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# A Feasibility Study to introduce Town Bus Service in Rajshahi City Corporation Area

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**Abstract**

*This article deals with the Rajshahi City Corporation (RCC) issue- the absence of Town Bus service in the RCC area. It also examines the feasibility of introducing the Town Bus service in the same area. The First Two sections of the paper are devoted to explaining the justification, objectives and methodology. The following two sections are devoted to analysing data and the feasibility of introducing town bus services in RCC. In the last and concluding section, the authors have recommended some policy options to consider the RCC authorities concerned.*

***JEL Classification*** *R41 · R42 · R52*

***Keywords*** *Feasibility Study · Town Bus Service · City Corporation, Rajshahi (Bangladesh)*

## Introduction and objective

Transportation has been considered one of the essential components of human civilisation and development from the early stages of human settlement. At present, transportation is also an issue of great concern for the increased population of a country, and an efficient transport system is a prerequisite for the economic development of a country. However, the people of Bangladesh spend a significant part of their time and money on transport. Significantly, the inadequate

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public transport system in most of the cities in Bangladesh cannot meet the travel demand of the city dwellers. Rajshahi City Corporation is one of them. Among 12 city corporations in Bangladesh, Rajshahi is one of the oldest city corporations established on 11 September 1988(RCC). The area of Rajshahi City Corporation is 2407.01 square kilometres. The present population of Rajshahi city is about 763,952 (RCC). Despite being an ancient city corporation, actual public transport, as we mean, is yet to develop here.

Town service is almost absent in the area. The leading cause is the presence of about 30-35 buses of Rajshahi University running in the city. Besides, some government and semi-government organisations, including Rajshahi College, RUET and Rajshahi Medical College buses running in the city to serve their purposes that deprive the ordinary residents of Rajshahi City Corporation. Therefore, a public transport system should be introduced in Rajshahi city to fulfil the transport needs of the city's inhabitants.

Before 2008, the man-pulled rickshaw was the primary vehicle for short distant transportation. However, after 2008, battery-driven auto-rickshaw has emerged as the main transport means in the Rajshahi City Corporation. Now it is the most popular transport means. According to a private survey, there are nearly 15,000 battery-run auto-rickshaws, 35,000 rickshaws, 800 CNG-run auto-rickshaws, 1,500 human hauliers, 1,200 rickshaw vans and 1,500 cars and microbuses in Rajshahi City (the independent 2015). According to the RCC (2016), 9,998 auto-rickshaws and 22,561 rickshaws are running in the city area.

Everyday several thousands of battery-driven unauthorised auto-rickshaws are plying on the main streets in the city, creating extreme traffic jams and sometimes deadly accidents. Many passengers of the auto-rickshaws said that, accidents and traffic jams are increasing on the streets due to plying of the auto-rickshaws by inefficient drivers. Most of the people, who earlier used to pull rickshaws and vans, are now driving the battery run auto-rickshaws without any training. They do not follow traffic rules and regulations. Even many of them do not have necessary papers like the license of the vehicle and driving. As a result, accidents occur every day. For this reason, to remove traffic jams, reduce accidents and travel faster at low cost, it has become essential to introduce town service in Rajshahi City Corporation.

The broad objective of this study is to examine the feasibility of introducing the Town Bus Service in the RCC area. Within this broad objective, the following sub-objectives have been determined.

a. To examine the conditions of the existing transport system in RCC.
b. To conduct a complete survey on the present transport vehicles plying within the RCC area.

c. To identify the problems of transportation in RCC.
d. To make recommendations for removing those problems and introducing town services in RCC like others city corporations.

### Limitations of the Study

Town bus services in Rajshahi City Corporation is a new and essential concept. There are some limitations of the study:

i. The researchers have faced difficulty with finding the present published papers and data about town services in Bangladesh. There are not enough research documents, updated data, or statistical records about RCC city bus services in any government source or website.
ii. We have failed to collect profit and loss of corresponding bus departments because they refused to give this information. Therefore, we may assume that they are losing concerns.

These limitations should be kept in mind while evaluating the results and implications of the study.

## METHODOLOGY

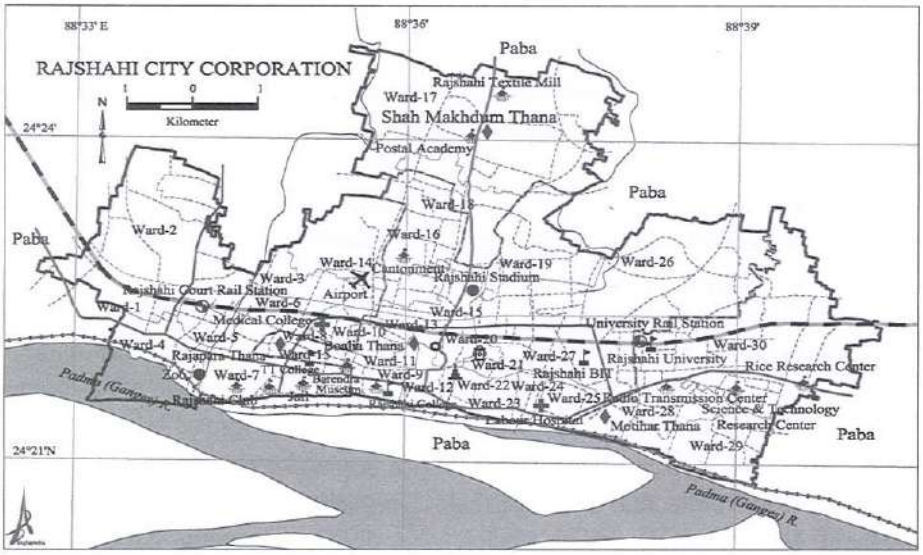
In preparing this paper, we have used both primary and secondary data. Secondary data have been collected from Rajshahi University, RUET, Rajshahi College, Rajshahi Medical College, RCC, RDA, and BBS. Primary data have been collected through a field survey. We have used statistical methods in the data processing. Besides these, we have taken the help of different publications on transportation systems by different Authors.

### Selection of Study Area

The selected area of the study is Rajshahi City Corporations (RCC) in Bangladesh. Rajshahi City Corporation (RCC) is one of the major divisional City corporations among 12 City Corporations in Bangladesh. Rajshahi City Corporation (RCC) is located in between 24°20″ and 24°24″ north latitudes and between 88°32″ and 88°40″ east longitudes. It got the status of City Corporation on 11 September 1988 (RCC). Before its establishment as City Corporation, it was a municipality from 1876. According to the 2001 and 2011 census, the population of Rajshahi City Corporation was 388,811 and 763,952 (RCC), respectively. From 2011 to 2016, there have been substantial changes in population size caused by the changes in national, regional, socio-economic and political conditions. Therefore, we see the population of Rajshahi city has doubled in a decade. Accordingly, the population may be about 1.5 million and 3 million

in 2021 and 2031, respectively. The density per square kilometre of the population is 4318 (BSS, 2012: Population and Housing Census 2011). So, it is high time to formulate plans of introducing town service to remove public sufferings. Figure 1.1 shows the map of Rajshahi City Corporation.

Figure 1.1. Map of RCC




## Selection of Sample

The present study is conducted in RCC. There are four thanas in Rajshahi City Corporation. The study area lies in four thanas: Boalia, Rajpara, Shah Makhdum and Motihar, which includes 30 wards. For collecting data, a multistage random sampling technique was used in the study. We collected 240 samples. 120 among 240 samples were collected from city dwellers, 60 samples were collected from rickshaw pullers, and 60 samples were collected from auto-rickshaw drivers. We selected different crucial points of RCC such as Binodpur, Kazla, Rajshahi Zero Point, C&B, Court, Kasiadanga, Rajshahi Court Station, Bornali Mor, Rajshahi Railway Station, Vodra More, Nowdapara, Baneshwar for collecting data from rickshaw pullers and auto-rickshaw drivers. We also collected data from city dwellers about starting city bus services randomly from 30 wards.

## Collection of Data

Data have been collected from both primary and secondary sources to meet the objectives of the study. All necessary data were not available in secondary

sources. Moreover, some were too backdated to use here. Therefore, we had to collect primary data to fulfil the objective of the study.

