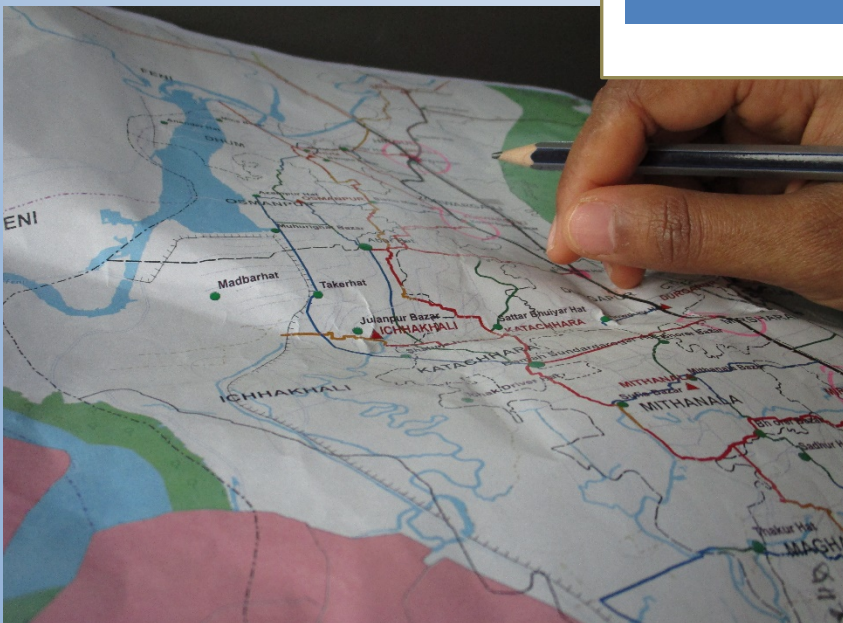




Preparation of Development Plan for
Mirsharai Upazila, Chittagong District:
Risk Sensitive Land Use Plan

under

Urban Development Directorate
(UDD)



Mobilization Report

Traffic and Transport
Surveys and Studies
(Package-4)

December 2017

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EXECUTIVE SUMMARY

Mirsharai is a land of potentials and various development possibilities. With smooth communication by means of road, rail and waterways, it is an ideal location for economic cum industrial development. In addition, Mirsharai is blessed with abundance of natural resources and scenic beauties having hilly forest areas, hill streams and waterfalls of Chittagong Hill Tracts on one side and the Bay of Bengal on the other. The first multi-sector EZ in the country has also been under-construction within this very location. There are immense possibilities to develop Mirsharai as a modern industrial hub and a place of eco-tourism.

The success of developing Mirsharai as a tourist center and Special Economic Zone depends on the availability of modern amenities connected through a sustainable transportation system. For this, it is necessary to understand the present state of the transport system based on which a sustainable transportation system can be built for the future. Therefore, a thorough traffic study on the existing road network is imperative. This will shed light on the recent state of transportation as well as provide information about its pros and cons and possibilities for future development. Through this transportation survey and studies, an improved transport system will be proposed which will be efficient, affordable and sustainable for the growth of Mirsharai Upazila.

Objectives of the Project

The main objectives of the project package is to develop a comprehensive computerized transportation planning tool (model). This model will be used to:

- Prepare integrated land use and transportation model for Mirsharai.
- Prepare disaster management plan for Mirsharai from the perspective of transportation.
- Develop new and improved affordable and effective transportation network for Mirsharai Upazila.

Scope of the Project

As per TOR, scope of services can be outlined as the following major tasks:

- Transport Surveys and Studies for the Project
- Database Preparation and Management
- Preparation of Development Plan of Mirsharai by Integrating Transportation Planning with Land Use and Disaster Management Plan.

Commencement of the Project

The contract for consultancy services between Urban Development Directorate (UDD), the Client and DevConsultants Limited (DevCon), Bangladesh, the Consultant, was signed on November 15, 2017. The total duration of the project is 4 (four) months.

Project Office Setup

The Consultants have been mobilized and is operating from a project office, which is fully equipped with computers, printers, photocopiers and scanners for effective working of the transport experts and technical support staff. The project office will be operational for the whole duration of 4 months. Also, with assistance from UDD, a search is ongoing to find a suitable place in Mirsharai to be used as the survey site office. The site office will remain in operation for two months (December, 2017 – January, 2018).

Preparation of Development Plan for Mirsharai Upazila, Chittagong District: Risk Sensitive Landuse Plan (MUDP) Traffic and Transport Survey (Package: 4)

Team Composition

The following table shows the team composition of the consultant

Position	Expert Assigned
<i>Transport Planning Expert (Team Leader)</i>	Dr. Moinul Hossain Expertise: Transportation Planning Traffic Engineering Transport Modelling Traffic Simulation Traffic Management Planning Project Management and Administration
<i>Transport Survey Expert</i>	Md. Mizanur Rahman Expertise: Design of Traffic Survey Survey Data Analysis and Interpretation Assistance in Transportation Planning
<i>Transport Survey Supervisor</i>	Sultana Rajia Expertise: Traffic Survey Design Data Analysis and Interpretation Assistance in Transportation Modelling GIS Map Preparation

Project Deliverables

During the entire project the following documents will be delivered to the client by the consultant.

Sl.	Name of Report	Contents	Tentative Submission Date
1	Mobilization Report	Project startup activities, reconnaissance survey outputs, detailed survey design, survey methodology etc.	December 14, 2017
2	Inception Report	Existing data collection from secondary source and Assessment of existing data.	January 15, 2017
3	Interim Report	Traffic survey data collection, Traffic survey data analysis, formulation of standard and policies, development and analysis of strategies etc.	February 15, 2018
4	Draft Survey Report	Detail survey analysis report, travel demand forecasting model etc.	March 04, 2018
5	Survey Report	Final travel demand forecasting model	March 15, 2018

This report is the first deliverable prepared by DevCon and covers the start-up activities under the Traffic and Transport Surveys and Studies (Package-4) project including findings from the Reconnaissance Survey taken up by the consultant team in cooperation with the client (UDD) and the local representatives of the study area.

In short, the report will highlight the following:

- Finalization of project start-up activities
- Identification of secondary sources
- Identification of stakeholders
- Conducted reconnaissance survey which has achieved the following objectives:
 - Identification of the road network to be considered in travel demand forecasting model building
 - Identification of major intersections and growth centers
 - Determination of survey requirements along with sites to be surveyed
- The meetings with stakeholders have achieved the following objectives:
 - Relationship building with stakeholders
 - Role, power and potential of the stakeholders
 - View and view point of the stakeholder in relation to the future development of Mirsharai

1 INTRODUCTION

1.1 Report Overview

This report prepared by DevCon, Bangladesh covers the start-up activities under the Traffic and Transport Surveys and Studies (Package-4) project including findings from the Reconnaissance Survey taken up by the consultant team in cooperation with the field personnel of the Urban Development Directorate (UDD) and the local representatives of the study area.

The report also presents a brief introduction of the mother project 'Preparation of Development Plan for Mirsharai Upazila: Risk Sensitive Landuse Plan (MUDP)' itself; information of the project area i.e., Mirsharai Upazila, scope of services under this particular component and the work schedule and staffing arrangement to achieve the project goal and specific objectives step-by-step. One of the most important aspects of this assignment is establishing a smooth coordination process among the Consultants, the Client, their local representatives and with the concerned bodies and stakeholders. This is to investigate and identify the demand and expectation of the local community as well as the government agencies and ensuring integration with various ongoing/ proposed development projects in and around the study area to come up with a pragmatic and futuristic development plan for Mirsharai.

In short, the report will highlight the following:

- Project Objectives, Work Program & Personnel
- Existing Transportation System and Possible Improvements
- Findings of the Reconnaissance Survey, and,
- Stakeholder Interviews

1.2 Project Background

Mirsharai Upazila, located only 60km away from port city Chittagong, is a land of various development possibilities. It is surrounded by Feni District & the River Feni on the North, Sandwip Channel (connecting the Bay of Bengal) on West, Khagrachhari District on the North-East & Chittagong on the South. With smooth communication by all means of road, rail and waterways, it is a potential location for economic cum industrial development. In addition, Mirsharai is blessed with abundance of natural resources and scenic beauties having hilly forest areas, hill streams and waterfalls of Chittagong Hill Tracts on one side and the Bay of Bengal on the other. At the same time, Mirsharai is blessed with excellent geographical advantage making it a suitable location to establish a bay terminal for the Chittagong Port Authority. The work of establishing one of the largest Economic Zones (EZ) have also commenced in Mirsharai. These are the key drivers of change for the Upazila under study.

Mirsharai Economic Zone

With an ambit of enhancement of economic development in the country, Government of Bangladesh (GOB) with support from World Bank and the Department for International Development, United Kingdom (UK-DFID) has proposed to develop EZs at various potential locations in Bangladesh as Private Sector Development Support



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Project (PSDSP). Bangladesh Economic Zone Authority (BEZA) is the agency overall responsible for establishments of EZs in all the potential areas including the backward and undeveloped regions. BEZA has been formed under the Bangladesh Economic Zone Act, 2010 on November 9, 2010. BEZA has identified various locations for development of EZs. One of the potential sites is located at Mirershorai Upzila covering an approximate area of 610 acres (246.86 ha).

Mirsharai Economic Zone will be the first multi-sector EZ in the country, with an area as large as 7716 acres. The Zone has all the potentials to fulfill the conditions necessary to become a successful economic zone. With only 2m of earth filling requirement for land development, it is expected that once it is established, there will be a huge demand for plots in the Mirsharai Economic Zone by both Local and Foreign Investors. It has access to waterways, Chittagong port (the largest sea port in the country), railway station and nearby 4-lane national highway. The site is suitable for garment, garment accessories, integrated textile, motorbike/ automobile assembling, automobile parts manufacturing and so on. Some key features of the proposed EZ are as follows:

Table 1.1: Key Features of Mirsharai Economic Zone

Land	Gross area of 7716 acres
Estimated Cost of Infrastructures	USD 818 million for on-site and USD 29 million for off-site infrastructures
Competitiveness	Along the Dhaka-Chittagong 4-lane Corridor, has advantage of road, river & rail access.
Employment Opportunities	Expected 700,000 workers

Table 1.2: Connectivity and Surroundings of Proposed EZ Site

Connectivity
Nearest Road/ Highway
Nearest Railway Station
Nearest Airport
Available Inland Water Transport
Nearest Ports

Source: Bangladesh Economic Zone Authority (BEZA)

Tourism

With holistic planning and establishment of easy accessibility, Mirsharai can be a great tourist attraction. The most attractive places of Mirsharai area are Mohamaya Lake and waterfalls such as *Khoiyachora*, *Baghbiani*, *Napitachora*, *Sonaichora*, *Mithachora* and *Boyalia*. Anyone can travel by bus or rail from the capital Dhaka. Again, it is only 56 km away from the Chittagong Divisional headquarters and takes a 1.5-hour travel by public bus. The Bangladesh Road Transport Corporation (BRTC) introduced a direct bus service from Dhaka to Mirsharai via Comilla (Banglapedia, 2015).



