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Ministry of Housing and Public Works

Urban Development Directorate (UDD)

Preparation of Development Plan for Fourteen Upazilas

Package-04

(Saghata Upazila, District: Gaibandha; Sariakandi Upazila and
Sonatala Upazila, District: Bogra)

FINAL SURVEY REPORT

TRAFFIC SURVEY

Of

Saghata Upazila, Gaibandha

June, 2017



Modern Engineers Planners & Consultants Ltd.

Letter of Transmittal

Ref No.: MEPC/UDD/2017/60

Date: 04.06.2017

To

The Project Director

“Preparation of Development Plan for Fourteen Upazilas” Project

Urban Development Directorate (UDD)

82 Segun Bagicha, Dhaka-1000.

Subject: Submission of the Final Traffic Survey Report of Saghata Upazila, Gaibandha.

Dear Sir,

I have the pleasure to submit herewith the Final Traffic Survey Report of Saghata Upazila, Gaibandha District under “**Preparation of Development Plan for Fourteen Upazilas Project**” Package No: 04 (Saghata Upazila, District- Gaibandha; Sonatala Upazila and Sariakandi Upazila, District- Bogra) for your kind information and further action.

Thanking you and assuring you of our best services.

Best Regards

.....
(Engr. A. Sobahan)

Managing Director of MEPC

.....
(Shamim Mahabubul Haque)

Team Leader, Package-4

Executive Summary

Transportation is a very important aspect of planning which has greater impact on development including land use or environment and thus it is very crucial for any plan preparation. Efficient and effective transportation is also a fundamental prerequisite for the people as well planned transportation system provides efficient movement of goods from one place to another. Thus, the assessment of the detailed features and characteristics of the transport infrastructure, mode and transport users of this Upazila is of very important for meeting the existing transport demand and the future challenges.

Saghata, the smallest upazila of Gaibandha Zila, in respect of both area and population came into existence in 1905 as a Thana and was upgraded to upazila in 1984. The upazila occupies a total area of 231.02 sq.km. It is located between 25°02' and 25°14' north latitudes and between 89°29' and 89°40' east longitudes. The upazila is bounded on the north by Gaibandha Sadar Upazila, east by Fulchhari Upazila, Sariakandi Upazila and Islampur Upazila, south by Sonatola Upazila and west by Gobindaganj Upazila and Palashbari Upazila.

According to the BBS report based on population census 2011, the Upazila has total 530 kilometer road of which 128 kilometer is metaled road and remaining 402 kilometer is unmetaled (Katcha) road. The area has 20 kilometer railway connection with Bogra Sadar. It has 30 kilometer water way in monsoon (both river and canal). The area has 108 bridges, 1 baily bridge and 96 culverts. The total area has 2 railway stations and 3 bus stands.

During the survey, the survey team assessed the existing transportation and traffic management system through observation, discussion with the local people, Union Parishad members and transport users, passengers. A total of 109 passengers were interviewed of which 79.82% are male and 10.18% are female. Out of the total passengers interviewed 6.42% are within the age of 20, 21.10% are within the age group of 20-30, 62.39% are within 30-60 and about 10.09% are above the age of 60 years. The survey revealed that the origin of trip of 15.6% of the total passengers were originated from different places located within the union, 39.45% movement were originated from different places located within the Upazila, 35.78% trips were originated from different places located within district and 5.50% trips were originated from different places located outside the district. The survey revealed that the destination of 6.42% movement were ended in different places located within the Union, 31.19% trips were ended in different places located within Upazila, 37.61% trips were ended in different places located within the district and 24.77% trips were ended in different places located outside the district. The survey revealed that the purpose of about 28.44% of the total passengers were to commute and to go back and forth, 33.94% movement were business trips, 7.34% trips were for shopping, 11.93%

trips were for educational school going, 18.35% trips social trips. It is evident that van and pick up are used mainly for carrying goods and commodities to relatively shorter distances within the ward, union and Upazila and on the other hand, bus, CNG and trucks are mainly used for a longer distance including Bogra, Gaibandha, Sherpur, Jamalpur and Dhaka etc.

The survey results of the transportation and traffic management has become the basis for further analysis and interpretation in the process of preparing master plan for Saghata Upazila. Care should be taken not only to the conditions of the roads and vehicles but also to the traffic management.

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List of Abbreviations/Acronyms

ADT	: Average Daily Traffic
ADTV	: Average Daily Traffic Volume
BBS	: Bangladesh Bureau of Statistics
CNG	: Compressed Natural Gas
DLRS	: Directorate of Land Record and Survey
GIS	: Geographic Information System
ICA	: Institute of Cultural Affairs
KM/km.	: Kilometer
LGED	: Local Government and Engineering Department
MEPC	: Modern Engineers Planners & Consultants Ltd.
MoHPW	: Ministry of Housing and Public Works
NGO	: Non-Government Organizations
No.	: Number
O-D	: Origin-Destination
PCU	: Passenger Car Unit
PRA	: Participatory Rapid Appraisal
SPSS	: Statistical Package for the Social Science
Sq. Ft.	: Square Feet
Sq. Km.	: Square Kilometer
Sq. M.	: Square Meter
Sq. Mile	: Square Mile
Tk.	: Taka
ToR	: Terms of Reference
UP	: Union Parishad
UDD	: Urban Development Directorate
UNO	: Upazila Nirbahi Officer

CHAPTER ONE: INTRODUCTION

1.1 Background

Transportation is a very important aspect of planning which has greater impact on development including land use or environment and thus it is very crucial for any plan preparation. Efficient and effective transportation is also a fundamental prerequisite for city dwellers as well planned transportation system provides efficient movement of people and goods from one place to another. Thus, the assessment of the detailed features and characteristics of the transport infrastructure, mode and transport users of this Upazila is very important for meeting the existing transport demand and the future challenges.

It is recognized that having a series of datasets from the field are of most important for development planning of an area. Transportation is a significant feature of physical planning for urban and rural planning. Specially in a country like Bangladesh where transport sector becomes failure to meet up the demand of its growing population and faces acute problems such as traffic congestion, delay, accidents, insufficient pedestrian facilities, parking difficulties, air and noise pollution, inadequate transport facilities for the city dwellers, entry and exit of the town, etc. In such a situation, proper and well-organized road network with standard and available transport facilities is the prerequisite for healthy and prosperous future growth of urban and rural areas.

1.2 Objectives of the Survey

The main objectives of the proposed survey are to collect relevant information on the traffic and transportation system of the area including as follows:

- To know the existing transportation networks and facilities;
- To find out the scenario of average daily traffic, peak hour traffic and off-peak hour traffic;
- To know the pattern of traffic generation, traffic distribution and movement, major origin and destination points;
- To know the pattern of traffic generation and traffic distribution in regional context;
- To know the pedestrian flow in measuring the capacity of the road;
- To figure out the findings of PRA and Socio-economic survey.

1.3 Scope of the Survey

As spelt out in the TOR the scope of survey includes identification of transport network including road, water and railways, common mode of transport, existing traffic volume, road hierarchy, traffic pattern etc. in the area. The scope of works include traffic count survey, origin and destination survey, pedestrian survey, bus passenger survey, train passenger survey, regional transportation survey, physical condition of roads, main roads, intersections, bus terminals, railway routes, location of existing ghats, routes etc. and analysis of survey findings including preparation of reports for use in the planning stage.

CHAPTER TWO: APPROACHES AND METHODOLOGIES

2.1 Survey Methodology

The survey was conducted through administering different pre-designed format finalized in consultation with the Client (UDD). The formats were directed to collect traffic and transport information and data within the selected areas. The formats were designed considering the required parameters and variables covering all relevant sectors to be incorporated in the reports and in the proposed development plan of traffic and transports. Different formats used in the survey are attached in Annex part. The survey formats included

- Traffic Volume Count Survey;
- Origin and Destination Survey;
- Pedestrian Survey;
- Bus Passenger Survey;
- Train Passenger Survey;
- Regional Road Network Analysis.

2.2 Sampling Techniques

The initial sample size was determined by the following formula

$$n = \frac{z^2 pq}{d^2} \quad \text{Where,}$$

z is the normal variation and which has 1.96 for 95% confidence interval

p is the target proportion. In this case, we have assumed p= 0.5

p+q =1, therefore q=0.5

And d is the desired error which is 0.1.

(Cochran, 1963)

The initial sample size is therefore:

$$n_0 = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.1)}$$

$$= 96.04$$

These sample size was adjusted by using the following formula:

$$n = \frac{n_0}{1 + \frac{n_0}{N}}$$

Where n is requiring sample size and N is no. of Population of Upazila.

Here, Sonatala Upazila has the population of 167547. After applying the above formula, it is found that minimum 96 samples will be surveyed for each category of survey. Considering the formula, the sample size of traffic and transportation surveys has been determined.

2.3 Types of Survey Related to Traffic and Transportation

Based on the TOR the following categories of survey were identified to be conducted in the Upazila area.

Traffic Volume Count Survey

Traffic Volume is the number of vehicles crossing a section of road per unit time at any selected period. Traffic volume is used as a quantity measure of flow; the commonly used units are vehicles per day and vehicles per hour.

One of the fundamental measures of traffic on a road is the volume of traffic using the road in a given interval of time. It is also termed as flow and it is expressed in vehicles per hour or vehicle per day. When the traffic is composed of a number of vehicles, it is the normal practice to convert the flow into equivalent Passenger-Car Unit (PCU), by using certain equivalency factors. The flow is then expressed as PCUs per hour or PCUs per day.

This covers the different vehicles types including

- a. *Motorized vehicles like truck, bus, car/microbus, auto rickshaw and motorcycle, and*
- b. *Non-motorized vehicles including rickshaw/van, bicycle, animal/ push cart etc.*

Origin-Destination (O - D) Survey

Origin-destination (O-D) surveys provide a detailed picture of the trip patterns and travel choices of a city's or region's residents. These surveys collect valuable data related to households, individuals and trips. This information allows stakeholders to understand: Travel patterns and characteristics Measure trends Provide input to travel demand model development forecasting, and planning for area-wide transportation needs and services Progress in implementing transportation policies. In a transportation study, it is often necessary to know the exact origin and destination of the trips. It is not only necessary to know how many trips are

made, but also group these trips with reference to the zones of their origin and destination. This carried out through roadside interview of passengers covering the followings important aspects of transportation planning.

- a) Sex of passengers,*
- b) Age of passengers,*
- c) Origin of trip,*
- d) Destination of trip,*
- e) Purpose of trip,*
- f) Mode of travel of respondent,*
- g) Travel time and travel cost.*

Regional Transportation Network Survey

This was carried out through direct interview of drivers covering the followings important aspects of transportation planning.

- a. Trip going out,*
- b. Trip destination point,*
- c. Trip coming in,*
- d. Average number of passengers/ weight of goods carried by per mode.*

Pedestrian Survey

As pedestrian is an important element or a part of moving vehicle, it is necessary to know the pedestrian flow in measuring the capacity of road, that's why the traffic survey has included the pedestrian count. This covers the different vehicles types including

- a. Origin of trips,*
- b. Destination of trips,*
- c. Trip distribution pattern,*
- d. Purpose of trips.*

Bus Passenger Survey

This covers the different vehicles types including

- a. Purpose of travel,*
- b. Age group and age-sex distribution,*
- c. Distance of travel,*
- d. Trips per week.*

Train Passenger Survey

This covers the different vehicles types including

- a. Purpose of the trips,*
- b. Origin and Destination of the trips,*
- c. Trips per week,*
- d. Travel distance with travel time,*
- e. Travel distance with travel cost.*

2.4 Field Survey Approach

The consultant team conducted several visits within the area and identified major road linkages and also identified the major intersections and crossing points for conducting the proposed survey. The major intersection covered by survey is shown in Map 3.2. For conducting the survey, roads were selected as a main arterial or transit route within the area and vehicles/traffic were grouped as motorized vehicles and non-motorized vehicles.

2.5 Days and Hours of Traffic Survey

The survey was conducted at one location of each of the selected roads in a day and the location was selected considering the important section of the road. The count was conducted in both directions for successive 12 hour periods between 6 am to 6 pm.

2.6 Recording of Information

Manual method was used to record the traffic as it passes the selected location. Trained enumerators were deployed for counting and recording the data using tally-marking system. For accurate counting, a day was divided into 2 shifts of 6 hours each between 6 am to 12 pm, and 12 pm to 6 pm. Two groups of enumerators and a supervisor for each shift were deployed for uninterrupted counting of traffic.

2.7 Orientation and Training to the Survey Team

Day long orientation training were conducted by the consultant team at the site office located in the Upazila Centre so that all the traffic and transportation team members (see details in Annex-v) become well conversant with purpose and methodology of the whole survey work as well as their responsibilities of the work to perform the activities efficiently in the field. The following issues/aspects were discussed in the orientation training program:

- Objectives of the traffic and transportation survey;
- Methodology of the survey;
- Assigned duties and responsibilities of team members;

- Monitoring and quality control of the survey;
- Details of survey formats and tools;
- Techniques to be followed during the survey;
- Recording of data;
- Reporting to the respective survey supervisor.

2.8 Selection of Survey Procedure

Considering the aspect of TOR of the assignment and the transport characteristics of the study area, the following factors were considered for conducting the transportation survey;

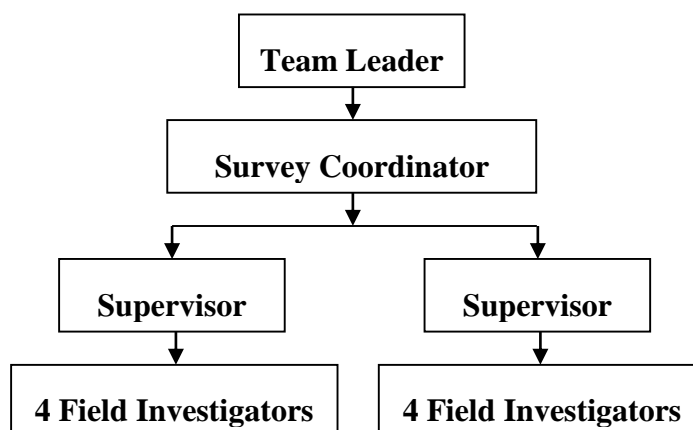
- To find out the roads and river way condition, accessibility condition;
- To find out the pattern of traffic generation, traffic distribution, trip assignment, trend of growth to find out the congestion points and other transportation related problems.

2.9 Quality Control of Field Survey

A consultant team consisting of team leader, transportation planner/coordinator, supervisor and investigators were engaged for traffic survey and data collection. The consultant engaged 3 experience and trained coordinators (see details in Annex-v) for day to day supervision and monitoring of field survey works by the supervisors. The Transport planners worked as coordinator to coordinate the overall survey activities including maintaining liaison with the supervisors and enumerators for smooth and effective conduction of the survey

2.10 Survey Organization

The consultant organized a survey team headed by the team leader involving the transport planner. Team organization is shown in flow diagram below.



2.11 Data entry, analysis and presentation

Traffic count surveys were manually counted following tally marking system and recorded in the survey formats. All data including O-D survey and regional transportation survey were processed using SPSS software. All the responses of the respondent were coded systematically for easy entry of respondent's responses in the computer program for analysis and interpretation. The findings of the survey are presented in statistical tabular and graphical forms based on the requirement and objectives of the survey.

2.12 Survey Data Processing

Using statistical software such as SPSS, data has been processed and presented into three forms/styles viz. tabular form, graphical and the textual/report form.

Passenger Car Units (PCUs) Equivalency Factors

The normal practice to convert the flow into common unit is Passenger Car Units (PCUs) by using certain equivalency factors. The flow is then expressed as PCUs per hour or PCUs per day.