**Primary data**

Following the conventional survey technique, primary data on present transport condition of Rajshahi City Corporation (RCC), dwellers opinions about city bus services, opinions of rickshaw pullers and auto-rickshaw drivers about their occupations and town bus services and some other relevant information were collected by face-to-face interview using a pre-tested and structured questionnaire.

**Secondary Data**

In addition to collecting data from primary sources, secondary sources have also been used to fulfil the objectives of the study. These secondary data have been collected from various local and international publications. Secondary data have been collected from Rajshahi University, RUET, Rajshahi College, Rajshahi Medical College, Rajshahi City Corporation (RCC), Rajshahi Development Authority (RDA), and Bangladesh Bureau of Statistics (BBS), Publications of IBS (University of Rajshahi) journal and research works, Economic Reviews. The publications and planning documents of various departments, divisions, and ministries have also been used as secondary data sources. Moreover, different local and international websites were also visited to collect the specific data.

## DATA ANALYSIS

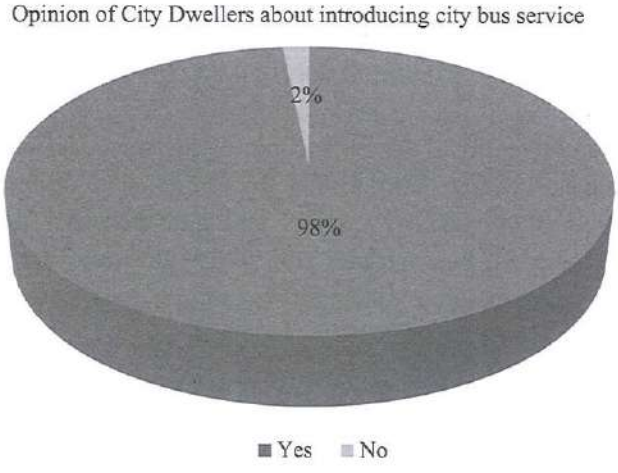
### Primary Data Analysis

**Opinion of City dwellers about starting City Bus service in RCC**

Rajshahi City Corporation has 30 wards under four police stations. We selected fifteen (15) among the thirty (30) wards. A total of 120 respondents (08 respondents from each wards) were asked to introduce City Bus Service in RCC. Among the respondents, 118 or 98.30% gave a positive opinion, while only 02 or 1.7% opined negatively. 1.7% of respondents believe that the roads of RCC are not spacious enough for bus service. However, after good years of road development, it should be introduced. Figure 1.2 shows the opinion of Rajshahi city dwellers about introducing city bus service.

**Occupation-wise Distribution of People Interviewed**

A variety of people live in Rajshahi City Corporation. To determine the necessity of town bus services, data have been collected from different people. In total 10 groups were selected including Doctors (6.7%), Reporters (4.2%),




Bankers (10%), Teachers (9.2%), Housewives (8.3%), Service holders (9.2%), Businessmen (16.7%), Students (23.3%), Workers (8.3%), and Unemployed (4.2 It has been shown in table - 4.1.

*Table 5.1: Occupation-wise distribution of people interviewed*

| | Occupation of RCC Dwellers | Share, % |
|---|---|---|
| 1. | Doctor | 6.7 |
| 2. | | |
| 3. | | |
| 4. | Reporter | 4.2 |
| 5. | Banker | 10.0 |
| 6. | Teacher | 9.2 |
| 7. | Housewife | 8.3 |
| 8. | Service Holder | 9.2 |
| 9. | Businessman | 16.7 |
| 10. | Student | 23.3 |
| 11. | Worker | 8.3 |
| 12. | Unemployed | 4.2 |
| | Total | 100.00 |

*Source: Authors' Calculation, Sample Size - 120*

**Percentage comments of city residents**

To study the feasibility of introducing town bus services in RCC, a survey was conducted among the ordinary people of the City Corporation area. Different people opined differently (Table-4.2). Among them 22% think that town bus services are a safe transport system, 59% believe that city bus services will reduce

the travel time and cost of the people, 34.2% perceive that the main modes of transport of the city ( Rickshaw and Auto-rickshaw) are precarious and costly, 9.8% guess that vehicles of educational institutions are very irregular and insufficient, 19.7 % people think that transport jams will be removed if city bus service is introduced and 0.9% provided other logics for introducing city bus services.

*Table 4.2: Opinions of city residents interviewed*

| | Opinions | % |
|---|---|---|
| 1. | Town bus service is a safe transport system | 22.0 |
| 2. | Town bus service reduces the travel time and cost | 59.0 |
| 3. | Rickshaw and Auto-rickshaw are risky and costly | 34.2 |
| 4. | Vehicles of educational institutions are irregular and insufficient | 9.8 |
| 5. | transport jam will be removed | 19.7 |
| 6. | Others | 0.9 |
| Total | | 100.0 |

*Source: Authors' Calculation, Source: Sample size-120*

**Characteristics of Rickshaw Pullers and Auto-Rickshaw drivers**

This section identifies and summarises the socio-demographic characteristics of rickshaw pullers and auto-rickshaw drivers interviewed in the study. It covers such background variables as age, marital status, education level, family size, and dependents.Understanding these selected background information is considered necessary for a greater understanding of the research questions addressed in this study.

**Age of Auto-Rickshaw Drivers and Rickshaw Pullers**

Figures presented in Table 4.3 show that the highest number of auto-rickshaw drivers lies in 31-40 (42.3%). The next highest lie in the age group 21-30 (32.7%). For age groups 41-50, 11-20, 51-60 and 61-70 the corresponding figures are (11.6%), (7.7%), (3.8%) and (7.9%) respectively. What is interesting is that there were no auto-rickshaw drivers in the age group 71-80.

Table 4.3 also shows that the highest number of Rickshaw pullers lie in the age group 31-40 (32%), and the next highest lie in the age group 21-30 (30%). For age group 41-50, 51-60 and 61-70, the corresponding figures are 28%, 6% and 2% respectively. Interestingly, there were nearly no rickshaw pullers in the age group 71-80 (only2%).

*Table 4.3: Distributions of auto-rickshaw drivers and rickshaw pullers according to age group*

| Age group | | Share of Auto-rickshaw drivers, % | Share of Rickshaw pullers, % |
|---|---|---|---|
| 1. | 11 – 20 | 7.7 | 0.0 |
| 2. | 21 – 30 | 32.7 | 30.0 |
| 3. | 31 – 40 | 42.3 | 32.0 |
| 4. | 41 – 50 | 11.6 | 28.0 |
| 5. | 51 – 60 | 3.8 | 6.0 |
| 6. | 61 – 70 | 1.9 | 2.0 |
| 7. | 71 – 80 | 0.0 | 2.0 |
| Total | | 100.0 | 100.0 |

*Source: Authors' Calculation, Sample Size: 60 for auto-ricksha drivers and 60 for rickshaw pullers*

**Level of Education of Auto-rickshaw Drivers and Rickshaw Pullers**

It is seen from Table 4.4 that the level of education of the rickshaw pullers and auto-rickshaw drivers were deficient in the study area. It was found that 36.5% of auto-rickshaw drivers and 56% of rickshaw pullers were illiterate or had the ability to signature only. About 23.1% of auto-rickshaw drivers completed PSC (Primary School Certificate) to SSC (Secondary School Certificate) level education, whereas only 14% of rickshaw pullers have this level of education. Therefore, it is seen from table 4.4 that auto-rickshaw drivers were more educated than rickshaw pullers.

*Table 4.4: Distribution of auto-rickshaw drivers and rickshaw pullers according to the level of education*

| Level of education | Share of Auto-rickshaw drivers, % | Share of Rickshaw pullers, % |
|---|---|---|
| 1. Up to PSC | 13.5 | 26.0 |
| 2. From PSC to SSC | 23.1 | 14.0 |
| 3. From SSC to HSC | 15.4 | 4.0 |
| 4. BSS or more | 11.5 | 0.0 |
| 5. Illiterate or Can Signature | 36.5 | 56.0 |
| Total | 100.0 | 100.0 |

*Source: Author's Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers*

**Family Members**

Table 4.5 shows that most families are nuclear in the case of auto-rickshaw drivers and rickshaw pullers. At present, the joint family is breaking down with the change of social and economic conditions. Very few auto-rickshaw drivers and rickshaw pullers live in joint families. This study found that most auto-rickshaw drivers and rickshaw pullers have 3 or 4 members in their families.