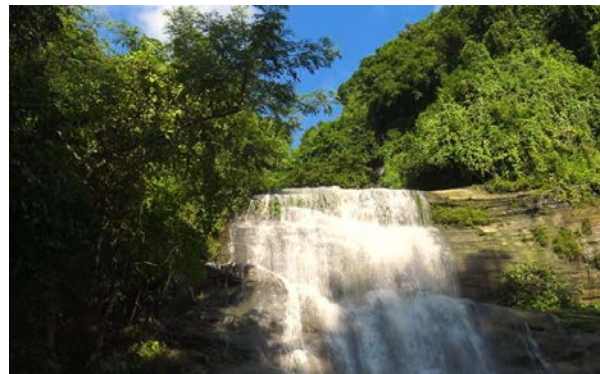
Mohamaya Chara Lake



Napitachora Waterfall



Sonaichora Waterfall



Khoiyachora Waterfall

However, there are still scope for development in the transportation accessibility to Mirsharai, and in between different spots, which are naturally located alongside the Dhaka-Chittagong Highway (N1) and at very close intervals. In addition, improvement of walkability and other facilities like housing, tourist entertainment activities, restaurants etc. within the tourist spots is necessary to provide safety and comfort to the local and international tourists. It will also open a new prospect in the thriving tourism industry of Bangladesh.

The proposed Special Economic Zone would generate many industry related new activities including huge vehicular traffic on air, rail, road and water. This phenomenon would have both positive and negative impact on the socio-economic condition and existing land use pattern of the region. The proposed planning package would guide such probable changes in the socio-economic condition and land use pattern of the region and would also address the adverse impact of such changes by presenting a proposal for sustainable transportation system. Also, this project has been under taken to protect the region from depletion of its natural resources and character and for tourism development as well.

1.3 Description of the Project

1.3.1 Mirsharai at a Glance

The project area is Mirsharai Upazila under Chittagong District having an area of 482.88 sq. km. Mirsharai Thana was formed in 1901 and it was turned into an Upazila in 1983.

It is located at 22°46.3' North and 91°34.5' East. It is bounded by is Tripura, Chhagalnaiya and Feni Sadar on the north, Sitakunda and Sandwip on the south, Fatikchhari on the east, Sonagazi and Companiganj on the west. It is approximately 60 km away from Chittagong city. Mirsharai Upazila consists of 2 Municipality, 16 Union and 208 villages. Mirsharai, the combination of the lake and hilly area contains attractive scenic beauty on the southernmost part of Bangladesh.

The administrative head of the Upazila is Upazila Nirbahi Officer (UNO). It has many development opportunities with abundance of natural and human resources that can be utilized for the socioeconomic development of the area and ultimately for the country.

Transportation Communication Facilities:
Pucca road 230 km, semi-pucca road 119 km,

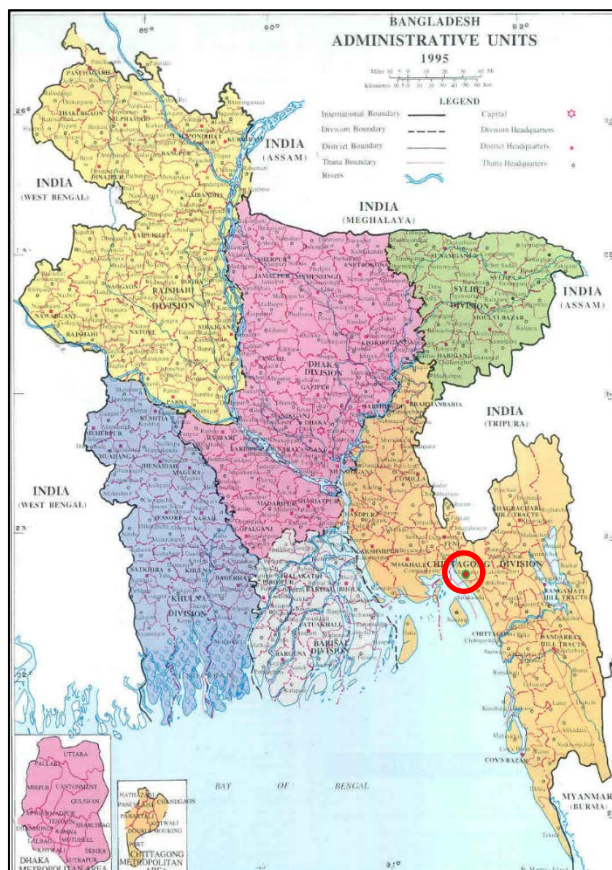


Figure 1-1: Location of Mirsharai Upazila, the Project Area

mud road 1435 km; railway 16 km; waterway 11 nautical miles. Rail junction 4. Extinct or nearly extinct traditional transport: Palanquin, bullock cart. The road network within the project area can be found from the LGED road map as illustrated by Figure 2.2.

Opportunity: Bangladesh has the opportunity to generate earnings in local and also in foreign exchange by opening a tourist resort at Mirsharai and such an initiative is already under way. Mirsharai sea beach, hilly area, Mohamaya Chara Lake, Khoiyachora region have the greater potential for tourism development as there are abundant resources to attract tourists. If properly developed the place will become an excellent holiday destination for both local and international tourists.

Moreover, honorable MoHPW Minister expressed his heartiest interest to develop an exclusive economic zone in Mirsharai Upazila. Bangladesh Economic Zones Authority (BEZA) has already taken steps to develop *Special Economic Zone* in Mirsharai.

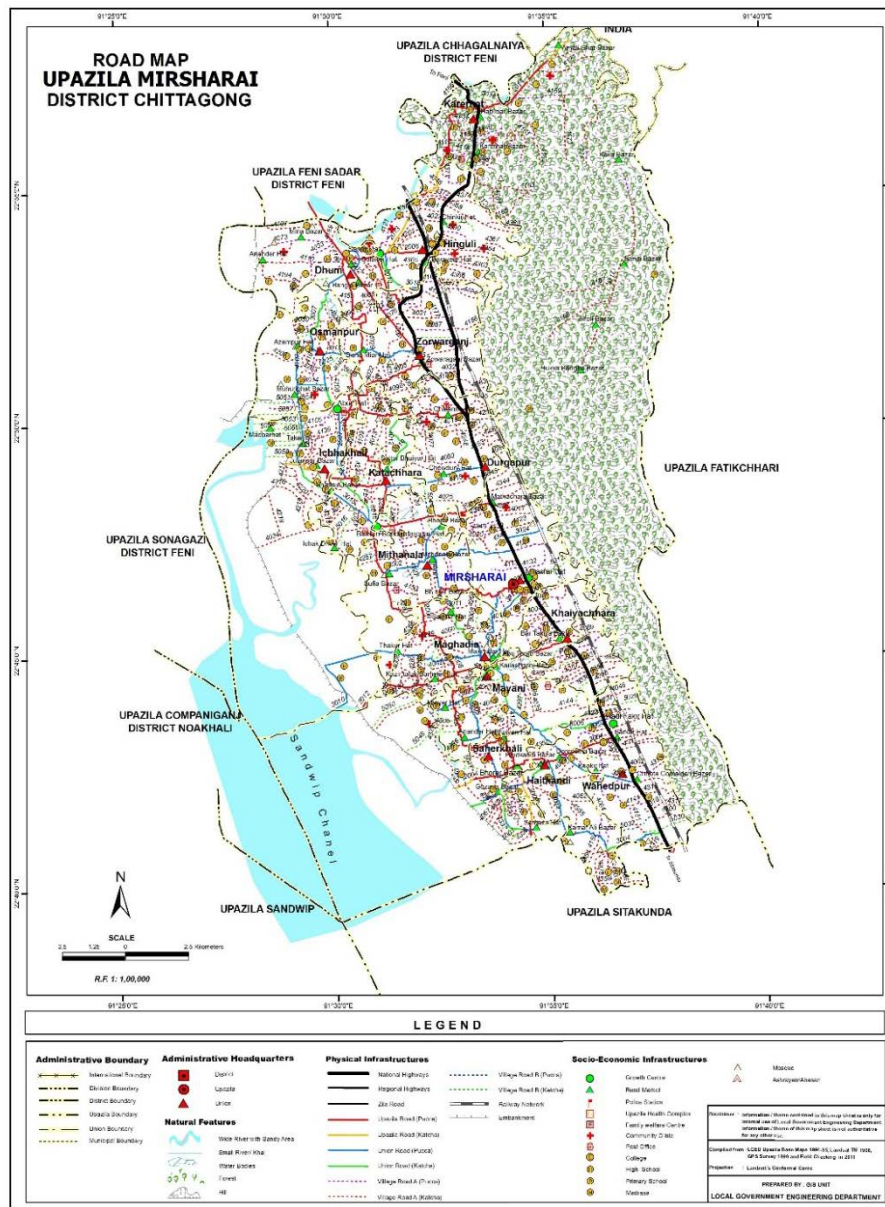
The following table gives an overview of the project area:

Table 1.3: Area, Population and Density of the Project Area

Municipality	Union	Mauza	Village	Population		Density (per sq. km)	Literacy rate (%)
				Urban Area	Rural Area		
2	16	103	208	31,206	3,67,510	826	55.1

Source: BBS, 2011

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Source: Local Government Engineering Department (LGED)

Figure 1-2: Mirsharai Upazila Map

The success of developing Mirsharai as a tourist center and Special Economic Zone depends on the availability of modern amenities connected through a sustainable transportation system. For this, it is necessary to understand the present state of the transport system based on which a sustainable transportation system can be built for the future. Therefore, a thorough traffic study on the existing road network is imperative. This will shed light on the recent state of transportation as well as provide information about its pros and cons and possibilities for future development. Through this transportation survey and studies, an improved transport system will be proposed which will be efficient, affordable and sustainable for the growth of Mirsharai Upazila.

