaction .

4. Purchase requirement: While quality assessments can be done without a purchase, satisfaction assessments necessitate one .

5. The role of expectations is twofold: although expectations predict satisfaction, they are the basis for determining service quality .

6. Customer satisfaction and service quality are connected, even if they are different. Positive word-of-mouth, repurchase intentions, and customer loyalty are all positively impacted by both variables .

7. While service quality has both direct and indirect impacts on repurchase intentions through satisfaction, satisfaction has a direct influence on post-purchase behavior .

8. Customer pleasure from high service quality results in loyalty, repeat business, and favorable long-term effects .

The following succinctly describes the differences between customer satisfaction and service quality:

i. Customer satisfaction is connected to affective evaluation (emotional), but service quality is related to cognitive judgment (emotional) [Iacobacci et al., 1994].

ii. While customer satisfaction evaluations are more comprehensive in scope, service quality evaluations are more detailed and concentrate on important characteristics.

iii. While price may affect satisfaction, service quality is typically not affected by price

iv. While evaluating service quality does not always need a purchase, determining customer satisfaction does involve one.

v. While expectations are a predictor of satisfaction, they form the foundation for determining service quality.

Customer satisfaction and service quality are related, even if they are different. Positive word-of-mouth and repurchase intentions are positively impacted by both variables .While service quality both directly and indirectly improves repurchase intentions through satisfaction, satisfaction also has a favorable impact on post-purchase behavior.Perceived service quality functions as a prelude to contentment, and subsequent satisfaction results in repurchase and long-term loyalty. High service quality therefore leads to consumer satisfaction and repeat buy intentions.

As previously stated, maintaining a high standard of service quality is necessary for public transportation to fulfill the demands of its users .To do this, a public transportation evaluation is required. Research carried out across several nations, with a primary focus on bus services, has evaluated customer satisfaction and the factors influencing service quality, with varying outcomes.

According to a Greek research, for instance, the main priorities should be a well-organized and coordinated transportation environment, in addition to other features like waiting times, frequency of service, accessibility, and cleanliness of the vehicles. Another research conducted in Qatar discovered that although the buses were inexpensive and clean, the public bus customers did not find the current bus transportation services suitable, mostly because of problems with reliability.

According to a research conducted in Nigeria, people were not happy with the quality of public bus transportation in Abuja, with the exception of aspects pertaining to driver and conductor behavior and passenger safety. According to a similar study conducted in Ghana using the SERVQUAL approach, passengers were unsatisfied with 15 out of 29 assessed qualities, indicating that they thought the intercity bus services were of low quality. These findings highlight the necessity for bus operators to raise customer satisfaction levels by enhancing their offerings.

The Dhaka Urban Transportation Project, according to a World Bank news release from 2005, emphasized how Dhaka is unlike other cities of its size in that it lacks a well-organized bus or mass transit infrastructure. While guaranteeing proper access and mobility, the establishment of an efficient and successful urban transportation infrastructure may encourage urban rejuvenation and growth.

Cities are frequently the main engines of economic growth in emerging nations, and Dhaka's transportation infrastructure may be greatly improved to increase productivity and efficiency. As a result, a lot of research has been done on Dhaka City's bus system.

According to a survey, low- and middle-class people in Dhaka mostly use public buses as their main form of transportation. But if buses are made better, wealthy people could start choosing buses over private vehicles, which would eventually ease traffic congestion. Regretfully, Dhaka does not have a bus system that is well-scheduled and coordinated. Due to traffic congestion, inefficiencies, and unsafe driving practices, the present bus service is unable to fulfill the increasing demand.

Another study survey that was carried out in five different parts of the city of Dhaka used a discrete choice logit model to evaluate the data. According to the data, buses require the least amount of space per passenger when compared to private vehicles, which highlights the important contribution that public buses make to easing traffic congestion. Nevertheless, the survey also showed that a majority of the participants expressed dissatisfaction with the existing state of the public bus service. In order to manage the growing number of traffic, the transportation system must be upgraded. Public transit should be made more appropriate, and the infrastructure supporting it should be dependable.

The ordered profit model, multinomial discrete model, least square regression model, and multinomial logit model are some of the models now used to evaluate the service quality of mass transportation. But because the ordered probit model offers benefits over other models, this study has chosen to use it for analysis. Given that the dependent variable accepts more than two values with a natural ordering, the ordered probit model is particularly well suited. Uneven discrepancies between the dependent variable's ordinal categories can also be explained by this approach. While it is feasible

to employ unordered probability models such as normal multinomial discrete models, doing so would lead to a loss of efficiency since the ordered character of the variable would be ignored and treated like nominal data.

The ordinal character of the dependent variable would also not be sufficiently addressed by other techniques like the multinomial logit model or simple least square regression. As a result, it has been acknowledged that the ordered probit model is a valuable tool for researching the factors impacting transit ridership as well as the perceived service quality of mass transportation.

In conclusion, there is much need for development in Dhaka's transportation infrastructure, especially in the area of bus services. To satisfy the increasing demand, lessen traffic congestion, and improve the appropriateness of public transportation, it is imperative to improve the infrastructure, scheduling, and quality and dependability of public transportation. The use of suitable analytical models, such the ordered probit model, facilitates a thorough comprehension of service quality and its influence on transit usage.

Because of its benefits over alternative models, the ordered probit model is frequently employed in a variety of research projects. It has proven especially useful in studies looking at how passengers' characteristics and transit and service qualities relate to the quality of the service. Furthermore, this model has been applied in other fields, including the analysis of seismic intensity data, the prediction of fragility in the banking industry, and the analysis of accident severity on Bangladeshi roadways.

It abundantly evident how much the people of Dhaka rely on public bus services for their everyday transportation requirements. These images, which highlight the degree of dependency on bus services, were taken on June 18, 2021, from an internet portal. It is noteworthy that on July 28 and 29, 2021, passenger buses operated by BRTC were the only ones accessible nationwide owing to unforeseen circumstances.It is imperative to improve the quality of bus services since the people of Dhaka rely heavily on these services. A thorough evaluation of the quality of bus service is required in order to accomplish this improvement.

2.3 Summary

In conclusion, there is a tight relationship between service quality and customer pleasure even if they are two different ideas. To satisfy the demands and expectations of its patrons, public transportation systems must aim for excellent service quality. Enhancing public transportation experiences and finding opportunities for improvement require measuring consumer happiness and service quality.

CHAPTER 3

Research Methodology

3.1: Introduction:

The purpose of this research is to predict and analyze the bus service quality in Dhaka City. This study adopts a two-step methodology. The first part involves data collection through a questionnaire survey, which includes specific variables. These variables have been selected based on a literature review and expert opinions. The second part focuses on model development and data analysis. Prior to analysis, the collected data is carefully examined.

The model aims to uncover the relationship between overall satisfaction with bus service and various service attributes. The questionnaire survey gathers the opinions of passengers who utilize bus services. Out of the 46 variables, a total of 40 variables are used to capture the user's perspective on bus service.

The questionnaire survey was conducted face to face at fifteen locations within Dhaka city. The locations where the survey took place are as follows:

- Shahbagh
- Gulshan-1
- Mohammadpur
- Azimpur
- Agargaon
- Bijoy Saroni
- Kuril Bishwa road
- Airport
- Uttara

3.2 Details of Questionnaire Survey & Survey Schedule:

The questionnaire survey consisted of seven main parts, excluding user information. Here is a breakdown of each part:

Part A: Trip Characteristics

- Questions about the convenience of the service
- Trip purpose
- Time needed to reach the bus stop

Part B: Quality of Service

- Questions about the frequency of service
- Punctuality of the transport
- On-road movement flexibility
- Sitting arrangement
- Speed of the bus
- Availability of information
- Ticketing system
- Transportation cost
- Reason for using the bus

Part C: Quality of Bus

- Questions about the fitness of buses
- Physical condition of the bus
- Cleanliness of the bus
- Seat comfort level
- Noise level
- Movement flexibility inside the bus
- Lighting facility during evening and night

Part D: Quality of Public Bus Stop

- Questions about the safety of the bus stop
- Cleanliness of the bus stop
- Condition of the bus stop
- Accessibility of the bus stop

Part E: Safety and Security of Bus

- Questions about the personal safety of passengers
- Easily accessible entry and exit points
- Security of passengers during off-peak periods
- Driving safety (driver's skills)

Part F: Staff Behavior

- Questions about the demeanor and courtesy of drivers and helpers

Part G: Reliability and Accessibility of Bus

- Question about the reliability of the local bus service
- Waiting time for the service
- Travel time during office days and holidays

These parts cover various aspects of the bus service, including trip characteristics, quality of service, bus quality, bus stop quality, safety and security, staff behavior, and the reliability and accessibility of the bus.

List of Variables

1	Often to Travel by Local Bus	21	Seat Comfort Level
2	Convenience of Service	22	Physical Condition
3	Time for reach Bus Stop	23	Rate the Quality of Bus Services
4	Trip Purpose	24	Safety at Bus Stop
5	Frequency of Service	25	Cleanliness
6	Punctuality of Transport	26	Condition
7	Movement Flexibility (On Road)	27	Accessibility of Bus Stop
8	Sitting Arrangement	28	Mode to Get Bus Stop
9	Speed of Bus	29	Security in Bus stops (Others)
10	Availability of Information	30	Levels of Personal Safety
11	Paying Fare/Ticketing System	31	Entry and Exit Facilities
12	Transport Cost	32	Security of Passengers (Off Peak)
13	Reason of Using Bus	33	Driving Safety (Driver's Skill)
14	Fitness of The Bus	34	Behavior of Driver
15	Seat Condition	35	Courtesy of Helpers/Contactors
16	Cleanness of Bus	36	Reliability of Local Bus Services
17	Buses are always crowed (Load Factor)	37	Waiting Time of the Service
18	Lighting Facility	38	Accessibility of Bus
19	Noise level of the Bus	39	Travel Time (Office Days)
20	Movement Flexibility (Inside Of Bus)	40	Travel Time (In Holidays)

Table 3.1 List of Variables

A survey schedule was prepared after selecting the locations for the survey in Dhaka city to ensure the proper completion of the questionnaire. The schedule for the survey is presented in Table 3.3.

Table 3.2 Questionnaire Survey Schedule in Dhaka City

Serial	Nameofthelocation	Date	Time(Start)
01	Shahbagh	05/01/2024	08.00am
02	Gulshan-1	12/01/2024	11.00pm
03	Mohammadpur	16/01/2024	10.30am
04	Azimpur	22/01/2024	01.30pm
05	Agargaon	06/02/2024	10.00am
06	BijoySaroni	10/02/2024	05.00pm
07	Kuril Bishwa Road	20/01/2024	09.30am
08	Airport	30/01/2024	03.00pm
09	Uttara	28/01/2024	11.00am

3.3 Details of Selected Field Survey Locations in Dhaka City:

3.3.1: Shahbagh:

Shahbagh, depicted in Figure 3.1, is a significant neighborhood in Dhaka City. It holds prominence as a junction that connects two contrasting sections of the city, namely Old Dhaka and New Dhaka. Shahbagh is also a major public transport hub, facilitating convenient travel for residents and visitors. This area is home to several renowned educational and public institutions, including the University of Dhaka, Dhaka Medical College, Bangabandhu Sheikh Mujib Medical University, and Bangladesh University of Engineering and Technology. With its central location and the presence of these prestigious institutions, Shahbagh plays a pivotal role in the educational and intellectual landscape of Dhaka City.



Figure 3.1 Survey location of Shahbagh

3.3.2: Gulshan-1:

Gulshan-1, depicted in Figure 3.2, is situated in the Easthern region of Mohakhali in Dhaka City. It is characterized by having some of the busiest roads in the city. These well-traveled roads serve as important routes for pedestrians to reach significant destinations, including All Diplomatic zone, Hazrat Shahajalal International Airport, Uttara, and Gazipur. Gulshan-1 strategic location and well-connected road network make it a crucial hub for transportation and facilitate convenient access to key areas within and outside Dhaka City.



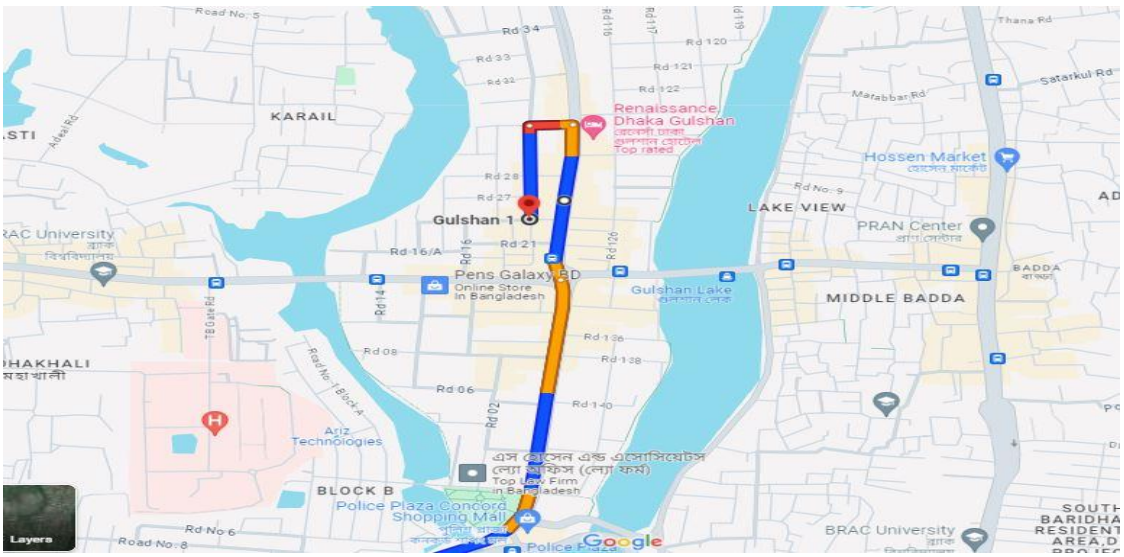


Figure 3.2 Survey location of Gulshan-1

3.3.3: Mohammadpur:

Mohammadpur, depicted in Figure 3.3, is a thana (administrative unit) located in the Dhaka District and Important Bus Stand of Bangladesh. Situated within the division of Dhaka, it holds significance as one of the primary residential areas in Dhaka city. While Mohammadpur initially flourished as a residential neighborhood, it has gradually witnessed the development of commercial establishments as well. Today, Mohammadpur strikes a balance between residential and commercial spaces, catering to the needs of its residents and serving as a bustling hub within Dhaka city.