*Table 4.5: Distribution of auto-rickshaw drivers and rickshaw pullers according to family size*

| Family Size | Auto-rickshaw drivers, number | Rickshaw drivers, number |
|---|---|---|
| 1. Mean | 4.28 | 4.49 |
| 1. Maximum | 9 | 10 |
| 2. Minimum | 3 | 2 |

*Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers*

**Ownership of the Vehicles**

The number of auto-rickshaws is increasing day by day, and rickshaws are decreasing within the RCC area. The prices of battery-driven rickshaws are higher than that of man pulled rickshaws. Due to this reason, most of the rickshaw pullers drives rickshaws on hired basis. In the case of auto-rickshaws, 67.3% of drivers have their own auto-rickshaws, and 32.7% use hired ones. Table 4.6 portraits the ownership of auto-rickshaws and rickshaws.

On the contrary, 48% of rickshaws were personal, and 52% were hired. Because of increasing demands and high incomes, the number of auto-rickshaws went up both personally and hired. Though, the cost of rickshaws is less than that of auto-rickshaws.

*Table 4.6: Distribution of auto-rickshaws and rickshaws according to ownership*

| Type of Ownership | Auto-rickshaws, % | Rickshaws, % |
|---|---|---|
| 1. Personal | 67.3 | 48.0 |
| 2. Rented | 32.7 | 52.0 |
| Total | 100.0 | 100.0 |

*Source: Authors' Calculation, Sample Size: 60 for auto-rickshaws and 60 for rickshaws*

**Net Income of Rickshaw Pullers and Auto-rickshaw Drivers**

Generally, the income level of auto-rickshaw drivers is high compared to rickshaw pullers, and for this reason, the living status of auto-rickshaw drivers is

comparatively better than rickshaw pullers. Figures presented in table 4.7 show that the monthly average net income of auto-rickshaw drivers and rickshaw pullers are Tk. 16,153.85 and Tk. 9,435 respectively. The maximum income of an auto-rickshaw driver is Tk. 27,000, which is two times higher than the income of a rickshaw puller. A rickshaw puller's minimum income is Tk. 4,500 per month, whereas the minimum income of an auto-rickshaw driver is Tk. 7,500.

*Table 4.7: Net income of an auto-rickshaw driver and a rickshaw puller (in a month)*

| Type of Incomes | | Net income of auto-rickshaw drivers | Net income of rickshaw pullers |
|---|---|---|---|
| 1. | Mean | 16,153.85 | 9,435 |
| 2. | Maximum | 27,000 | 13,500 |
| 3. | Minimum | 7,500 | 4,500 |

*Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers*

**Marital Status of Rickshaw Pullers and Auto-rickshaw Drivers**

Figures presented in table 4.8 show that almost all the rickshaw pullers and auto-rickshaw drivers interviewed are married. Ninety-eight percent of rickshaw pullers and 80.8 percent of auto-rickshaw drivers are married. Only 19.2 percent of auto-rickshaw drivers and 2% of rickshaw pullers are unmarried.

*Table 4.8: Marital Status of rickshaw Pullers and Auto-rickshaw Drivers*

| Marital Status | | Auto-rickshaw Drivers, % | Rickshaw Pullers, % |
|---|---|---|---|
| 1. | Married | 80.8 | 98.0 |
| 2. | Unmarried | 19.2 | 2.0 |
| Total | | 100.0 | 100.0 |

*Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers*

**Land ownership of Rickshaw Pullers and Auto-rickshaw Drivers**

As shown in table 4.9, around 75% of the Auto-rickshaw drivers and 92% of Rickshaw pullers have no land, and only 11.5% Auto-rickshaw drivers and 1% of Rickshaw Pullers have only 1 to 10 decimals of land. 7.7% Auto-rickshaw drivers have 31 to 40 decimals of land.

**Land ownership of Rickshaw Pullers and Auto-rickshaw Drivers**

Therefore, it can be inferred that Rickshaw pullers have almost no land in their ownership though Auto-rickshaw drivers possess a negligible amount of land.

*Table 4.9: Land ownership of rickshaw pullers and auto-rickshaw drivers*

| Amount of Land, Decimal | Auto-rickshaw drivers, % | Rickshaw Pullers,% |
|---|---|---|
| 1. No land | 75.0 | 92.0 |
| 2. 1 - 10 | 11.5.0 | 2.0 |
| 3. 11 - 20 | 0.0 | 0.0 |
| 4. 21 -30 | 0.0 | 0.0 |
| 5. 31 - 40 | 7.7 | 0.0 |
| 6. 41 - 50 | 0.0 | 2.0 |
| 7. 51 - 60 | 0.0 | 0.0 |
| 8. 61 - 70 | 5.8.0 | 4.0 |
| Total | 100.0 | 100.0 |

*Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers*

**Preferred alternative professions reported by Rickshaw pullers and Auto-rickshaw drivers, if opportunities of current occupation die down**

The study also investigated the occupations to which the existing auto-rickshaw drivers and rickshaw pullers would prefer to switch if the auto-rickshaws and rickshaws are withdrawn from the roads to introduce city bus service Rajshahi city corporation area (Table-4.10). In the case of auto-rickshaw drivers, nearly one-third (28.7%) have shared their preferences favouring business. Almost one-fifth has expressed the desire to go back to agriculture (farming activities). Over one-seventh would prefer to switch over as grocery shoppers, and 11.5% of auto-rickshaw drivers have refused to comment on the question. On the other hand, in the case of rickshaw pullers, over one-third (40%) shared.

*Table 4.10: Preferred alternative professions of Rickshaw pullers and Auto-rickshaw drivers*

| Alternative profession | Auto-rickshaw drivers,% | Rickshaw pullers,% |
|---|---|---|
| 1. Business | 28.7 | 4.0 |
| 2. Grocery | 13.5 | 8.0 |
| 3. Day labor | 1.9 | 12.0 |
| 4. Farming activities | 21.2 | 40.0 |
| 5. Pulling rickshaw in other towns | 0.0 | 2.0 |
| 6. Factory worker | 1.9 | 0.0 |
| 7. Bus diver | 9.8 | 0.0 |
| 8. Others | 3.8 | 4.0 |
| 9. No works | 7.7 | 14.0 |
| 10. No comments | 11.5 | 16.0 |
| Total | 100.0 | 100.0 |

*Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 50 for rickshaw pullers*

Table 4.10: Preferred alternative professions reported by Rickshaw pullers and Auto-rickshaw drivers, if opportunities of current occupation die down, their preferences favour agriculture; 16% of rickshaw pullers have no comments on the question, and 14% opined that they would not do any work without pulling a rickshaw.

**Route-wise number of trips by Rajshahi Universitybuses**

Though Rajshahi University was established in 1953, its transport department started functioning in 1970. After our independence, Bangabandhu Sheikh Mujibur Rahman sanctioned 12 buses. As the number of students was small, the number of buses and their routes were also limited. Now the number of both buses and trips have increased with the increase inthe number of students. Route-wise number of trips of RU buses are given in below (table 4.11).

*Table 4.11: Route-wise number of trips by Rajshahi University Buses*

| Routes | | Number of Buses | Number of Trips |
|---|---|---|---|
| 1. | Banehsor | 3 | 7 |
| 2. | Laxmipur | 2 | 13 |
| 3. | C&B | 3 | 8 |
| 4. | Court | 3 | 8 |
| 5. | Bornali | 2 | 8 |
| 6. | New-market | 1 | 7 |
| 7. | Naohata | 1 | 5 |
| 8. | Allupotti | 1 | 7 |
| 9. | Kashiadanga | 2 | 7 |
| 10. | Bihas | 1 | 4 |
| 11. | BGB sector | 1 | 6 |
| 12. | Katakhali | 1 | 6 |
| 13. | BRTA(am chottor) | 1 | 7 |
| 14. | Somsadipur | 2 | 13 |
| 15. | Rajshahi rail station | 1 | 6 |
| 16. | Naricelbaria Krishi unit | 1 | 3 |
| 17. | Library trip | 4 | 4 |
| 18. | Club trip | 1 | 1 |
| Total | | 31 | 120 |

Source: Rajshahi University transport department

Figures presented in table 4.11 indicate that 26 buses take 120 trips through 16 routes every day. Moreover, every Friday, two buses are used for Bazar trips for the teachers. Baneswar is the remotest route to the east, while Kasiadanga and Naohata are the remotest routes to the west and north.