1.3.2 Objectives of the Assignment

The main objective of the project package is to develop a comprehensive computerized transportation planning tool (model). This model will be used to:

- Prepare integrated land use and transportation model for Mirsharai.
- Prepare disaster management plan for Mirsharai from the perspective of transportation.
- Develop new and improved affordable and effective transportation network for Mirsharai Upazila.

1.3.3 Scope of Work

The goal of the project is to prepare a development plan for Mirsharai Upazila. For this, it is necessary to understand the transportation network in the study area to be achieved through various traffic and transportation surveys which will eventually help to understand the transport network of the project area.

The survey firm is vested with the responsibility for the following activities:

- The firm shall conduct all necessary traffic and transport surveys and studies through digital system and collect all relevant data and information for the project and upload the collected data to website instantly through online communication device.
- Survey firm shall prepare working paper on the relevant fields under study and at the end of each month submit a report containing all information have been uploaded to website and ensure that all data and information are accessible to viewer.
- The firm shall be responsible for quality of data and information collected, data processing, cleaning and editing and presentation into tabular form.
- The survey firm shall provide all necessary assistance in gathering and procuring all relevant traffic and transportation related attribute and spatial data of relevant features within the project area, GIS database operation and management, analysis and preparation of maps and reports till completion of the project.
- Shall deliver all raw and processed data along with working papers containing guidelines for preparing the planning package as required by PD.
- The survey firm shall assist the UDD team members in preparation of final and all relevant reports till completion of the project.

For achieving the goal and objectives, the following sub-objectives need to be fulfilled (some of these will be the output of the other packages of the project running parallel to this package):

- » To prepare a socio-economic geodatabase of the study area related to transportation modeling and land use planning.
- » To prepare an inventory of existing land use of the study area using GIS and conduct survey to calculate the trip production-attraction rates for various land use.
- » To prepare an inventory of road network as well as transportation system (road network, public transport facilities, options for non-motorized trips etc.) of the study area using GIS.
- » To conduct a comprehensive household travel demand survey.
- » To obtain values for various demographic and socio-economic indicators included in the model.
- » To forecast the land value and land use as impacted by changes in transportation accessibility and policies.
- » To collect detailed data on freight movement and develop travel demand forecasting models for freight.
- » To simulate transportation operations in details at the project area.
- » To simulate vehicular traffic flow to analyze and solve traffic bottlenecks.
- » To estimate the risk, resilience and vulnerability of the network under general operating condition and even during extreme conditions.

1.4 Project Commencement

The contract for consultancy services between Urban Development Directorate (UDD), the Client and DevConsultants Limited (DevCon), Bangladesh, the Consultant, was signed on November 15, 2017 in a nice seminar having the whole UDD HQ team in presence of, among other, the honorable Director Dr. Khurshid Zabin Hossain Toufiq, former Director Khondoker Fouzi Bin Farid and the MUDP Project Director, Mr. Ahmed Akhtaruzzaman.



2 PROJECT ADMINISTRATION

2.1 The Client

The Client of this particular assignment is Urban Development Directorate (UDD). Due to rapid urbanization and increase in population and economic development in the early sixties, an urge was felt to create a regional and central office for Physical Planning which resulted in creation of the Urban Development Directorate (UDD) on the 17th July 1965, under the administrative control of Works, Power and Irrigation Department of the then East Pakistan, vide memo no. 464E, dated, Dhaka, July 17, 1965. Functions were allocated to UDD in 1983 by the Martial Law Committee, headed by Brigadier Enamul Haque Khan. Organizational set up of UDD was approved by the Review Committee, headed by Major General Atiqur Rahman. UDD mainly works in collaboration with the Public Works Department (PWD) under the Ministry of Housing and Public Works (MoHPW) at national, regional and local level. Besides the Head Office, 82 Segunbagicha, Dhaka-1000, there are five (5) regional offices outside the capital city: Rajshahi, Khulna, Sylhet, Barisal and Cox's Bazar.

Visions of UDD:

- To enhance the quality of life of the people by improving the environment through planned development activities for adequate infrastructure, service and utility provisions.
- To make optimum utilization of resources especially land.
- To ensure a geographically balance urbanization
- It also aims to reduce local and regional disparity by alleviation poverty and to create good governance in the country through people's participation, empowering of woman and developing gender equality.

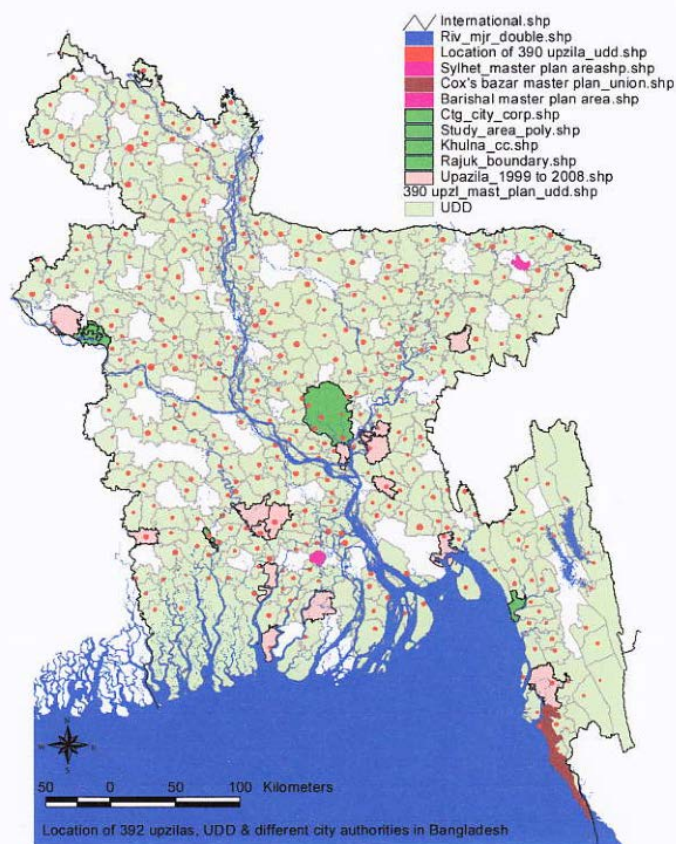


Figure 2-1: Jurisdiction Areas of UDD

2.2 The Consultant

DevConsultants Limited (DevCon) is a multi-disciplinary consulting firm registered in Bangladesh. DevCon's objective is to provide professional and specialist services to their clients from both local and international market to ensure international standard of professional practices. Being a former member of DHV Group of the Netherlands, DevCon has built up within itself management and professional capability compatible to the needs of International Consulting standard. DevCon although registered and operational in Bangladesh, has however stepped in to the regional market with prospect of its stronger presence in South Asia. DevCon has **ISO 9001:2015 Quality Management System** (Certificate No. 62630A/0001/UK/En) and **ISO 14001:2015 for Environmental Management System** (Certificate No. 81768/B/0001/UK/En).



DevCon maintains a pool of renowned specialists in most of the professional areas. Both the payroll staff and retainers are all renowned professionals in their field of specialization and a large number of them have experience overseas to work in multi-national and multi-cultural team.

DevCon's focus is embodied in the slogan, "value creation in local development". For DevCon, the end is therefore not the service itself, but:

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- The **People** who benefit from out of services, and
- The **Growth** that our services promote.

A fully developed Management Information System (MIS) is functional to generate and provide required management information e.g. status of ongoing projects, developing projects, staff resources, inventories of documents, CVs, etc. The MIS is continuously monitored to accommodate new issues to meet the management requirement and to facilitate decision-making.

In relation to this project, it can be mentioned that DevCon is the only consulting company in Bangladesh to have a fully functional full scale transportation modelling laboratory (both macro and micro level transportation modelling) which is being operated by the experts directly trained by Citilabs, USA (<http://www.citilabs.com/>).

2.3 Consultants' Organization

The consultant team has been formed keeping in mind the type of works to be performed under this project and the amount of relevant experience needed for the task. Dr. Moinul Hossain is vested with the responsibility of the Team Leader. He has 15 years of professional experience in transportation planning and traffic engineering. He has experience in transport modelling, traffic management planning, traffic simulation by using ArcGIS compatible Transport Planning Software. He is also the local representative of Citilabs, USA, the developer of Citilabs CUBE, which is one of the leading transportation planning software products available in the market.

The Team Leader will be assisted by the other 2 (two) professionals i.e., Transport Survey Expert, Mr. Mizanur Rahman and Transport Survey Supervisor, Sultana Rajia. They all have required experience in their respective line of work and are well capable of performing the duties assigned on them. Ms. Rajia has received training from Citilabs on transportation modelling. The team will be assisted by the administrative or other support staff for the project. According to the characteristics of the designed surveys, a number of survey teams and a data entry team will be formed to work under the direct supervision of Transport Survey Expert and Transport Survey Supervisor. The whole team will work with the close coordination of the Project Director and will be overall assisted by the project management and coordination team of DevCon.