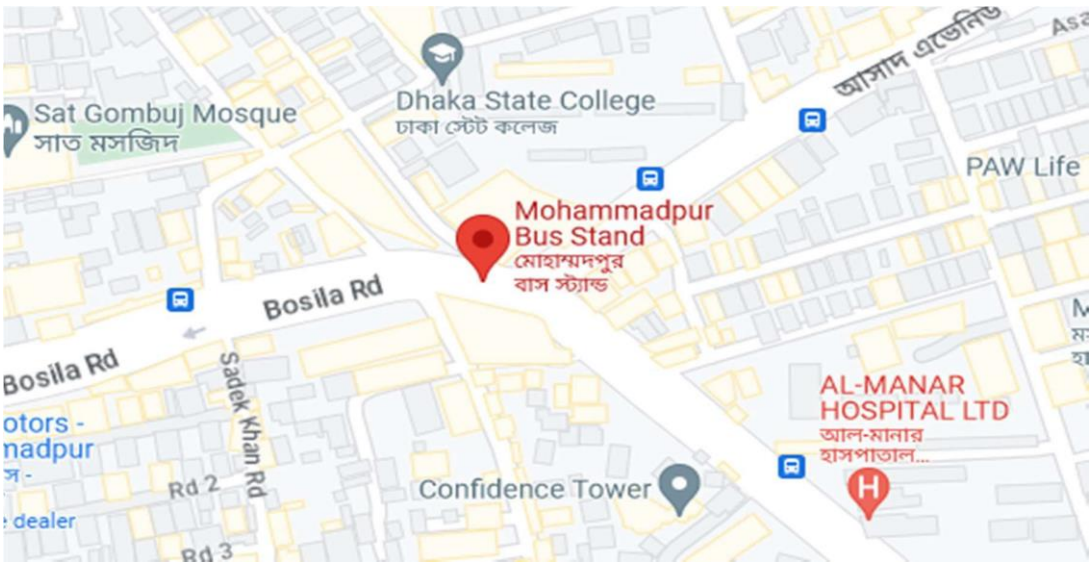


Figure 3.3 Survey location of Mohammadpur

3.3.4: Azimpur :

Azimpur, illustrated in Figure 3.4, is a significant north-south road that connects the Mirpur in Dhaka. It serves as one of the thorough in the city, traversing through prominent areas such as Gulistan Bus stand, Sadarghat,Hanif Flyover, BUET,Dhaka University, Lalbaghkella,NewMarket,Dhanmondi Shyamoli, Mohammadpur and Known for its bustling nature, Azimpur is among the busiest roads in Dhaka City.



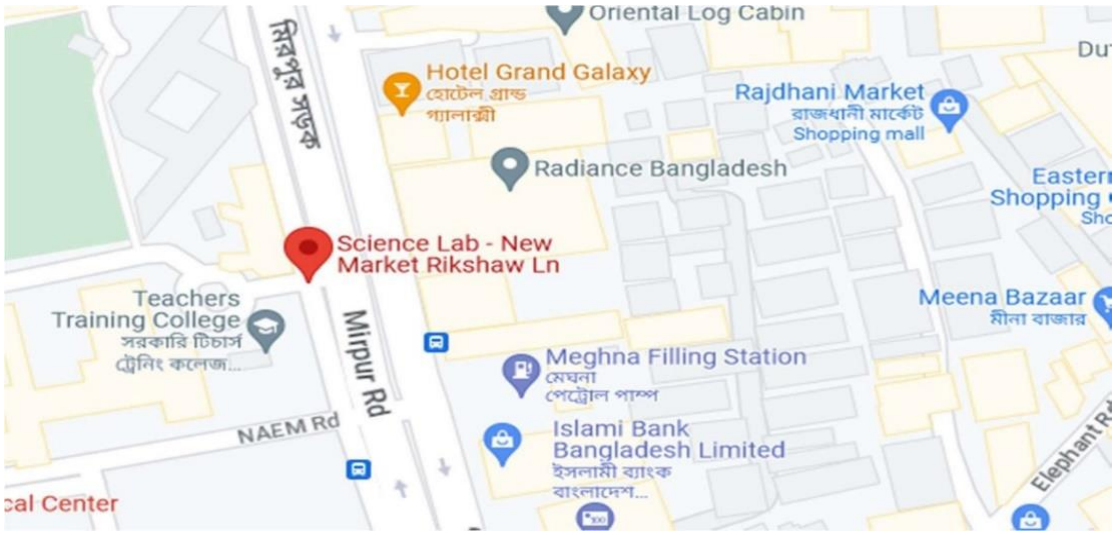


Figure 3.4 Survey location of Azimpur

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3.3.5: Agargaon:

Agargaon, depicted in Figure 3.5, stands as one of the largest Government Offifes area in Dhaka City. It is encompassed by various neighboring areas, including Kurmitola Airport and Dhaka cantonment to the East, Kafrul Thana, Mirpur-10 to the North site, Shyamoli, Adabor Thana and Gabtoli Busstand to the West, and National Parliament Bhabon & Mohammadpur Thana to the South. Mirpur-10 circle serves as a prominent roundabout within Dhaka City, connecting major roads in the Mirpur area. It serves as a central location where buses of all routes converge, making it a crucial transportation hub. Agargaon holds significance in facilitating convenient travel and transportation for residents and visitors alike in Dhaka City.



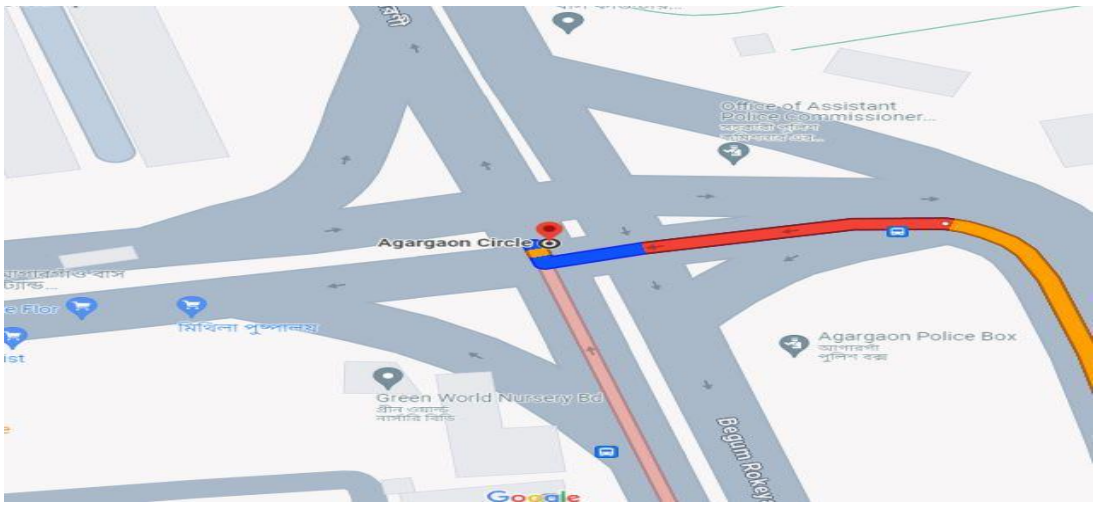


Figure 3.5 Survey location of Agargaon

3.3.6: BijoyShorony:

Bijoy Shorony in Figure 3.6 is a bustling and heavily populated area in Dhaka city, known for being a major transportation hub. It serves as a gateway to various parts of the city, making it a crucial transportation junction. Figure 3.1 illustrates the survey location, Bijoy Shorony, which holds significant importance in the transportation network of Dhaka city.



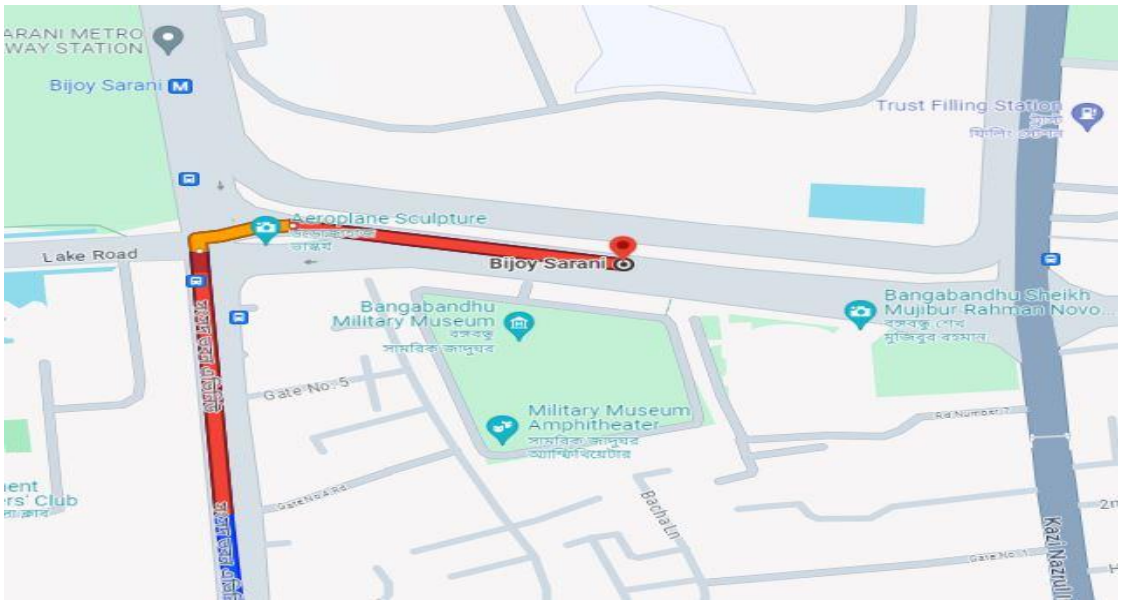


Figure 3.6 Survey location of BijoyShorani

3.3.7: Kuril Bishwa Road

Kuril Bishwa road, depicted in Figure 3.7, is an area located within Khilkhet, Dhaka. It is widely recognized as a bustling and crowded place, known for its vibrant atmosphere. Kuril Bishwa road is home to numerous institutions, including schools, colleges, private universities, and hospitals, making it a hub of educational and healthcare facilities. Additionally, this area boasts a multitude of shops and Jamuna Future Park, shopping malls, offering a diverse range of retail options. With its lively ambiance and diverse amenities, Kuril Bishwa road has established itself as a prominent location within Dhaka city.



Figure 3.7 Survey location of Kuril Bishwa Road

3.3.8: Airport Road:

Airport Road, showcased in Figure 3.8, holds significant importance as a vital area within Dhaka City. It serves as a hub for numerous important offices and institutions. The Hz.S.International Airport, situated in this area, is one of the most crucial area in Dhaka City. Every day, a large number of people, especially from the greater Mymensingh region, utilize this Road for their travel needs. Airport Road is ordered by Banani to the south, Gazipur to the north, and Hazz camp to the east, further adding to its prominence and connectivity. With its strategic location and essential facilities, Airport Road plays a pivotal role in the transportation and commercial activities of DhakaCity.



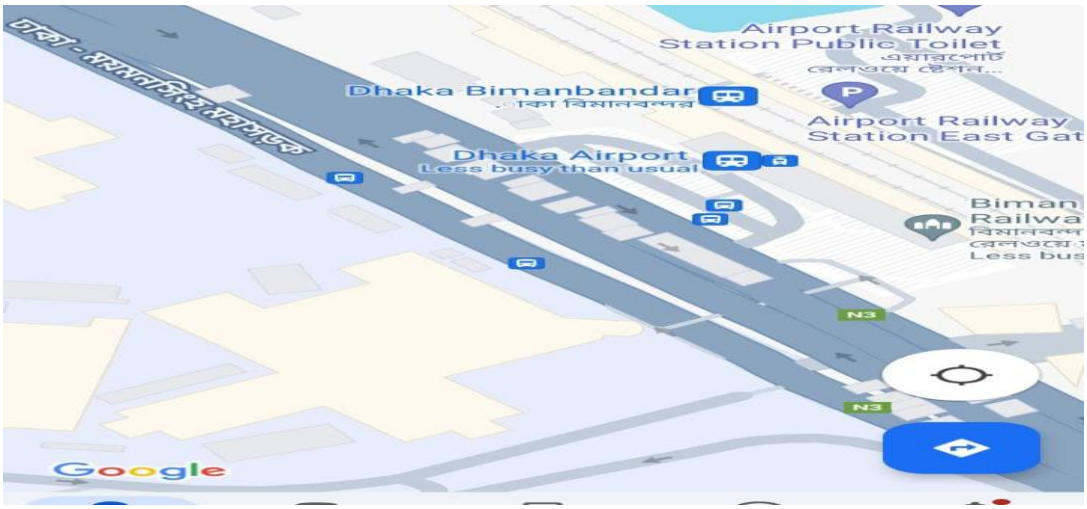


Figure 3.8 Survey location of Airport road.

3.3.9: Uttara :

Uttara as depicted in Figure 3.9, holds significant importance as an essential Airport road in Dhaka City. It serves as a vital link connecting Airport Road and Gazipur Tongi Road. This bustling thoroughfare is lined with a plethora of shops, hospitals, and malls, including Raj Laxmi Complex, which is one of largest shopping centers.



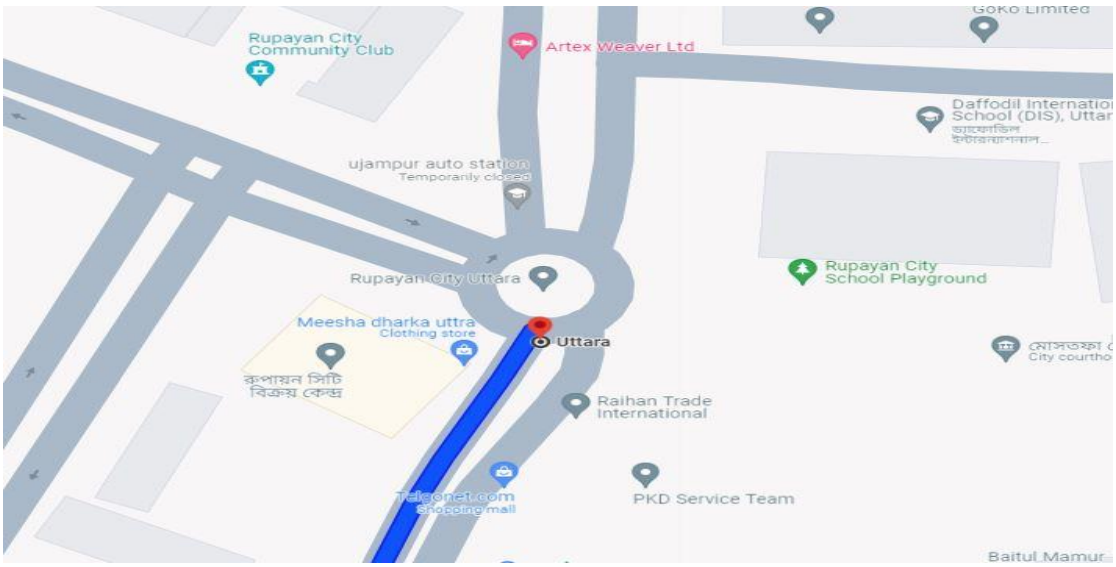


Figure 3.9 Survey location of Uttara

3.4 User Information

3.4.1 Demographic Information about Public Bus Service Users

For this study, a team of 10 surveyors was involved in collecting data from 9 different locations in Dhaka City. After careful scrutiny, a total of 956 data points were selected and included in this study. The demographic information of the respondents has been presented in Table 3.4.

Table3.3DemographicInformationaboutBusServiceUsers

Characteristics	Statistics	No.oftheRespondent(Total :151)	Percentage
Gender	Male	133	88%
	Female	18	12%
	Others	2	4%
Age	10y-20y	02	1%
	21y-30y	110	73%
	31y-40y	29	19%
	41y-50y	06	4%
	51y-60y	01	0.66%
	>60	02	1.3%
Occupation	Students	43	28%
	Private Service	81	54%
	Public Service	18	12%
	Housewife	02	1.3%
	Labor	04	2.6%
	Businessman	01	0.66%
Salary Range(BDT)	<10000	24	16%
	10000-30000	73	48%
	30000-50000	31	20%
	50000-70000	07	5%
	>Others	12	8%
Main Mode of Travel	Bus	132	87%
	MetroRail	04	2.65%
	Rickshaw	08	5.3%
	Para-transit	05	3%
	Motor/Bi-	09	6%
Allocation for Monthly Travel Expenditure	1%~10%	94	62%
	11%~20%	36	24%
	21%~30%	12	8%
	>30%	08	5%

[1 USD = 107.20 BDT (Updated on May18, 2023)

3.4.1 Analysis of Demographic Information of Public Bus Service Users

According to the gender classification presented in Figure 3.10, the data indicates that approximately 88% of the respondents in this study are male, while 12% are female.