No Passenger Car Units (PCUs) standard is available for using in such projects of Bangladesh. In deciding the equivalency factors of different types of vehicles, different study and practice guidelines have been reviewed, such as, Dhaka Integrated Transport Study, 1994 (DITS), Road Materials and standards study, 1994 (RMSS), British Practice and Indian Practice. After reviewing those common practice, the practices of ongoing relevant projects has also been considered. Through the literature survey, the PCUs for different vehicle have been decided that are most appropriate for an Upazila. However, the following values have been considered for PCUs of Sonatala Upazila study (Table 2.1).

Table 2.1: Comparisons of different PCU Factors and Considered PCU

Vehicle Type	Recommended PCU Factor				PCU Factor Considered for the Project
	DITS 1994	RMSS 1994	British Practice	Indian Practice	
(A) Motorized					
1.Bus	2.50	3.00	3.00	3.00	3.00
2. Truck	2.00	3.00	2.00	3.00	3.00
3.Car/Jeep/Microbus	1.00	1.00	1.00	1.00	1.00
4.Autorickshaw		0.50	0.75		0.75
5.Motor cycle	0.30	0.75	0.75	0.50	0.75
6.Tempo/Easy Bike	0.50	0.75		1.00	0.75
(B) Non-Motorized					
1.Rickshaw/Van	0.80	2.00		2.00	2.00

Vehicle Type	Recommended PCU Factor				PCU Factor Considered for the Project
	DITS 1994	RMSS 1994	British Practice	Indian Practice	
2. Bicycle	0.20	0.50	0.33	0.50	0.50
3. Push Cart	4.00	4.00		3.00	4.00

Source: Field Survey, 2016

PCU= Passenger Car Unit

DITS=Dhaka Integrated Transport Study, 1994

RMSS=Road Materials and Standards Study, 1994.

CHAPTER THREE: EXISTING TRANSPORTATION NETWORKS AND FACILITIES

3.1 Location and Regional Setting of the Area

Saghata Upazila is located in Gaibandha District under Rangpur Division. This Upazila is located in between 25°02' and 25°14' north latitudes and in between 89°29' and 89°40' east longitudes. The Upazila is bounded on the north by Gaibandha Sadar Upazila, east by Fulchhari Upazila and Islampur Upazila of Jamalpur Zila, south by Sonatala Upazila and Sariakandi Upazila of Bogra Zila and west by Gobindaganj Upazila and Palashbari Upazila. There are one Paurashava and 10 union centers within the Upazila. The Upazila consisted of 118 mauzas covering 125 villages. The Jamuna, Bangali and Kalapani are the major rivers of the area. Beside this, Telian Beel, Badia Beel, etc. are notable major water bodies. The location of the upazila is shown in the regional setting Map, Map 3.1.

Saghata, the smallest upazila of Gaibandha Zila, in respect of both area and population came into existence in 1905 as a Thana and was upgraded to upazila in 1984. Nothing is definitely known about the origin of the upazila name. It is said that in the past some Hindu Shah family settled in the present place of upazila adjacent to a Ghat of the river Jamuna. The place got prominent as a business center due to the great contribution of that Shah family. Consequent upon the effect of these two words Shah and Ghat, the place was named as Saghata. It is generally believed that the upazila was named Saghata at the time of its creation.

The total area of Saghata Upazila is 231.02 sq. km with a total population of 2,67,819 (BBS, 2011). Main occupations are agriculture, business, retail & whole sellers, vehicle mechanic, rickshaw puller, masonry, government & non-government services, wage labor, trade & commerce etc. There are some saw mills and brick fields including other small-scale industries like rice/flour mills, bakeries, ice factory within the area. Geographical location and the regional economic influence also put an importance on the area. The area is basically an agrarian basin and the major crops cultivated are rice, jute, wheat, vegetables etc. The Paurashava is almost an urban center and has been playing as a commercial center of the Upazila.

Table 3.1: Road Classification (Pucca, Semi-pucca and Katcha) of Saghata Upazila

Type of Road	Length (km)
Pucca Road	128
Semi-Pucca Road	0
Katcha Road	402
Total	530

Source: BBS District Statistics 2011, Gaibandha District

According to the BBS report based on population census 2011, the Upazila has total 530 kilometer road of which 128 kilometer is metaled road and remaining 402 kilometer is un-metaled (katcha) road. The area has 20 kilometer railway connection with Bogra Sadar. It has 30 kilometer water way in monsoon (both river and canal). The area has 108 bridges, 1 baily bridge and 96 culverts. The total area has 2 railway stations and 3 bus stands.

Table 3.2: Number of Bridge, Baily Bridge, Culvert, Pool, Shako of Saghata Upazila

Types	Saghata
Bridge	108
Bailey bridge	1
Culvert	96
Pool	130
Shako	4

Source: BBS District Statistics 2011, Gaibandha District

As this area has been developed on the both side of Jamuna River and the river has been playing important role for its development and transportation. However, due to course of time the river transportation system is almost extinct and road transportation system has been developed. However, seasonal river transport is still used to transport specially goods and commodities.

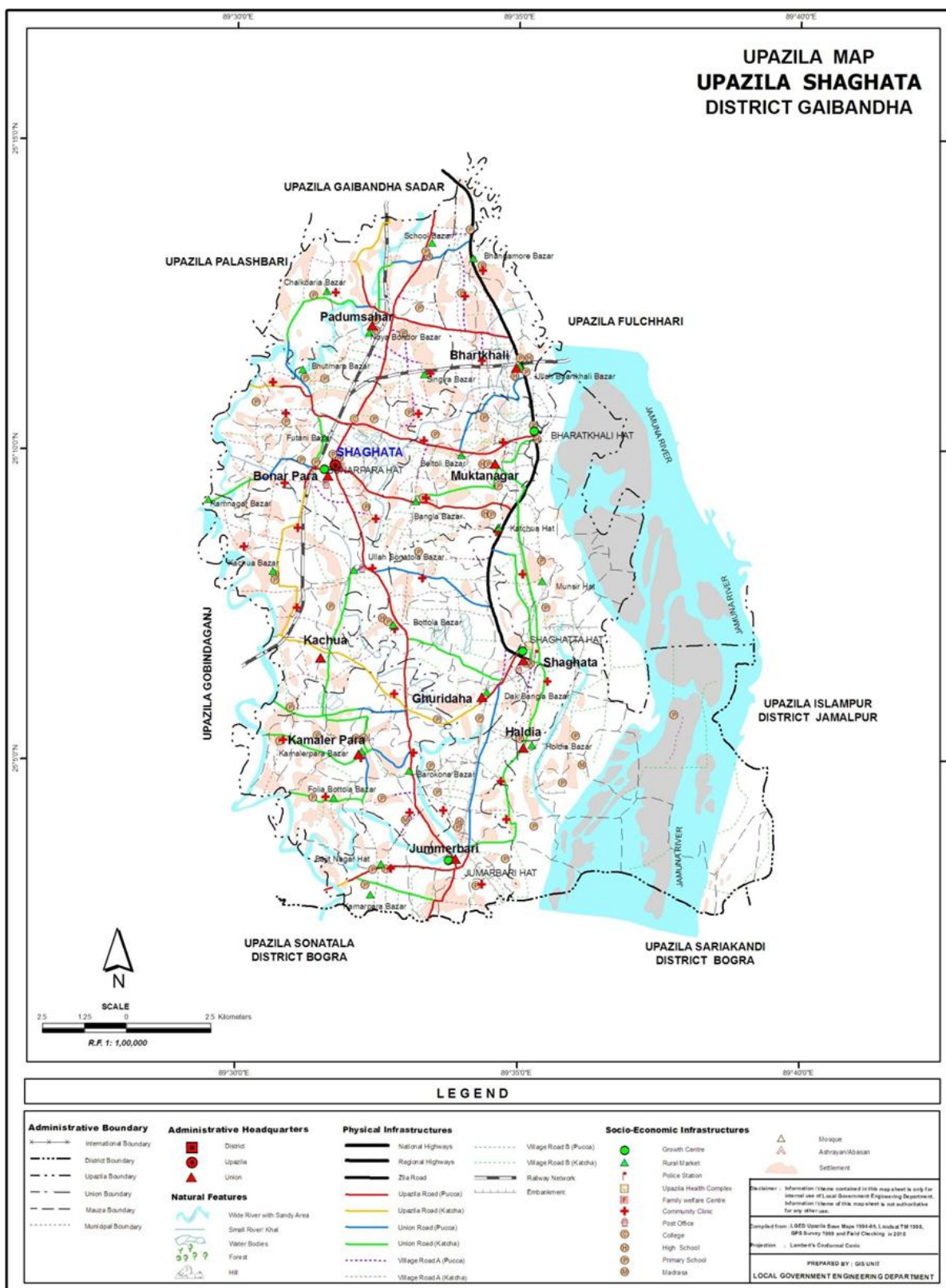
Railway is also playing a vital role in the transportation of Saghata Upazila. A large number of people use train to go other Upazilas and district towns. Moreover, this transportation system is also used to transport goods and commodities to other places.

3.2 Regional Connectivity

Saghata Upazila is located in Gaibandha District under Rangpur Division. The Upazila is bounded on the north by Gaibandha Sadar Upazila, east by Fulchhari Upazila and Islampur Upazila of Jamalpur Zila, south by Sonatala Upazila and Sariakandi Upazila of Bogra Zila and west by Gobindaganj Upazila and Palashbari Upazila. The Upazila has its road network and communication system with the Gaibandha District and other regional Upazila centers of Gaibandha district.

As this area has been developed on the both side of Bangali River and the river has been playing important role for its development and transportation. However, due to course of time the river transportation system is almost extinct and road transportation system has been developed. However, seasonal river transport is still used to transport specially goods and commodities.

Map 3.1: Regional Setting of Saghata Upazila



Source: LGED

3.3 Existing Road Network

The existing major road networks of the Upazila with other regional centers are as follows and shown in the Map 3.2.

- Shagata Union Parishad - Gaibandha Sadar road;
- Badiakhali Bridge R&H - Jumarbari Hat GC road;
- Bonarpara GC - Katcha hat R&H road;
- Shagata Union Parishad - Muktinagar Union Parishad road;
- Shagata Union Parishad - Muktinagar Union Parishad road;
- Bonarpara GC - Gobindaganj - Gaibandha RHD at Sagdha Bridge via Ramnagar Bazar road;
- Saghata GC - Mohimagong GC road;
- Bharatkali R&H – Nayabondar - Badiakhali GC road;
- Jumarbari GC-Sonatola GC road.

Table 3.3: Road Classification (Village, Union and Upazila) of Saghata Upazila

Type of Road	Length (km)		Total
	Earthen	Paved	
Village Road-A	137.35	40.05	177.40
Village Road-B	217.33	25.78	243.10
Union Road	25.98	55.66	81.63
Upazila Road	5.80	70.40	76.20

Source: LGED

3.4 Inventory of Important Road in the Project Area

In this Upazila there are some important roads which connect some Unions of this Upazila and also connect with other regional centres. The major roads are-

- Padumshahor Union Parishad - Bhutmara hat road via Chalkdateya bazar;
- Barokona FRB - Bangabari Khayaghat;
- Bonarpara Union Parishad sadar - Ramnagar bazar;
- Shagata Union Parishad - Muktinagar Union Parishad road via Munshirhat;
- Bonarpara GC - Gobindogonj - Gaibandha RHD at Sagdha Bridge via Ramnagar Bazar Road at Paschim Bati Bridge - Kashiabari Ghat;
- Gaibandha Saghata pucca road.

UPAZILA MAP
UPAZILA SHAGHATA
DISTRICT GAIBANDHA

Shagata UP-Gaibandha Sadar Rd.

Bonarpara - Gobindaganj - Gaibandha RHD

Bonarpara GC-Katucha Hat R&H Rd.

Badiakhali Bridge R&H-Jumarbari Hat GC Road

LEGEND

Administrative Boundary	Administrative Headquarters	Physical Infrastructures	Socio-Economic Infrastructures
International Boundary	District	National Highways	Growth Centre
District Boundary	Upazila	Regional Highways	Rural Market
Upazila Boundary	Union	Zila Road	Police Station
Union Boundary		Upazila Road (Pucco)	Upazila Health Complex
Mauza Boundary		Upazila Road (Katcha)	Family Welfare Centre
Municipal Boundary		Union Road (Pucco)	Community Clinic
		Union Road (Katcha)	Post Office
		Village Road A (Pucco)	College
		Village Road A (Katcha)	High School
		Village Road B (Pucco)	Primary School
		Village Road B (Katcha)	Madrasa
		Village Road C (Katcha)	
		Village Road D (Katcha)	
		Village Road E (Katcha)	
		Village Road F (Katcha)	
		Village Road G (Katcha)	
		Village Road H (Katcha)	
		Village Road I (Katcha)	
		Village Road J (Katcha)	
		Village Road K (Katcha)	
		Village Road L (Katcha)	
		Village Road M (Katcha)	
		Village Road N (Katcha)	
		Village Road O (Katcha)	
		Village Road P (Katcha)	
		Village Road Q (Katcha)	
		Village Road R (Katcha)	
		Village Road S (Katcha)	
		Village Road T (Katcha)	
		Village Road U (Katcha)	
		Village Road V (Katcha)	
		Village Road W (Katcha)	
		Village Road X (Katcha)	
		Village Road Y (Katcha)	
		Village Road Z (Katcha)	
		Village Road AA (Katcha)	
		Village Road AB (Katcha)	
		Village Road AC (Katcha)	
		Village Road AD (Katcha)	
		Village Road AE (Katcha)	
		Village Road AF (Katcha)	
		Village Road AG (Katcha)	
		Village Road AH (Katcha)	
		Village Road AI (Katcha)	
		Village Road AJ (Katcha)	
		Village Road AK (Katcha)	
		Village Road AL (Katcha)	
		Village Road AM (Katcha)	
		Village Road AN (Katcha)	
		Village Road AO (Katcha)	
		Village Road AP (Katcha)	
		Village Road AQ (Katcha)	
		Village Road AR (Katcha)	
		Village Road AS (Katcha)	
		Village Road AT (Katcha)	
		Village Road AU (Katcha)	
		Village Road AV (Katcha)	
		Village Road AW (Katcha)	
		Village Road AX (Katcha)	
		Village Road AY (Katcha)	
		Village Road AZ (Katcha)	
		Village Road BA (Katcha)	
		Village Road BB (Katcha)	
		Village Road BC (Katcha)	
		Village Road BD (Katcha)	
		Village Road BE (Katcha)	
		Village Road BF (Katcha)	
		Village Road BG (Katcha)	
		Village Road BH (Katcha)	
		Village Road BI (Katcha)	
		Village Road BJ (Katcha)	
		Village Road BK (Katcha)	
		Village Road BL (Katcha)	
		Village Road BM (Katcha)	
		Village Road BN (Katcha)	
		Village Road BO (Katcha)	
		Village Road BP (Katcha)	
		Village Road BQ (Katcha)	
		Village Road BR (Katcha)	
		Village Road BS (Katcha)	
		Village Road BT (Katcha)	
		Village Road BU (Katcha)	
		Village Road BV (Katcha)	
		Village Road BW (Katcha)	
		Village Road BX (Katcha)	
		Village Road BY (Katcha)	
		Village Road BZ (Katcha)	
		Village Road CA (Katcha)	
		Village Road CB (Katcha)	
		Village Road CC (Katcha)	
		Village Road CD (Katcha)	
		Village Road CE (Katcha)	
		Village Road CF (Katcha)	
		Village Road CG (Katcha)	
		Village Road CH (Katcha)	
		Village Road CI (Katcha)	
		Village Road CJ (Katcha)	
		Village Road CK (Katcha)	
		Village Road CL (Katcha)	
		Village Road CM (Katcha)	
		Village Road CN (Katcha)	
		Village Road CO (Katcha)	
		Village Road CP (Katcha)	
		Village Road CQ (Katcha)	

(Source: LGED)

3.5 Existing Infrastructure

Bus Terminal

There is one bus terminal under Saghata Upazila which is located at Jumarbari Union. Saghata Upazila does not have any direct transport communication with the Dhaka. The people have to come first at Bogra Sadar to come to Dhaka. But it has good connection with the nearest district and regional centres like Bogra District, Dhunat Upazila and Gabtali Upazila.