The consultant's organization for the assignment can be presented with the following diagram:

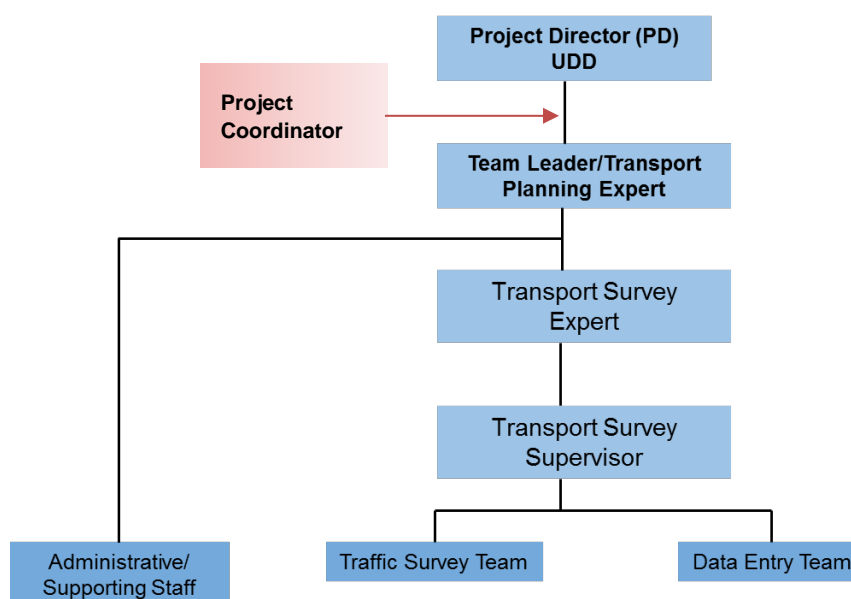


Figure 2-2: Consultant's Organization

2.4 Logistics and Support

In order to achieve the objectives as set out in the TOR and explained in the methodology of work, various logistics related to office accommodation, transport, computer facilities, and field survey equipment, support staff and various communication facilities are required. These facilities required for the project can be arranged for by DevCon. However, some counterpart facilities will essentially be ensured by the Client, such as-

- UDD will assist in communication and arrangement of meetings with various important stakeholders of the project
- UDD will issue letters for notice, permission and approval for performance of the survey and related field activities
- UDD will expedite collection of data from other government agencies as and when required

2.5 Coordination Scheme with Client and Other Agencies

Urban Development Directorate (UDD) under the Ministry of Housing and Public Works (MoHPW) is the Executing Agency (EA) for the Project. Project Implementation Committee (PIC) is headed by Director of the Directorate who is directly involved in the project evaluation and in direct contact with the Secretary of MoHPW. The Project Director (PD), Mr. Ahmed Akhtaruzzaman from UDD, will have the overall responsibility for the project including procurement, monitoring and will directly report to the UDD. The PD will maintain coordination with the other government and non-government agencies providing necessary information with the support of the director of the directorate. The consulting team has identified the following offices/agencies to be directly or indirectly involved in the project interventions:

- Roads and Highways Department (RHD)
- Local Government Engineering Department (LGED)
- Bangladesh Railway (BR)
- Bangladesh Water Development Board (BWDB)
- Bangladesh Economic Zone Authority (BEZA)
- Bangladesh Export Processing Zones Authority (BEPZA)
- Forest Department
- Bangladesh Parjatan Corporation (BPC)
- DC Office, Chittagong
- UNO Office, Mirsharai
- Pourashava Offices (Mirsharai and Baroiyarhat)
- Police Stations (Mirsharai and surrounding)

The Team Leader will be responsible for all the works that are mentioned in the TOR. The Team Leader, accompanied by the 2 nos. of other experts will be accountable for transportation planning, modelling, analyzing data, reporting and other works as assigned by the PD. The Consultants headed by the Team Leader, will be closely working with the PD, UDD and with assistance from the local representatives of UDD in Mirsharai. The interaction with the PD, UDD will mainly be maintained by the Team Leader while liaison with other survey firms and primary stakeholders will be made by UDD officials. The consultant team, under team leader, will be liable for supervision of surveys, database creation, checking & management and all other transportation survey and study related works. The consultants will assist Project Team of UDD in gathering and procuring all relevant traffic and transportation related data, database management, analysis and preparation of planning till the end of the project. A pictorial illustration of the overall coordination process can be as follows:

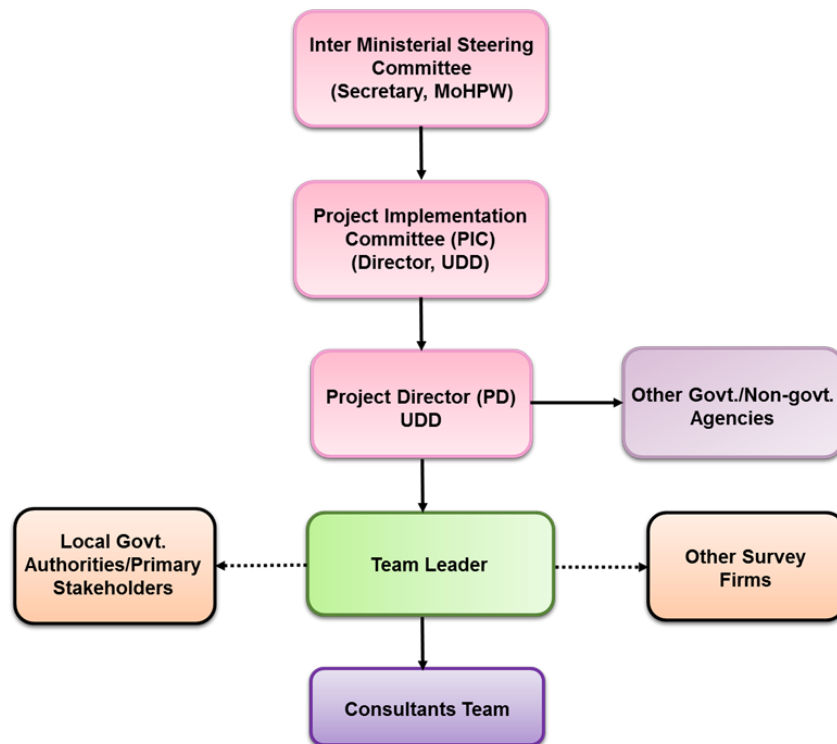


Figure 2-3: Project Coordination Process

3 WORK SCHEDULE AND STAFFING

3.1 Work Plan

As per TOR, the assignment is to be completed within 4 months. The TOR outlined the scope of services as three major tasks:

- ✦ **Transport Surveys and Studies for the Project**
- ✦ **Database Operation and Management**
- ✦ **Preparation of Development Plan of Mirsharai by Integrating Transportation Planning with Land Use and Disaster Management Plan.**

The Methodology adopted for the services have, therefore, been broadly divided into the following task Groups:

- Group I: Mobilization and Planning of the Project
- Group II: Existing Data Collection
- Group III: Survey Activities
- Group IIV: Traffic Data Analysis and Assistance in Policy Making
- Group V: Assistance in Overall Planning from Transportation Perspective
- Group VI: Reporting and Presentation

The work will proceed in order to achieve several identified milestones and targets as set out in the adopted methodology formulated from experience of various projects in transport sector and the consulting team’s recent work in transport planning. Based on the requirements stipulated in the TOR, the following time frame is considered while formulating the Work Plan for the project:

Date of Commencement: November 15, 2017

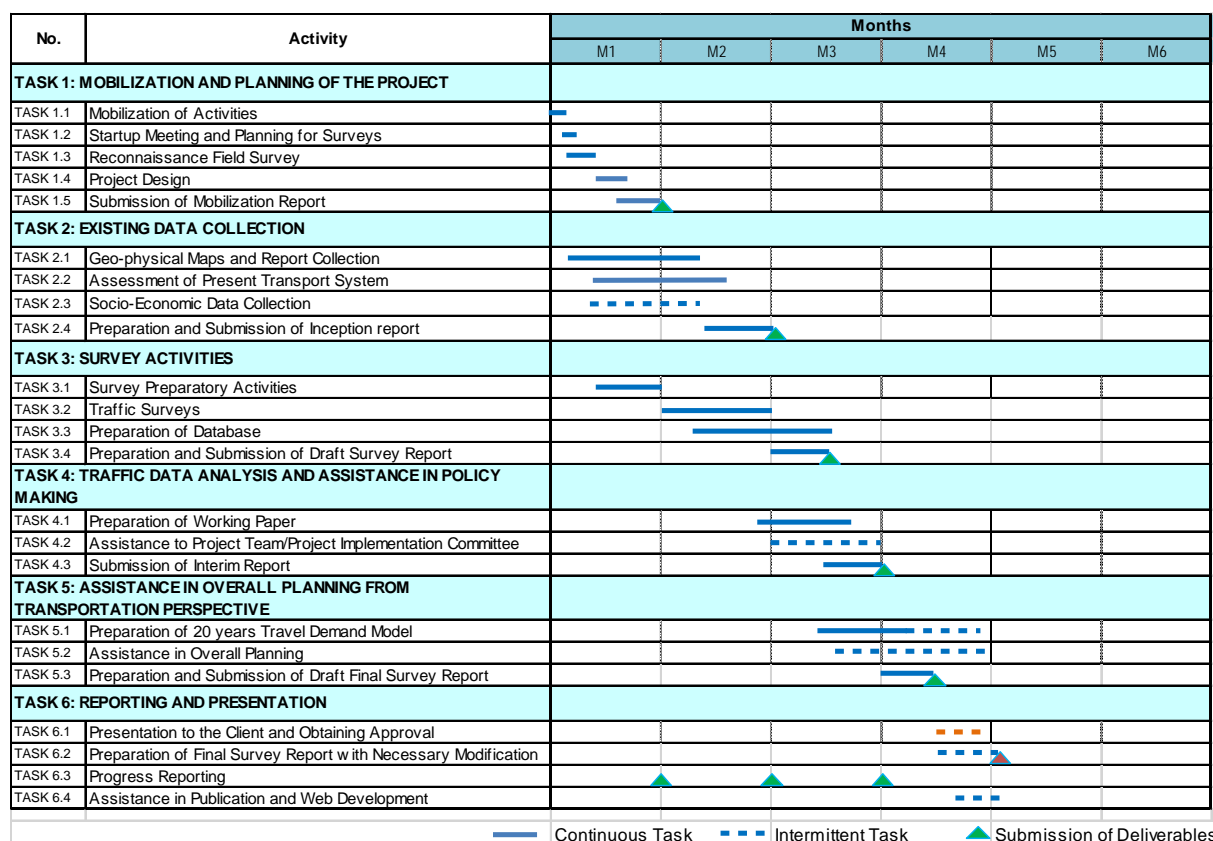
Duration: 4 Months

Sl.	Name of Report	Contents	Submission Date
1	Mobilization Report	Project startup activities, reconnaissance survey outputs, detailed survey design, survey methodology etc.	December 14, 2017
2	Inception Report	Existing data collection from secondary source and Assessment of existing data.	January 15, 2017
3	Interim Report	Traffic survey data collection, Traffic survey data analysis, formulation of standard and policies, development and analysis of strategies etc.	February 15, 2018
4	Draft Survey Report	Detail survey analysis report, travel demand forecasting model etc.	March 04, 2018
5	Survey Report	Final travel demand forecasting model	March 15, 2018

3.1.1 Activity Schedule

The aforementioned milestone dates are taken into account while developing the Work Program and Manning Schedule for required services. The Methodology adopted for accomplishment of the project objectives, is split into various tasks groups and subtasks. The main tasks have also been integrated into a Work Schedule in the form of a bar chart as shown below, which will be fulfilled within the given time frame of 4 months so that the objectives of the Project could be comprehensively achieved.