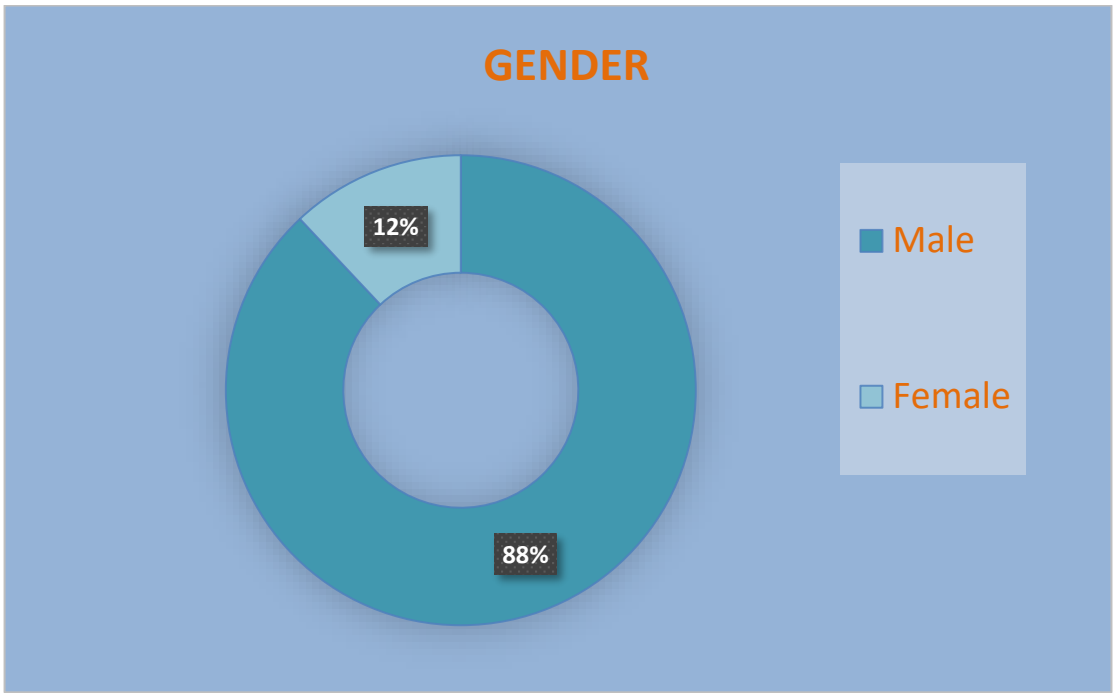


Figure 3.10 Users classification according to gender

As depicted in Figure 3.11, the age groups of users are classified accordingly. The data reveals that 1% of the users fall within the age range of 10-20 years old, 73% of the users fall within the age range of 21-30 years old, indicating a significant proportion of young users. Furthermore, 19% of the users are aged between 31-40 years old. 4% of the users are aged between 41-50 years old. On the other hand, senior citizens over the age of 50+ comprise the smallest percentage of users, This can be attributed to the fact that older individuals tend to have reduced mobility and may not frequently travel for work- related purposes, resulting in their lower representation among bus service users.

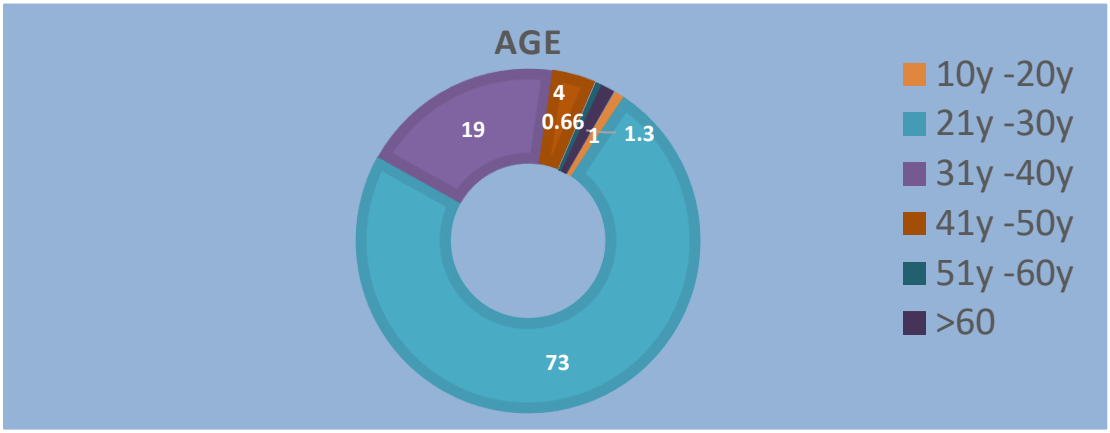


Figure 3.11 Users classification according to age

According to the occupation classification presented in Figure 3.12, the data reveals that the majority of bus users are students, accounting for 30% of the respondents. Additional 53% comprises private service holders. Another 12% are public service holders .Conversely, the occupation group with the least representation among bus users is labor, making up only 14% of the respondents and others 14% This suggests that students and private service holders are the primary user groups of the bus service, while the proportion of laborers utilizing this mode of transportation is relatively lower.

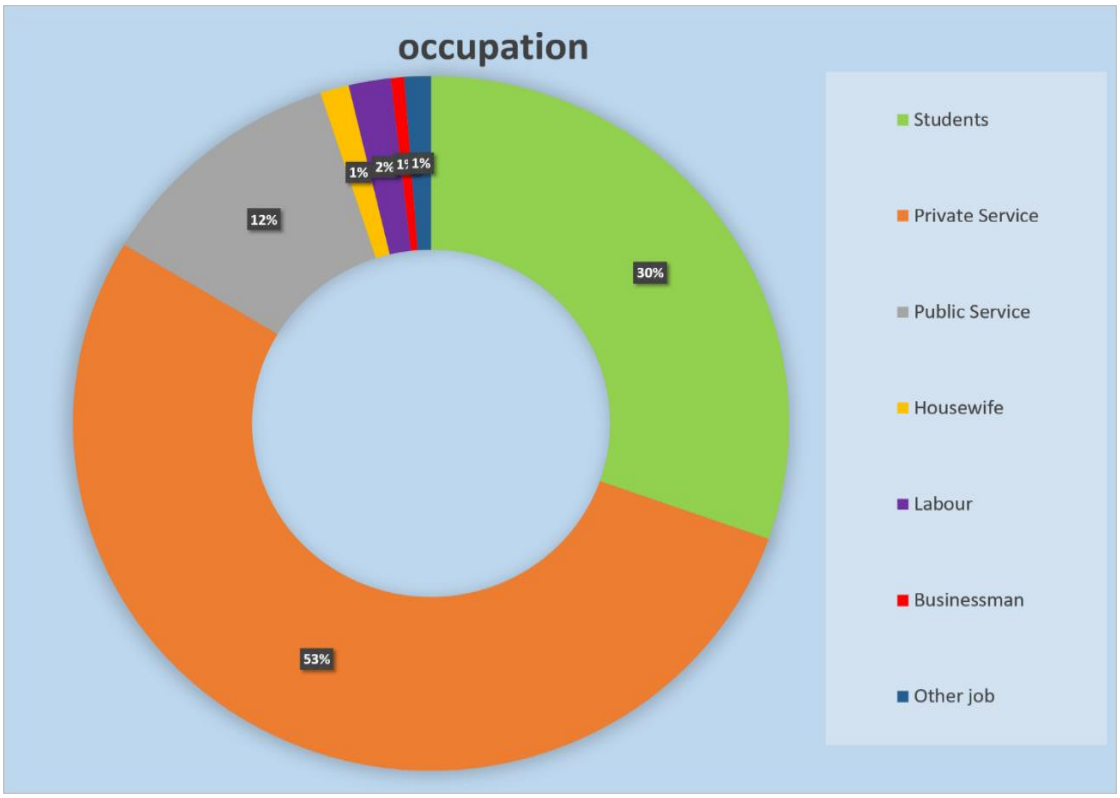


Figure 3.12 Users classification according to occupation

Based on the salary range classification depicted in Figure 3.13, the data reveals that the majority of users, comprising 53% of the respondents, fall within the salary range of BDT10000-BDT30000. On the other hand, only a small percentage (2%) of the users reported earning more than BDT100000. This indicates that a significant portion of bus users in the study have moderate to average income levels, while a smsller proportion falls within the higher income bracket.

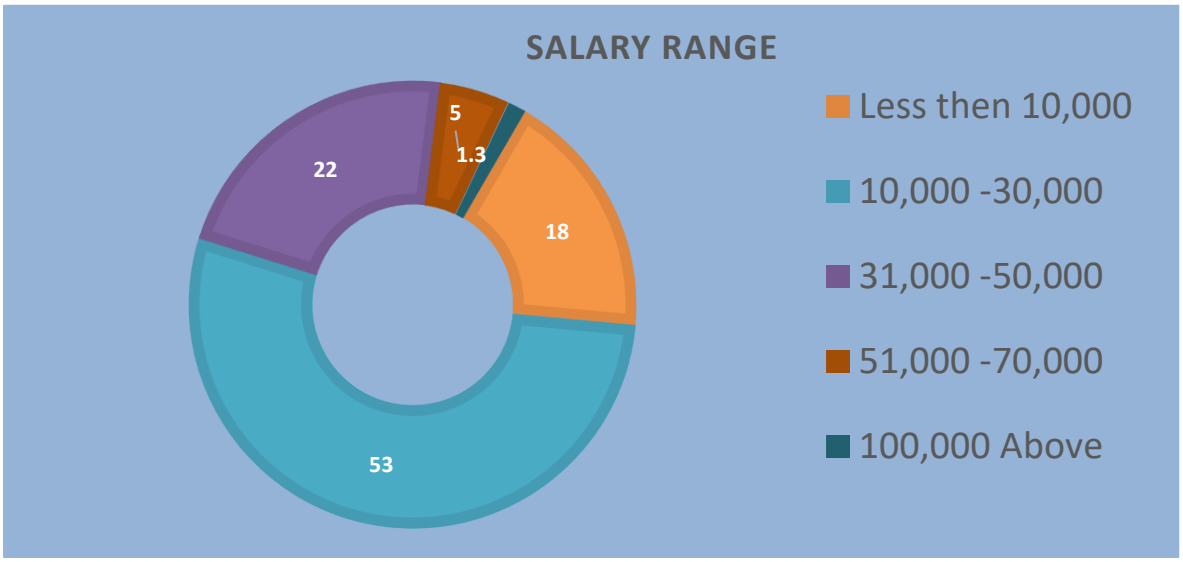


Figure 3.13 Users classification according to Salary Range

Based on the classification of users according to their main mode of travel, as shown in Figure 3.14, the majority of the respondents (89.10%) in this study reported using the bus as their main mode of travel. Conversely, only 3.20% of the respondents indicated using Para-transit as their mode of travel, which was the least preferred option among the respondent.

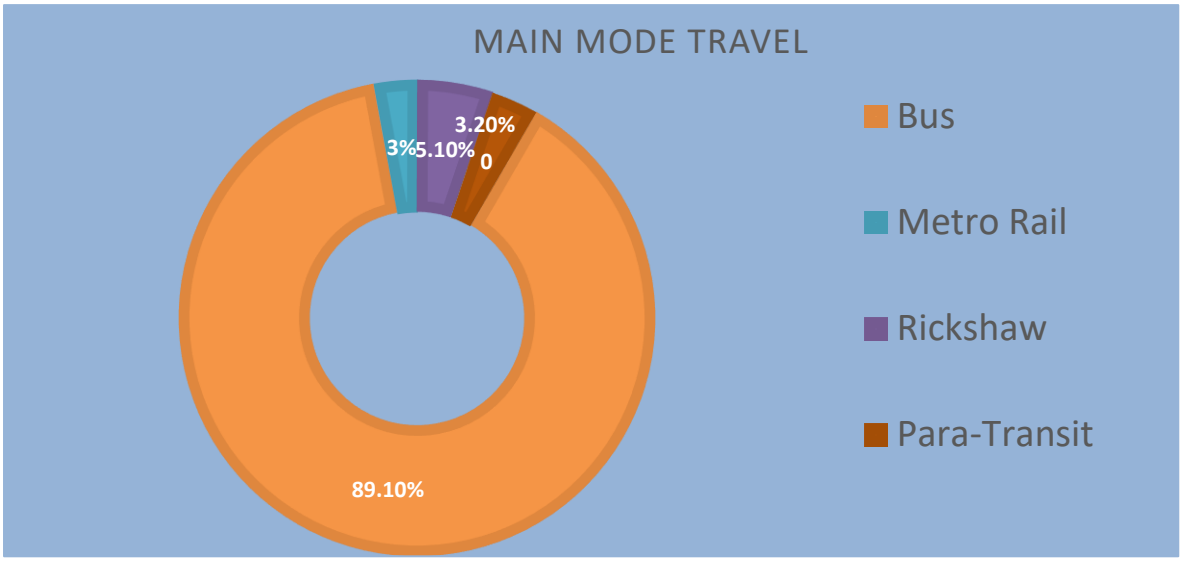


Figure 3.14 Users classification according to main mode of travel.

According to the classification of users based on monthly expenditure shown in Figure 3.15, the data indicates that approximately 62% of users have a monthly travel expenditure ranging from 1% to 10% of their overall expenses. Additionally, 25% of users reported allocating 11% to 20% of their monthly expenditure towards travel costs. Conversely, only a small proportion (3%) of users have a monthly travel expenditure exceeding 40% of their overall expenses. This suggests that the majority of users tend to allocate a moderate percentage of their monthly budget towards travel expenses, while a smaller portion has relatively higher travel expenditures.

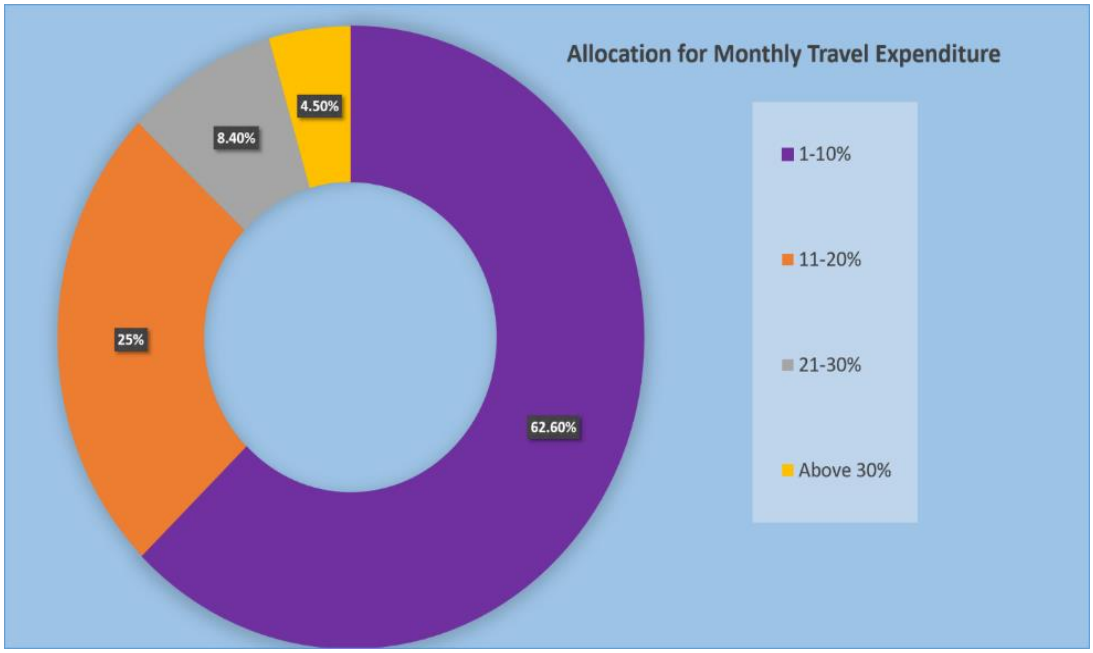


Figure 3.15 Users classification according to monthly travel expenditure

3.5 Conclusion

This chapter provides an overview of the survey locations, including their names and details. It also presents the survey schedule used to conduct the study. Additionally, the chapter discusses the total number of respondents and provides an analysis of their demographic information. The demographic information is analyzed in terms of gender, main mode of travel, age groups, occupation, salary range, and monthly expenditure. The findings of the demographic analysis are visually represented using pie charts to provide a clear understanding of the distribution within each category.