**Route-wise number of trips by RUET buses**

Rajshahi University of Engineering and Technology (RUET) was established in 1964 as Rajshahi Engineering College with three engineering departments. Later it was converted into Bangladesh Institute of Technology (BIT), Rajshahi, in 1986 to enhance technical education. The institute was upgraded to Rajshahi University of Engineering and Technology (RUET) in September 2003 to expand education and research. Currently, there are more than 3000 students and 254 academic staff in RUET. The university provides its regular bus service almost everywhere in Rajshahi City for the convenience of students and academic staff. Information presented in table 4.12 shows that eight buses provide 21 trips in 10 routes every day.

*Table 4.12: Route-wise number of trips by RUET buses*

| Routes | Number of Buses | Number of Trips |
|---|---|---|
| 1. Court | 1 | 4 |
| 2. Baya | 1 | 2 |
| 3. Court-station | 1 | 1 |
| 4. C&B -Vadra | 1 | 3 |
| 5. Katakhali | 1 | 2 |
| 6. RUET-Quarter | 3 | 3 |
| 7. 217 Fellow- Quarter | 1 | 3 |
| 8. Bazar trip | 1 | 1 |
| 9. Mohila Hall | 1 | 1 |
| 10. Naodapara | 1 | 2 |
| Total | 12 | 22 |

Source: RUET Transport department

**Route-wise number of trips of Rajshahi College buses**

Rajshahi College was established in 1873. It is said to be the third oldest institutions of higher education in Bangladesh following Dhaka College and Chittagong College. After establishment, the college became one of the leading centres of higher education for the inhabitants of then East Bengal, North Bengal, Bihar, Purnia and Assam. Rajshahi College was the first institution in the territory to offer bachelor and honours degree courses in various disciplines since 1878. There are about 4000 students in Rajshahi College.

For smooth transportation of the students, 11 buses are running on a fare in different routes. These buses take 66 trips in 5 routes every day. Figures presented in Table-4.13 show that Baneswar, Belpukur, Naohata and Kasiadanga are the main routes located 17 km, 12 km, 11.1km, and 6.8 km apart from the college campus, respectively. The number of buses compared to about 4000 students is not sufficient.

*Table 4.13: Route-wise number of trips of Rajshahi College buses*

| Routes | Number of Buses | Number of Trips |
|---|---|---|
| 1. Baneshor | 4 | 24 |
| 2. Bellpukur | 1 | 6 |
| 3. Horian | 1 | 6 |
| 4. Naohata | 3 | 18 |
| 5. Kashiadanga | 2 | 12 |
| Total | 11 | 66 |

Source: Rajshahi College Transport department

**Route-wise number of trips by RMC buses**

Rajshahi Medical College (RMC), established in 1958, is the first medical college in the northern region of Bangladesh. Presently the college has only two buses for student's transportation. Figures presented in Table-5.14 show that two buses take a total of four trips to Dental and Court routes. Therefore, it can be inferred that most of the students use local public vehicles for their transportation.

*Table 4.14: Route-wise number of trips by RMC buses*

| Number of Routes | Number of Buses | Number of Trips |
|---|---|---|
| 1. Dental | 1 | 2 |
| 2. Court | 1 | 2 |

Source: Rajshahi Medical College Transport department

**Comparison of transport information among buses of RU, RUET, RMC and RC**

Figures presented in Table-4.15 show that 164 staff are working in RU, RUET, RMC and RC. Among them, 119 staff work in RU. In RC, 20 out of 23 are contractual staff, as all the buses run on a hired basis. The four institutions have 46 buses, among which RU has 26 buses of its own. It is further shown that RU

*Table 4.15: Comparison of transport information among buses of RU, RUET, RMC and RC*

| Items | Rajshahi University | RUET | Rajshahi Medical College | Rajshahi College |
|---|---|---|---|---|
| Number of Staffs | 119 | 20 | 2 | 23 |
| Number of Buses | 26 | 8 | 1 | 11 |
| Number of Routes | 18 | 10 | 2 | 5 |
| Number of Trips | 120 | 21 | 4 | 66 |

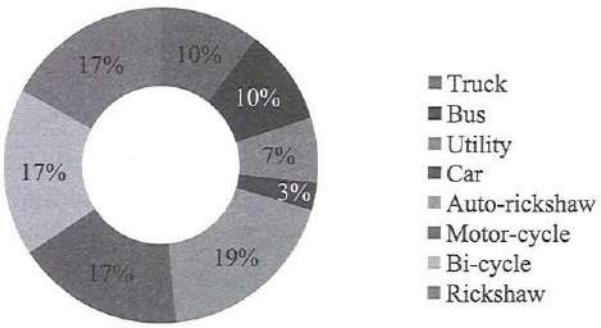
Source: Sample Survey Results

buses take 120 trips in 18 routes, RC buses take 66 trips in 5 routes, and RUET buses take 21 trips in 10 routes.

Apart from the buses of Rajshahi University, RUET, Rajshahi Medical College and Rajshahi College, buses of different government, semi-government, and autonomous institutions of RCC move throughout the city. On the other hand, the primary mode of transportation of the city's dwellers is battery driven auto-rickshaws. There are 19% auto-rickshaws, 17% motorcycles, 17% bi-cycles and 17% rickshaws, 10% trucks, 10% buses, 7% utilities and 3% cars running in the city area (Ashraful Haque, 2015). It is illustrated in diagram-1 the below:

In analysing the purpose of travelling, it is seen that 40% of the RCC people

Diagram-1: Shares of different modes of transport vehicles in RCC.




use transport means for returning home, 25% for work, 22% for education, 6% for social activities, 4% for shopping and 3% for other purposes (Diagram-2).

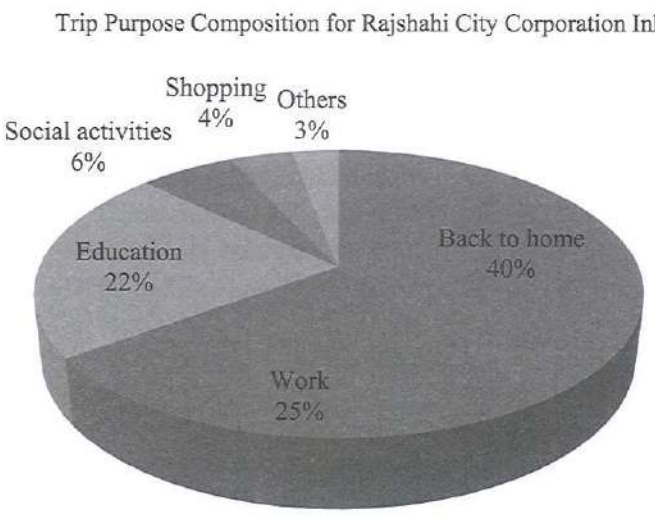
## INTRODUCTION OF PLANNED CITY BUS SERVICE

### The necessity of Planned City Bus Service

The population of Rajshahi City Corporation is about to cross one million. The number of permanent residents and the number of floating people are increasing day by day. There are many reasons behind the increasing population of RCC. These are:

1. Being a divisional town, many people come here for official purposes and leave the city after finishing their jobs the same day. As the city's main transport is rickshaws and auto-rickshaws, it takes more time and money to travel in this city. If town service is introduced, the floating people will be able to leave for their destination on the same day after completing their works in the city.

Diagram-2: Uses of transport vehicles by the city dwellers of RCC, 2015.