Preparation of Development Plan for Mirsharai Upazila, Chittagong District: Risk Sensitive Landuse Plan (MUDP) Traffic and Transport Survey (Package: 4)



3.1.2 Staffing Schedule

The project staffs have been mobilized right after the contract signing and the project activities were commenced along with the staff mobilization. The professionals engaged in the project will be working in the following schedule:

No	Name of Staff	Position	Staff-month input by month					Total staff-month input				
			M-1	M-2	M-3	M-4	M-5	Home	Field	Total		
1	Dr. Moinul Hossain	Transport Planning Expert (Team Leader)	[Home]									
			[Field]	■	■	■	■					4.00
2	Md. Mizanur Rahman	Transport Survey Expert	[Home]									
			[Field]	■	■	■						3.00
3	Sultana Rajia	Transport Survey Supervisor	[Home]									
			[Field]	■	■	■						3.00
TOTAL											10.00	

3.2 Consultant's Personnel

The following table describes the experts engaged against the three positions in the assignment, their area of expertise and the key responsibilities:

Position	Expert Assigned	Key Responsibilities
Transport Planning Expert (Team Leader)	Dr. Moinul Hossain Expertise: Transportation Planning Traffic Engineering Transport Modelling Traffic Simulation Traffic Management Planning Project Management and Administration	<ul style="list-style-type: none"> - Initiate, conduct and coordinate all activities - Study in existing transportation system - Simulate traffic flow; analyze and solve bottlenecks. - Develop integrated land use and GIS based transportation model - Determine mode choice and freight transport demand to forecast regional and long distance commodity flow and alternative pricing and freight specific facilities.

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		<ul style="list-style-type: none"> - Simulate transport operations to increase safety and ensure overall improvement - Prepare guidelines for improved transport system - Find out and propose new transportation network - Prepare a 20-year Transport model with ArcGIS compatible Transportation Modelling Software. - Provide on job training to the project team members - Prepare working paper, reports and futuristic transport plan
Transport Survey Expert	<p>Md. Mizanur Rahman</p> <p>Expertise: Design of Traffic Survey Survey Data Analysis and Interpretation Assistance in Transportation Planning</p>	<ul style="list-style-type: none"> - Design transport surveys for the project - Arrange and conduct trainings to surveyors - Conduct, coordinate and monitor traffic and transportation surveys and studies - Ensure quality and validation of survey data - Compile all the survey data into digital form - Assist in transforming survey data into GIS
Transport Survey Supervisor	<p>Sultana Rajia</p> <p>Expertise: Traffic Survey Design Data Analysis and Interpretation Assistance in Transportation Modelling GIS Map Preparation</p>	<ul style="list-style-type: none"> - Supervise and Monitor the traffic and transport related digital surveys - Ensure the quality of survey data - Capture the geo-coordinate and photograph of the survey activities - Prepare data in the format acceptable to be entered into the Arc GIS based transportation modelling software (Citilabs CUBE) - Work as an assistant modeller to assist the team leader in constructing the travel demand forecasting model - Assist in database preparation for the UDD website - Upload/ enter the surveyed data into computer

4 ACTIVITIES TO DATE

4.1 Project Office Establishment

The Consultants have been mobilized and is operating from a project office at the following address:

House No. - 54, Road No. - 16
 Block- A, Banani
 Dhaka- 1213, Bangladesh
 Tel: +8802 55035214-16/ Fax: +8802 55035217
 E-mail: devcon@devconbd.com

The office is fully equipped with computers, printers, photocopiers and scanners for effective working of the transport experts and technical support staff. A small backup generator also has been provided which will allow some basic equipment to be run during blackouts. Even so, prolonged blackouts will affect project productivity.

The project office will be operational for the whole duration of 4 months. Also, with assistance from UDD, a search is on going to find a suitable place in Mirsarai to be used as the survey site office. The site office will remain in operation for two months (December, 2017 – January, 2018).

4.2 Secondary Data Collection

The project site is experiencing a number of other ongoing projects and future developments in and around the impact area and the aim of the consultants is to identify all these projects and propose a sustainable multimodal transportation network following an integrated approach in order to achieve the best outcome. Following the checklist of data requirement prepared through discussion with the consulting team, major stakeholders and the project team of UDD, all the relevant data are to be obtained from available sources along with their source details for the record. The sources will cover open data sources from public and private sector as well as various project reports concerning the study area. A comprehensive but non-exhaustive list is presented with Table 5.1. As the project proceeds, the consulting team will be meeting all the major stakeholders time to time and further data/information will be collected with the need of the analysis at later stages of the project.

Table 4.1: Collected Data (to date)

Data	Documents	Source
Demographic Data: administrative units, population, no. of households, source of income	Population Census, Community Series: Chittagong, 2011	Bangladesh Bureau of Statistics (BBS)
Existing road network, growth center, administrative boundary, rural markets, headquarters	GIS format both in soft and hard copy	Local Government Engineering Department (LGED), Bangladesh
Proposed Road network of Economic Zone, Mirsharai	Report on Feasibility Study for Mirsharai Economic Zone	Bangladesh Economic Zones Authority (BEZA)
Different future road development projects in Mirsharai	Report on Sustainable Transport System: A Road to Development	Ministry of Road Transport and Bridges; Road Transport and Highways Division
Railway development projects in Mirsharai	Master Plan, Bangladesh Railway	Bangladesh Railway

Appendix A presents some of the essential data collected so far from the secondary sources mentioning in which part of the project the data will be employed.

4.3 Review of Work Methodology

Due to extensive scope of work requiring detailed data collection through appropriate methodology to produce the expected outcome as well as the budget constrain, a well-crafted strategy is required for data collection. Through discussion with the team members responsible for data collection, analysis and model building, a checklist with detailed taxonomy of all the data required for the project is being identified and prioritized. Based on the data collected and prioritization of important locations from the reconnaissance field visit, a final approach for the traffic surveys and methodology for the consequent transportation studies will be fixed up. A detailed design, program, specific logistic requirements and resource planning of the traffic survey will be furnished and submitted with the Inception Report.

4.4 Field Reconnaissance

As a specific requirement of the TOR, the consultants are to pay a thorough visit to the project area covering, if not all, the critical locations of the existing transport network. In addition, the experts are to discuss major issues and field constraints with the field staff of UDD in cooperation with the local people and their elected representatives. The reconnaissance will also result in consultation meetings local stakeholders and finding out important aspect of the existing scenario from the transportation point of view, later to be incorporated in the future transport network to be proposed.

In this connection, the consultants arranged for a two-day reconnaissance field visit to Mirsharai on November 24, 2017(vide our memo no. URI-UI-53-4972). The detailed survey program that was taken up and followed is as follows:

<u>RECONNAISSANCE FIELD VISIT TO MIRSHARAI UPAZILA, CHITTAGONG</u>		
TOUR PROGRAM		
Date: Starts- Friday Night, Nov 24 th 2017 Ends- Sunday Night, Nov 26 th 2017		Duration: 2 days
Transport: Microbus (arranged by DevCon)		Participants: 4 persons lead by Team Leader
Night Halt: In Comilla and Feni district towns		
Detailed Program		
Date	Time	Activities
Nov 24, 2017; Start	7:00 PM	Start from Dhaka
	11:00 PM	Check in & night stay at Comilla
Nov 25, 2017; Visit Day 1	8:00 AM	Start for Mirsharai
	10:00 AM - 5:00 PM	Discussion with UDD Officials Meeting with Stakeholders and Pourashava Mayor (Mirsharai) along with UDD representatives Visit to Economic Zone sites, major growth centers & bazars and road intersections for observations
	7:00 PM	Return to Feni and halt
	9:00 PM	Dinner and internal discussion
Nov 26, 2017; Visit Day 2	8:00 AM	Start for Mirsharai
	10:00 AM - 5:00 PM	Visit to important Tourist Spots & photo session Discussion & Lunch with UDD Officials Visit tentative survey locations Meeting with Remaining Stakeholders and Secretary to Mayor of Baroiyarhat Pourashava
	6:00 PM	Start for Dhaka
	11:00 PM	Arrive at Dhaka and disperse

The project involves several survey activities, such as, assessing the road condition, collection of traffic volume, investigate major intersections, major OD pairs, operational speed of the road, public transport

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availability, etc. For each survey, the suitable location of survey along with resource requirements to conduct the survey were estimated during the reconnaissance survey. Opportunities to involve local people was also considered to increase the quality of survey. The field visit also identified major stakeholders– both institutes/ organizations and individuals. Relevant data and available maps collected during performing the task of reviewing available data are validated and updated accordingly during the reconnaissance. A work checklist that was prepared before going to the field is as follows:

Works Checklist:

- ✓ Inspection of Major Intersections and Growth Centers along the highway and internals
- ✓ Cross checking maps of existing road network with the present condition (up to Upazila level) collected from LGED, dated 2011;
- ✓ Road Condition Assessment (visual assessment, photo/ video recording, discussion with LGED Upazila office/ RHD Sub-division)
- ✓ Sample cross-referencing of collected demographic data with actual condition
- ✓ Assessment of existing Traffic Volume in different routes
- ✓ Identification of public/ para-transit routes
- ✓ Preliminarily identify probably traffic (Fix up survey points)
- ✓ Identification and Discussion with Primary Stakeholders (as available at site)
- ✓ Video filming of important routes having potential to improve
- ✓ Identification of existing bottlenecks and speculate problems that might arise with the increasing traffic from the EZ activities
- ✓ Discuss with local representatives and the UDD officials to identify possible solutions to existing problems
- ✓ Gather up all necessary information to furnish an integrated road network

The findings and assessment of the existing transportation scenario as understood from the field visit are elaborately discussed in the following Section.

5 RECONNAISSANCE SURVEY FINDINGS

5.1 Places Visited (including MAPs and photos)

For better understanding the project area the survey team visited some places of Mirsharai upazila. The places include some intersections, bazars and growth centers. The following table gives the list of the visited places. Figure 5-1 shows the visited locations (marked by black circle).