Truck Terminal

Till now, there is no truck terminal in Saghata Upazila. As a result, trucks are using the road side existing hat/bazar area as a truck stand.

Tempo/CNG Station

There is one Tempo Stand in Saghata Upazila which is located at Saghata Teen Matha Morh. Apart of this Tempo Stand there is another CNG stand which is familiar to local people as Jumarbari-Sonatala-Bonarpara-Shalika Morh CNG stand.



Source: Field Survey, 2016

Plate 3.1: Tempo/CNG Stand at Jumarbari-Sonatala-Bonarpara-Shalika Char Matha Rickshaw/Van Stand

In this Upazila Van is very popular mode other than rickshaw to local people for the purpose of travelling one area to others. Every Union has at least two Van Stands in this Upazila. It is observed that most of the van stands are located on the roadside especially around bazaar/Haat areas.



Source: Field Survey, 2016

Plate 3.2: Van Stand at Jumarbari Char Matha

3.6 Railway

Saghata Upazila has two railway hub; one is junction which is located at Bonarpara Union and another is station which is located at Bharatkhalai Union. These two railways are connected to Sonatala Upazila under Bogra District and Gaibandha Sadar and Fulchhari Upazila under Gaibandha District.



Source: Field Survey, 2016

Plate 3.3: Bonarpara Rail Junction

3.7 Water Way

Jamuna River flows east side of the Upazila. As this area has been developed on one side of Jamuna River and other river has been playing important role for its development and transportation. However, due to course of time the river transportation system is almost extinct and road transportation system has been developed. However, seasonal river transport is still used to transport specially goods and commodities.

CHAPTER FOUR: SURVEY FINDINGS

4.1 Identification of Critical Intersections/Road Networks

The road network of Saghata Upazila (shown in Map 4.1) was developed and established according to the needs and not in a planned way. Most of the cases road network is established after the development of infrastructure resulting poor layout of road network, narrow, pedestrian problem, utility services problem, emergency services problem etc. Unauthorized encroachments are common problems along the roadside and major road cross-sections.

4.1.1 Major Intersections and their Networks/Linkages

The major intersections within the Saghata Upazila as identified during the survey and field visits are as follows and are shown in **Map 4.1** Major intersections are:

- Saghata 3 Matha Morh (CNG Station)
- Jumarbari 4 Matha Morh
- Muktinagar 4 Matha Morh
- Bonarpara 4 Matha Morh.

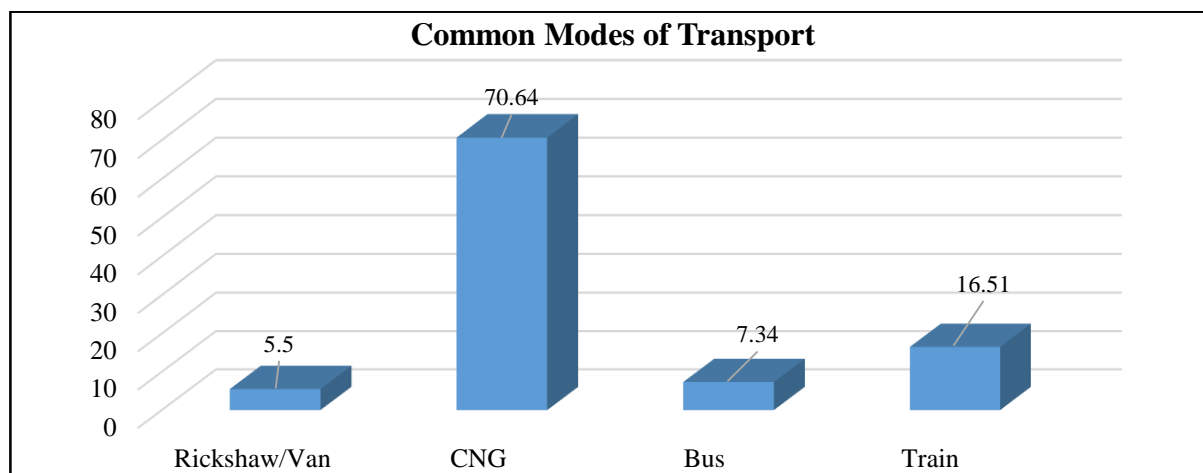
Transportation and traffic management survey result reveals that there is no public or private bus service is available for internal movement of passengers within the Upazila. Intra Upazila traveling is mostly done through non-motorized transport like rickshaw van, etc. The dwellers also use 2/3 wheelers motorized transports like CNG, motor cycle, Bhatvati and van are used for carrying both passengers and goods.

4.1.2 Nature and Common Mode of Travel

It has been observed that, the town does not appear to demonstrate serious signs of traffic congestion. It is also observed that road side parking of vans, auto-rickshaw, loading-unloading of passengers on the road haphazard parking of transport are the main problems of the area. It is hard-headed that the main mode of transport within the Upazila is auto-rickshaw. Other mode of transport as intra Upazila transport could be identified as CNG, Bhatvati, van etc. Inter district and long route transport mode is mainly bus and train. The percentage distribution of common mode of travel is shown in Figure 4.1.

Transportation and traffic management survey reveals that there is no public or private bus service is available for internal movement of passengers within the Upazila. Intra Upazila traveling is mostly done through non-motorized transport like rickshaw van, etc. The dwellers

also use 2/3 wheelers motorized transports like CNG, motor cycle, Bhatvati and van are used for carrying both passengers and goods.



Source: Field Survey, 2016

Figure 4.1: Common Modes of Transport

4.1.3 Non-motorized Vehicle

Common non-motorized vehicles included rickshaw van and bicycle

4.1.4 Motorized Vehicle

Auto rick/ Tempo, Nasimon/Karimon, CNG, Jeep/car/Taxi, Micro/Pickup, Motor cycle, Bus/ Mini Bus, and truck.

4.2 Identification of River/Water Way Networks and Transport Facility

Water transport network of the Upazila has significant importance in carrying both people and goods. Trawler/Mechanized boats are used for carrying both passenger and commodity frequently. At present, as passenger water transport, one launch service per day from the existing launch terminal that is operated by private operator. Various types of trawlers and boats are plying for carrying goods and commodities and also passengers.

4.2.1 Major Water Way and their Linkages

Bangali River flows inside the upazila. Brahmaputra River flows through the eastern side of Sonatala Upazila. As this area has been developed on the both side of Bangali river and other rivers such as; Jamuna river, Bhimti, Lohagara, Mohicharan, Neagan, Gobarchanpa beels etc. have been playing important role for its development and transportation. However, in course of time the river transportation system is almost extinct and road transportation system has been developed. However, seasonal river transport is still used to transport specially goods and commodities.

UPAZILA MAP UPAZILA SHAGHATA DISTRICT GAIBANDHA

Administrative Boundary

- International Boundary
- District Boundary
- Upazila Boundary
- Union Boundary
- Mauza Boundary
- Municipal Boundary

Administrative Headquarters

- District
- Upazila
- Union

Natural Features

- Wide River with Sandy Area
- Small River/Khal
- Water Bodies
- Forest
- Hill

Physical Infrastructures

- National Highways
- Regional Highways
- Zila Road
- Upazila Road (Pucca)
- Upazila Road (Katcha)
- Union Road (Pucca)
- Union Road (Katcha)
- Village Road A (Pucca)
- Village Road A (Katcha)
- Village Road B (Pucca)
- Village Road B (Katcha)
- Railway Network
- Embankment

Socio-Economic Infrastructures

- Growth Centre
- Rural Market
- Police Station
- Upazila Health Complex
- Family Welfare Centre
- Community Clinic
- Post Office
- College
- High School
- Primary School
- Madrassa
- Mosque
- Ashrayan/Abasan
- Settlement

LEGEND

Scale: 0 to 2.5 Kilometers
R.F. 1: 1,00,000

Prepared by: GIS UNIT
LOCAL GOVERNMENT ENGINEERING DEPARTMENT

MEPC

4.2.2 Nature and Common Mode of Water Transport

Mechanized boats/Trawlers and local boats are the common mode of river transport in the water way.

4.3 Traffic Flow/Volume Survey at Major Intersections (Roadway links)

4.3.1 Major Critical Junctions/Intersections

The major critical junction/intersections points and their road linkages with in the areas are mainly the followings.

- i. Saghata 3 Matha (CNG Station) Morh (Bonarpara to Saghata Bazar Road);
- ii. Jumarbari 4 Matha Morh (Bonarpara-Mamudpur and Saghata-Sonatala Road);
- iii. Muktinagar 4 Matha Morh (Gaibandha-Bonarpara and Gaibandha-Saghata Road);
- iv. Bonarpara 4 Matha Morh (Saghata-Upazila and Rail Station-Kachua Road).

4.3.2 Intersections Wise Average Daily Traffic Volume

Traffic and transport management survey was conducted at five selected intersections as indicated above. These intersections comprise several important links that are the dominant traffic generating links of the area. Traffic volume survey locations are presented on Map 4.1. The surveyed intersections with their lane are presented in Figures and average daily traffic volume is presented in the following Tables.

Saghata 3 Matha (CNG Station) Morh Intersection

Saghata 3 Matha (CNG Station) Morh is one of the major intersections on the Bonarpara - Saghata Bazar road. The common modes of transport on this road are Auto-Van, Bhatvati, Nasimon/Karimon, CNG, Motor cycle, Bus/Mini Bus and Truck among the motorized transport and Rickshaw, Rickshaw Van and Bicycle among the non-motorized transport.

The daily average motorized traffic flow is 522 and non-motorized flow is 409 and the total motorized and non-motorized traffic flow is 931. It is observed that the major average traffic compositions at this locations are auto rickshaw indicating 36.78%, motor cycle 32.76% and CNG 23.18% of the total motorized flow. Bicycle representing about 54.52% and rickshaw van representing 45.48% among the non-motorized flow and has been playing the significant role as the common mode of travel within the area. The distribution of average motorized and non-motorized traffic passes through this junction point is presented in Table 4.1.

Table 4.1: Daily Traffic Volume of Saghata 3 Matha (CNG Station) Morh Intersection

Traffic Type	Traffic Count	
Vehicle	Total	Percentage (%)
Motorized		
Auto rickshaw/Van	192	36.78
Bhatvati	15	2.87
Nasimon/Karimon	8	1.53
CNG	121	23.18
Jeep/car/Taxi	3	0.57
Micro/Pickup	3	0.57
Motor cycle	171	32.76
Bus/ Mini Bus	0	0.00
Truck	9	1.72
Sub-Total	522	100.00
Non-Motorized		
Rickshaw	0	0.00
Rickshaw Van	186	45.48
Bicycle	223	54.52
Bullock Cart	0	0.00
Push Cart	0	0.00
Sub-Total	409	100.00
Total	931	

Source: Traffic Survey, 2016



Source: Traffic Survey, 2016

Plate 4.1: Saghata 3 Matha (CNG Station) Morh Intersection

Jumarbari 4 Matha Morh Intersection

Jumarbari 4 Matha Morh is one of the major intersections on the Bonarpara – Mamudpur and Saghata - Sonatala road. The common modes of transport on this road are Auto-Van, Bhatvati, Nasimon/Karimon, CNG, Motor cycle, Bus/Mini Bus and Truck among the motorized transport and Rickshaw, Rickshaw Van and Bicycle among the non-motorized transport. The daily average motorized traffic flow is 1729 and non-motorized flow is 1040 and the total motorized and non-motorized traffic flow is 2769. It is observed that the major average traffic compositions at this locations are auto rickshaw indicating 45.23%, motor cycle 25.39% and CNG 22.50% of the total motorized flow. Bicycle representing about 59.81% and rickshaw van representing 40.19% among the non-motorized flow and has been playing the significant role as the common mode of travel within the area. The distribution of average motorized and non-motorized traffic passes through this junction point is presented in Table 4.2.



Source: Traffic Survey, 2016

Plate 4.2: Jumarbari 4 Matha Morh Intersection

Table 4.2: Daily Traffic Volume of Jumarbari 4 Matha Morh Intersection

Traffic Type	Traffic Count	
Vehicle	Total	Percentage (%)
Motorized		
Auto rickshaw/Van	782	45.23
Bhatvati	48	2.78
Nasimon/Karimon	31	1.79
CNG	389	22.50
Jeep/car/Taxi	9	0.52

Traffic Type	Traffic Count	
Vehicle	Total	Percentage (%)
Micro/Pickup	11	0.64
Motor cycle	439	25.39
Bus/ Mini Bus	0	0.00
Truck	20	1.16
Sub-Total	1729	100.00
Non-Motorized		
Rickshaw	0	0.00
Rickshaw Van	418	40.19
Bicycle	622	59.81
Bullock Cart	0	0.00
Push Cart	0	0.00
Sub-Total	1040	100.00
Total	2769	

Source: Traffic Survey, 2016

Muktinagar 4 Matha Morh Intersection

Muktinagar 4 Matha Morh is one of the major intersections on the Gaibandha-Bonarpara and Gaibandha-Saghata road. The common modes of transport on this road are Auto-Van, Bhatvati, Nasimon/Karimon, CNG, Motor cycle, Bus/Mini Bus and Truck among the motorized transport and Rickshaw, Rickshaw Van and Bicycle among the non-motorized transport.



Source: Traffic Survey, 2016

Plate 4.3: Muktinagar 4 Matha Morh Intersection

The daily average motorized traffic flow is 1570 and non-motorized flow is 983 and the total motorized and non-motorized traffic flow is 2553. It is observed that the major average traffic compositions at this locations are auto rickshaw indicating 36.11%, motor cycle 26.94% and CNG 26.43% of the total motorized flow. Bicycle representing about 54.73% and rickshaw van representing 45.27% among the non-motorized flow and has been playing the significant role as the common mode of travel within the area. The distribution of average motorized and non-motorized traffic passes through this junction point is presented in Table 4.3.

Table 4.3: Daily Traffic Volume of Muktinagar 4 Matha Morh Intersection

Traffic Type	Traffic Count	
Vehicle	Total	Percentage (%)
Motorized		
Auto rickshaw/Van	567	36.11
Bhatvati	71	4.52
Nasimon/Karimon	41	2.61
CNG	415	26.43
Jeep/car/Taxi	7	0.45
Micro/Pickup	27	1.72
Motor cycle	423	26.94
Bus/ Mini Bus	0	0.00
Truck	19	1.21
Sub-Total	1570	100.00
Non-Motorized		
Rickshaw	0	0.00
Rickshaw Van	445	45.27
Bicycle	538	54.73
Bullock Cart	0	0.00
Push Cart	0	0.00
Sub-Total	983	100.00
Total	2553	

Source: Traffic Survey, 2016

Bonarpara 4 Matha Morh Intersection

Bonarpara 4 Matha Morh is one of the major intersections on the Saghata-Upazila and Rail Station-Kachua road. The common modes of transport on this road are Auto-Van, Bhatvati, Nasimon/Karimon, CNG, Motor cycle, Bus/Mini Bus and Truck among the motorized transport and Rickshaw, Rickshaw Van and Bicycle among the non-motorized transport.



Source: Traffic Survey, 2016

Plate 4.4: Bonarpara 4 Matha Morh Intersection

The daily average motorized traffic flow is 1307 and non-motorized flow is 908 and the total motorized and non-motorized traffic flow is 2215. It is observed that the major average traffic compositions at this locations are auto rickshaw indicating 36.50%, motor cycle 29.76% and CNG 26.17% of the total motorized flow. Bicycle representing about 50.11% and rickshaw van representing 49.89% among the non-motorized flow and has been playing the significant role as the common mode of travel within the area. The distribution of average motorized and non-motorized traffic passes through this junction point is presented in Table 4.4.