2. Rajshahi city is known as an educational city. From October to December, admission tests are held in Rajshahi University, RUET, Rajshahi Medical College, Rajshahi College. During this period, more than a million floating people visit the city. Besides, many students come to the city for admission coaching purposes after completing their HSC examination and stay for about one year. Also, every year more than 0.01 million students get admitted to different universities, colleges and institutions. However, after completing education, they stay in the city for preparing themselves for jobs and other urban facilities. Due to the increase of these floating people, the demand and supply of auto-rickshaws and rickshaws increase in the city, creating massive traffic jams.
3. As Rajshahi is a divisional city, job tests of different government, semi-government and private organisations are being held in Rajshahi City Corporation area, which is another reason for the city's increasing population.
4. Thousands of people from nearby areas visit the city for medical purposes as the 2nd oldest medical college in Bangladesh and other famous private clinics are here.
5. Rajshahi city is one of the famous places for tourists. The country's 1st museum (established in 1910), Zoo Park, the bank of Padma River are very famous spots for tourists. Many people from nearby cities visit the city, especially during the holidays.

Photograph-1: Rickshaws and auto-rickshaws at Zero point.

As mentioned earlier and other causes, the number of battery-driven auto-rickshaws and rickshaws is increasing day by day for their increasing demand and popularity among the travellers resulting in traffic jams in essential points. To portrait the scenario of traffic jams, two points named Monichatter and the Zero point is shown in the picture (Photographs 1 and 2). The illustration shows a more considerable number of rickshaws and auto-rickshaws compared to other vehicles.

Photograph-2: Rickshaws and auto-rickshaws at Monichatter

To remove traffic congestion from the city and ensure fast, safe, and cheap public transport, it has become crucial to introduce a city bus service. Despite existing narrow roads in some areas of the city, many critical busy roads will be

widened and well renovated in the master plan 2004-24 of RDA. The master plan includes the following components:

1. Alupotti-Talaimari road will be upgraded to two lanes;
2. The court-Bypass road will be widened;
3. Natore Road-Rajshahi Bypass road will be widened;
4. Construction of roads: Airport-Bypass connection road and Kapasia-Sucorno Mor road will be widened;
5. Binodpur-Halidagachi Taltola Mor road will be widened;
6. Bangabandhu Sheikh Mujibur Rahman Square will be constructed in Talaimari;
7. Greater road Shahid Captain Monsur Ali Park overpass will be constructed;
8. Bypass connection road will be upgraded to four lanes;
9. Choto Bongram Purbopara-Meherchondi and Barind Medical-Chakpara roads will be widened and renovated;
10. Alif Lam Mim Vatar Mor-Aligonj Bypass Mor road will be constructed;
11. Koirdara Mor-Sontospur bypass road will be constructed.

After implementing the RDA master plan, there will be no obstacle to launchinga city bus service in RCC.

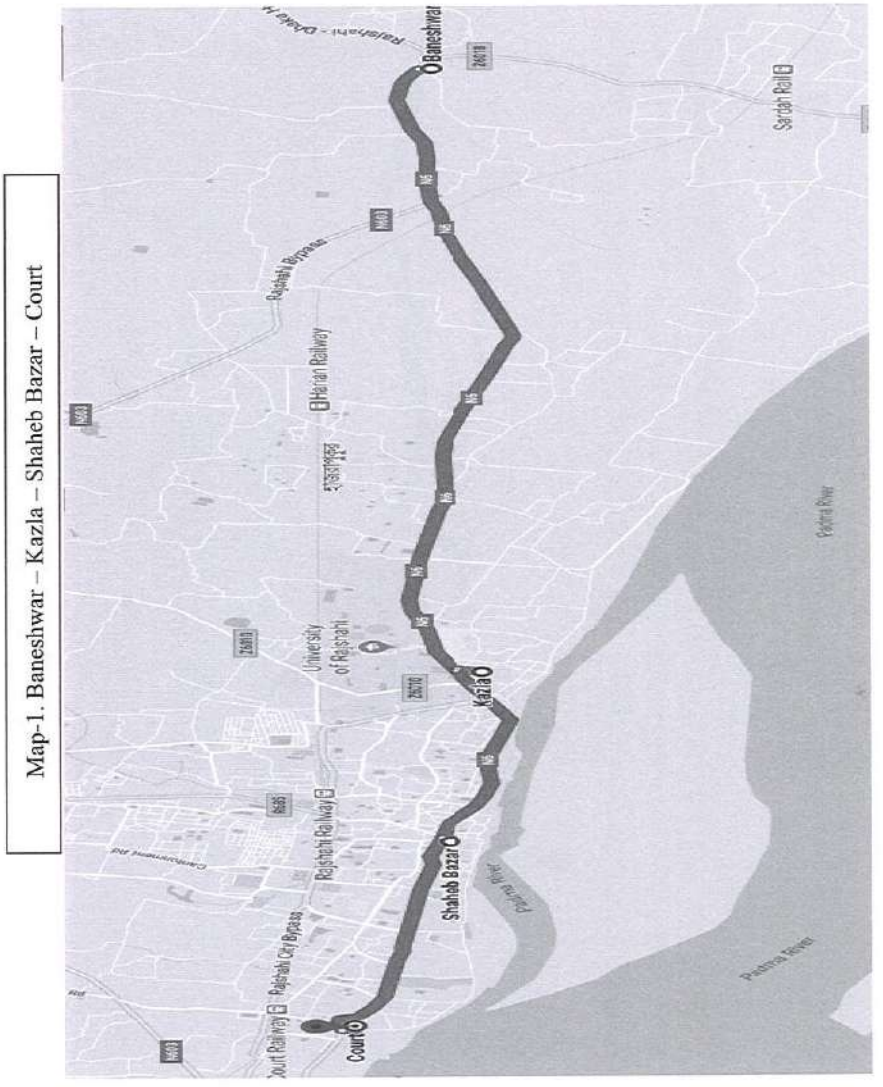
**Probable Routes of Planned City Bus Service**

Time is a very vital factor for every nation. In developed countries, travel time is of the highest consideration in city life. To reduce travel time in everyday life for work or school, they are constantly improving and updating their transport policy and modes of transportation. To do so, this is highly recommended that town service for the citizens of Rajshahi City Corporation as incorporated in other city corporations would be the most prominent solution to the existing traffic problem.

To reduce the travel time and hassle, town service is now a situational demand for a long-term solution to the traffic problem in the Rajshahi City Corporation Area. Besides, it will reduce traffic jams and consequently lower road accidents. Auto-rickshaws are running with electricity. Recently RCC has been suffering from severe load shedding due to auto-rickshaws. If town service is introduced, this load shedding will be reduced.

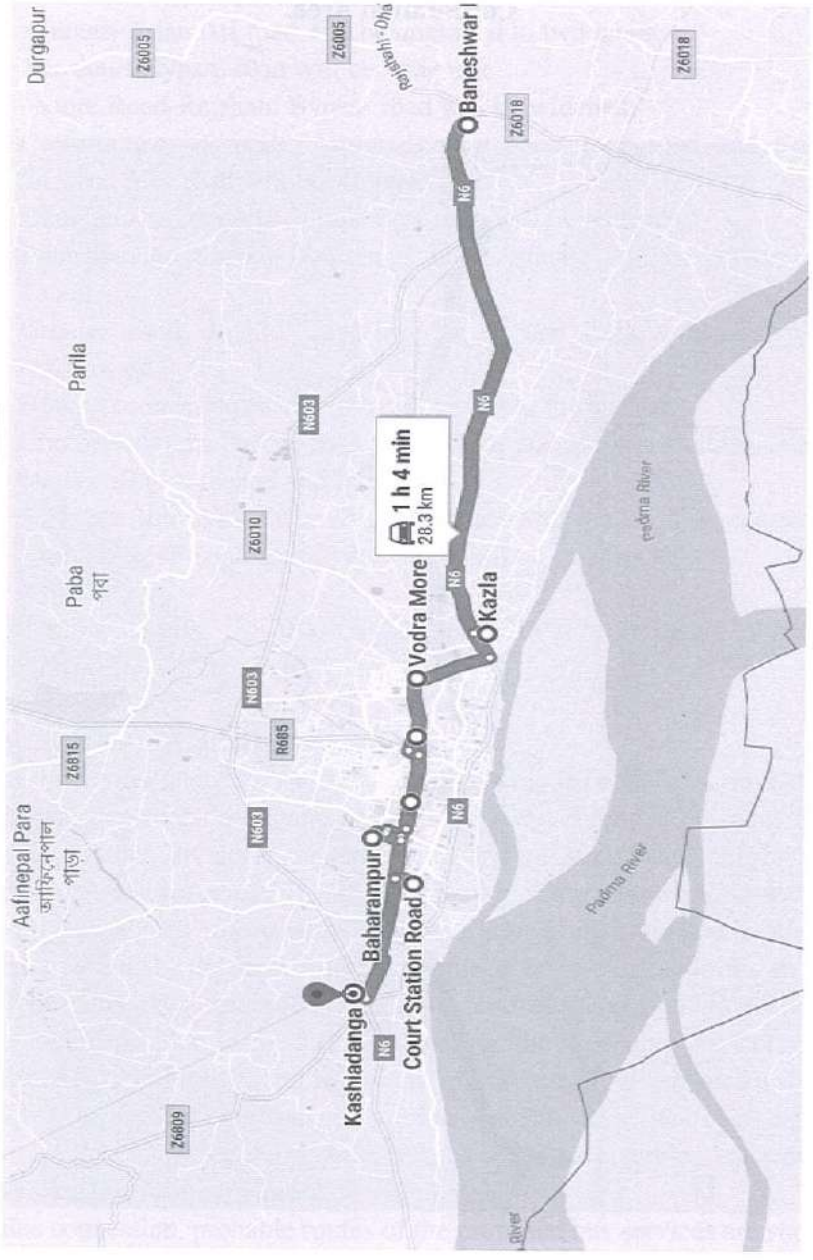
In this connection, probable routes of the proposed bus services are shown in maps 1 through 6 on the following pages.