Table 5.1: Lists of Visited Places during Reconnaissance Survey

Intersection	Growth center	Bazar	Tourist Spot
Baraiyerhat	Santir Hat	Abu Torab Bazar	Mohamaya Lake
Zorawargonj	Abur Hat	Azampur Hat	Khoyachhara Waterfalls
Chitanner	Baman Sunder Hat	Bishu Mia Bazar	
Mithachara	Mirsharai Hat	Haidkandi Bazar	
Mirsharai	Hadi Fakir Hat	Domdoma Bazar	
Bara Takiya Bazar	Bhorer Bazar (Shaherkhali)	Mithanala Bazar	
Sarkarhat		Sufia Bazar	
		Zorawargonj Bazar	
		Muhurighat Bazar	



Figure 5-1: Visited Locations during Reconnaissance Survey

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Some photographs showing parts of the overall reconnaissance visit of the project area are as follows:



Project office of UDD in Mirsharai



Baraiyar hat intersection (N1), one of the busiest



Chitanner hat intersection



Mithachara intersection on Dhaka-Chittagong highway



Mirsharai intersection on the highway



Fatikchhari road (Z1021) from Mirsharai intersection

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Sarkar hat on Dhaka-Chittagong Highway



Shantir hat growth center, Mirsharai



Hadi Fakir hat growth center, Mirsharai



Access road to Mohamaya Lake



Mohamaya Lake, Mirsharai



Way to Khoiyachora waterfalls, Mirsharai

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Survey team on the way to Khoiyachora waterfalls



Khoiyachora waterfalls, Mirsharai



Site visit to Mirsharai Economic Zone



New Embankment Road within the EZ site



Future residential zone of Economic Zone, Mirsharai (Phase-1)

5.2 Assessment of the Existing Road Network

The reconnaissance survey covered 7 major intersections, 6 growth centers and several large/ small bazars within the Mirsharai Upazila. Most of the major intersection are located along the Dhaka-Chittagong Highway (N1) which needs expert attention for future development since the access roads to the Economic Zones will mostly connect with the highway and some will cross over further East towards Khagrachhari. As for now the roads connecting to these intersections are mostly LGED Upazila roads having narrow opening, except for the Baroiyar Hat intersection where there are 3 important roads those connect to it (an Upazila road towards Shantir hat, the old section of the highway N1 and the regional road towards Ramgarh, Khagrachari). The RHD regional road is critical because it goes across the rail track and directly connects the Land Port in Ramgarh and is proposed for widening and improvement. Again, the N1 old section is one of the proposed access roads to the EZ. These issues make this intersection the most important of all. Another important intersection on the road network is the Bar Takia Bazar because it will be the intersection of the under construction access road of the EZ (and the only one at present) with the National Highway. However, the alignment passes through 3 growth centers and is likely to suffer traffic congestion.

Of the other growth centers, Abur Hat is critical because it is very close to the EZ Phase 1 site and the Muhuri Project of BWDB; and an access road can be proposed across it having the shortest distance to the highway. The other growth centers are built up in an unplanned manner and are located in different locations throughout the Upazila. The roads connecting these growth centers are narrow LGED roads and the present modes of transport are mainly para transits like auto-rickshaw (CNG), cycle rickshaw, cycle van etc.

Another important aspect of the existing road network is the RHD embankment road along the EZ and EPZ sites which is also a part of the Marine Drive road. Although widening may require in future, this road will be one of the most important roads for the economic zones connecting its different parts, the new residential area (modern industrial city) and connecting EZs with the national road network.

Further details of these intersections and growth centers are presented in the following articles.

5.2.1 Major Intersections/Growth Centers

Major Intersections:

The study team has visited seven major intersections as part of the reconnaissance survey. Among them Baraiyarhat, Mirsharai, Baratakiya and Sarkar hat intersections are identified as the most important ones being along the highway. Other intersections along the highway are: Chitanner hat and Mithachhara Bazar intersections and Zorawargonj intersection is located a little far from the highway. In Figure 5-3: to Figure 5-8 the locations of these intersections have been presented and Table 5.2 briefly describes the major observations by the survey team regarding their current status, land use, traffic characteristics and possibilities for future modifications.



Figure 5-3: Baraiyar Hat Intersection



Figure 5-2: Zorawargonj Intersection



Figure 5-5: Chitanner Hat Intersection



Figure 5-4: Mithachhara Bazar Intersection



Figure 5-7: Mirsharai Intersection



Figure 5-6: Bara Takiya Bazar Intersection



Figure 5-8: Sarkar Hat Intersection

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Table 5.2: Overall observations of Intersections of Mirsharai

Intersections	Union/ Paurashava	Road Connectivity	Road condition	Vehicle	Major Activity	Possibility to widen	Remarks
Baraiyerhat	Baraiyerhat Paurashava	<ul style="list-style-type: none"> Santir hat road (upazila road) intersects N1: T-type intersection Old Dhaka-Chittagong Road intersects N1 Regional Highway (R151 toward Raamgarh) intersects N1 R151 and Old Dhaka-Chittagong create <i>Four leg Intersection</i> 	<ul style="list-style-type: none"> Upazila road is Pucca. Width of upazila road is 16 to 18 feet. Regional road is narrow not more than 18 feet. Both sides of every road are encroached by different activities On street illegal parking There are bus, truck and auto rickshaw parking stands. 	<ul style="list-style-type: none"> In upazila road auto rickshaw and non-motorized vehicles comprise of major transport In regional road leguna, auto rickshaw and non-motorized vehicles are major. 	<ul style="list-style-type: none"> Commercial activities Stationary shops, bazar. Educational institutions (school, college, madrasa) Hospitals etc. 	<ul style="list-style-type: none"> Widening is possible but there are many permanent structures which may create problem while widening the road. 	<ul style="list-style-type: none"> Foot over bridge connects both sides of the N1 road Santir hat road connects the Santir hat Growth Center (GC) with N1.
Zorawargonj	Zorawargonj Union	<ul style="list-style-type: none"> Two roads connect the old Dhaka-Ctg Hiwhway - Muhuri project road (union road) - Zorawargonj-Bangla bazar-Santir hat GC road (upazila road) <i>T-type intersection</i> 	<ul style="list-style-type: none"> Both upazila and union roads are pucca Road with 15 to 17 feet 	<ul style="list-style-type: none"> Auto rickshaw and non-motorized vehicles are major. 	<ul style="list-style-type: none"> Educational institutions Commercial activities 	<ul style="list-style-type: none"> Widening is possible. 	<ul style="list-style-type: none"> Muhuri project road is directly connected to the embankment road which access Zila road Z1034 leading to Feni.
Chitanner	Durgapur Union	<ul style="list-style-type: none"> Old Dhaka-Ctg Hiwhway connects with N1 Ahmed Kabir Chowdhury Road (Chaitanna hat-Abur hat) (upazila road) also connects with N1 <i>T-type intersection</i> 	<ul style="list-style-type: none"> Upazila road is pucca Width: 16 to 18 feet 				
Mithachara	Mirsharai Union	<ul style="list-style-type: none"> Mithachara-Bamon Sunder upazila road connects N1 					<ul style="list-style-type: none"> Upazila road directly

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Intersections	Union/ Paurashava	Road Connectivity	Road condition	Vehicle	Major Activity	Possibility to widen	Remarks
		<ul style="list-style-type: none"> • <i>T-type intersection</i> 					connects the Baman Sunder GC.
Mirsharai	Mirsharai Paurashava	<ul style="list-style-type: none"> • Upazila road (Court road) and Zila road connects with N1 • Zila road Z1021 connects the Fotikchhari upazila • <i>Four leg intersection</i> 	<ul style="list-style-type: none"> • Upazila road is pucca • Width: 15 to 16 feet • Zila road (Z1021 is narrow • Road is encroached by hat, bazar and many illegal establishments 	<ul style="list-style-type: none"> • Auto rickshaw and non-motorized vehicles are major modes in upazila and zila road 	<ul style="list-style-type: none"> • Major Business center • Commercial activities on both sites of roads • Educational institutions 	<ul style="list-style-type: none"> • Widening is possible 	<ul style="list-style-type: none"> • Zila road Z1021 is main connecting road with the Fatikchhari Upazila
Bara Takiya Bazar	Khaiyachhara Union	<ul style="list-style-type: none"> • Abu Torab road (Upazila road) intersects the service road situated beside the N1 (Dhaka-Chittagong Highway). U-turn is needed from service road to access the N1 • <i>T-type intersection</i> 	<ul style="list-style-type: none"> • Upazila road pucca • Widening of Abu Torab road is in progress • Vehicle parking beside the service road • Width: 16 to 18 feet 	<ul style="list-style-type: none"> • Auto rickshaw and non-motorized vehicles are major in upazila road • Leguna, minibus tempo uses service road 	<ul style="list-style-type: none"> • Educational institutions • Commercial activities 	<ul style="list-style-type: none"> • Widening of Abu Torab Road to 100 feet is in progress 	<ul style="list-style-type: none"> • Abu Torab road is the main access road of Economic Zone of Mirsharai which is now under construction by BEZA and BEPZA. • The road is now under the jurisdiction of RHD
Sarkarhat	Wahedpur Union	<ul style="list-style-type: none"> • Oli Ahammed Abdur Rahman Shaherkhali Rd. (Nizampur-Saherkhali-Bhorerbazar) connects N1 • <i>T-type intersection</i> 	<ul style="list-style-type: none"> • Upazila road pucca • Width: 16 to 18 feet • Vehicle parking beside the service road 		<ul style="list-style-type: none"> • Activities on both sides of road • Educational institutions • Commercial activities 	<ul style="list-style-type: none"> • Widening is possible 	<ul style="list-style-type: none"> • Upazila road leading to Bhorer bazar GC. • Foot over bridge connects both sides of roads.

Growth Centers:

There are six (06) major growth centers in Mirsharai Upazila and the survey team has covered all these growth centers as part of the reconnaissance survey. Figure 5-9 to Figure 5-14 represent the locations of the growth centers. Table 5.3 outlines their connectivity, traffic access, land use and any other aspects that are to be known for planning the future transportation network.