Table 4.4: Daily Traffic Volume of Bonarpara 4 Matha Morh Intersection

Traffic Type	Traffic Count	
Vehicle	Total	Percentage (%)
Motorized		
Auto rickshaw/Van	477	36.50
Bhatvati	51	3.90
Nasimon/Karimon	17	1.30
CNG	342	26.17
Jeep/car/Taxi	7	0.54
Micro/Pickup	7	0.54
Motor cycle	389	29.76
Bus/ Mini Bus	0	0.00
Truck	17	1.30
Sub-Total	1307	100.00
Non-Motorized		

Traffic Type	Traffic Count	
Vehicle	Total	Percentage (%)
Rickshaw	0	0.00
Rickshaw Van	455	50.11
Bicycle	453	49.89
Bullock Cart	0	0.00
Push Cart	0	0.00
Sub-Total	908	100.00
Total	2215	

Source: Traffic Survey, 2016

4.3.3 Average Daily Traffic Volume (ADTV) in the Major Intersections

The summary of the Average Daily Traffic Volume (ADT) volumes at 7 surveyed locations is presented in Table 4.5. The survey results exhibit that Jumarbari 4 Matha on Gaibandha-Bonarpara road is the most important junction point having the highest ADT volume of 1503, Jumarbari 4 Matha intersection on Gaibandha-Saghata Road is another important junction point having ADT volume of about 1319, Jumarbari 4 Matha intersection on Bonarpara – Mamudpur having 1266, Muktinagar 4 Matha on Gaibandha-Bonarpara road having the 1234 ADT.

Table 4.5: Average Daily Traffic Volume

Name of Intersection/ Junction Point	Motorized Traffic	Non-Motorized Traffic	Total	Percentage (%)		
				Motorized	Non-Motorized	Total
Saghata 3 Matha	522	409	931	56.07	43.93	100
Jumarbari 4 Matha	815	451	1266	64.38	35.62	100
Jumarbari 4 Matha	914	589	1503	60.81	39.19	100
Muktinagar 4 Matha	746	488	1234	60.45	39.55	100
Jumarbari 4 Matha	824	495	1319	62.47	37.53	100
Bonarpara 4 Matha	687	452	1139	60.32	39.68	100
Bonarpara 4 Matha	620	456	1076	57.62	42.38	100
Total	5128	3340	8468			

Source: Traffic Survey, 2016

4.3.4 Intersections Wise Average Hourly Traffic Volume

To find out total hourly discharging of traffic during the day, day long traffic survey has been conducted in each of the major junction point. The hourly distribution of traffic flow in each of the junction point is presented in following tables and Figures based on the survey findings.

The hourly traffic flow on the Bonarpara – Saghata Bazar Road at Saghata 3 Matha Intersection point is shown in Table 4.6. It is observed that hourly traffic volume on this road is higher during 9 am to 10 am and 10 am to 11 am ranging from 163 to 113 including both motorized

and non-motorized traffic. It is also observed that hourly traffic volume on this road is higher during 4 pm to 5 pm and 5 pm to 6 pm having the total flow of 94 and 66 traffic including both motorized and non-motorized vehicles.

Table 4.6: Hourly Traffic Volume at Saghata 3 Matha Intersection

Traffic Flow (From-to)	Motorized Traffic	Non-Motorized Traffic	Total
6 am-7 am	5	7	12
7am- 8 am	10	11	21
8 am- 9 am	64	38	102
9 am- 10 am	103	60	163
10am- 11 am	55	58	113
11am- 12 pm	48	63	111
12pm- 1 pm	52	40	92
1 pm- 2 pm	31	27	58
2 pm- 3 pm	24	25	49
3 pm- 4 pm	31	19	50
4 pm- 5 pm	59	35	94
5 pm- 6 pm	40	26	66
Total	522	409	931

Source: Traffic Survey, 2016

The hourly traffic flow on Bonarpara - Mamudpur Road and Saghata – Sonatala Road at Jumarbari 4 Matha Intersection point is shown in Table 4.7. It is observed that hourly traffic volume on this road is higher during 10 am to 11 am and 11 am to 12 am indicating flow of 340 and 351 traffic including both motorized and non-motorized. It is also observed that hourly traffic volume on this road is higher during 4 pm to 5 pm and 5 pm to 6 pm having the flow of 293 and 256 including both motorized and non-motorized vehicles.

Table 4.7: Hourly Traffic Volume at Jumarbari 4 Matha Intersection

Traffic Flow (From-to)	Motorized Traffic	Non-Motorized Traffic	Total
6 am-7 am	10	9	19
7am- 8 am	33	29	62
8 am- 9 am	87	60	147
9 am- 10 am	198	73	271
10am- 11 am	203	137	340
11am- 12 pm	218	133	351
12pm- 1 pm	189	93	282
1 pm- 2 pm	172	93	265
2 pm- 3 pm	147	113	260
3 pm- 4 pm	120	103	223
4 pm- 5 pm	188	105	293
5 pm- 6 pm	164	92	256
Total	1729	1040	2769

Source: Traffic Survey, 2016

The hourly traffic flow on the on Gaibandha - Bonarpara Road and Gaibandha - Saghata Road at Muktinagar 4 Matha Intersection point is shown in Table 4.8. It is observed that hourly traffic volume on this road is higher during 10 am to 11 am and 11 am to 12 am indicating flow of 323 and 245 traffic including both motorized and non-motorized. It is also observed that hourly traffic volume on this road is higher during 4 pm to 5 pm and 5 pm to 6 pm having the flow of 260 and 307 including both motorized and non-motorized vehicles.

Table 4.8: Hourly Traffic Volume at Muktinagar 4 Matha Intersection

Traffic Flow (From-to)	Motorized Traffic	Non-Motorized Traffic	Total
6 am-7 am	12	17	29
7am- 8 am	44	37	81
8 am- 9 am	99	89	188
9 am- 10 am	168	130	298
10am- 11 am	197	126	323
11am- 12 pm	156	89	245
12pm- 1 pm	149	97	246
1 pm- 2 pm	106	46	152
2 pm- 3 pm	153	97	250
3 pm- 4 pm	119	55	174
4 pm- 5 pm	165	95	260
5 pm- 6 pm	202	105	307
Total	1570	983	2553

Source: Traffic Survey, 2016

The hourly traffic flow on the on Saghata – Upazila Road and Rail Station - Kachua Road at Bonarpara 4 Matha Intersection point is shown in Table 4.9. It is observed that hourly traffic volume on this road is higher during 9 am to 10 am and 10 am to 11 am indicating flow of 267 and 289 traffic including both motorized and non-motorized. It is also observed that hourly traffic volume on this road is higher during 4 pm to 5 pm and 5 pm to 6 pm having the flow of 198 and 231 including both motorized and non-motorized vehicles.

Table 4.9: Hourly Traffic Volume at Bonarpara 4 Matha Intersection

Traffic Flow (From-to)	Motorized Traffic	Non-Motorized Traffic	Total
6 am-7 am	14	14	28
7am- 8 am	24	15	39
8 am- 9 am	97	74	171
9 am- 10 am	152	115	267
10am- 11 am	177	112	289
11am- 12 pm	157	105	262
12pm- 1 pm	117	92	209
1 pm- 2 pm	112	86	198
2 pm- 3 pm	92	69	161
3 pm- 4 pm	98	64	162

Traffic Flow (From-to)	Motorized Traffic	Non-Motorized Traffic	Total
4 pm- 5 pm	125	73	198
5 pm- 6 pm	142	89	231
Total	1307	908	2215

Source: Traffic Survey, 2016

4.3.5 Peak Hour Total Traffic Volume

Based on the survey findings, it is observed that the traffic flow is highest in the morning period of 9 am to 10 am and 10 am to 11 am and evening period of 4 pm to 5 pm and 5 pm to 6 pm. It is therefore, the morning Peak hour is considered from 9 am to 11 am and evening peak hour is considered from 4 pm to 6 pm. The rest of the time periods are considered as off peak hours. The results of the peak hour traffic volume both in terms of the combined traffic numbers are shown in Table 4.10.

Table 4.10: Peak Hour Traffic volume

Traffic Junction Point	Peak hour Period	Peak hour Time	Motorized Traffic	Non-Motorized Traffic	Total
Saghata 3 Matha (CNG Station)	Morning Period	9 am to 10 am	168	130	298
		10 am to 11 am	197	126	323
		Total	365	256	621
	Evening Period	4 pm to 5 pm	165	95	260
		5 pm to 6 pm	202	105	307
		Total	367	200	567
Jumarbari 4 Matha Junction	Morning Period	9 am to 10 am	198	49	247
		10 am to 11 am	203	141	344
		Total	401	190	591
	Evening Period	4 pm to 5 pm	188	89	277
		5 pm to 6 pm	164	114	278
		Total	352	203	555
Muktinagar 4 Matha Junction	Morning Period	9 am to 10 am	168	130	298
		10 am to 11 am	197	126	323
		Total	365	256	621
	Evening Period	4 pm to 5 pm	165	95	260
		5 pm to 6 pm	202	105	307
		Total	367	200	567
Bonarpara 4 Matha Junction	Morning Period	9 am to 10 am	152	115	267
		10 am to 11 am	177	112	289
		Total	329	227	556
	Evening Period	4 pm to 5 pm	125	73	198
		5 pm to 6 pm	142	89	231
		Total	267	162	429

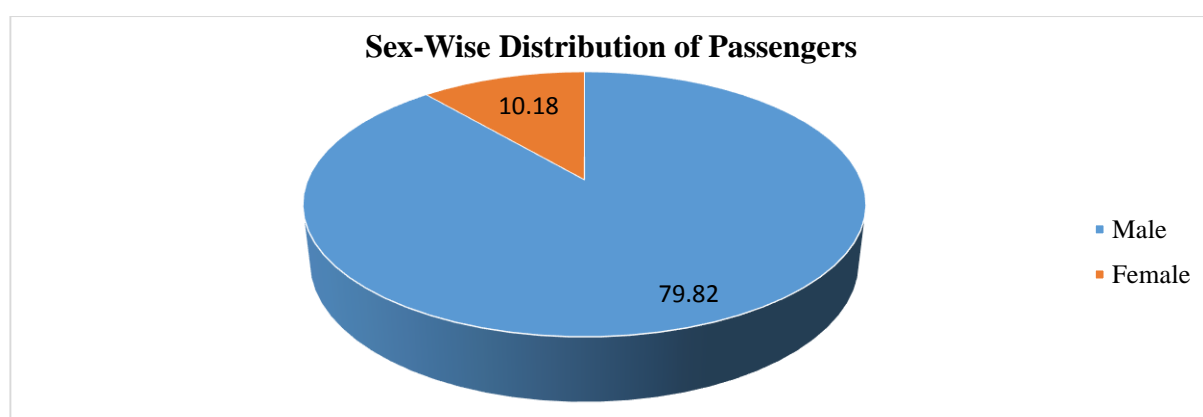
Source: Traffic Survey, 2016

4.4 Origin - Destination Survey (Roadway)

Origin Destination survey were conducted on passengers of passenger vehicle in the 4 same selected locations of Saghata 3 Matha (CNG Station), Jumarbari 4 Matha Junction, Muktinagar 4 Matha Junction and Bonarpara 4 Matha Junction. The passengers' origin and destination point are considers based on the passenger movement from one mahallah/ward to others mahalla/ward which indicated the movement within the Upazila and also outside the Upazila for different purposes. This section mainly described the findings of passenger's interview regarding the origin, destination and purpose etc. of the trips.

4.4.1 Sex Wise Distribution of Passenger

A total of 109 passengers were interviewed of which 79.82% are male and 10.18% are female. Figure 4.2 shows sex wise distribution of passengers.



Source: Traffic Survey, 2016

Figure 4.2: Sex Wise Distribution of Passengers

4.4.2 Age Wise Distribution of Passengers

Out of the total passengers interviewed 6.42% are within the age of 20, 21.10% are within the age group of 20-30, 62.39% are within 30-60 and about 10.09% are above the age of 60 years. Age wise distribution of passengers including male and female is shown in Table 4.11.

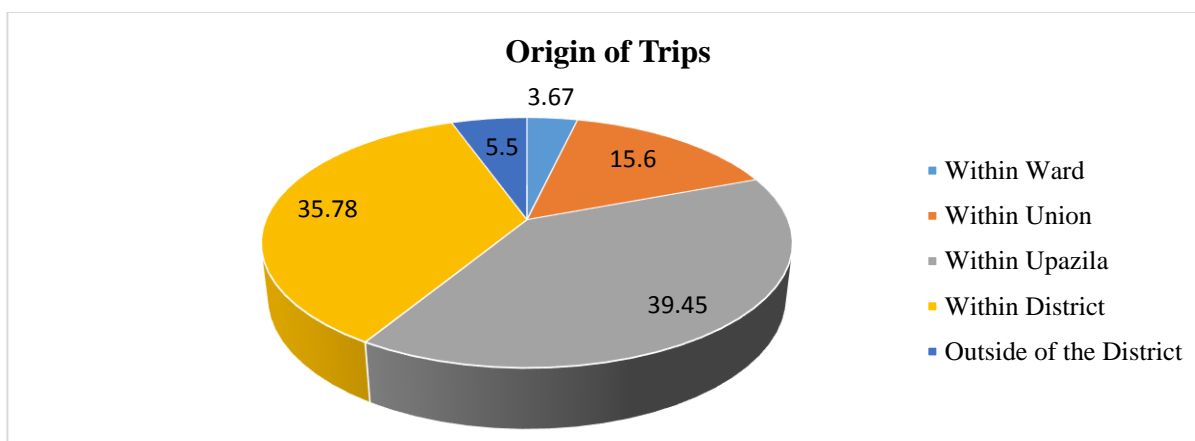
Table 4.11: Age Wise Distribution of Passengers Based on Sex

Sl. No.	Age Group	Male	Percentage (%)	Female	Percentage (%)	Total	Percentage (%)
1.	Up to 20	7	8.05	0	0.00	7	6.42
2.	20-30	15	17.24	8	36.36	23	21.10
3.	30-60	57	65.52	11	50.00	68	62.39
4.	60+	8	9.20	3	13.64	11	10.09
Total		87	100.00	22	100.00	109	100.00

Source: Traffic Survey, 2016

4.4.3 Origin of Trips

The survey revealed that the origin of trip of 15.60% of the total passengers were originated from different places located within the union, 35.45% movement were originated from different places located within the Upazila, 35.78% trips were originated from different places located within district and 5.50% trips were originated from different places located outside the district. Origin wise distribution of passengers is shown in Figure 4.3.

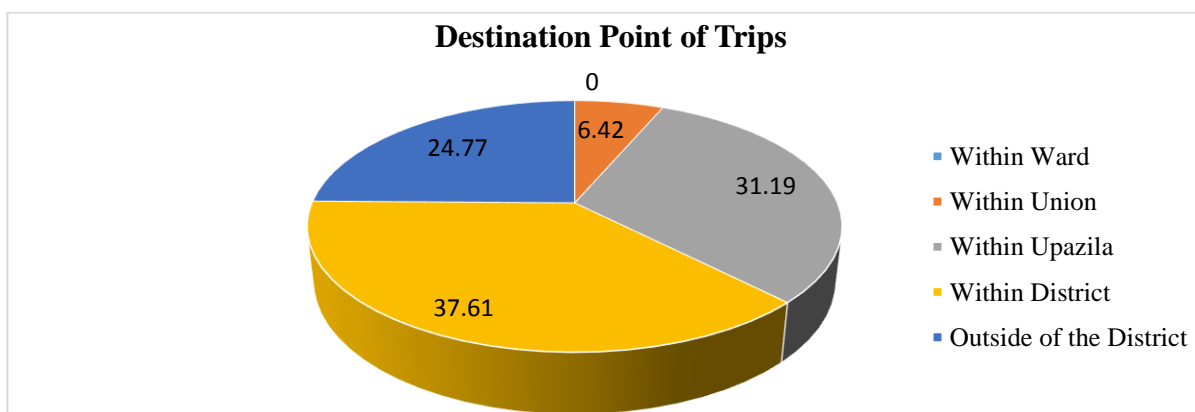


Source: Traffic Survey, 2016

Figure 4.3: Origin of Trips

4.4.4 Destination of Trip

The survey revealed that the destination of 6.42% of the total passengers were ended in different places located within the union, 31.19% trips were ended in different places located within Upazila, 37.61% trips were ended in different places located within the district and 24.77% trips were ended in different places located outside the district. Destination wise distribution of passengers is shown in Figure 4.4.