**Maps 1 to 6 show the proposed routes for town service in Rajshahi City Corporation Area.**

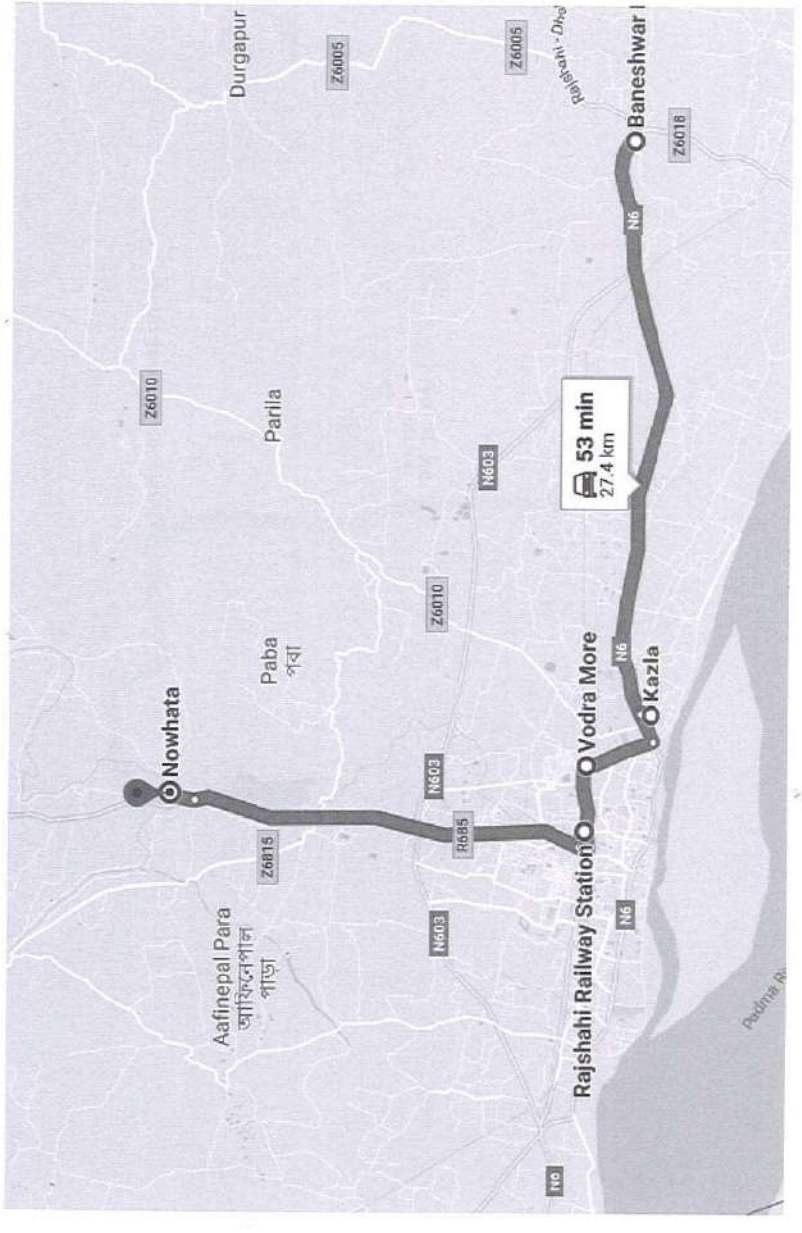


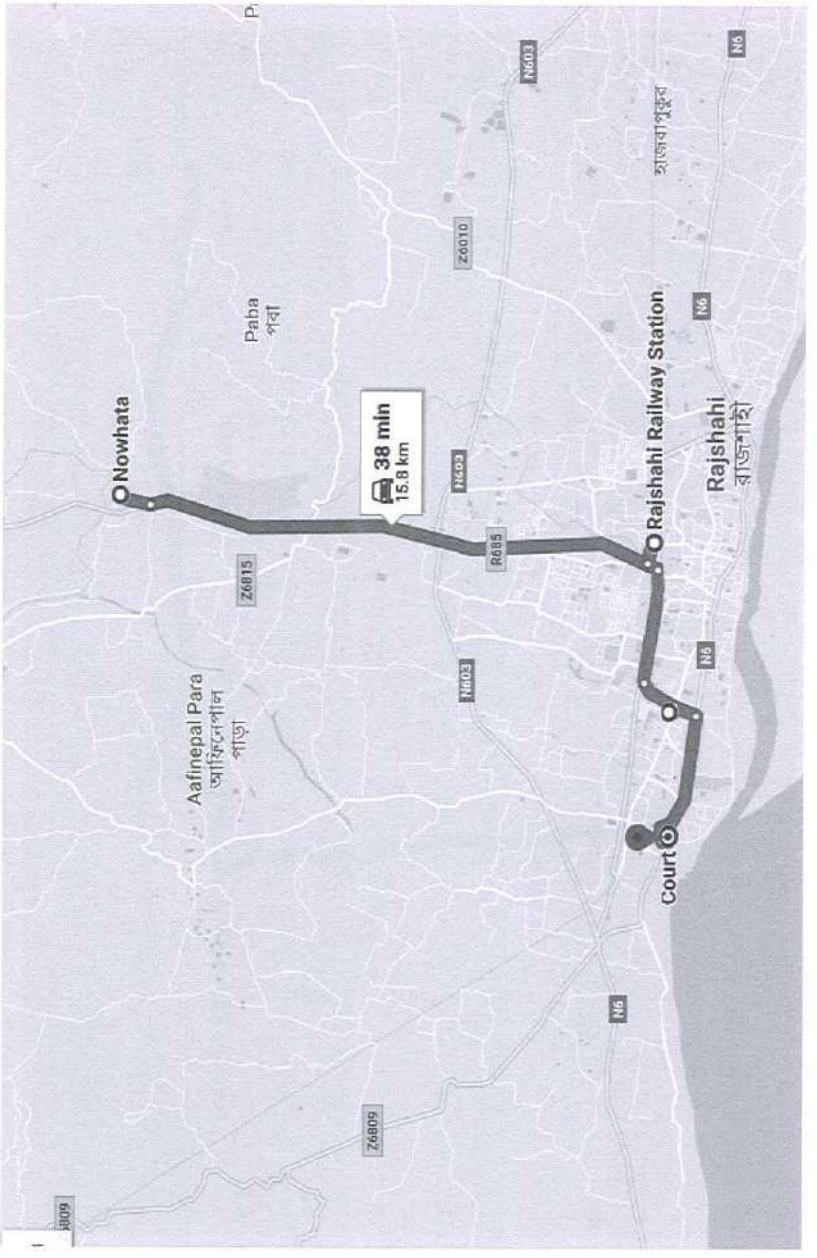

Map-1. Baneshwar – Kazla – Shaheb Bazar – Court

Map-2. Baneshwar – Kazla – Vodra More – Kasiadanga



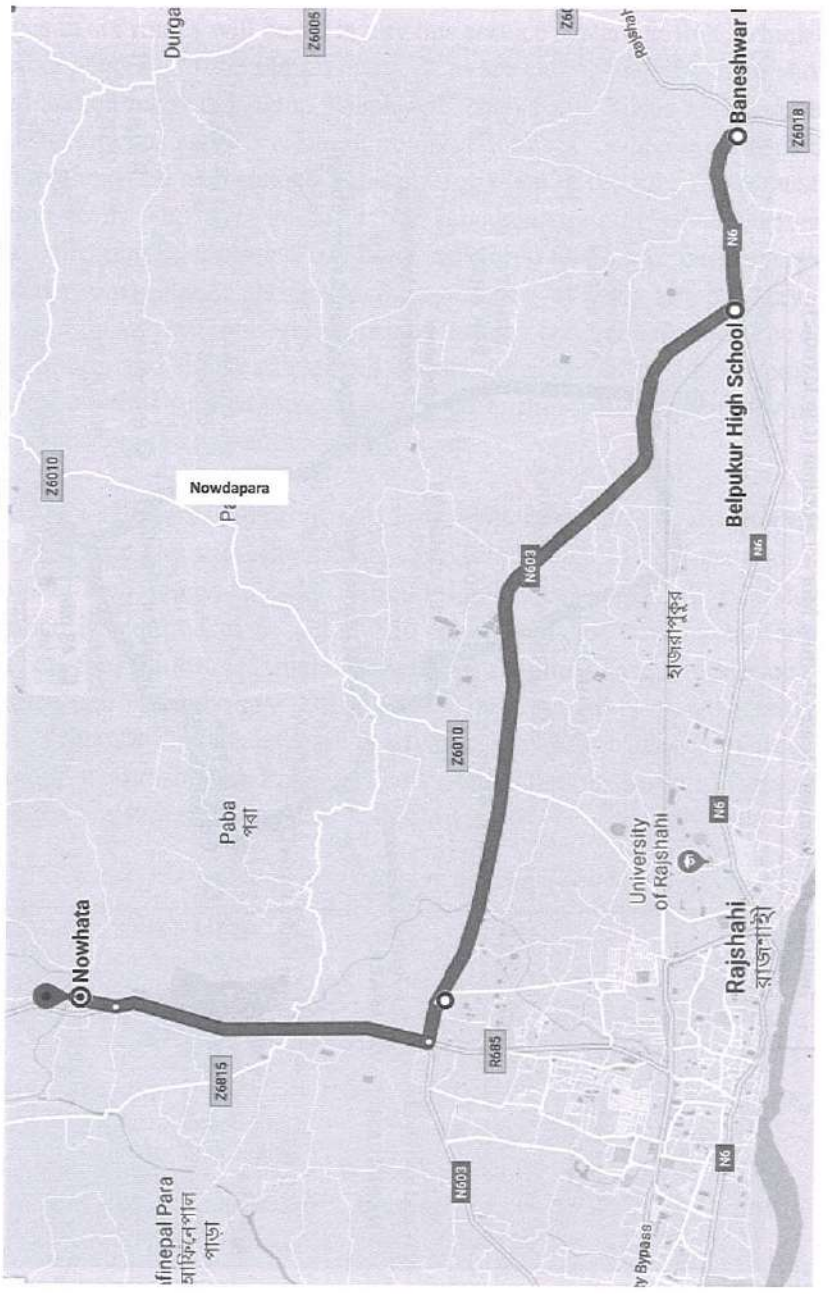
Map-3. Baneshwar – Kazla – Vodra More – Rajshahi Railway Station - Naohata



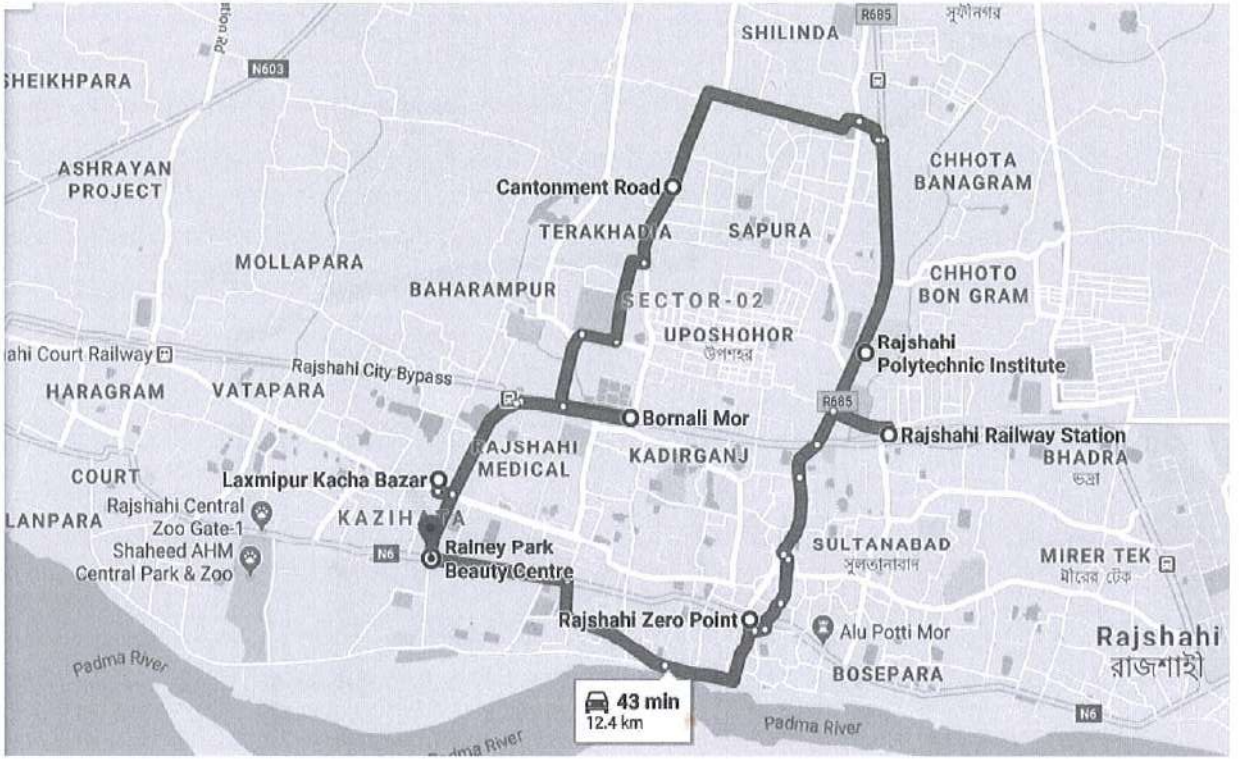



Map- 4. Naohata – Rajshahi Railway Station -- Court

Map- 5. Baneshwar – Belpukur – Naodapara – Naohata



Map-6. C&B – Rajshahi Zero Point – Railgate – Rajshahi Polytechnic Institute– Cantonment Road –Bornali Mor – Laxmipur (Circle route)



### Number of Buses Needed for Running the Service

In every route there will be 16 bus stoppages. Therefore, total number of bus stoppages in six routes will be 96 in city bus service system in RCC which can be changed depending on the requirement. At every end of the city, there should be two bus stations with oil pump which will enable city buses not to depend on others. The city bus service will require only 18 buses for one route. Bus drivers and helpers must be well trained in permitting them in the job. There must be an inspection team who shall monitor bus schedule, training of the drivers and helpers, collection of approved bus fares, permitted number of passengers etc.

In order to popularise and increasing awareness of using city bus service, the residence of the city must be well informed through bus route maps at free of costs in printed form and signboards or bill boards. As a part of its advertisement, the benefits of city bus service must be conveyed to the common people which will help in increasing the passengers of the buses.