Chapter-4

Data Analysis

4.1 Genarel

The primary aim of this chapter is to examine the gathered data. It encompasses the feedback received from bus users and involves conducting an analysis of the questionnaire survey data.

Process of Data Analysis

A random selection of respondents was made from fifteen various locations across Dhaka City to conduct the survey. After careful scrutiny, data from 956 respondents were chosen and stored in Microsoft Excel. The purpose of analyzing these data was to determine the overall perception of bus service quality in Dhaka City. By utilizing this dataset, the estimation of choice model parameters was performed in order to generate the most suitable solution that aligns with the input data.

4.2 Users Rating About Public Bus Service in Dhaka city:

Question 1: How often do you travel by public bus?

The survey included a question regarding the frequency of public bus travel among the respondents. According to the findings, 57.60% of the participants reported using the bus on a daily basis. Additionally, 16% stated that they travel by bus more than once a week, but not every day. Only a small proportion, 3% of the respondents, indicated that they use the bus less frequently, representing the lowest response rate. Figure 4.1 illustrates the users' opinions regarding the frequency of bus travel.

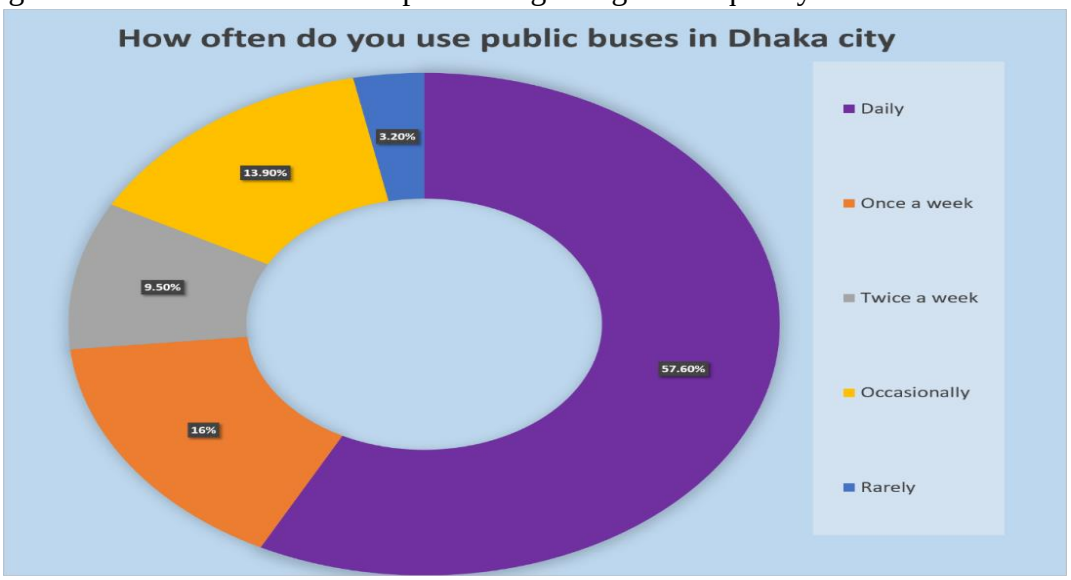


Figure 4.1 Users opinion about frequency of travelling by bus

Question 2: How was the convenience of service?

The survey included a question regarding the convenience of the bus service, as perceived by the users. The results revealed that 36% of the respondents considered the convenience of service to be poor. Additionally, 11% of the participants rated it as satisfactory. Interestingly, only a mere 3% of the respondents regarded the convenience of service as excellent. Figure 4.2 provides a graphical representation of the users' opinions concerning the convenience of the bus service.

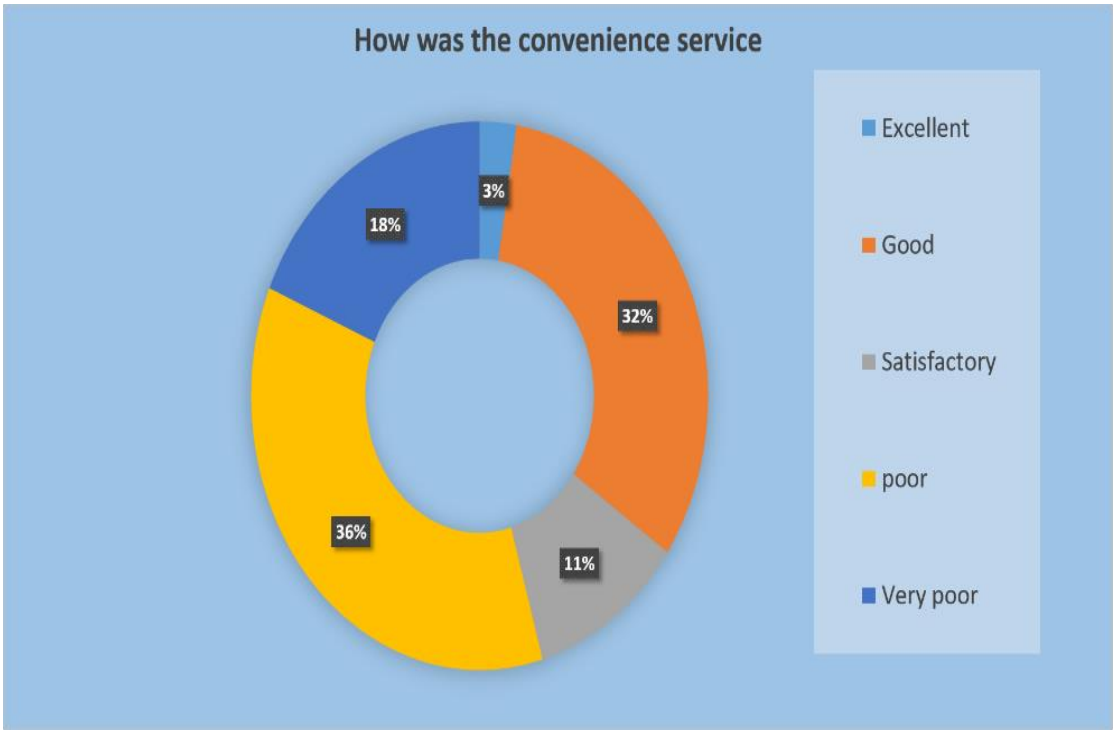


Figure 4.2 Users opinion about convenience of service

Question 3: How long it takes to reach bus stop?

The survey included a question about the time it takes for users to reach the bus stop. The responses revealed that 49% of the participants reported taking approximately 10 minutes to reach the bus stop, while 19% stated that it takes them around 20 minutes. Interestingly, a small percentage, only 15% of the respondents, indicated that it takes them 5 minutes to reach the bus stop. Figure 4.3 illustrates the users' opinions regarding the time required to reach the bus stop.

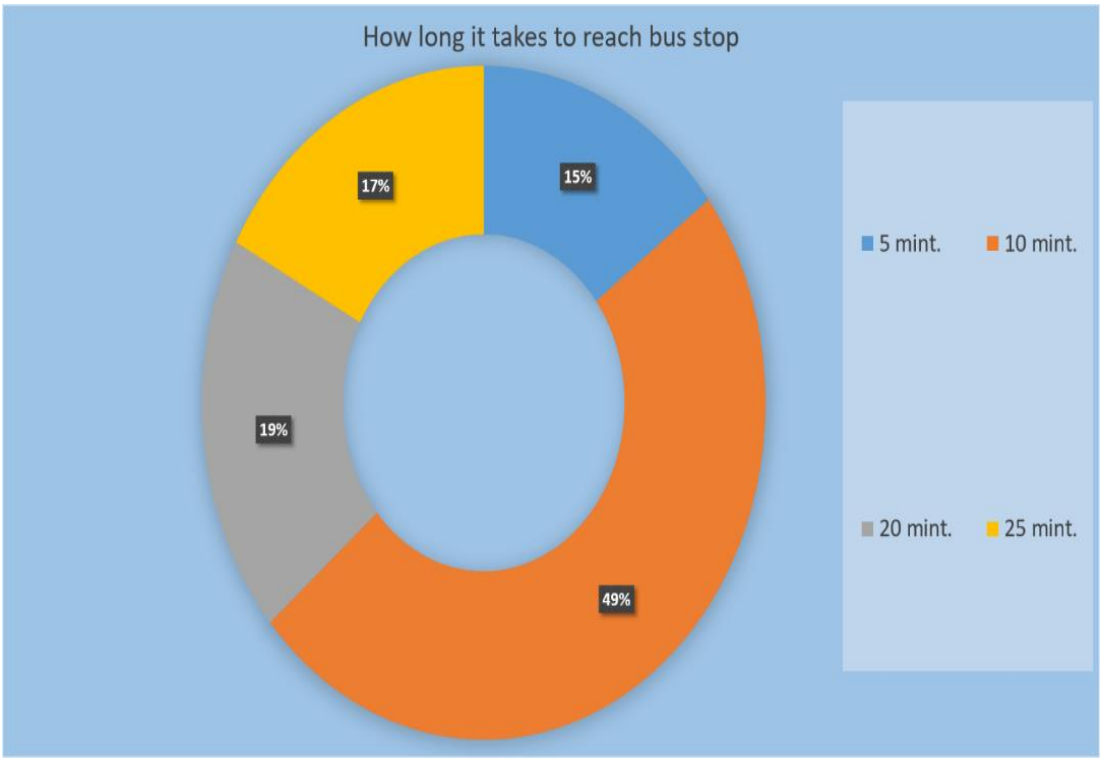


Figure 4.3 Users opinion about time to reach bus stop.

Question 4: What is the trip purpose?

The survey included a question regarding the purpose of the users' trips when utilizing the bus service. The findings indicate that the majority, a maximum of 35% of the participants reported that their purpose of using the bus was to reach their school, college, polytechnic, or university. Additionally, 33% of the total respondents, stated that their purpose of the trip was to reach their office. Figure 4.4 provides a graphical representation of the users' opinions regarding the trip purpose.

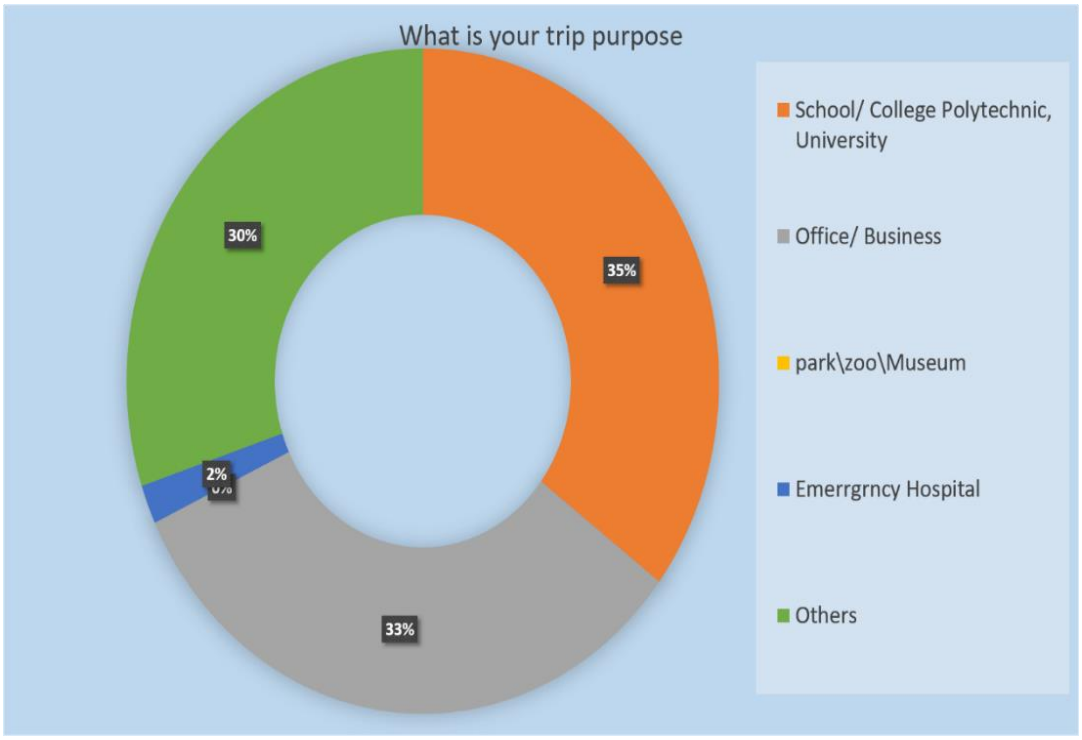


Figure 4.4 Users opinion about trip purpose

Question 5: How was the frequency of service?

The survey included a question about the frequency of the bus service as perceived by the users. According to the responses, 36% of the respondents rated the frequency of service as poor. Additionally, 18% of the participants considered it to be Very poor. Interestingly, only a minimal 32% of the respondents rated the frequency of service as good. Figure 4.5 provides a graphical representation of the users' opinions regarding the frequency of the bus service.

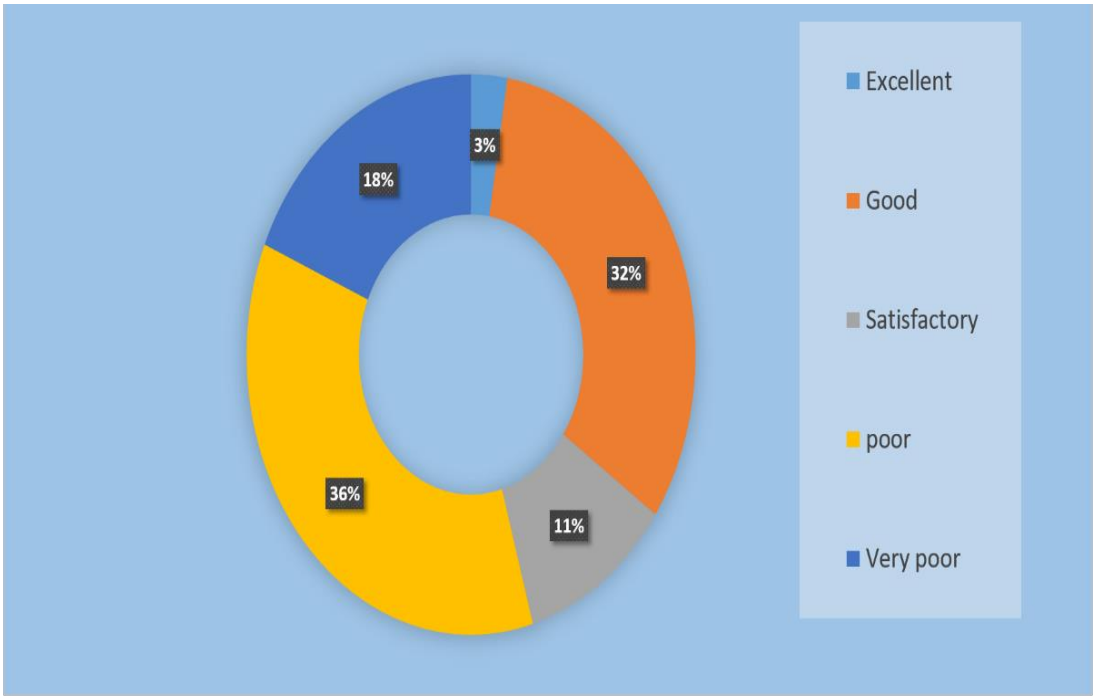


Figure 4.5 Users opinion about frequency of service

Question 6: How is the punctuality of the public transport?