Figure 5-9: Shantir Hat Growth Center



Figure 5-10: Abur Hat Growth Center



Figure 5-12: Mirsharai Growth Center

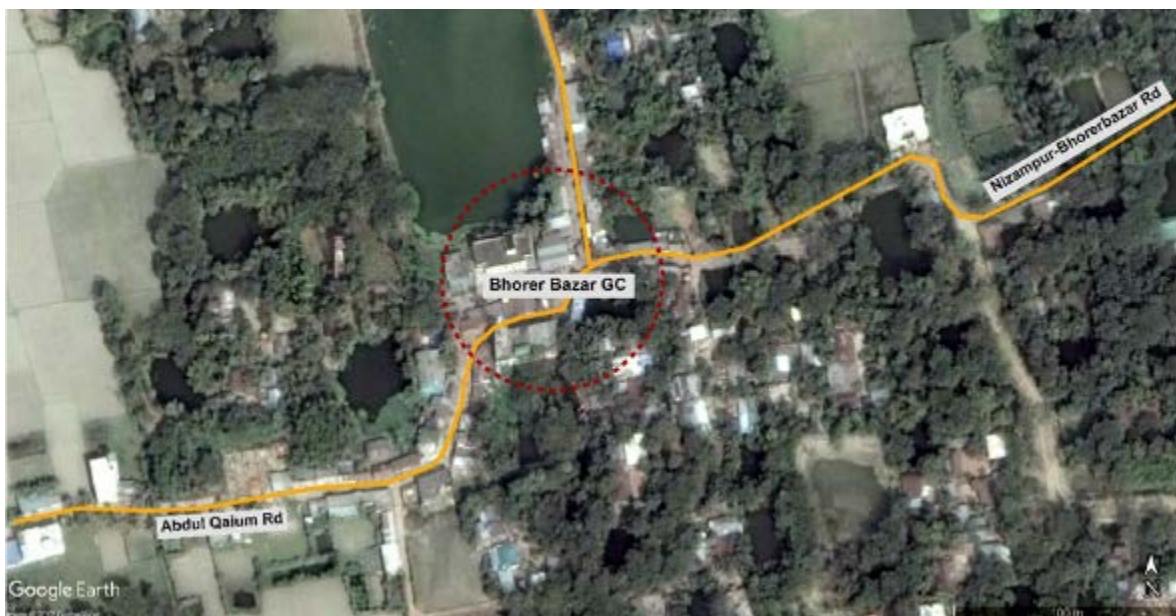


Figure 5-14: Bhorer Bazar Growth Center, Shaherkhali

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Table 5.3: Overall observations of Growth Centers of Mirsharai

Growth Centers	Union/Paurashava	Road Connectivity	Road condition	Vehicle	Major Activity	Possibility to widen	Remarks
Santir Hat	Dhum Union	<ul style="list-style-type: none"> Located beside the Shantir hat road Upazila road 	<ul style="list-style-type: none"> Pucca road With 16 to 18 feet 	<ul style="list-style-type: none"> Auto rickshaw (CNG) and non-motorized vehicles 	<ul style="list-style-type: none"> Bank, shops, commercial business, retail and wholesale markets etc. 	<ul style="list-style-type: none"> Widening is difficult at the entry point due to the presence of high number of permanent structures that have to be demolished otherwise 	<ul style="list-style-type: none"> Large scale GC
Abur Hat	Ichhakhali Union	<ul style="list-style-type: none"> Located beside the Muhuri project road Union road 	<ul style="list-style-type: none"> Road is pucca Width: 16 to 18 feet 		<ul style="list-style-type: none"> Retail bazar, shops etc. 	<ul style="list-style-type: none"> Widening is possible 	<ul style="list-style-type: none"> This road already under the Muhuri Project Abur Hat is Medium scale GC
Baman Sunder Hat	Katachhara Union	<ul style="list-style-type: none"> Located in the three-leg intersected section of upazila road 			<ul style="list-style-type: none"> Retail and wholesale bazar, shops etc. 		
Mirsharai Hat	Mirsharai Paurashava	<ul style="list-style-type: none"> Located in the intersection of Mirsharai Upazila road (Court road) and Zila road connects with N1 Zila road Z1021 connects the Fotikchhari upazila <i>Four leg intersection</i> 	<ul style="list-style-type: none"> Upazila road is pucca Width: 15 to 16 feet Zila road (Z1021 is narrow Road is encroached by hat, bazar and many illegal establishments 	<ul style="list-style-type: none"> Auto rickshaw and non-motorized vehicles are major modes in upazila and zila road 	<ul style="list-style-type: none"> Major Business center Commercial activities on both sites of roads Educational institutions 	<ul style="list-style-type: none"> It is imparative to widen the upazila and zila road and oust the encroachment from the main highway 	<ul style="list-style-type: none"> Foot over bridge connects both sides Bus stand, auto and truck stand Large GC

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Hadi Fakir Hat	Wahedpur Union	<ul style="list-style-type: none"> • Located along with the N1 • A union road also connects with the Growth center. 	<ul style="list-style-type: none"> • Pucca union road • Width: 16 to 18 feet 	<ul style="list-style-type: none"> • Auto rickshaw (CNG) and non-motorized vehicles on union road • Leguna, small pick up on highway 	<ul style="list-style-type: none"> • Activities on both sides of road • Educational institution, mosque • Retail bazar, shops etc. 	<ul style="list-style-type: none"> • Union road is possible to wide 	<ul style="list-style-type: none"> • Medium scale GC • Foot over bridge is needed to connect the both sides
Bhorer Bazar (Shaherkhali)	Shaherkhali Union	<ul style="list-style-type: none"> • Located in the three-leg intersection of upazila road 	<ul style="list-style-type: none"> • Pucca and katcha road • Width: 16 to 18 feet 	<ul style="list-style-type: none"> • Auto rickshaw (CNG) and non-motorized vehicles on union road • There is auto-stand 	<ul style="list-style-type: none"> • Retail and wholesale business of vegetables • Small shops 	<ul style="list-style-type: none"> • Katcha road is needed to be paved and made widen 	<ul style="list-style-type: none"> • Small growth center

5.2.2 Major Bazars

There are 48 small, medium and large bazars/hats in Mirsharai upazila. Among these the survey team visited nine (09) bazars/hats during the reconnaissance survey after discussion with the local stakeholders and the UDD project site officers. The lists of the bazars/hats has already been provided in Section 6.2. The following illustrations shows the location of the visited bazars and hats and Table 5.4 represents the overall observations of the survey team.



Figure 5-15: Abu Torab Bazar



Figure 5-16: Azampur Hat



Figure 5-17: Muhurighat Bazar



Figure 5-18: Bishu Miar Hat

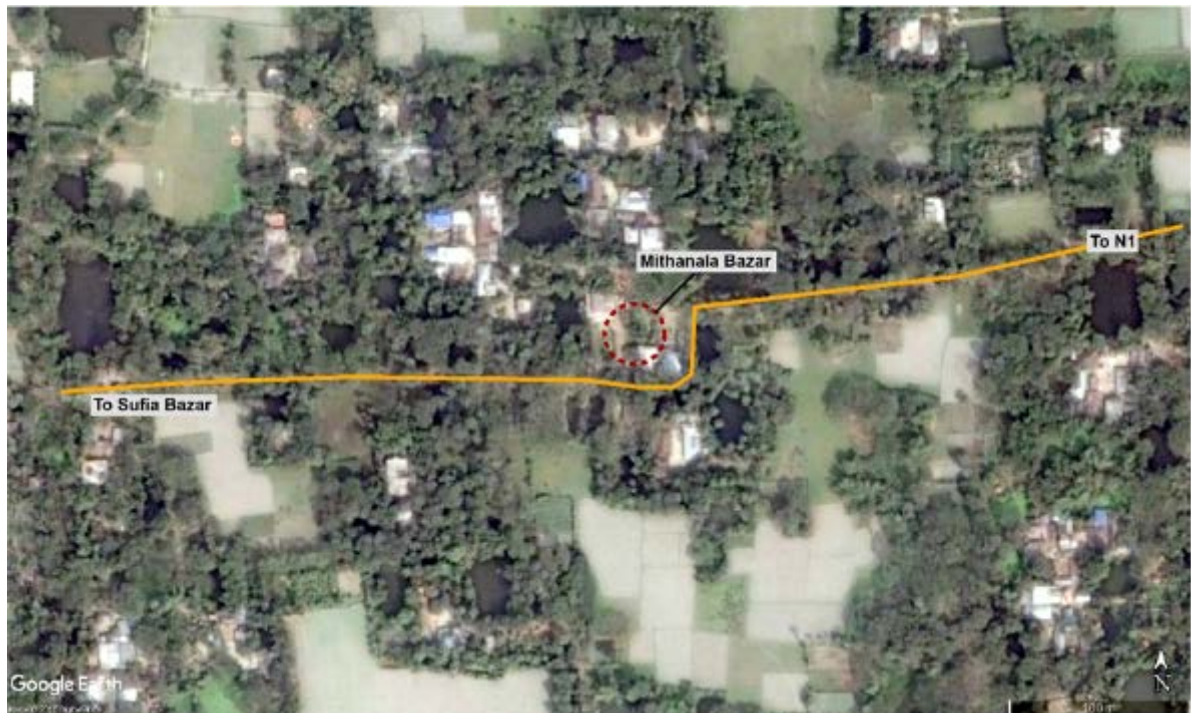


Figure 5-19: Mithanala Bazar



Figure 5-20: Haidkandi and Domdoma Bazar



Figure 5-21: Zorawarjonj Bazar



Figure 5-22: Sufia Bazar

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Table 5.4: Overall observations of bazar/hat of Mirsharai