### Methods of Fare Determination and Fare Collection of City Bus Services

Digital Bangladesh is a concept where everything ought to be done with the use of computer technology. In order to build digital Bangladesh, fare collection of bus service is required to be automated through digital devices and computer instead of the traditional manual method. Digital Fare Collection Cards facilitating one way, hourly, daily, 3-day pass, monthly pass, weekly, half monthly, 3 monthly, half yearly and yearly pass may be introduced in order to run a sound and well-disciplined bus service system. Determination of fares of RCC bus services are shown in the table 5.1 below:

*Table 5.1. Fares according to category of people and travelling duration*

| **ONE-WAY CASH FARES** | **FARE, %** |
|---|---|
| 1. For General People | 100.0 |
| 2. For Seniors aged 65 and older | 70.0 |
| 3. For Disabled | 70.0 |
| 4. For Students from Primary to University | 70.0 |
| **HOURLY PASS** | **FARE, %** |
| 1. For General People | 80.0 |
| 2. For Seniors aged 65 and older | 60.0 |
| 3. For Disabled | 60.0 |
| 4. For Students from Primary to University | 60.0 |
| **DAY PASS** | **FARE, %** |
| 1. For General People | 75.0 |
| 2. For Seniors aged 65 and older | 50.0 |
| 3. For Disabled | 50.0 |
| 4. For Students from Primary to University | 50.0 |

| 3-DAY PASS | FARE, % |
|---|---|
| 1. For General People | 70.0 |
| 2. For Seniors age 65 and older | 50.0 |
| 3. For Disabled | 50.0 |
| 4. For Students from Primary to University | 50.0 |
| **WEEKLY PASS** | **FARE, %** |
| 1. For General People | 70.0 |
| 2. For Seniors aged 65 and older | 50.0 |
| 3. For Disabled | 50.0 |
| 4. For Students from Primary to University | 50.0 |
| **BI-WEEKLY PASS** | **FARE, %** |
| 1. For General People | 70.0 |
| 2. For Seniors aged 65 and older | 50.0 |
| 3. For Disabled | 50.0 |
| 4. For Students from Primary to University | 50.0 |
| **MONTHLY PASS** | **FARE, %** |
| 1. For General People | 60.0 |
| 2. For Seniors aged 65 and older | 50.0 |
| 3. For Disabled | 50.0 |
| 4. For Students from Primary to University | 50.0 |
| **HALF-YEARLY PASS** | **FARE, %** |
| 1. For General People | 50.0 |
| 2. For Seniors aged 65 and older | 50.0 |
| 3. For Disabled | 50.0 |
| 4. For Students from Primary to University | 50.0 |
| **YEARLY PASS** | **FARE, %** |
| 1. For General People | 50.0 |
| 2. For Seniors aged 65 and older | 50.0 |
| 3. For Disabled | 50.0 |
| 4. For Students from Primary to University | 50.0 |

Digital cards structured with the above schemes will ensure optimum revenue earning from the bus services resulting in the assurance of low-cost transport services for the ordinary people of RCC. In order to mitigate conflict between passengers and bus contractors, route wise bus fare chart should be displayed in the visible place of the buses. The initial or starting fare must be taka 2; takaone will be charged for every kilometre. The minimum fare will be taka 5.

There must be a driver and a supervisor on each bus. The supervisor would monitor whether every passenger is paying the required fare according to the route. Bus fare should be paid with digital cards. Until issuing digital cards in the buses, a manual ticketing system must be followed. After a certain distance, well-structured bus stoppages should be built for comforting passengers waiting for buses. For this purpose, RCC should invite well-established companies to sponsor building modern bus stations at every stoppage.

## Recommendations and Conclusion
### Policy Recommendations

To introduce City Bus Service, our recommendations are as follows:

1. In order to introduce city service a new department named "RCC Bus Department" should be established.
2. At the initial stage, the RCC should contract with the existing bus service departments of Rajshahi University, Rajshahi College, Rajshahi Medical College, and RUET to transfer their buses under Rajshahi City Corporation. The City Corporation may buy the buses or pay rent to this organisation. Their staff can be utilised for this purpose. Wages should be paid to the staff monthly to find job security and work safely.
3. There may be six routes in RCC. These are:
   Baneshwar – Kazla – Shaheb Bazar – Court;
   i. Baneshwar – Kazla – Vodra More – Kasiadanga;
   ii. Baneshwar – Kazla – Vodra More – Rajshahi Railway Station – Naohata;
   iii. Nowata – Rajshahi Railway Station – Court;
   iv. Baneshwar – Belpukur – Naodapara – Nowhata;
   v. C & B – Rajshahi Zero Point – Railgate – Rajshahi Polytechnic Institute– Cantonment Road – Bornali Mor – Laxmipur (Circle route).
4. In every route, there must be specific stoppages. Without stoppages, no buses shall halt and take passengers. Buses shall leave their stations every 10 minutes.
5. Different sorts of cards like hourly, daily, weekly, monthly, half-yearly, yearly for fare collections (in future smart fare cards) shall be introduced on a concession basis.
6. According to RDA, two road construction projects from Airport road to the Bypass road and Kapasia bazaar to Sucorno Mor will be completed in June 2018. Within June 2020, two projects will be completed to construct an overpass from Greater Road to Shahid Captain Monsur Ali Park and a four lane upgradation of the Bypass road. Upgradation of roads from Choto Bongram Purbopara to Meherchandi and from Barind Medical to Chakpara will be completed in June 2020. Besides these projects, following the RDA master plan, many other projects will be taken for implementation very soon. These upcoming projects will gradually pave the way for a smooth town service system.
7. In the main centre point of the city having busy and narrow roads, rickshaw and auto-rickshaw may run there as buses cannot move without specific routes.

8. Separate lanes should be built for cycles, rickshaws, and auto-rickshaws to smooth the buses' running.

It is a well-established fact that adequate and efficient mass transportation service plays an important role in combating traffic congestion and improving safety within urban areas. So, city bus service system is essential for ensuring safe, comfortable and cheap movement of the city dwellers of RCC. In this paper, an attempt has been made to present the conditions of the existing transport system in Rajshahi City Corporation and identify the problems of transportation of RCC.

At present, the population of Rajshahi city is about one million. The population is rising day by day. So, RCC authorities should build an underground rail system (metro) soon. Otherwise, Rajshahi city would be a congested and blocked city like Dhaka. Besides RCC, other cities like Chittagong, Khulna, Sylhet, Barisal, Rangpur and Mymensingh should construct underground railways. Otherwise, we would not be able to build Sonar Bangla, the long-cherished goal of the Father of the Nation Bangabandhu Sheikh Mujibur Rahman.

**Conclusion**

Bangladesh is one of the fastest-growing countries in the world. Already it has achieved an 8% plus growth rate. In all social studies, our country's achievements are remarkable. To cite some of them will suffice; literacy rate 72.3%, life expectancy 72 years, per capita income 1272 dollars, population growth rate 1.37%, electricity coverage nearly 90%. It is noteworthy that our country already has got developing country status. However, still,many problems remain to be solved in order to get sustainable developing country status. Infrastructural weakness is one of them, perhaps the most important one. Especially our country is incurring huge losses in terms of material and human lives because of the absence of modern and sound transport infrastructure (Rail, bus services). Rajshahi City Corporation is not an exception in this respect as well. Although RCC is one of Bangladesh's oldest city corporations, there is still no city bus services. It is a matter of great regret that with a population of nearly one million, RCC has miserably failed to develop a city bus service, not to speak about metro rail or subway service. In the developed country, metro, bus, trolley-bus, trams are the primary transport means of huge cities like RCC, DCC, KCC, and CCC. Even there are laws or rules that cities or towns with a population of one million must have metro rail or sub-way services. China and India are building metro rail or subway at a rocket speed. Already China has built nearly four thousand kilometres

of metro lines, whereas India has built only one-fifth of that of China, i.e. only four hundred kilometres. The number of populations of both countries is nearly the same: China 136 crores and India 130 crores.

However, in respect of urban transport facility particularly metro rail India is lagging behind China ten times. But what about our cities like DCC, RCC, KCC, CCC, and others? The services of our cities are like that of 18th century Europe. For RCC, we think it is like that of the middle ages of Europe. Attempts have been taken by the private sector bus owners to introduce bus services but failed miserably. Therefore, it is our firm conviction that the private sector would not come forward. Only RCC can and must introduce a city bus service here in RCC for the more significant benefits of RCC inhabitants. RCC must, at the same time, visualise building metro-rail or subway in RCC soon.

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