The survey included a question regarding the punctuality of the transport service, which measures the efficiency of maintaining the time schedule. Out of the total respondents, 36% rated the punctuality of the transport as poor, indicating dissatisfaction with timeliness. Furthermore, 28 % of the participants rated it as good. Surprisingly, 24% respondents rated the punctuality of the transport as excellent. Figure 4.6 illustrates the users' opinions regarding the punctuality of the transport service.

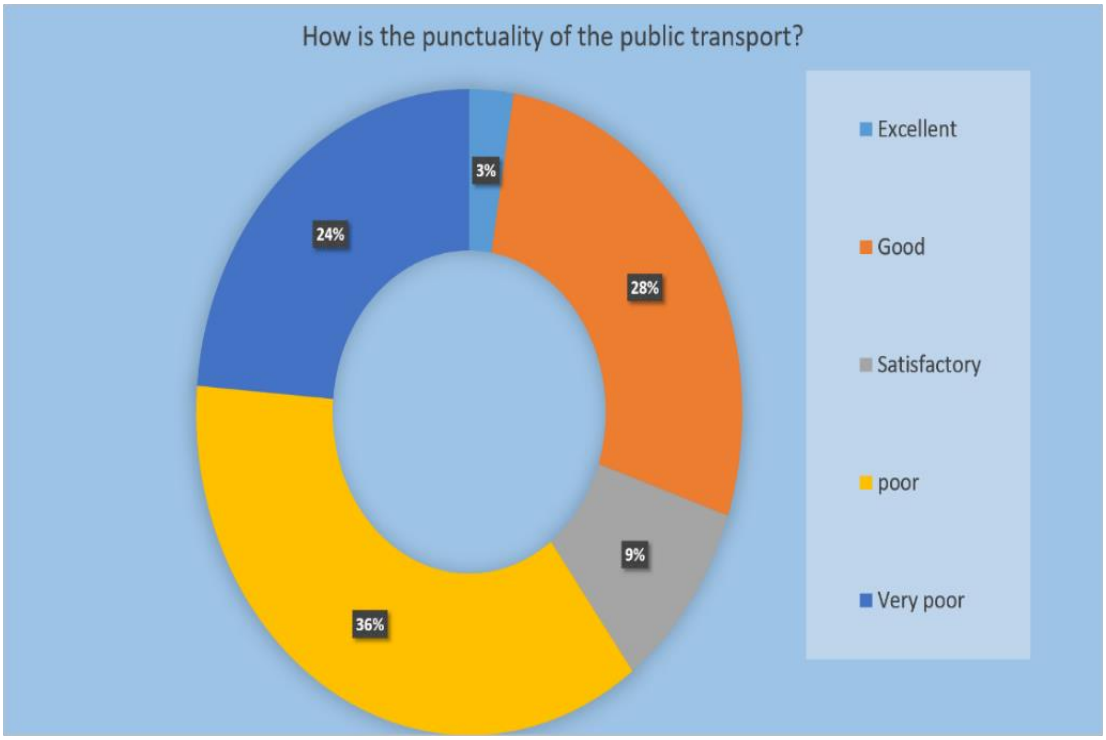


Figure 4.6 Users opinion about punctuality of transport

Question 7: How was the movement flexibility (On Road)?

The survey included a question concerning the movement flexibility of buses on the road, referring to the ease with which buses can maneuver. The results indicate that 38% of the respondents rated the movement flexibility as poor, expressing dissatisfaction with the buses' maneuverability. Additionally, 26% of the participants rated it as Good. Interestingly, very few respondents rated the movement flexibility as excellent. Figure 4.7 visually represents the users' opinions regarding the movement flexibility of buses on the road.

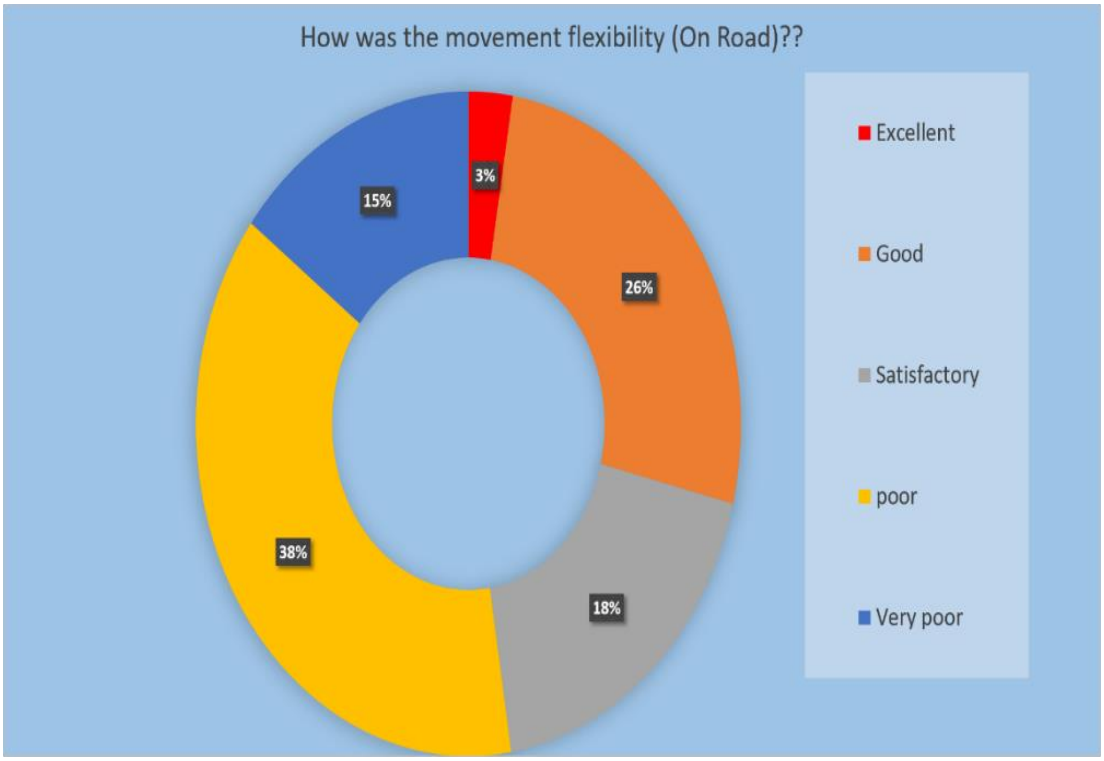


Figure 4.7 Users opinion about movement flexibility on road

Question 8: What about the accessibility of public bus stop?

The survey included a question regarding the accessibility of the bus stop, assessing users perceptions of how easily they can reach the bus stop. Interestingly, only a minimal 2% of the respondents rated the accessibility of the bus stop as excellent, suggesting a high level of ease in reaching the bus stop.

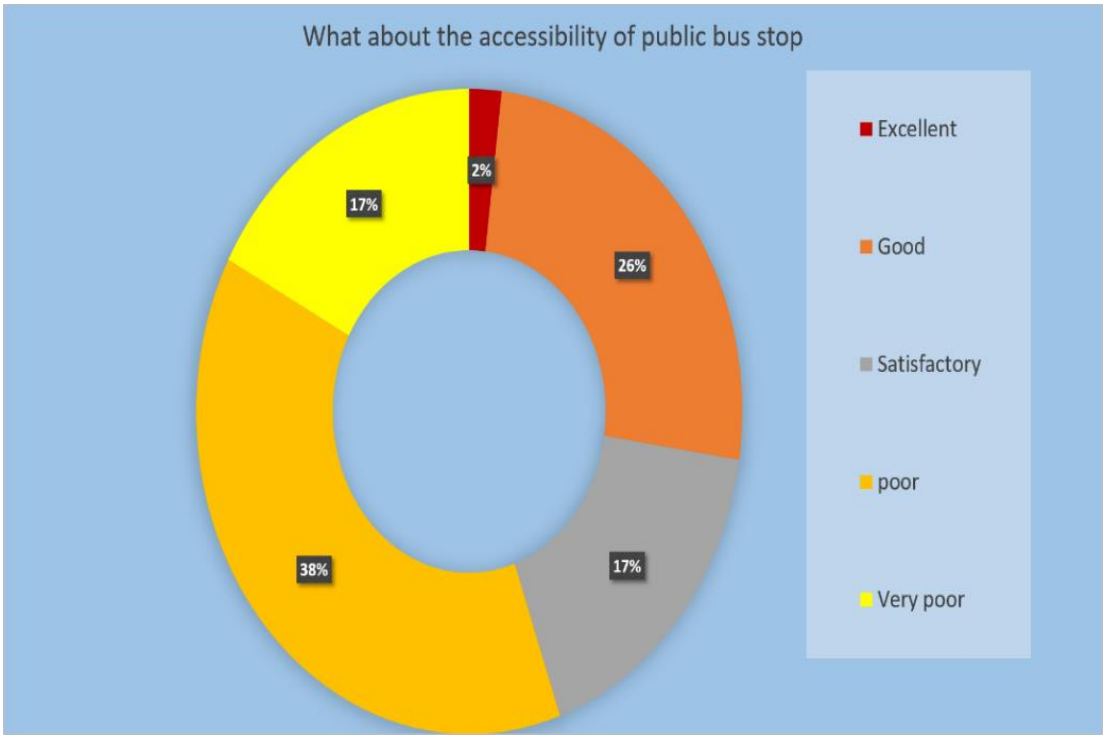


Figure 4.8 Users opinion about accessibility of bus stop

Question 9: How was the speed of the bus?

The survey included a question regarding the speed of the bus, assessing how respondents perceive the pace of the bus service. According to the responses, 21% of the participants rated the speed of the bus as poor, indicating satisfaction with the speed. Additionally, 39% of the respondents rated it as good. Interestingly, 30% of the respondents, rated the speed of the bus as satifactory. Figure 4.9 visually represents the users' opinions regarding the speed of the bus

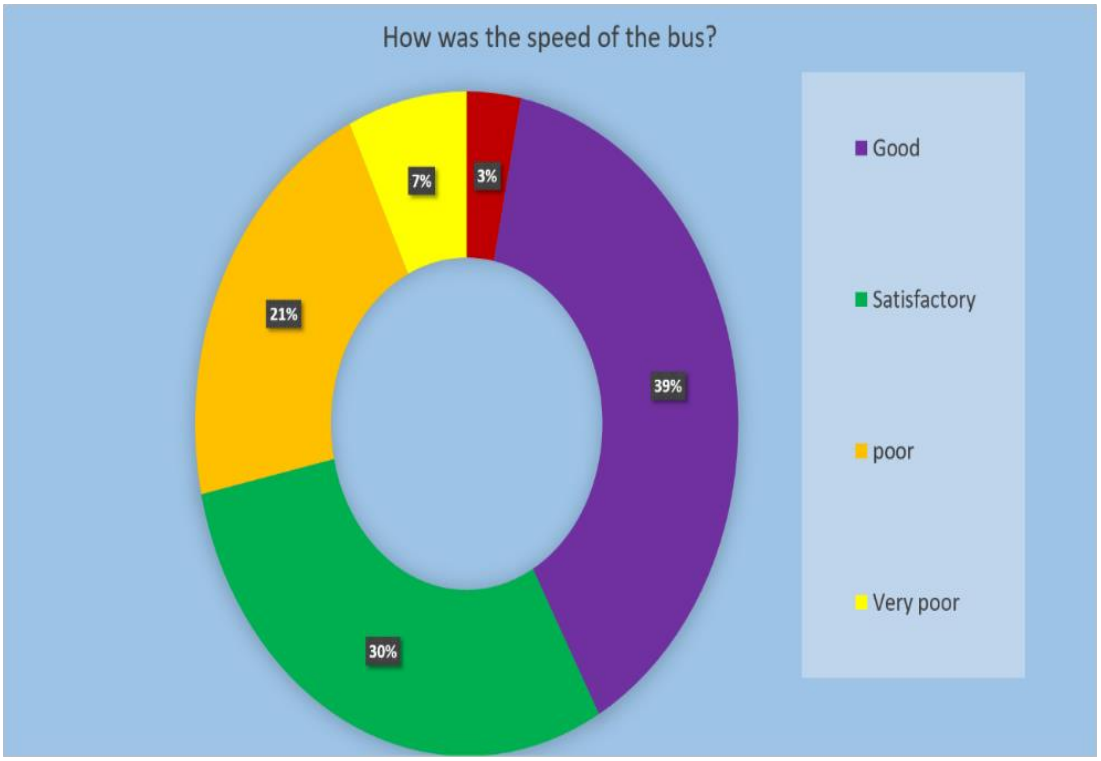


Figure 4.9: Users opinion about speed of the bus

Question 10: Is the information of the bus service available?

The survey included a question regarding the availability of information about the bus service, assessing how well users perceive the accessibility of relevant details. The results reveal that 36% of the respondents rated the availability of information as poor, indicating dissatisfaction with the information provided. Additionally, 20% of the participants rated it as satisfactory. Interestingly, due to the lack of information availability, very few respondents rated it as excellent. Figure 4.10 visually represents the users' opinions regarding the availability of information about the bus service.

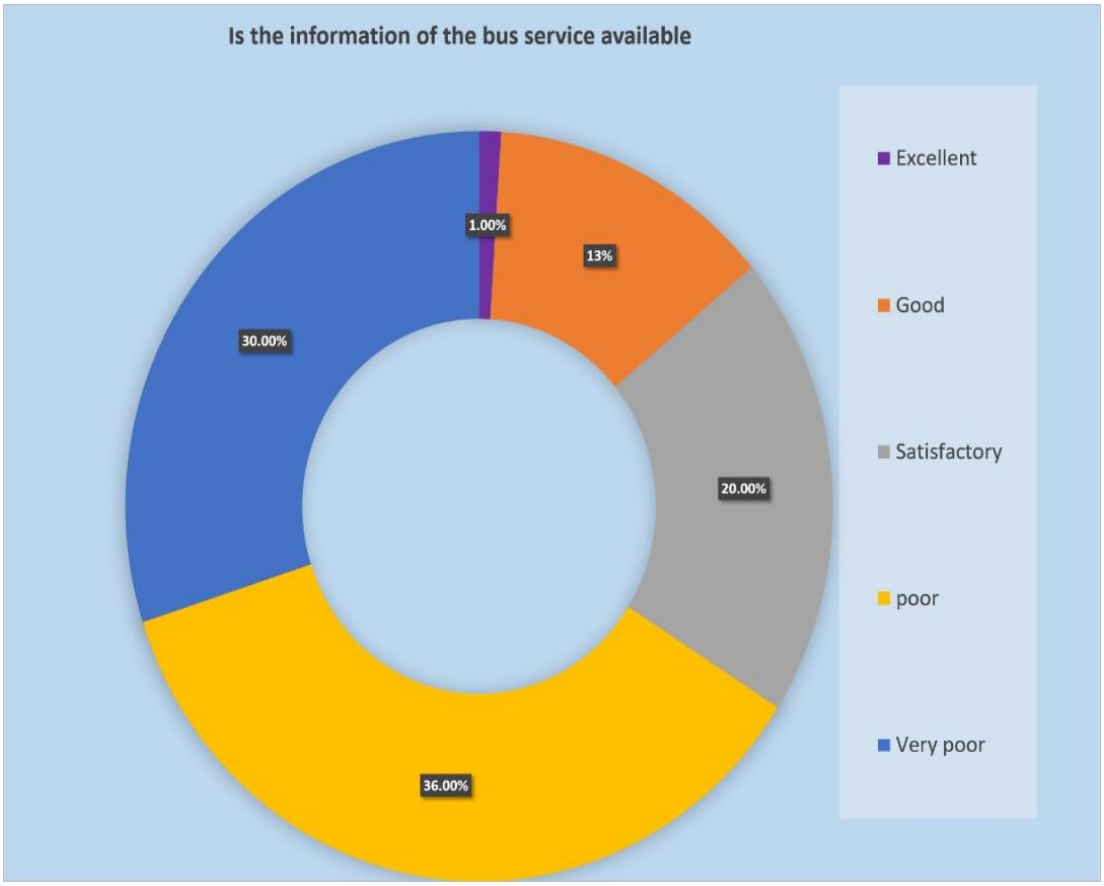


Figure 4.10: Users opinion about availability of information of the bus service

Question 11: How was the transport cost?