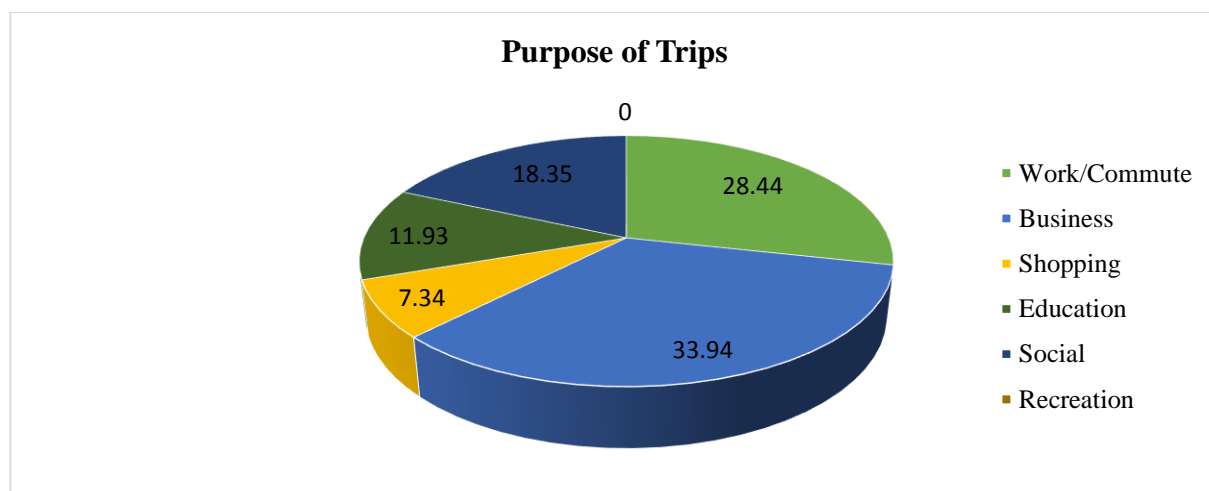


Source: Traffic Survey, 2016

Figure 4.4: Destination Point of Trips

4.4.5 Purpose of Trips

The survey revealed that the purpose of about 28.44% of the total passengers were to commute and to go back and forth, 33.94% movement were business trips, 7.34% trips were for shopping, 11.93% trips were for educational/school going, 18.35% trips social trips. Purpose wise distribution of passenger's movement is shown in Figure 4.5.

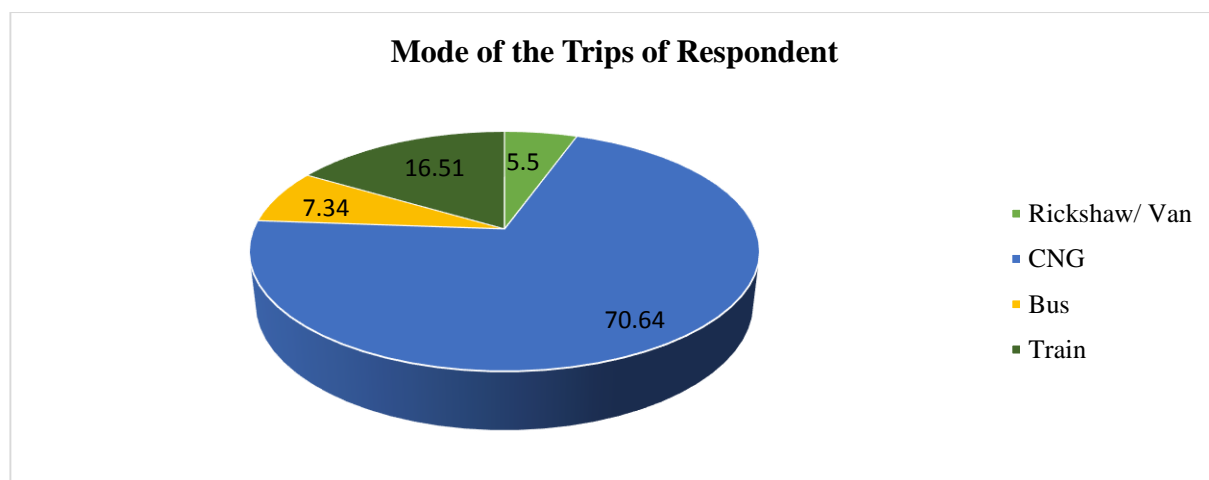


Source: Traffic Survey, 2016

Figure 4.5: Purpose of Trips

4.4.6 Type of Modes/Transport Used

The survey revealed that 5.50% of the total passengers were used rickshaw van to complete their trips, 70.64% of the total passengers were used CNG to complete the trips. 7.34% used bus and 16.51% used train for travel. The distribution of passenger based on travel mode used for trips is shown in Figure 4.6.

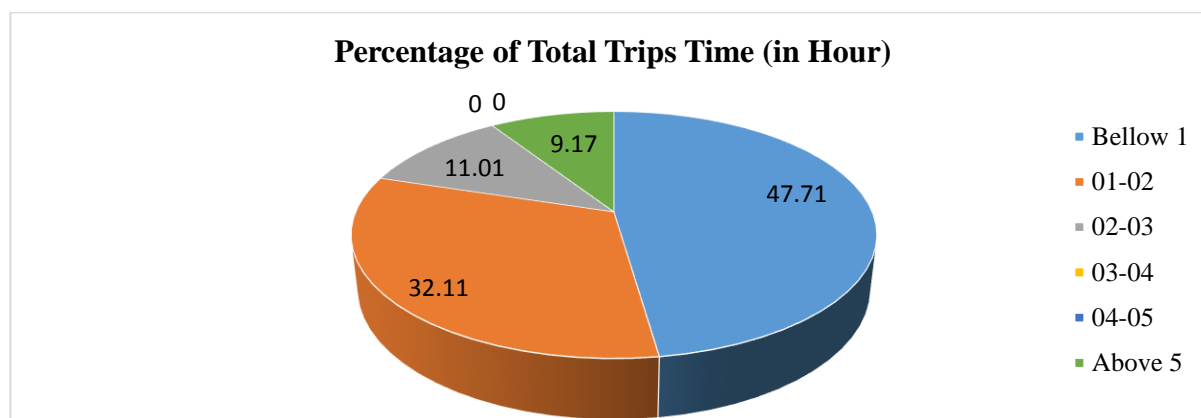


Source: Traffic Survey, 2016

Figure 4.6: Mode of Trips of Respondent

4.4.7 Total Travel Time

The survey revealed that about 47.71% trips took below one hour, about 32.11% trips were completed within 1-2 hours indicating 11.01% trips were completed within 2 hours. The distribution of passenger based on travel time for trips is shown in Figure 4.7.



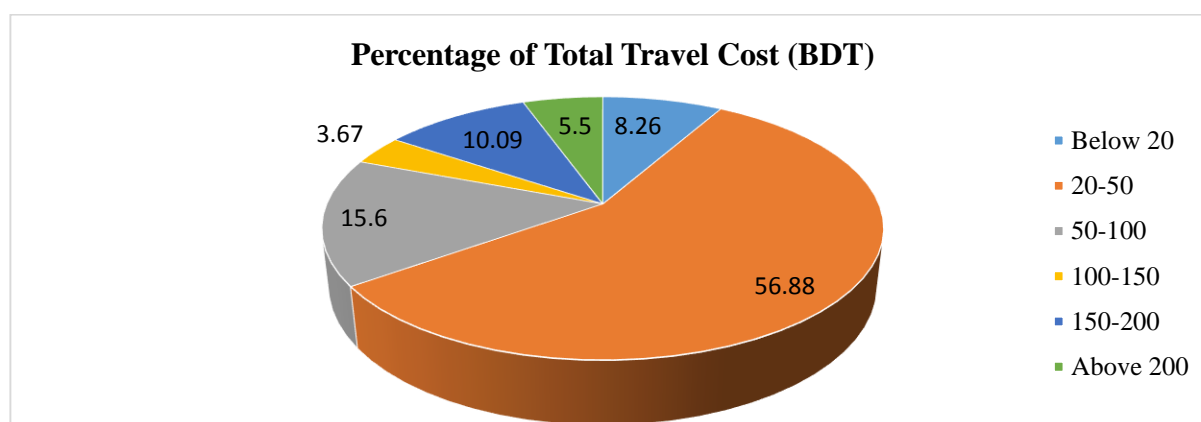
Source: Traffic Survey, 2016

Figure 4.7: Total Trips Time

4.4.8 Average Travel Cost

From the Origin and Destination survey it has been observed that people are moving to different destinations for different purposes which included within the ward, union, Upazila, district and outside district.

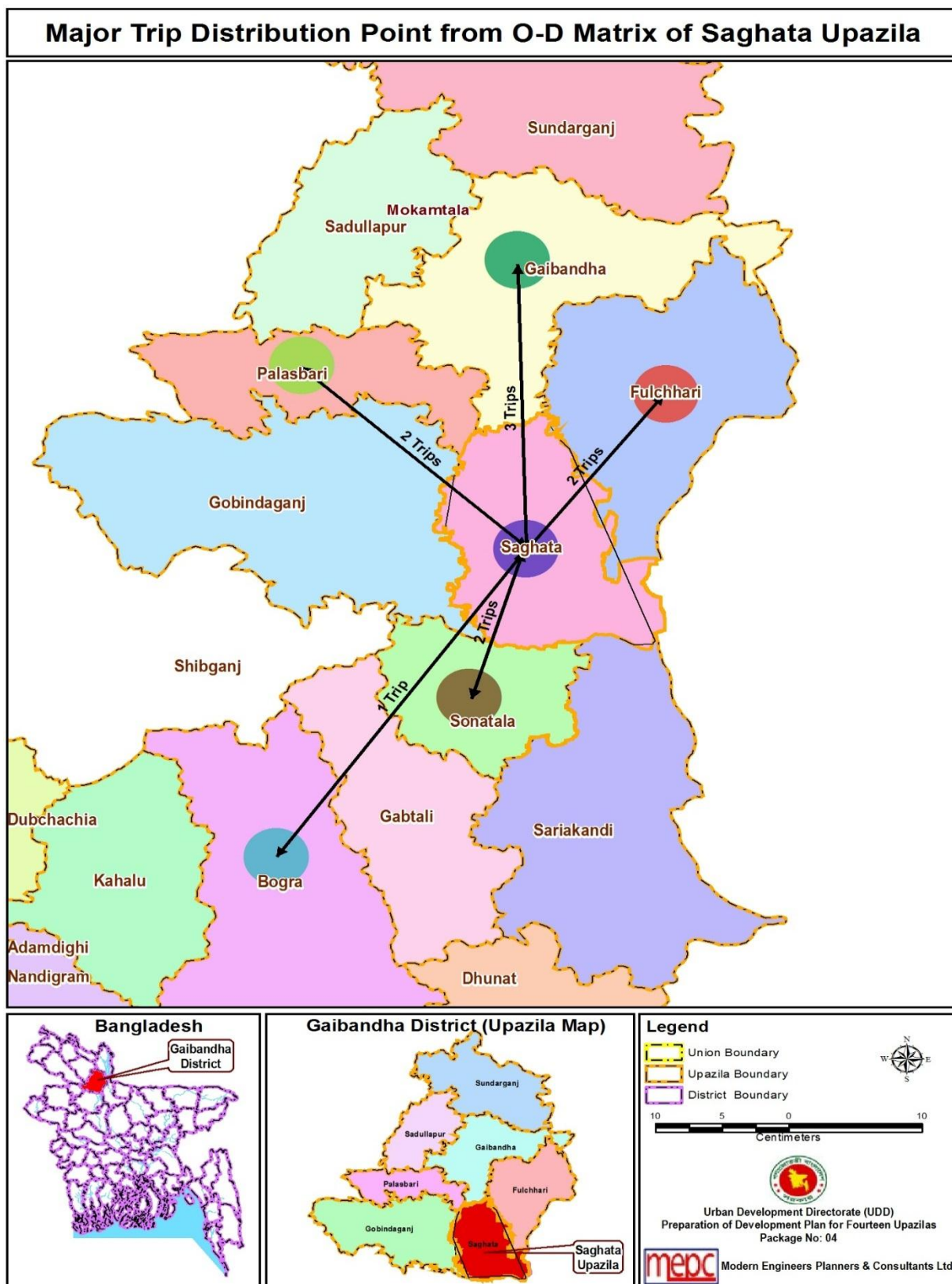
The survey revealed that about 8.26% passengers incurred taka up to 20 to complete the trip, about 56.88% passengers incurred BDT 20-50 to complete the trip and about 15.60% passengers incurred BDT 50-100 to complete the trip and only 5.50% traveler incurred more than BDT 200 for the trip. The distribution of passenger based on travel cost incurred for trips is shown in Figure 4.8.



Source: Traffic Survey, 2016

Figure 4.8: Total Travel Cost

Map 4.2: Major Trip Distribution Point from O-D Matrix of Saghata Upazila



Source: MEPC

4.4.9 Trip Distribution Pattern

The O-D survey has been conducted on 40 trips of both motorized and non-motorized vehicles. Within all the trips passes over the Upazila have originated and distributed within Saghata Upazila and Gaibandha District. The rest of the trips go to the other places such as Fulchhari Upazila, Palashbari Upazila and Sonatala Upazila through Saghata Upazila. Table 4.12 shows the O-D matrix of surveyed trips from one place to another.

Table 4.12: Origin and Destination (O-D) Matrix

Destination Origin	Saghata	Fulchhari Upazila	Gaibandha District	Palashbari	Bogra District	Sonatala Upazila	Total (Trips)
Saghata	0	2	3	2	1	2	10
Fulchhari Upazila	2	0	0	0	0	0	2
Gaibandha District	3	0	0	0	0	0	3
Palashbari Upazila	2	0	0	0	0	0	2
Bogra District	1	0	0	0	0	0	1
Sonatala Upazila	2	0	0	0	0	0	2
Total	10	2	3	2	1	2	20

Source: Traffic Survey, 2016

4.5 Regional Transport Study

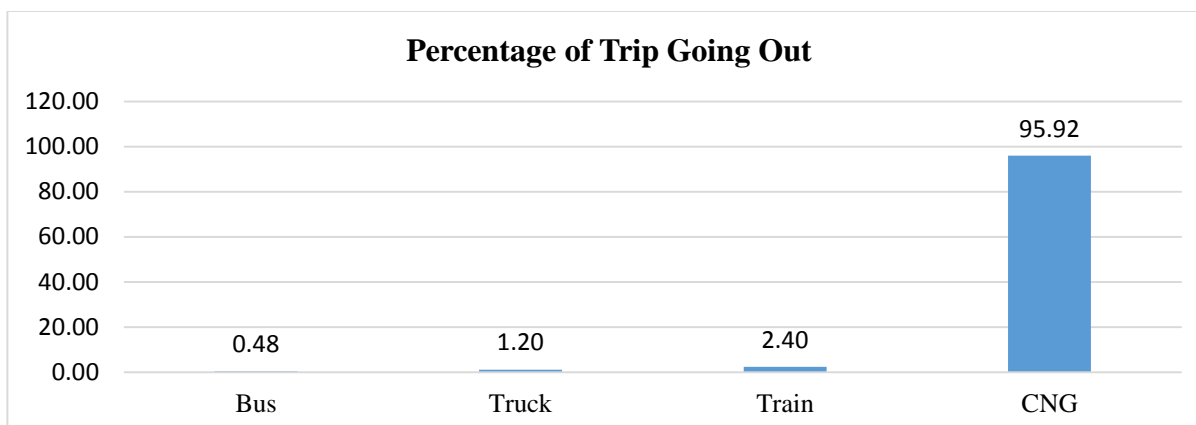
Regional linkages of the area with other regional centers, large cities and other growth and commercial centers and transportation network are the best indicators for its growth and development. The consultant team conducted study on the road linkages of the area with other areas and origin and destination survey of different freight trips. Major road linkages and survey finding are presented in the following sections.

Major Regional Road Linkages of the area

- Saghata to Rangpur;
- Saghata to Bogra.

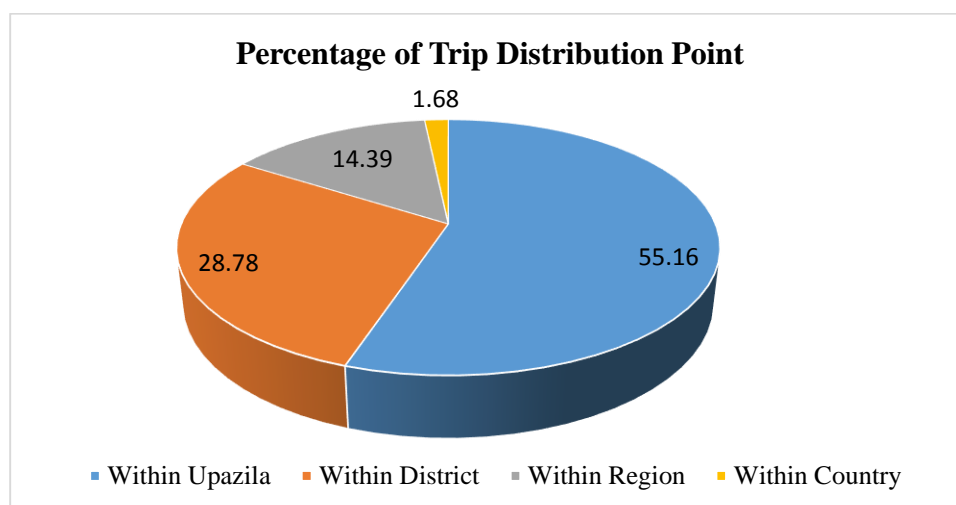
4.5.1 Trip Generation

It is evident that van and pick up are used mainly for carrying goods and commodities to relatively shorter distances within the ward, union and upazila and on the other hand, bus, CNG and trucks are mainly used for a longer distance including Bogra, Gabtali and Dhaka, Rangpur, Joypurhat etc. Figure 4.9 to Figure 4.11 and Table 4.13 shows the origin and destination of freight vehicles.



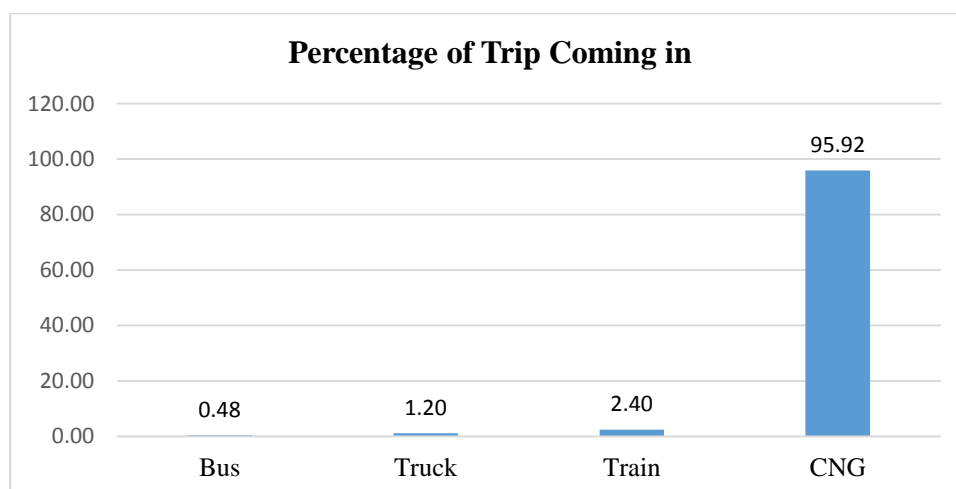
Source: Traffic Survey, 2016

Figure 4.9: Trip Going Out



Source: Traffic Survey, 2016

Figure 4.10: Trip Distribution Point



Source: Traffic Survey, 2016

Figure 4.11: Trip Coming in

Table 4.13: Average No. of Passengers/Weight of Goods

Sl. No.	Passenger/Goods	Number	Weight (Ton)
1.	Bus	40	00
2.	Truck	00	5
3.	Train	50	00
4.	CNG	06	00

Source: Traffic Survey, 2016

4.6 Pedestrian Survey

4.6.1 Survey Intersection or Points

As pedestrian is an important element or a part of moving vehicle, it is necessary to know the pedestrian flow in measuring the capacity of road, that's why the traffic survey has included the pedestrian count. The maximum number of pedestrian passes through Barokona-Jumarbari link (92 no.) and lowest number of pedestrian found in Barokona-Sonatala link (only 14 no.).

Pedestrian interview survey has been conducted for 1 day (August 14, 2016) in some selected locations such as Bonarpara Bazar, Saghata Bazar, Jumarbari Bazar and Barokona Bazar. The survey was accomplished by enumerators who were locally recruited and adequately oriented and trained by an experienced coordinator.

For the efficiency of the survey work, a standard format has been prepared by the assigned consultants considering all relevant issues such as about their purpose of journey; their origin and destination; travel distance, etc. The pedestrian count on the basis of link has summarized below:

Table 4.14: Summary of Pedestrian Count at Hat/On Day and Non Hat/Off Day

Intersection/ Link Road	Link Name	Pedestrian/Hour	
		Hat Day/ On Day	Non Hat Day/ Off Day
Bonarpara Bazar	Bonarpara-Kachua	66	42
	Bonarpara-Saghata	29	19
	Bonarpara-Jumarbari	59	31
	Bonarpara-Padumsahar	70	49
Saghata Bazar	Saghata-Jumarbari	59	38
	Saghata-Bonarpara	61	32
	Saghata-Ghuridaha	55	18
	Saghata-Bharatkhalai	71	39
	Saghata-Muktinagar	35	13
Jumarbari Bazar	Jumarbari-Barokona	67	42
	Jumarbari-Bonarpara	52	29
	Jumarbari-Sonatala	32	13
	Jumarbari-Saghata	59	37
Barokona Bazar	Barokona-Jumarbari	92	34

Intersection/ Link Road	Link Name	Pedestrian/Hour	
		Hat Day/ On Day	Non Hat Day/ Off Day
	Barokona-Sonatala	26	9
	Barokona-Bonarpara	46	26
	Barokona-Saghata	39	22
Total			

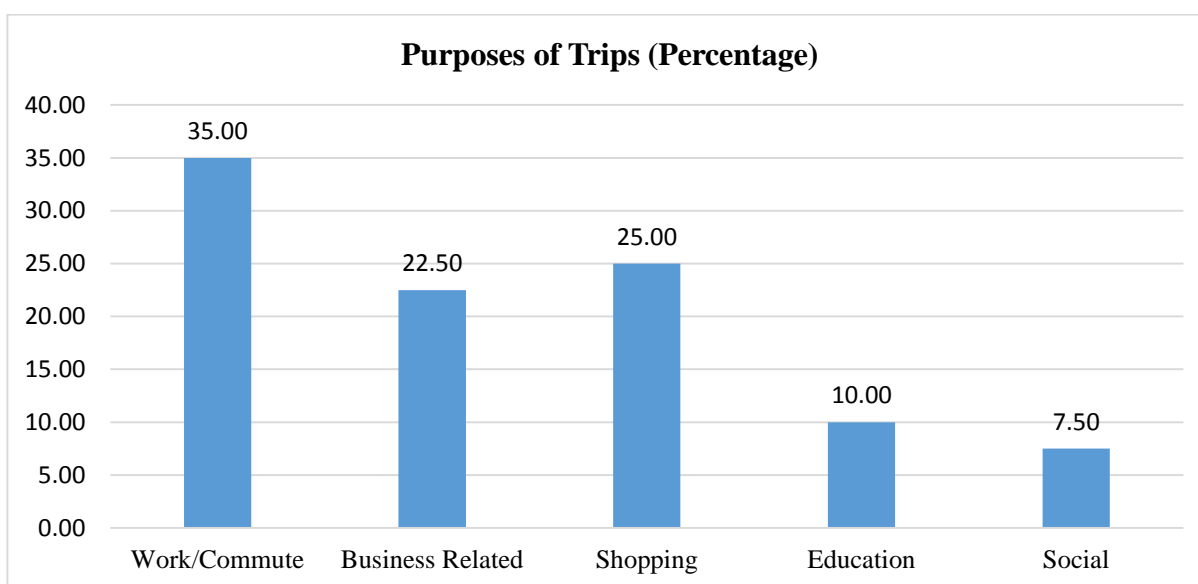
Source: Traffic Survey, 2016

4.6.2 Origin-Destination (O-D) Pedestrian Survey Findings

Origin-Destination (O-D) pedestrian survey has conducted in important nodes of the study area. Major findings of Origin-Destination (O-D) pedestrian survey are described in the following paragraphs.

4.6.2.1 Purposes of Trips

From the survey it is observed that around 35% of the trip are generating for work/commute purpose, 22.50% for business purpose, 25% for shopping, 10% for educational purpose and rest 7.50% for social purposes. Figure 4.12 shows the purposes of trips of the people.



Source: Traffic Survey, 2016

Figure 4.12: Purposes of Trips

4.6.2.2 Trips Starts and Ends Places

From the pedestrian survey, it is revealed that within all trips most the trips start and ends at residence and then workplace and then shopping. Details of types of place start and end points of trips have shown in the Table 4.15.

Table 4.15: Types of Place Start and End Points of Trips

Type of place	Trip Starting Point		Trip Ending Point	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Residence	18	45.00	13	32.50
Workplace	8	20.00	11	27.50
Shopping	6	15.00	6	15.00
School/College/University	4	10.00	3	7.50
Social	3	7.50	4	10.00
Recreational	1	2.50	3	7.50
Total	40	100.00	40	100.00

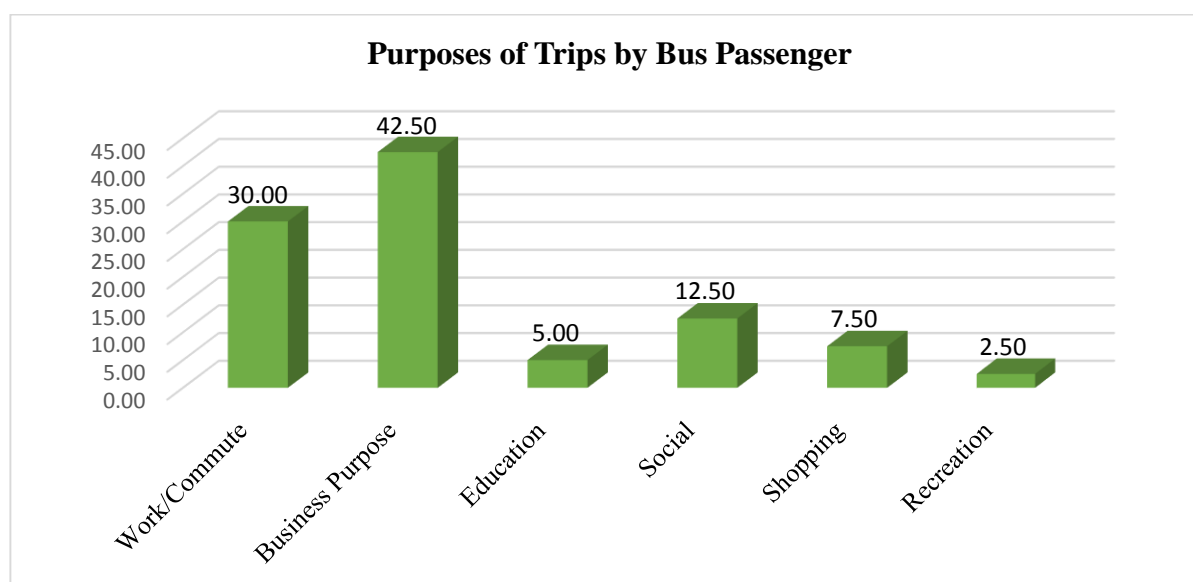
Source: Traffic Survey, 2016

4.7 Bus Passenger Survey

Bus passenger survey was conducted to know the pattern of travel of bus passenger of Saghata Upazila. Bus passenger survey has conducted at the bus stand of Saghata Upazila where the enumerators were able to get information within short time (1 day). The survey was accomplished by five enumerators who were locally recruited and adequately oriented and trained by an experienced coordinator.

4.7.1 Purpose of Trips

From the survey it is observed that people are travelling by bus mainly for business (42.50%), work (30%), social (12.50%), shopping (7.50%) and educational (5%) purposes. Figure 4.13 shows the purposes of trips by bus passenger.



Source: Traffic Survey, 2016

Figure 4.13: Purposes of Trips by Bus Passenger

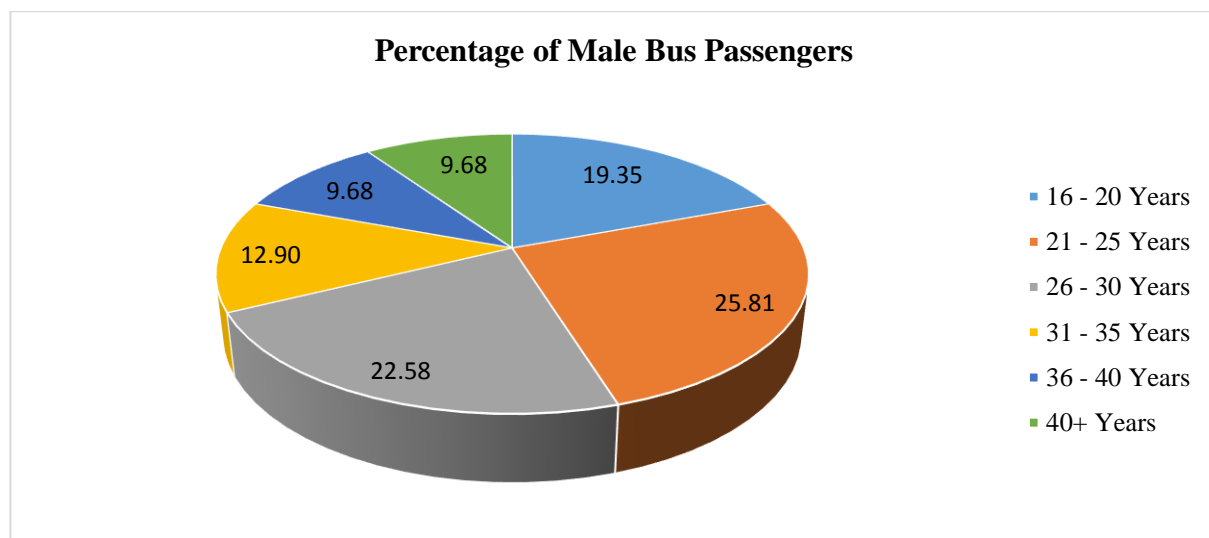
4.7.2 Age Group and Age Sex Distribution

From the Table 4.16 it has been observed that the survey covered all age groups both male and female. Within all bus passenger 25% are 21-25 years age group, 22.50% are at 16-20 years age group, 20% are below 26-30 years age group and rest are in different categories. About 77.50% of the passengers are male and rest 22.50% is female. Different age group wise percentage of male bus passengers shown in Figure 4.14.