The survey included a question soliciting users' opinions regarding the transport cost. The findings reveal that 30% of the respondents considered the transport cost as satisfactory. However, a significant proportion, totaling 39% of the respondents is good. Among this group, 21% rated it as poor and 7% rated it as very poor. Interestingly, only a minimal 3% of the respondents rated the cost as excellent. Figure 4.11 visually represents the users' opinions regarding the transport cost

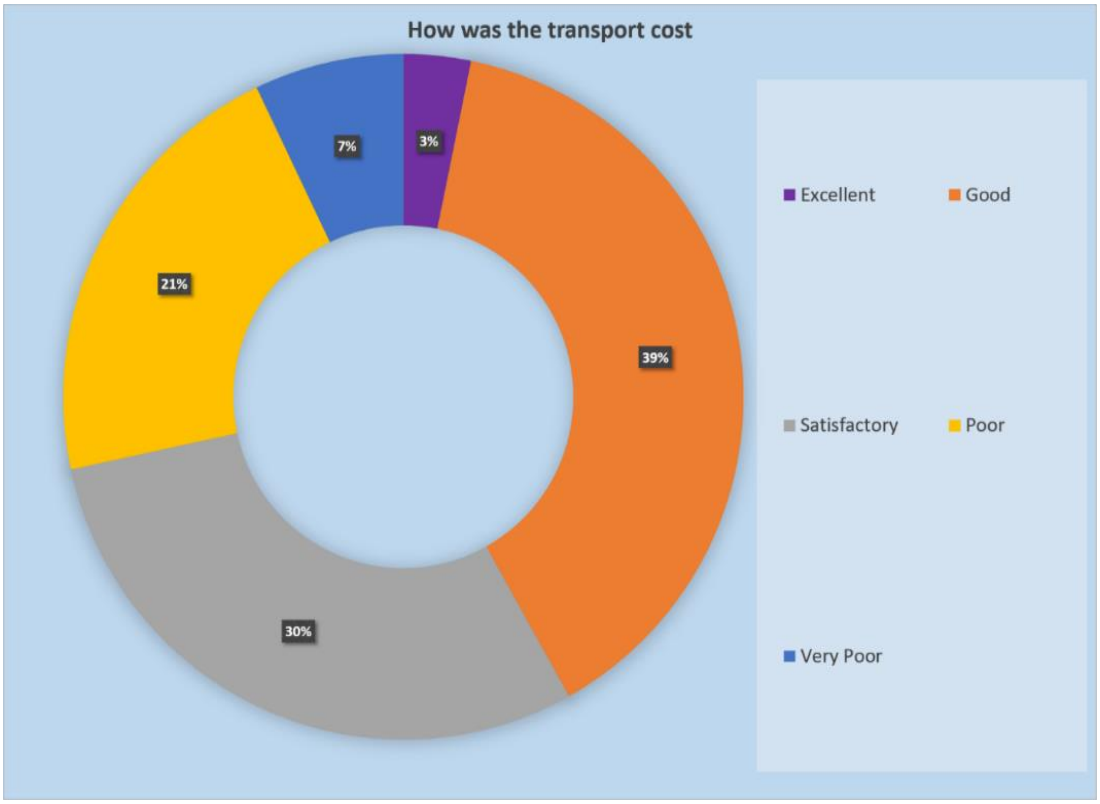


Figure 4.11: Users opinion about availability of information of the Transport Cost.

Question 12: What was the reason of using public bus?

The survey included a question asking users about the reasons for using the local bus service. The results indicate that 35% of the respondents use the local bus due to its low cost, emphasizing affordability. Another 17% mentioned the lack of personal transportation as the reason for no other trasport utilizing the local bus service. Additionally, 17% of the respondents indicated that they had no other option but to use the local bus, suggesting limited alternatives. Figure 4.12 provides a visual representation of the users' opinions regarding the reasons for using the local bus.

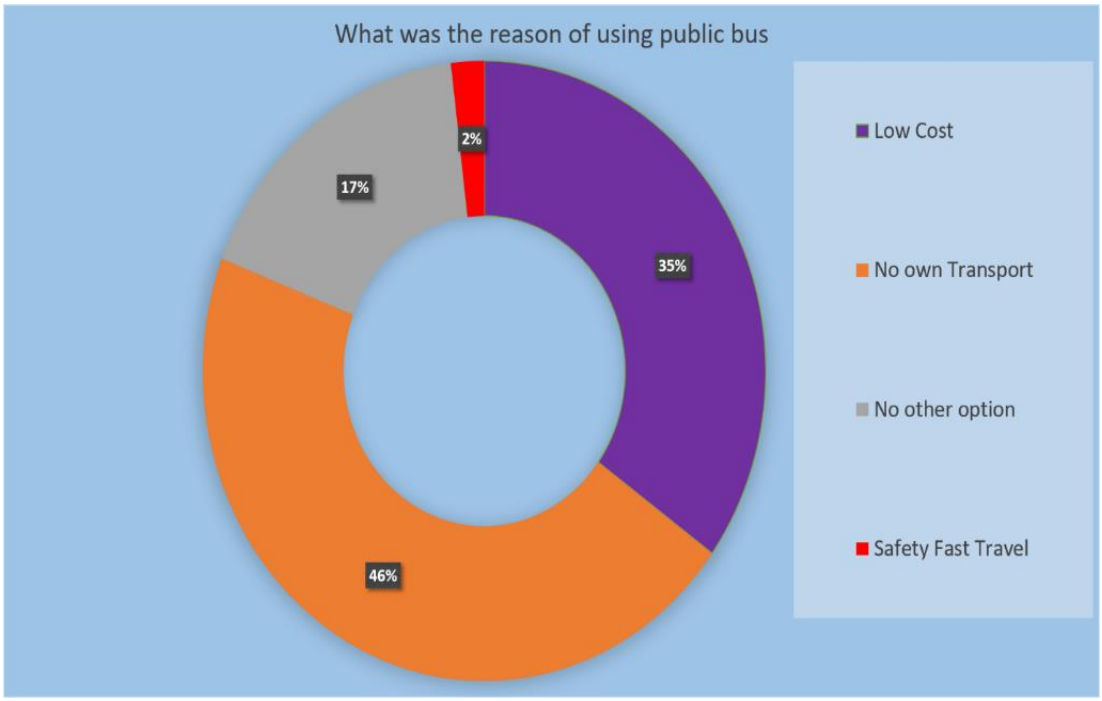


Figure 4.12 Users opinion about reason of using local bus

Question 13: How was the fitness of the public bus?

The survey included a question regarding the fitness of the bus, assessing users' perceptions of its condition and maintenance. The findings reveal that 36% of the respondents rated the fitness of the bus as very poor and 28% respondents rated poor, expressing dissatisfaction with its overall condition. Additionally, 13% of the participants rated it as satisfactory. Interestingly, only a minimal 1% of the respondents rated the fitness of the bus as excellent.

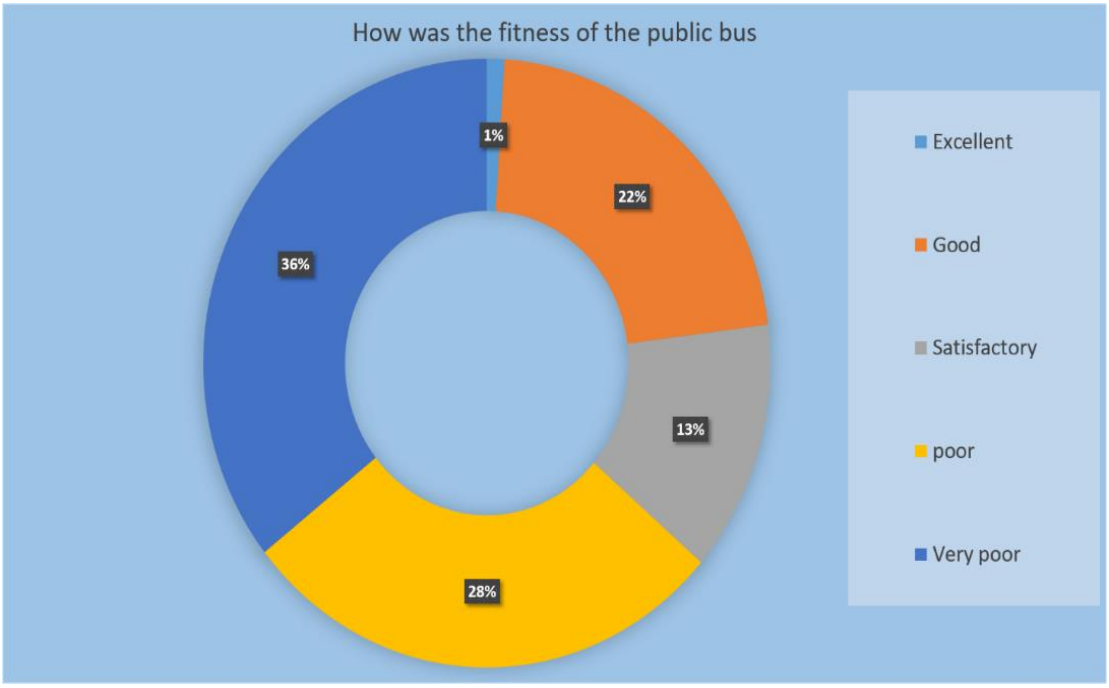


Figure 4.13 visually represents the users' opinions regarding the fitness of the bus.

Question 14: What about the seat condition of public bus?

The survey included a question regarding the seat condition of the bus, evaluating users' opinions on the quality and comfort of the seats. According to the responses, 34% of the respondents rated the seat condition of the bus as very poor, indicating dissatisfaction with the state of the seats. Additionally, 10% of the participants rated it as satisfactory. Surprisingly, only 1% of the respondents rated the seat condition of the bus as excellent.

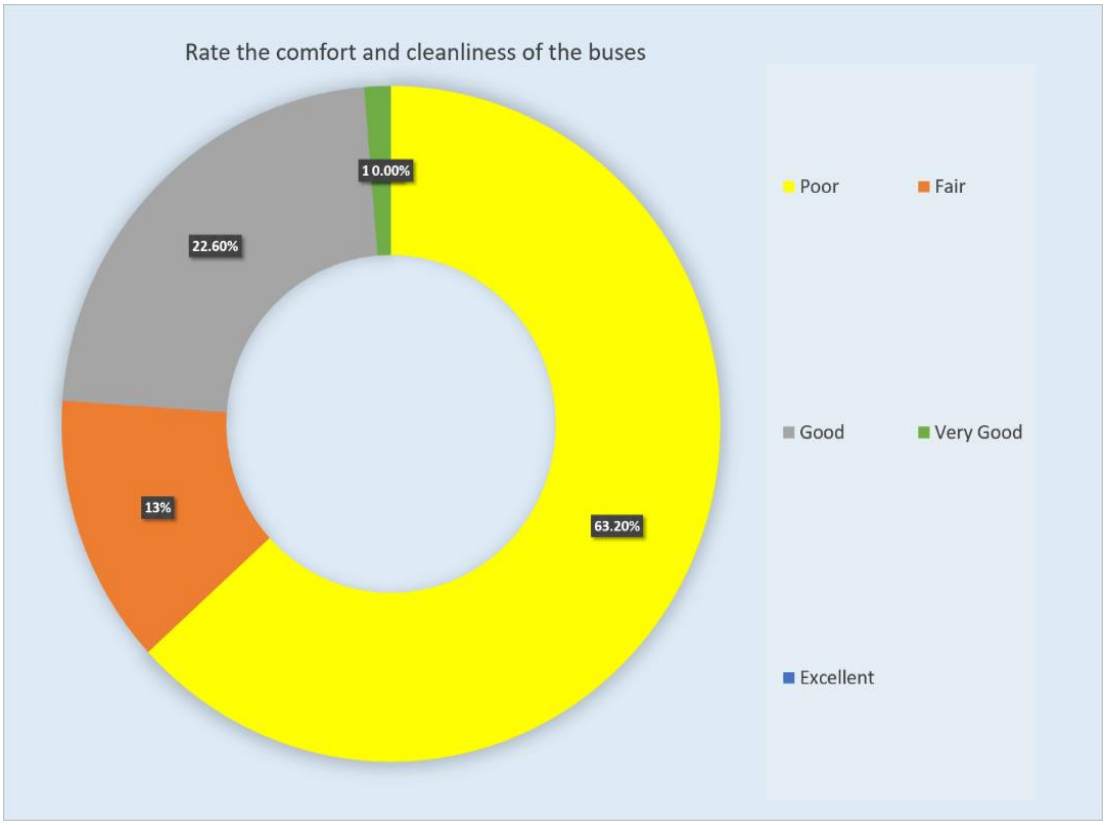


Figure 4.16 Users opinion about comfort level

Question 17: How was the physical condition of public bus?

The survey included a question regarding the physical condition of the bus, assessing users' perceptions of its overall state and appearance. The findings reveal that 28% of the respondents rated the physical condition of the bus as poor, indicating dissatisfaction with its physical state. Additionally, 13% of the participants rated it as satisfactory. Interestingly, only a minimal 1% of the respondents rated the physical condition of the bus as excellent, suggesting a well-maintained and visually appealing bus.

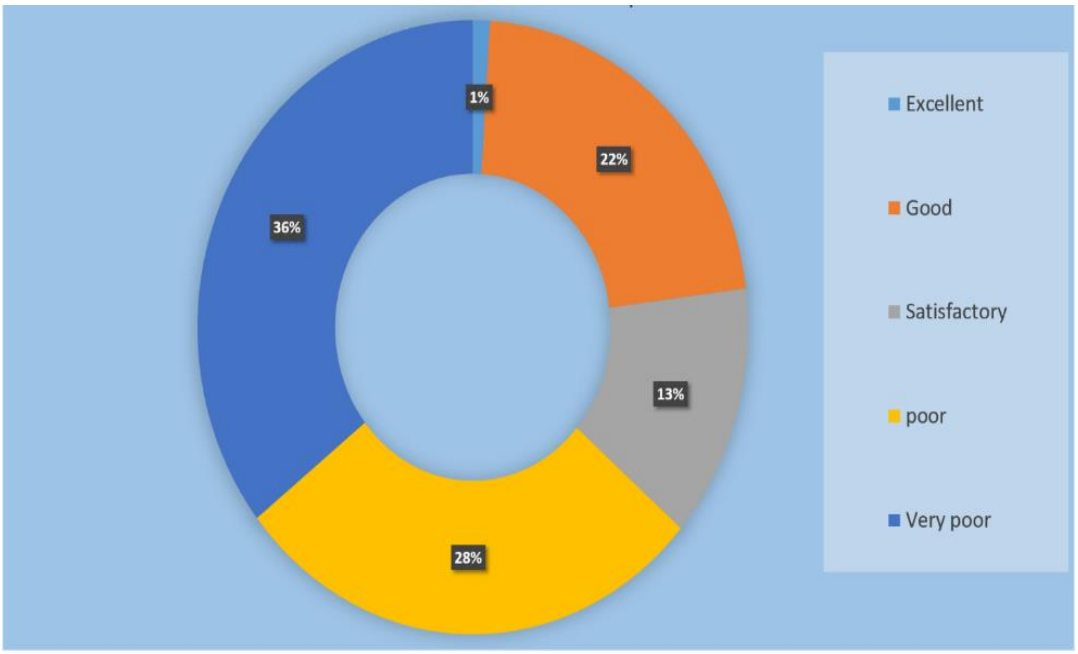


Figure 4.17 Users' opinions regarding the physical condition of the bus

Question 18: What about the safety of bus stop?