Table 4.16: Age-Sex Distribution of Bus Passenger

Age Range (Year)	Male		Female		Total	
	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)
16 - 20	6	19.35	3	33.33	9	22.50
21 - 25	8	25.81	2	22.22	10	25.00
26 - 30	7	22.58	1	11.11	8	20.00
31 - 35	4	12.90	0	0.00	4	10.00
36 - 40	3	9.68	1	11.11	4	10.00
40+	3	9.68	2	22.22	5	12.50
Total	31	100.00	9	100.00	40	100.00
Percentage	77.50		22.50		100	

Source: Traffic Survey, 2016

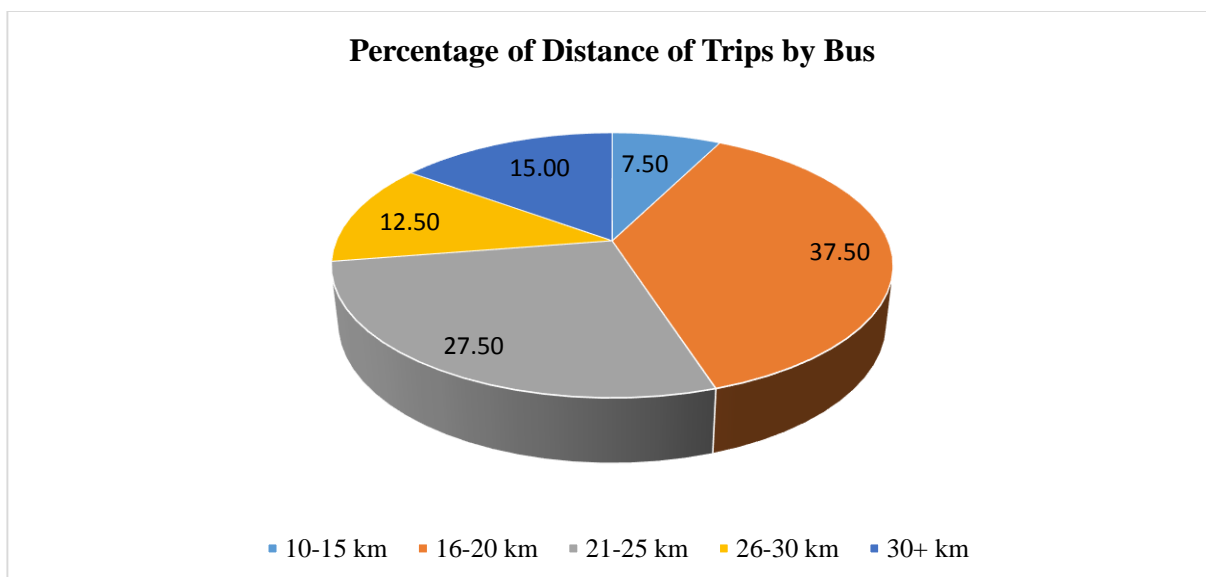


Source: Traffic Survey, 2016

Figure 4.14: Percentage of Male Bus Passenger

4.7.3 Distance of Trips

Passengers are mainly travelling above 10 km distance through bus. Only 7.50% passengers are travelling by bus to go for 10-15 km distance. About 37.50% passenger travel for 16-20 km and 27.50% passenger travel for 21-25 km. Figure 4.15 shows the percentage of distance of trips by bus.

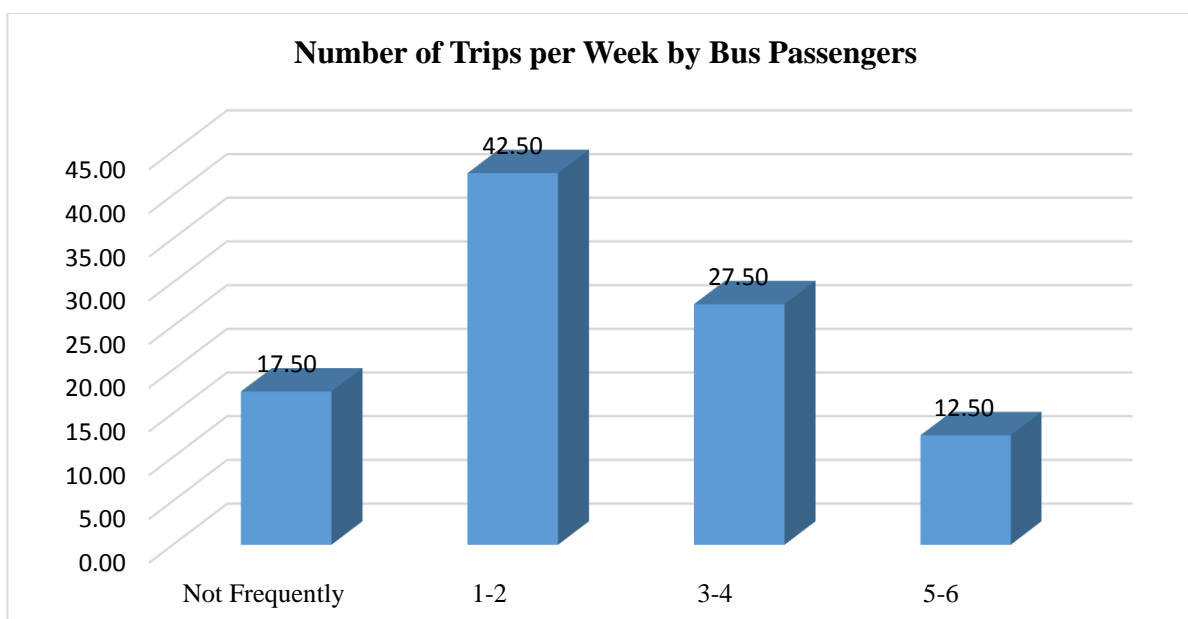


Source: Traffic Survey, 2016

Figure 4.15: Distance of Trips by Bus

4.7.4 Number of Trips

From Figure 4.16 it has been observed that 17.50% people do not travel frequently. Around 35% people travel 1-2 times per week, 27.50% people travel 3-4 times per week and 22.50% people travel 5-6 times per week.



Source: Traffic Survey, 2016

Figure 4.16: Number of Trips per Week by Bus Passengers

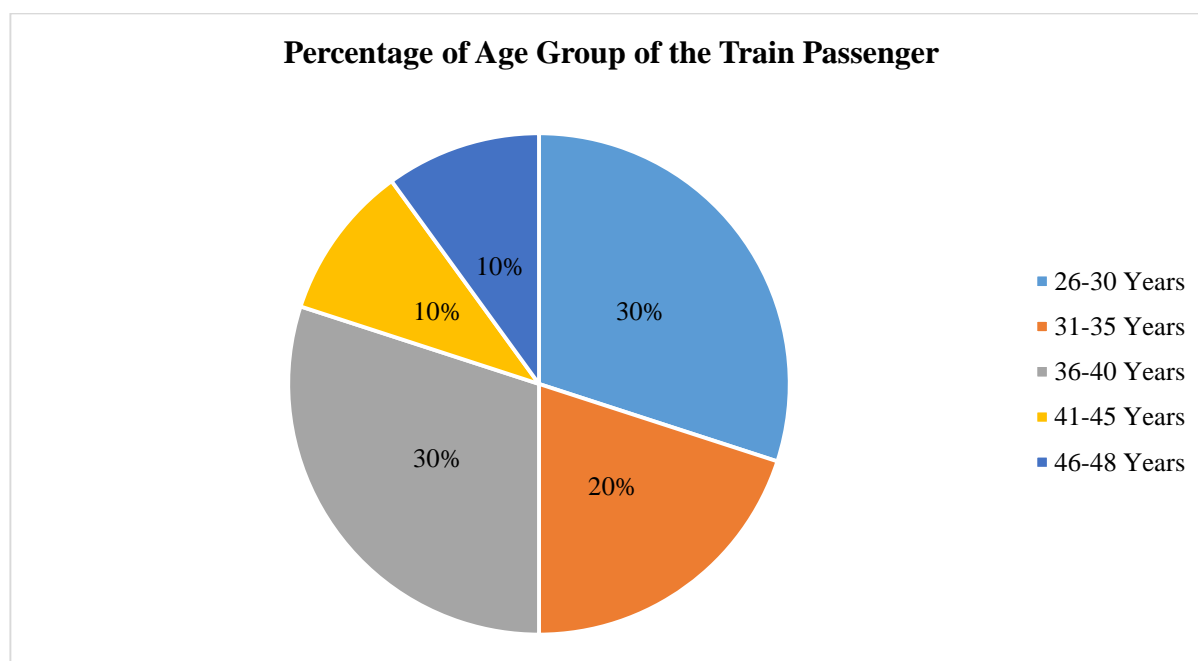
4.8 Train Passenger Survey

Train passenger survey has been carried out to find out peoples' view, their problems and suggestions about their used mode train. Interview has been conducted on passengers on Saghata Railway Station. The survey was accomplished by 1 enumerator who is locally recruited and adequately oriented and trained by an experienced coordinator.

The survey results have been described below.

4.8.1 Age of the Train Passenger

From the survey it is observed that within all male train passenger 30% are 26-30 years age group, 20% are at 31-35 years age group, 30% are at 36-40 years age group, 10% are at 41-45 years age group and rest of the groups are above of 45 years.

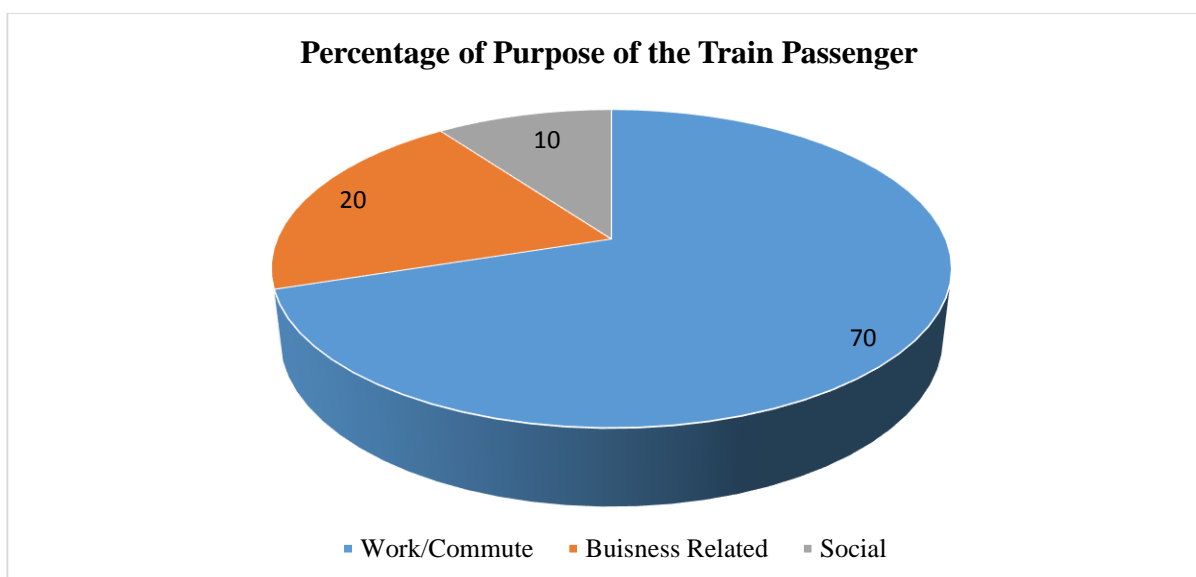


Source: Traffic Survey, 2016

Figure 4.17: Age Group of the Train Passenger

4.8.2 Purpose of the Trips

Train passenger interview survey result depicts that almost 70% of the respondents travel for work/commute purpose which is chased by business (20%) and social (10%) purposes. Figure 4.18 shows the purpose of the trips of respondent.



Source: Traffic Survey, 2016

Figure 4.18: Purpose of the Trips of Respondent

4.8.3 Origin and Destination of the Trips

Table 4.17 shows the origin and destination location of the train passenger's trips. Here, peoples move from different areas and their trips also ends at various destinations.

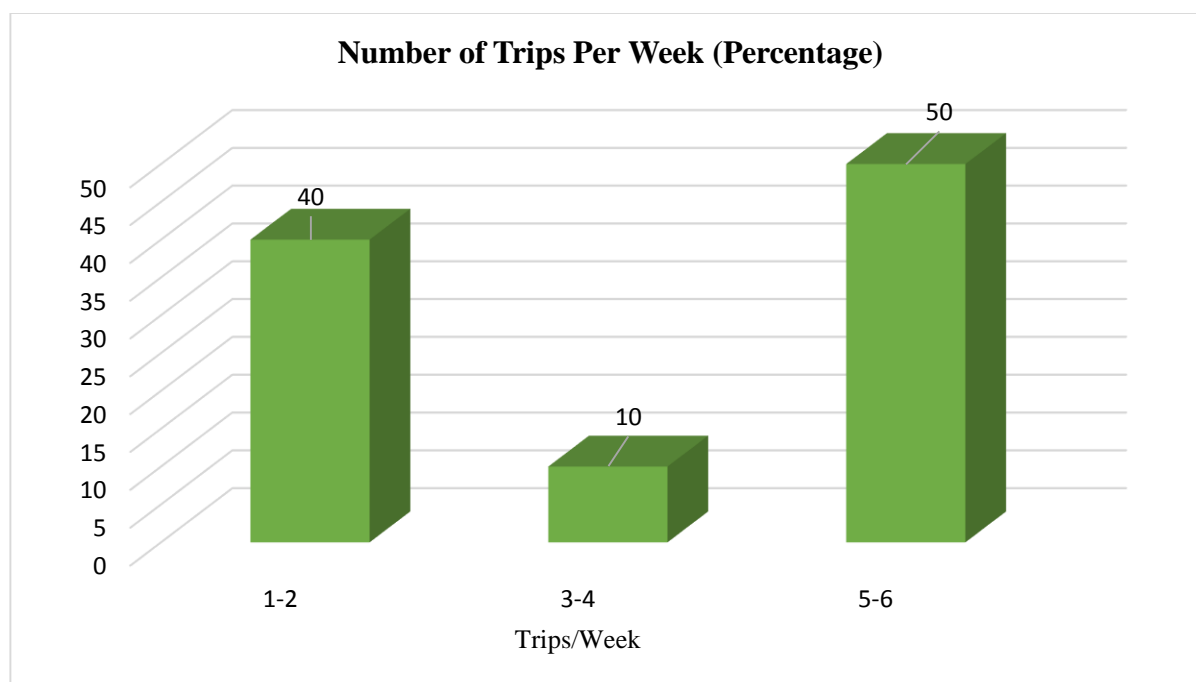
Table 4.17: Origin and Destination of the Trips

Trip Begin	Trip Ending			Total
	Adamdighi	Bonarpara	Sonatola	
Bonarpara	1	-	1	1
Gabtali	-	2	-	2
Kamarpara	-	2	-	2
Sonatola	-	1	-	1
Talora	-	1	-	1
Trimohini	-	1	-	1
Velurpara	-	1	-	1
Total	1	8	1	10

Source: Traffic Survey, 2016

4.8.4 Trips per Week

Most of the passenger made 5 to 6 trips per week (about 50%) and then 1 to 2 trips per week (about 40%) and rest of the passenger made 3 to 4 trips per week (10%). Figure 4.19 shows the percentage of number of trips per week.



Source: Traffic Survey, 2016

Figure 4.19: Number of Trips per Week

4.8.5 Travel Distance with Travel Time

From the train passenger survey travel time as per travel distance has been revealed. Table 4.18 shows the travel distance with travel time.