The survey included a question regarding the safety of the bus stop, evaluating users' perceptions of its security and safety measures. The results indicate that 32% of the respondents rated the safety of the bus stop as poor, expressing concerns about its safety standards. Additionally, 15% of the participants rated it as satisfactory. Interestingly, only a minimal 4% of the respondents rated the safety of the bus stop as excellent, suggesting a high level of confidence in its safety measures.

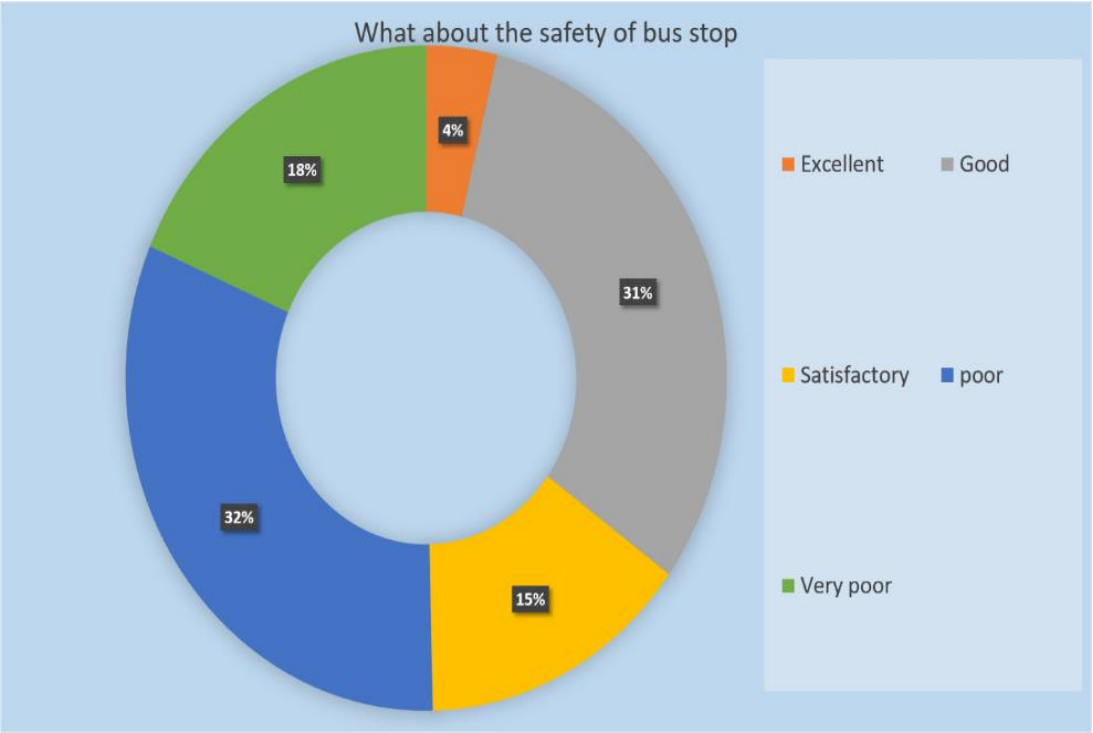


Figure 4.18 visually represents the users' opinions regarding the safety of the bus stop

Question 19: Which mode are used to reach public bus stop?

The survey included a question regarding the mode of transportation used by users to reach the bus stop. The results reveal that 41% of the respondents reported reaching the bus stop by walking, emphasizing the use of pedestrian mode. Additionally, 50% of the participants mentioned using a rickshaw to reach the bus stop.

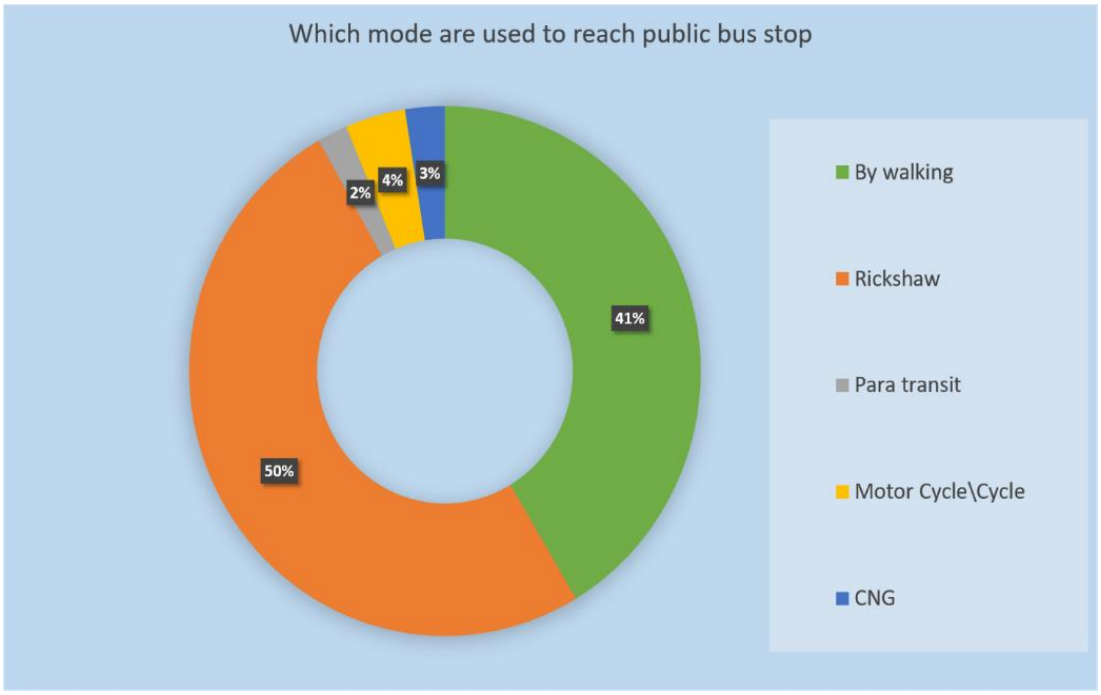


Figure 4.19 users' opinions regarding the mode of transportation to reach the bus stop

Question 20: What are the levels of personal safety in public bus?

The survey included a question regarding the levels of personal safety, evaluating users' perceptions of their own safety. The results indicate that 32% of the respondents rated the level of personal safety as poor, expressing concerns about their safety. Additionally, 18% of the participants rated it as very poor. Interestingly, only 4% of the respondents rated the level of personal safety as excellent, suggesting a high level of perceived safety.



Figure 4.20:Users opinion about personal safety in public bus

Chapter 5

Conclusion & Recommendation

5.1 General

The primary objective of this study was to analyze and predict the quality of public bus service in Dhaka City. Specifically, the study aimed to investigate the key service factors that impact bus service quality and explore overall passenger satisfaction. The major findings from this study are summarized below.

According to the respondents, the following aspects were rated as poor in terms of bus service quality: convenience, frequency, punctuality, movement flexibility, sitting arrangements, availability of information, ticketing system, fitness, seat condition, cleanliness of the bus, noise level, movement flexibility inside the bus, comfort level, physical condition of the bus, safety at the bus stop, cleanliness of the bus stop, condition of the bus stop, accessibility of the bus stop, security in the bus stop, level of personal safety, entry and exit procedures, travel time on office days, security of passengers during off-peak hours, driver safety, courtesy of helpers/contractors, reliability of the local bus service, and accessibility of the bus.

On the other hand, the speed of the bus, transport cost, lighting facility of the bus, behavior of the driver, accessibility of the bus, and travel time during holidays were rated as satisfactory by the respondents.

Overall, 64% of the respondents rated the bus service quality as unsatisfactory.

Based on the findings, this study provides several recommendations to improve the bus service quality in Dhaka City. Furthermore, suggestions for future research in this area are also provided in this chapter.

5.2 Recommendation for Improving Public Bus Service Quality

To enhance bus service quality based on the identified factors, attention should be given to improving the seat comfort level. Since passenger's value comfort during their bus journeys, focusing on enhancing the comfort of the seats will contribute to an overall improvement in bus service quality.

To further enhance bus service quality, the following actions can be taken:

1. Ensuring Safety at Bus Stops: Safety measures should be implemented at bus stops, considering the concerns of both male and female passengers. Special attention should be given to women's safety, as it is a major concern for them. By increasing safety measures at bus stops, overall bus service quality can be improved.

2. Improving Seat Conditions: The condition of bus seats directly affects the comfort level for passengers. It is often observed that the seat conditions are poor and uncomfortable. Therefore, efforts should be made to improve the seat conditions and provide comfortable seating arrangements to enhance the overall bus service quality.

3. Enhancing Physical Condition and Fitness of Buses: Regular maintenance and upkeep of buses are essential to improve their physical condition and fitness. This includes ensuring proper cleanliness, addressing any mechanical issues promptly, and maintaining a well-functioning fleet of buses. By improving the physical condition and fitness of buses, the overall bus service quality can be enhanced.

4. Enhancing Convenience and Accessibility: Measures should be taken to improve the convenience of the bus service, such as providing clear and easily accessible information to passengers. Additionally, efforts should be made to improve the accessibility of buses, ensuring that they are accessible to all passengers, including individuals with disabilities.

5. Improving Movement Flexibility: In a congested city like Dhaka, where traffic jams are a major concern, improving the movement flexibility of buses is crucial. This is especially important for student and working passengers who are often in a rush to reach their destinations on time. By increasing the movement flexibility, such as implementing efficient routing and managing traffic congestion, the overall bus service quality can be significantly improved.

By addressing these areas of improvement, the bus service quality in Dhaka City can be enhanced, leading to increased passenger satisfaction and a better overall experience for bus users.

In addition to the mentioned factors, several other variables need to be fulfilled to improve bus service quality. These variables may include:

1. Timeliness and Punctuality: Ensuring buses adhere to a schedule and arrive and depart on time is crucial for improving service quality. Passengers rely on buses to be punctual to minimize waiting times and maintain efficient travel plans.

2. Information and Communication: Providing accurate and up-to-date information regarding bus routes, schedules, delays, and disruptions can significantly improve the overall user experience. Clear communication channels and real-time updates will help passengers make informed decisions and reduce uncertainties.

3. Staff Training and Professionalism: Enhancing the professionalism and customer service skills of bus staff, including drivers, conductors, and customer service representatives, can contribute to a positive and pleasant passenger experience. Well-trained staff members who interact politely and provide assistance when needed can greatly improve service quality.

4. Integration with Other Modes of Transport: Promoting seamless integration between different modes of transportation, such as connecting bus routes with train or metro networks, can offer passengers more convenient and efficient travel options. Coordinated schedules, intermodal ticketing, and well- designed transfer points can enhance the overall travel experience.

By improving bus service quality, the goal is to retain existing users and attract new ones.

If the bus service can consistently satisfy users in all aspects, people will be more inclined to choose it over other modes of transportation, including private vehicles.This shift towards utilizing buses instead of private vehicles can have several positive outcomes.

Firstly, it can help alleviate traffic congestion to some extent by reducing the number of private vehicles on the roads. This reduction can lead to smoother traffic flow and a reduction in overall traffic jams. Secondly, improved bus service quality can contribute to environmental sustainability by reducing carbon emissions associated with private vehicles. The shift towards using buses can help lower pollution levels and promote greener transportation options. Therefore, enhancing bus service quality is of utmost importance as it not only improves the overall travel experience for passengers but also has broader positive impacts on traffic congestion, environmental sustainability, and the overall livability of the city.

5.3 Limitation of the Study & Recommendation for Future Study

Despite the thoroughness of the study, there were certain limitations that should be acknowledged:

1. Gender Bias: The data collected exhibited a gender bias, with only one-third of the participants being female. To ensure a more balanced representation, future studies should strive for greater participation from women.

2. Limited Number of Variables: The study included a total of 29 variables. To obtain more comprehensive results, future research should consider increasing the number of variables to capture a wider range of factors influencing bus service quality.

3. Sample Size: The analysis was conducted using data from 151 respondents. Increasing the number of respondents in future studies would provide a more robust and representative sample for more accurate findings.

4. Limited Survey Locations: The study focused on 9 specific locations for data collection. To obtain a more comprehensive understanding of bus service quality across the city, future studies should aim to include a larger number of survey locations.

5. Respondent Engagement: There were instances where respondents may not have been enthusiastic or sincere in their responses. Efforts should be made in future studies to ensure greater respondent engagement and sincerity to obtain more reliable data.

The findings from this study can be utilized by city transportation officials in Bangladesh to improve the overall service quality of buses and attract more users. Service providers can also utilize these findings to identify areas that require improvement to better satisfy users and attract new ones. Therefore, the results of this study are valuable and can assist in making informed decisions to enhance bus service quality.