Table 4.18: Travel Distance with Travel Time

Travel Distance (km)	Travel Time in Minutes							Total	
	≤10	11-20	21-30	31-40	41-50	51-60	61-70	Number	Percent (%)
Less than 10	0	0	0	0	0	0	0	0	0.00
10-20	0	1	0	0	1	1	0	3	30.00
21-30	0	0	0	0	0	1	0	1	10.00
31-40	0	0	2	2	0	0	0	4	40.00
41-50	0	0	0	0	0	0	0	0	0.00
51-60	0	0	0	0	0	0	0	0	0.00
61-70	0	0	0	0	0	0	1	1	10.00
More than 70	0	0	0	0	0	0	1	1	10.00
Total	0	1	2	2	1	2	2	10	100.00

Source: Traffic Survey, 2016

4.8.6 Travel Distance with Travel Cost

From the train passenger survey travel cost as per travel distance has been revealed. Table 4.19 shows the travel distance with travel cost.

Table 4.19: Travel Distance with Travel Cost

Travel Distance (km)	Travel Cost in BDT						Total	
	Below 5	6-10	11-15	16-20	21-25	Above 25	Number	Percent (%)
Less than 10	1	0	0	0	0	0	1	10.00
10-20	0	2	0	0	0	0	2	20.00
21-30	0	1	0	0	0	0	1	10.00
31-40	0	0	4	0	0	0	4	40.00
41-50	0	0	0	0	0	0	0	0.00
51-60	0	0	0	0	0	0	0	0.00
61-70	0	0	0	1	0	0	1	10.00
More than 70	0	0	0	0	1	0	1	10.00
Total	1	3	4	1	1	0	10	100.00

Source: Traffic Survey, 2016

CHAPTER FIVE: FINDINGS FROM PRA, SOCIO-ECONOMIC AND PHYSICAL FEATURE SURVEY

5.1 Findings from PRA, Socio-Economic and Physical Feature Survey

5.1.1 PRA Survey

Based on PRA findings obtained in forms of resource maps, problems Venn diagram and potentials Venn diagrams and development needs workshops of ten Union Parishads of Saghata Upazila carry huge importance to be incorporated in the preparation of development plan for Saghata Upazila. However, these findings need to be examined by and matched with technical analysis of data gathered from other sectoral surveys and analyses as designed under the current project. It is evident from PRA findings of Saghata Upazila that most of Union Parishads are flood prone, affected by river erosion, water logging and disaster such as flood and cyclone. Most of the Unions Parishad lack of necessary road, electricity connection, sanitation facility, health services and necessary educational institutions. According the PRA participants, the Upazilas major potentials include agricultural production, char areas, water bodies, rivers, fisheries, educated people and unemployed labor across many unions that need to be utilized for the comprehensive development of Saghata Upazila. The participants of PRA session sat Saghata Upazila believe that development schemes for short term, mid-term and long-term must include river embankment construction, river training, drainage system development, installation of electricity connection, cyclone shelter construction and educational and health care facilities as urgent needs for the Upazila. Besides, agro-food processing industries, cottage industries and cold storages need to be placed to address poverty and unemployment problem of the Upazila (Source: PRA Survey, 2016).

5.1.2 Socio-economic Survey

Satisfaction Level on the Road: In reply to a question posed to the respondents on the level of satisfaction on the availability of the services of the Paurashava/Union level roads, only 16.10% of the total respondents are found very satisfied with the existing provision of service facilities of road, 43.60% are satisfied, the service is reasonable to 5.50% respondents and unsatisfactory to 34.80% respondents (Table 5.1).

Table 5.1: Satisfaction Level on the Road

Sl. No.	Satisfaction Level	Number	Percentage (%)
1.	Highly Satisfactory	179	16.10
2.	Satisfactory	486	43.60
3.	Reasonable	61	5.50

Sl. No.	Satisfaction Level	Number	Percentage (%)
4.	Unsatisfactory	388	34.80
5.	Not Known	1	0.10
Total		1115	100.0

Source: Traffic and Transportation Survey, 2016

5.1.3 Physical Feature Survey

Issues to be Given Priority for the Area: The survey reflected that rural road development, upazila road developments, increase of public awareness program, protection of riverbank/canal dredging, establishment of government school & college and increase of social security program are the most important issues to be given priority in the areas representing opinion of about 90.01%, 69.67%, 58.06%, 54.01%, 49.86% and 49.86% respondents respectively (Table 5.2).

Table 5.2: Issues to be given Priority for the Area

Sl. No.	Priority Area	Number	
1.	Upazila Road Development	774	69.67
2.	Up gradation of Drainage System	519	46.71
3.	Protection of Riverbank/Canal Dredging	600	54.01
4.	Kitchen Market Development	323	29.07
5.	Drinking Water Supply	246	22.14
6.	Rural Road Development	1000	90.01
7.	Play Field	186	16.74
8.	Establishment of Government School and College	554	49.86
9.	Increase of Public Awareness Program	645	58.06
10.	Increase of Social Security Program	554	49.86

Source: Physical Feature Survey, 2016.

CHAPTER SIX: FINDINGS AND WAY FORWARD

6.1 Findings

During the survey, the survey team assessed the existing transportation and traffic management system through observation, discussion with the local people, Union Parishad members and transport users, passengers. The major findings of observation and discussions are presented below.

- The overall road condition within the Upazila is not so much satisfactory. Most of the roads are semi pucca and katcha and pavement condition is poor.
- Water transport network has significant importance in carrying both people and goods. There are about 100–150 mechanized engine boats plying in the river and the surrounding areas to transport fish, rice, wood and other goods.
- Rail Way network has also significant importance in carrying both people and goods. There are about 100-150 mechanized engine boats plying by train.
- No public or private bus service is available for internal movement of passengers within the area.
- Intra Upazila traveling is mostly done through CNG, motor bike, rickshaw, van, etc.
- Motorized vehicles are generally used both for intercity and intra city movement. Buses are commonly used for intra city travel.
- Different types of freight vehicles are available in locality such as truck, pickup, van, trawler etc. Among these, van is most common freight vehicle in this locality. These freight vehicles carry various types of goods and commodities such as rice, brick, wood, raw materials, vegetables, fishes etc.

6.2 Way Forward

The survey results of the transportation and traffic management has become the basis for further analysis and interpretation in the process of preparing master plan for Saghata Upazila. Care should be taken not only to the conditions of the roads and vehicles but also to the traffic management. The following are the specific recommendations in relation to the survey findings of transportation and traffic management:

- Planned road network system should be proposed in the plan;
- Places of Bus, truck, tempo and rickshaw stands should be set aside in the proposed land use plan;
- New route development proposals should addressing regional connectivity.

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ANNEXURE

Annexure-I: Format of Traffic Volume Count Survey

Preparation of Development Plan for Fourteen Upazilas Project																	
Package 04																	
Urban Development Directorate																	
24 hours Traffic Count Survey (6 am to 6 am)																	
Name of Upazila:																	
Name of Union/Ward:					Traffic Count Survey					Day Type			Weekly Hat day	Non Hat day			
Name of Road:					Surveyor Name:					Day	Weather	Season					
Road Type:					Survey Date:												
Survey Location:																	
Hours	Motorized Vehicle									Total MV	Non-Motorized Vehicle					Total NMV	
	Auto- Rick/Van	Batbati	Nasimon/ Karimon	CNG	Jeep/ Car /Taxi	Micro/ Pickup	Motor- cycle	Bus/ Minibus	Truck		Rickshaw	Rickshaw Van	Bi- cycle	Bullock Cart	Push Cart		
6am to 6pm																	

Annexure-II: O-D Survey Questionnaire

Preparation of Development Plan for Fourteen Upazilas Project

Package 04

Urban Development Directorate (UDD)

Roadside Interview Survey (O-D Survey) Questionnaire

Time: Every half an Hour Interval (24 hours clock)

Name of Upazila:

Date:

Route Name:

Hours counted: **Start**am/pm, **Finish**am/pm

Traffic Direction: Fromto.....

A. Vehicle Type:

1. Truck 2. Bus 3. Car/Pickup/Jeep/Motorbus 4. Auto Rickshaw/Tempo 5. Motorcycle 6. Rickshaw/Van 7. Bicycle

B. Where did your trip begin?

City/Town.....

C. What type of place is your trip start point?

1. Residence 2. Workplace 3. Shopping 4. School/College/University 5. Social 6. Recreational

D. Where did your trip end?

City/Town.....

E. What type of place is your trip end point?

1. Residence 2. Workplace 3. Shopping 4. School/College/University 5. Social 6. Recreational

F. What was the purpose of your trip?

1. Work/Commute 2. Business related 3. Shopping 4. Education 5. Social 6. Recreation

G. How many people were in the vehicle including the driver?

No. of people.....

H. Any comments on Transportation?

Name of Enumerator:

Name of Supervisor:

Signature of Enumerator:

Signature of Supervisor:

Annexure-III: Pedestrian Interview Survey Questionnaire

Preparation of Development Plan for Fourteen Upazilas Project

Package 04

Urban Development Directorate (UDD)

Roadside Interview Survey (O-D Survey) Questionnaire

Name of Upazila :
Date :
Time of Interview :
Location of Interview point :

A. Present Address of the respondent

B. **Sex:** (a) Male (b) Female

C. **Age:** 1. Below 15 2. 16-20 3. 21-30 4. 31-40 5. 41-50 6. Above 51

D. **Where did your trip begin?**
years years years years years years

E. **Where did your trip end point?**

F. What was the purpose of your trip?

1. Work/Commute 2. Business related 3. Shopping 4. Education 5. Social 6. Recreation

G. **Total distances of the trip?** (In k.m.)

Name of Enumerator:
Signature of Enumerator:

Name of Supervisor:
Signature of Supervisor:

Annexure-IV: Questionnaire on Regional Transportation Network System

**Urban Development Directorate
PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILAS
(PACKAGE: 04): UDD**

Questionnaire on Regional Transportation Network System

Name of Upazila :
Date of survey :

A. Information of trip going out from study area to other region (upazila/district)

1) Type of Mode (Bus/Truck/Train/Water way):

(Response will be collected from every mode)

2) Name of trip destination point (Upazila/District):

3) No. of trips per day (hour basis)

4) Average no. of passengers carried by per mode (per trip):

5) Types of goods carried by per mode (per trip):

B. Information of trip coming into study area from other region (upazila/district)

1) Type of Mode (Bus/Truck/Train/Water way):

(Response will be collected from every mode)

2) Name of trip origin point (Upazila/District):

3) No. of trips per day (hour basis)

4) Average no. of passengers carried by per mode (per trip):

5) Types of goods carried by per mode (per trip):

6) Stoppage area inside the upazila area.

Annexure-V: List of Members in Traffic and Transportation Survey

Sl. No.	Name	Number	Activities
1	Transportation Expert Md. Sayedur Rahman Khan	1	Planning, preparation of questionnaire and overall supervision of the survey activities and subsequent report preparation
2	Planner Md. Maksudur Rahman	1	Training, and supervision of field level activities
4	Mahbubur Rahman Linkon	1	Data base format preparation and supervision of data entry activities
5	Survey Coordinator <ul style="list-style-type: none"> • Mahbubur Rahman Linkon • Tapas Kumer Roy • Shawon Barua 	3	Field level vigilance and provide training to the enumerators
6	Enumerators	16	Field Survey
7	Data Entry Operators	10	Data Entry in SPSS and Analysis and presentation in tabular form

Annexure-VI

▪ Origin - Destination Survey (Roadway) Calculation

Table 1: Sex Wise Distribution of Passengers

Sl. No.	Types of respondent	No. of Passenger	Percentage (%)
1	Male	87	79.82
2	Female	22	10.18
Total		109	100.00

Table 2: Origin of Trips

Sl. No.	Origin of Trip	Number of Passengers	Percentage
1.	Within Ward	4	3.67
2.	Within Union	17	15.60
3.	Within Upazila	43	39.45
4.	Within District	39	35.78
5.	Outside of the District	6	5.50
TOTAL		109	100.00

Table 3: Destination Point of Trips

Sl. No.	Destination of Trip	Number of Passengers	Percentage
1.	Within Ward	00	0.00
2.	Within Union	7	6.42
3.	Within Upazila	34	31.19
4.	Within District	41	37.61
5.	Outside of the District	27	24.77
TOTAL		109	100.00

Table 4: Purpose of Trips

Sl. No.	Purpose	Number of Person	Percentage (%)
1.	Work/Commute	31	28.44
2.	Business	37	33.94
3.	Shopping	8	7.34
4.	Education	13	11.93
5.	Social	20	18.35
6.	Recreation	00	0.00
TOTAL		109	100.00

Table 5: Mode of the Trips of Respondent

Sl. No.	Mode of Travel	Number of respondent	Percentage (%)
1.	Rickshaw/ Van	06	5.50
2.	CNG	77	70.64
3.	Bus	08	7.34
4.	Train	18	16.51
TOTAL		109	100.00

Table 6: Total Travel Time

Sl. No.	Travel Time (Hour)	No. of Passenger	Percentage (%)
1.	Bellow 1	52	47.71
2.	1-2	35	32.11
3.	2-3	12	11.01
4.	3-4	00	0.00
5.	4-5	00	0.00
6.	Above 5	10	9.17
TOTAL		109	100.00

Table 7: Total Travel Cost

Sl. No.	Travel Cost (BDT)	No. of Passenger	Percentage (%)
1.	Below 20	9	8.26
2.	20-50	62	56.88
3.	50-100	17	15.60
4.	100-150	4	3.67
5.	150-200	11	10.09
6.	Above 200	6	5.50
TOTAL		109	100.00

▪ Regional Transport Study Calculation

Table 8: Trip Going Out

Sl. No.	Type of Mode	Number	Percentage (%)
1.	Bus	2	0.48
2.	Truck	5	1.20
3.	Train	10	2.40
4.	CNG	400	95.92
TOTAL		417	100.00

Table 9: Trip Distribution Point

Sl. No.	Destination to Outside	Number	Percentage (%)
1.	Within Upazila	230	55.16
2.	Within District	120	28.78
3.	Within Region	60	14.39
4.	Within Country	7	1.68
TOTAL		417	100.00

Table 10: Trip Coming in

Sl. No.	Type of Mode	Number	Percentage (%)
1.	Bus	2	0.48
2.	Truck	5	1.20
3.	Train	10	2.40
4.	CNG	400	95.92
TOTAL		417	100.00

▪ Pedestrian Survey Calculation

Table 11: Purpose of Trips

Purpose	Frequency	Percentage (%)
Work/Commute	14	35.00
Business Related	9	22.50
Shopping	10	25.00
Education	4	10.00
Social	3	7.50
Total	40	100.00

▪ Bus Passenger Survey Calculation

Table-12: Purpose of Trips by Bus Passenger

Purpose of Trip	Frequency	Percentage (%)
Work/Commute	12	30.00
Business Purpose	17	42.50
Education	2	5.00
Social	5	12.50
Shopping	3	7.50
Recreation	1	2.50
Total	40	100.00

Table 13: Percentage of Male Bus Passenger

Age Range	Male	
	Number	Percentage (%)
16 - 20 Years	6	19.35
21 - 25 Years	8	25.81
26 - 30 Years	7	22.58
31 - 35 Years	4	12.90
36 - 40 Years	3	9.68
40+ Years	3	9.68
Total	31	100.00

Table 14: Distance of Trips by Bus

Distance of Trip	Number	Percentage
0-5 km	3	7.50
6-10 km	15	37.50
11-15 km	11	27.50
16-20 km	5	12.50
20+ km	6	15.00
Total	40	100.00

Table 15: Number of Trips per Week by Bus Passengers

Trips per Week	Frequency	Percentage
Not Frequently	7	17.50
01-02	17	42.50
03-04	11	27.50
05-06	5	12.50
Total	40	100.00

▪ **Train Passenger Survey Calculation**

Table 16: Age Group of the Train Passenger

Age Group (Years)	Frequency	Percentage (%)
26-30	3	30.00
31-35	2	20.00
36-40	3	30.00
41-45	1	10.00
46-50	1	10.00
Total	10	100.00

Table 17: Number of Trips per Week by Train Passengers

Trips per Week	Frequency	Percentage
01-02	4	40.00
03-04	1	10.00
05-06	5	50.00
Total	10	100.00