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Appendix

List of Existing Bus Routes in Dhaka City

Sl.	Name of the Buses	Routes
01	Akik Poribohon	Gabtoli ⇄ Mirpur 1 ⇄ Mirpur 10 ⇄ Kalshi ⇄ Jamuna Future Park ⇄ Natun Bazar, ⇄ Badda
02	Trust Line	Mirpur 10 ⇄ Cantonment ⇄ Banani ⇄ Notun Bazar
03	Tetulia Poribphon	Shiya Masjid ⇄ Shyamoli ⇄ Agargaon ⇄ Mirpur 10 ⇄ Kalshi ⇄ Bisshoroad ⇄ Airport ⇄ Uttara ⇄ Abdullahpur
04	Jabale Noor Poribohon, Ovijat Poribohon	Agargaon ⇄ Mirpur 10 ⇄ Kalshi ⇄ Bisshoroad ⇄ Airport ⇄ Uttara ⇄ Abdullahpur
05	Alif Poribohon, Rois Poribohon	Mirpur Sony Cinema Hall ⇄ Mirpur 10 ⇄ Kazipara ⇄ Shewrapara ⇄ Mohakhali ⇄ Gulshan 1 ⇄ Badda ⇄ Rampura ⇄ Bonoshri
06	Himachol Poribohon	Mirpur Sony Cinema Hall ⇄ Mirpur 10 ⇄ Kazipara ⇄ Shewrapara ⇄ Mohakhali ⇄ Gulshan 1 ⇄ Badda ⇄ Rampura ⇄ Khilgaon Khidma Hospital
07	Projapoti Poribohon, New Pallabi Express, Konok Poribohon	Gabtoli ⇄ Mirpur 1 ⇄ Mirpur 10 ⇄ Kalshi ⇄ Bisshoroad ⇄ Airport ⇄ Uttara ⇄ Abdullahpur
08	Bosumoti Poribohon, BRTC	Gabtoli ⇄ Mirpur 1 ⇄ Mirpur 10 ⇄ Kalshi ⇄ Bisshoroad ⇄ Airport ⇄ Uttara ⇄ Abdullahpur ⇄ Tongi ⇄ Gazipur
09	Robrob Poribohon	Gabtoli ⇄ Mirpur 1 ⇄ Mirpur 10 ⇄ Kalshi ⇄ Banani ⇄ Gulshan 2 ⇄ Gulshan 1 ⇄ Badda Link Road
10	Jabale Noor Poribohon 2	Gabtoli ⇄ Mirpur 1 ⇄ Mirpur 10 ⇄ Kalshi ⇄ Kuril Flyover ⇄ Natun Baz

11	BRTC	Gabtoli ⇄ Mirpur 1 ⇄ Mirpur 10 ⇄ Kazipara ⇄ Shewrapara ⇄ Mohakhali ⇄ Kakoli ⇄ Banani ⇄ Gulshan 2 ⇄ NatunBazar ⇄ Badda ⇄ Rampura
12	Everest Poribohon	Roopnagar Abasik ⇄ Mirpur 2 ⇄ Mirpur 1 ⇄ Khamarbari ⇄ Farmgate ⇄ Gulistan ⇄ Keraniganj
13	Mirpur Mission Poribohon Limited	Chiriyakhana ⇄ Mirpur 1 ⇄ Khamarbari ⇄ Farmgate ⇄ Press Club ⇄ Motijhil

14	Itihas Poribohon	Mirpur 10 ⇄ Mirpur 2 ⇄ Mirpur 1 ⇄ Gabtoli ⇄ Savar ⇄ Nobinogor ⇄ Chondra
15	Bihongo Poribohon	Mirpur 12 ⇄ Mirpur 11 ⇄ Mirpur 10 ⇄ Kazipara ⇄ Shewrapara ⇄ Mohakhali ⇄ Gushan 1 ⇄ Badda ⇄ Natun Bazar
16	Dhaka Metro Service	Mirpur 1 ⇄ Kolyanpur ⇄ Shyamoli ⇄ Asadgate ⇄ Shukrabad ⇄ Kolabagan ⇄ Science Lab ⇄ New Market ⇄ Nilkhet ⇄ Azimpur
17	Ashirbad Poribohon,	Roopnagar Abasik ⇄ Mirpur 2 ⇄ Mirpur 1 ⇄ Kolyanpur ⇄ Shyamoli ⇄ Asadgate ⇄ Shukrabad ⇄ Kolabagan ⇄ Science Lab ⇄ New Market ⇄ Nilkhet ⇄ Azimpur
18	New Vision	Chiriyakhana ⇄ Mirpur 1 ⇄ Khamarbari ⇄ Farmgate ⇄ Press Club ⇄ Motijhil
19	Dishari Poribohon	Chiriyakhana ⇄ Mirpur 1 ⇄ Gulistan ⇄ Keraniganj ⇄ Babubazar Bridge
20	Trans Silva Limited	Mirpur 1 ⇄ Technical ⇄ Kolyanpur ⇄ Asadgate ⇄ Kolabagan ⇄ Science Lab ⇄ Shahbag ⇄ Press Club ⇄ Gulistan ⇄ Motijhil ⇄ Jatrabari
21	Bikolpo Service 1/E	Mirpur 14 ⇄ Mirpur 1 ⇄ Technical ⇄ Kolyanpur ⇄ Asadgate ⇄Kolabagan ⇄ Science Lab ⇄ New Market ⇄ Nilkhet ⇄ Azimpur ⇄ TSC ⇄ Shahbag ⇄ Press Club ⇄ Gulistan ⇄ Tikatuli ⇄ Jatrabari
22	Alif (Bengal) Poribohon	Mirpur 10 ⇄ Mirpur 1 ⇄ Mazar Road ⇄ Beri Badh ⇄ Ashuliya ⇄ Fantasy Kingdom ⇄ Nondon Park
23	Pollobi Local Service	Asadgate ⇄ Shyamoli ⇄ Kolyanpur ⇄ Technical ⇄ Mirpur 1 ⇄ Mirpur 2 ⇄ Mirpur 6 ⇄ Cholontika Mor ⇄ Mirpur 7 ⇄ Mirpur 11 ⇄ Mirpur 12
24	Brihottor Mirpur, Titas	Chiriyakhana, ⇄ Mirpur 1 ⇄ Gabtoli ⇄ Savar ⇄ Nobinogor ⇄ Chondra

25	Etc Poribohon	Kalshi ⇄ Mirpur Sare 11 ⇄ Mirpur 10 ⇄ Kazipara ⇄Shewrapara ⇄ IDB ⇄ Khamarbari ⇄ Farmgate ⇄Karwanbazar ⇄ Shahbag ⇄ Gulistan ⇄ Sadarghat
26	Shokolpo Poribohon	Chiriyakhana ⇄ Mirpur 1 ⇄ Mirpur 10 ⇄ Agargaon ⇄

27	Nobokoli Poribohon	Mirpur 1 ⇄ Kolyanpur ⇄ Shyamoli ⇄ Agargaon ⇄ Notun Rasta ⇄ Mohakhali Flyover ⇄ Banani ⇄ Gulshan 2 ⇄ Notun Bazar
28	Boishakhi Poribohon	Savar ⇄ Gabtoli ⇄ Kolyanpur ⇄ Shyamoli ⇄ Agargaon ⇄ Notun Rasta ⇄ Mohakhali ⇄ Gulshan 1 ⇄ Badda Link
29	Desh Bangla Poribohon,	Gabtoli ⇄ Abdullahpur
30	Konok Poribohon	Mirpur 12 ⇄ Mirpur 10 ⇄ Kakoli ⇄ Airport ⇄ Uttara ⇄ Abdullahpur
31	Provati Bonoshri Poribohon	Gulistan ⇄ Polton ⇄ Malibag ⇄ Mogbazar ⇄ Saatrasta ⇄ Nabisko ⇄ Mohakhali ⇄ Bonani ⇄ Airport ⇄ Uttara ⇄ Abdullahpur ⇄ Tongi ⇄ Gazipur ⇄ Kaliyakoir
7 32	6 Number Motijhil Banani Transport Limited (Local)	1.Motijhil ⇄ Gulistan ⇄ Polton ⇄ Malibag ⇄ Mogbazar ⇄ Karwanbazar ⇄ Farmgate ⇄Bijoy Sarani ⇄ Mohakhali ⇄ Gulshan 1 ⇄ Gulshan 2 ⇄ Notun Bazar 2. Motijhil ⇄ Gulistan ⇄ Polton ⇄ Malibag ⇄ Mogbazar ⇄ Saatrasta ⇄ Nabisko ⇄ Mohakhali ⇄ Gulshan 1 ⇄ Badda Link Road ⇄ Notun Bazar
33	4 Number Alike Transport & BRTC Articulated (Wi-Fi Bus)	Balughat ⇄ Cantonment ⇄ Bijoy Sarani ⇄ Farmgate ⇄ Banglamotor ⇄ Shahbag ⇄ Polton ⇄ Gulistan ⇄ Motijhil
34	3 Number Airport – Bangabandhu Avenue Poribohon (Local)	Bongo Bazar ⇄ High Court ⇄ Shahbag ⇄ Farmgate ⇄ Mohakhali ⇄ Banani ⇄ Bisso Road ⇄ Airport ⇄ Uttara ⇄ Abdullahpur
35	9 Number Bus	College Gate ⇄ Shyamoli ⇄ Technical ⇄ Mirpur 1 ⇄ Mirpur 1
36	Torongo Bus Company,	Mohammadpur ⇄ Asadgate ⇄ Farmgate ⇄ Mohakhali ⇄ Titumir College ⇄ Gulshan 1 ⇄ Badda ⇄ Notun Bazar
37	Torongo Plus Transport	Mohammadpur Bus Stand ⇄ Shankar ⇄ Dhanmondi 15 ⇄
38	Projapoti Poribohon	Gabtoli ⇄ Mohammadpur ⇄ Asadgate ⇄ Mirpur 1 ⇄ Mirpur
39	Bahon Poribohon Limited	Mirpur 14 ⇄ Mirpur 10 ⇄ Mirpur 1 ⇄ Technical ⇄ Kolyanpur ⇄ Asadgate ⇄ Science Lab ⇄ Shahbag ⇄ Press Club ⇄ Motijhil ⇄ Komlapur ⇄ Mugda ⇄ Khilgaon

40	Nisorgo Poribohon Limited	Mirpur 14 Bus Stand ⇄ Mirpur 10 ⇄ Kazipara ⇄ Agargaon ⇄ Shyamoli ⇄ Asadgate ⇄ Mohammadpur ⇄ Dhakmondi 15 ⇄ Jhigatola ⇄ Science Lab ⇄ Dhaka College ⇄ New Market ⇄ Nilkhet ⇄ Eden College ⇄ Azimpur
41	Shotabdi Poribohon Limited	Mirpur 14 Bus Stand ⇄ Mirpur 14 ⇄ Mirpur 1 ⇄ Shyamoli ⇄ Asadgate ⇄ Mohammadpur ⇄ Shankar ⇄ Dhanmondi 15 ⇄ Jhigatola ⇄ Katabon ⇄ Shahbag ⇄ Gulistan ⇄ Motijhil ⇄ Notre Dame College
42	Cantonment Mini Service	Mirpur 14 ⇄ Kochukhet ⇄ Soinik Club ⇄ Kakoli ⇄ Banani
43	Rongdhonu Express	Adabor ⇄ Shiya Masjid ⇄ Shyamoli ⇄ College Gate ⇄ Asadgate ⇄ Kolabagan ⇄ Science Lab ⇄ Shahbag ⇄ Kakrail ⇄ Fokirapul ⇄ Motijhil ⇄ Doyaganj
44	Borak Poribohon	Polashi ⇄ Meghna Ghat
45	Rajdhani Express	Shaymoli ⇄ Asadgate ⇄ Kolabagan ⇄ Science Lab ⇄ Katabon ⇄ Shahbag ⇄ Gulistan
46	Super Bus	Gulistan ⇄ Shahbag ⇄ Farmgate ⇄ Shyamoli ⇄ Gabtoli ⇄ Savar ⇄ Nobinogor ⇄ Nandan Park
47	Dhaka Poribohon	Gulistan ⇄ Shahbag ⇄ Farmgate ⇄ Banani ⇄ Uttara ⇄ Gazipur ⇄ Shib Bari
48	Bolaka Poribohon	Motijhil ⇄ Komlapur ⇄ Malibag ⇄ Mogbazar ⇄ Nabisko ⇄ Mohakhali ⇄ Banani ⇄ Khilkhet ⇄ Airport ⇄ Uttara ⇄ Tongi ⇄ Board Bazar ⇄ Gazipur ⇄ Shib Bari
49	Himaloy Transport	Modonpur (Narayanganj) ⇄ Jatrabari ⇄ Bangladesh Bank ⇄
50	Labbayek Poribohon	Jatrabari ⇄ Sayedabad ⇄ Mugda ⇄ Khilgaon ⇄ Malibag ⇄ Mogbazar ⇄ Karwan Bazar ⇄ Farmgate ⇄ Asadgate ⇄Shyamoli ⇄ Gabtoli ⇄ Savar
51	Mirpur Poribohon Service	Mirpur 12 ⇄ Shewrapara ⇄ Gulistan Golap Shah Mazar
52	Mirpur United Service Limited, Bihongo Poribohon Limited	Mirpur 12 ⇄ Sadarghat Victoria Park

53	BRTC	Mirpur 12 ⇄ Mirpur 10 ⇄ Agargaon ⇄ Farmgate ⇄ Shahbag ⇄ Motijhil
54	Bikolpo Auto Service	Mirpur 12 ⇄ Mirpur 10 ⇄ Agargaon ⇄ Farmgate ⇄ Shahbag ⇄ Motijhil
55	Hazi Transport	Mirpur 12 ⇄ Mirpur 10 ⇄ Agargaon ⇄ Farmgate ⇄ Shahbag ⇄ Motijhil ⇄ Notre Dame College
56	Winner Transport Co Ltd	Eden College (Azimpur) ⇄ Kolabagan ⇄ Karwan Bazar ⇄ Nabisko ⇄ Mohakhali ⇄ Gulshan 1 ⇄ Badda Link Road ⇄ Kuril Bissho Road
57	Dip Bangla Poribohon Ltd	Azimpur ⇄ City College ⇄ Kolabagan ⇄ Panthopoth ⇄ Karwan Bazar ⇄ Nabisko ⇄ Gulshan Link Road ⇄ Gulshan 1 ⇄ Kuril Bissho Road
58	Suchona Brf	Azimpur Etimkhana Mor ⇄ Kolabagan ⇄ Asadgate ⇄ Farmgate ⇄ Mohakhali ⇄ Banani ⇄ Uttara House Building
59	Falgun Art Transport Private Limited	Azimpur Girls School & College ⇄ Science Lab ⇄ Shahbag ⇄ Kakrail ⇄ Mouchak ⇄ Malibag ⇄ Rampura ⇄ Badda ⇄ Kuril Bissho Road ⇄ Uttara House Building
60	BRTC	Eden College ⇄ Science Lab ⇄ Kolabagan ⇄ Asadgate ⇄ Khamarbari ⇄ Kakoli ⇄ Bonani ⇄ Abdullahpur
61	Suprovat Poribohon	Sadarghat Victoria Park ⇄ Kakrail ⇄ Mouchak ⇄ Malibag Railgate ⇄ Badda ⇄ Notun Bazar ⇄ Basundhara ⇄ Kuril ⇄ Uttara ⇄ Tongi ⇄ Gazipur
	Azmery Glory Limited, Skyline Express Limited	Sadarghat Victorial Park ⇄ Gulistan ⇄ Kakrail ⇄ Malibag
62		⇄ Mogbazar ⇄ Mohakhali ⇄ Airport ⇄ Abdullahpur ⇄ Gazipur Bypass ⇄ Chondra
63	Raja City Poribohon Limited, FTCL Moitri Poribohon	Mohammadpur ⇄ Shankar ⇄ Star Kabab ⇄ Jhigatola ⇄ City College ⇄ Science Lab ⇄ Shahbag ⇄ Press Club ⇄ Gulistan ⇄ Arambag ⇄ Notre Dame College
64	ATCL	Mohammadpur ⇄ Asadgate ⇄ Shukrabad ⇄ Kolabagan ⇄ City College ⇄ Science Lab ⇄ Katabon ⇄ Shahbag ⇄ Press Club ⇄ Gulistan ⇄ Arambag ⇄ Notre Dame College
65	Swapno	Mohammadpur ⇄ Farmgate ⇄ Mohakhali ⇄ Gulshan ⇄
66	Shadin	Mohammadpur ⇄ Asadgate ⇄ Kawranbazar ⇄ Banglamotor⇄ Eskaton

67	Welcome	Motijheel ⇄ Science Lab ⇄ Shahabagh ⇄ Gabtoli ⇄ Savar
62		⇄ Mogbazar ⇄ Mohakhali ⇄ Airport ⇄ Abdullahpur ⇄ Gazipur Bypass ⇄ Chondra
63	Raja City Poribohon Limited, FTCL Moitri Poribohon	Mohammadpur ⇄ Shankar ⇄ Star Kabab ⇄ Jhigatola ⇄ City College ⇄ Science Lab ⇄ Shahbag ⇄ Press Club ⇄ Gulistan ⇄ Arambag ⇄ Notre Dame College
64	ATCL	Mohammadpur ⇄ Asadgate ⇄ Shukrabad ⇄ Kolabagan ⇄ City College ⇄ Science Lab ⇄ Katabon ⇄ Shahbag ⇄ Press Club ⇄ Gulistan ⇄ Arambag ⇄ Notre Dame College
65	Swapno	Mohammadpur ⇄ Farmgate ⇄ Mohakhali ⇄ Gulshan ⇄ Damra staff ⇄ Quarter
66	Shadin	Mohammadpur ⇄ Asadgate ⇄ Kawranbazar ⇄ Banglamotor⇄ Eskaton