Bazar/Hat	Union/Paurashava	Road Connectivity	Road condition	Vehicle	Major Activity	Remarks
Abu Torab Bazar	Maghadia Union	<ul style="list-style-type: none"> Located along with Baratakiya-Abu Torab road 	<ul style="list-style-type: none"> Pucca road Under widening progress 	<ul style="list-style-type: none"> Auto rickshaw (CNG) and non-motorized vehicles 	<ul style="list-style-type: none"> Large scale bazar Wholesale and retail business Many shops 	<ul style="list-style-type: none"> Abu Torab Road is the main access to EPZ
Azampur Hat	Osmanpur Union	<ul style="list-style-type: none"> Located along with Muhuri project road 	<ul style="list-style-type: none"> Union road Pucca Width: 16 to 18 feet 	<ul style="list-style-type: none"> Auto rickshaw (CNG) and non-motorized vehicles 	<ul style="list-style-type: none"> Small bazar, shops. 	
Mhurighat bazar	Osmanpur Union	<ul style="list-style-type: none"> Located in the intersection Muhuri Project road and Sonagazi road (Z1034) 	<ul style="list-style-type: none"> Pucca road 	<ul style="list-style-type: none"> Truck in Zila road Auto rickshaw (CNG) and non-motorized vehicles Private car 	<ul style="list-style-type: none"> Shops, bazar etc. 	<ul style="list-style-type: none"> Muhuri project road connects the embankment road of BEZA's EPZ
Bishu Mia Bazar	Zorawargonj Union	<ul style="list-style-type: none"> Located in intersection of Zorawargonj-Taker Hat union road and Santir Hat-Abur Hat G.C upazila road 	<ul style="list-style-type: none"> Pucca 16 to 18 feet wide 	<ul style="list-style-type: none"> Auto rickshaw (CNG) and non-motorized vehicles 	<ul style="list-style-type: none"> Small bazar 	<ul style="list-style-type: none"> Muhuri project road connects the bazar
Haidkandi Bazar	Haitkandi Union	<ul style="list-style-type: none"> Along with Shaherkhali-Bhorer bazar GC road Upazila road 			<ul style="list-style-type: none"> Small bazar Educational institution 	
Domdoma Bazar	Haitkandi Union					
Mithanala Bazar	Mithanala Union	<ul style="list-style-type: none"> Along with Sufia-Mithanala Road Union road 	<ul style="list-style-type: none"> Pucca 15 to 17 feet 		<ul style="list-style-type: none"> Small katcha bazar and shops. 	
Sufia Bazar	Mithanala Union	<ul style="list-style-type: none"> Located three-leg intersection of upazila and union road 	<ul style="list-style-type: none"> Pucca and katcha Width: 15 to 17 feet 			
Zorawargonj Bazar	Zorawargonj Union	<ul style="list-style-type: none"> Located along the N1 	Survey team could not conduct a detailed reconnaissance during the first visit and plans to cover it comprehensively during the next visit.			

5.2.3 Major Tourist Spots

There are several attractive places of touristic interest in Mirsharai upazila, such as, Mohamaya Chara Lake, Khoiyachora, Baghbiani, Napitachora, Sonaichora, Mithachora and Boyalia waterfalls. Among these places the survey team visited Mohamaya Lake and Khoiyachora waterfalls. Figure 5-23 and Figure 5-24 illustrate the location of Mohamaya Lake and Khoiyachora waterfalls along with their connecting roads and a brief introduction to these sites from accessibility point of view.



Figure 5-23: Mohamaya Lake, Mirsharai

Location: Karerhat Union

Road Connectivity:

- Mohamaya rubber dam road connects with N1
- Village road
- Rail crossing

Road condition:

- Some part of road is pucca and some is katcha
- Narrow road

Vehicle:

- Local people use CNG Rickshaw to visit the place or they visit the place by walking
- Tourist come to visit the place using bus or car

Possibility to widen: Mohamaya rubber dam road possible to wide



Figure 5-24: Khoyachhara Waterfalls, Mirsharai

Location: Karerhat Union

Road Connectivity:

- Khoyachhara Waterfall road connects with N1
- This is a village road
- Rail crossing
- Walking trail

Road condition:

- Some part of road is pucca
- Most of the parts of road are katcha
- Narrow road

Vehicle:

- Mainly CNG, Rickshaw
- Private car can move in certain distance
- Walk

Possibility to widen: Khoyachhara Waterfall road possible to wide

5.2.4 Public Transport Routes

The reconnaissance survey revealed that the conventional public transport services are only available in Mirsharai along the Dhaka-Chittagong highway. Within the Paurashava/Union/Village, unconventional modes of transport – mainly auto rickshaws, easy bikes and leguna serve as para transit. Rickshaws are also predominant just like throughout Bangladesh. Even along the Dhaka-Chittagong highways, along side conventional buses and mini-buses, a substantial number of leguna were seen in operation. However, their routes shorter in length (under 30 km) and covers the major business centers along the highway.

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The survey team engaged into discussion with the on-duty local traffic police, the conductors and drivers of the unconventional modes of transport (UCM) both on the Dhaka-Chittagong highway and in the growth centers to understand their operational model. It was revealed that in most cases, the UCMs are operated through local unions informally. Therefore, in the geometric design of these roads, there are no provisions for their stoppage design. On the highways, they often share the space within the bus layby with the conventional buses and mini-buses. In the local roads, they normally queue at the intersections. The informal union based organization dispatches these vehicles following the queue. Normally these UCMs within the union or pourashobha operate between growth centers or connect the growth centers with the Dhaka-Chittagong highway. Figure 5-25 presents the major UCM routes identified during the reconnaissance survey.

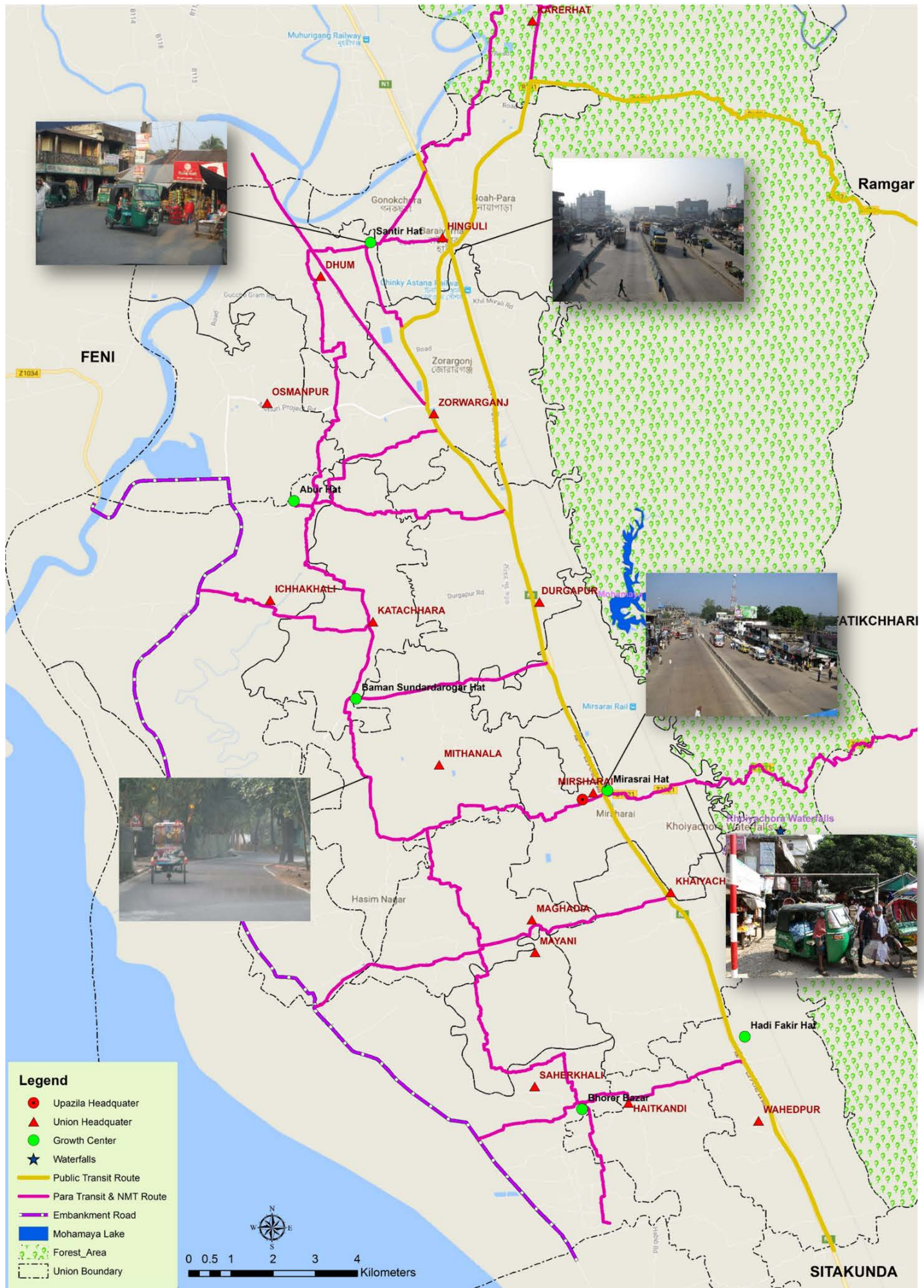


Figure 5-25: Different Transit Routes of the Study Area

5.3 Stakeholder Consultations

Separate meetings with major stakeholders, i.e., municipal authority, LGED, RHD, UNO office, representatives of different communities that can directly be impacted from transportation planning were identified in this stage of reconnaissance survey. In individual meetings, the objectives of the project were explained to obtain their remarks, the public demand, specific development needs and opportunities with available alternative options in the study area. The identified stakeholders are listed out previously in article 3.5. Although in general, organizing FGDs are beyond the scope of a reconnaissance survey, considering the time constrains, FGDs were organized with the identified major stakeholders only. The objective of this first FGD was to introduce the project to the community, reconfirm the selected locations of interest that need to be investigated, obtain support from on-site through the local community while planning in project office in Dhaka and gain assurance of cooperation from the community. Meetings that took place already are:

- Meeting with Project Director, in the UDD HQ (Dhaka),
- Meeting with UDD Mirsharai Officials, in Mirsharai
- Meeting with Forest Department and representatives of BWDB, in Mohamaya Lake
- Meeting with Honorable Mayor, Mirhsarai Pourashava (in presence of Counsilors and SI, Mirsharai Thana)
- Meeting with Secretary to Honorable Mayor, Baroiyarhat Pourashava
- Discussion with locals, throughout the project area

The outcomes of the abovementioned meetings and discussions are described in the form of meeting minutes are attached in the **Appendix-B**. A few glimpses of such interviews are as follows:



Baraiyar hat Paurashava



Consultation with Mr. Foyz Ahmed, Secretary to Mayor, Baraiyarhat Paurashava

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Consultation with Mayor, Mirsharai Paurashava



Consultation with Mr. Golam Kabir, of Forest Department



Discussion with a local people

5.4 Possible Road Network

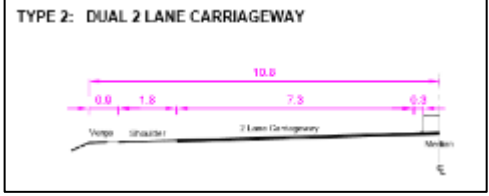
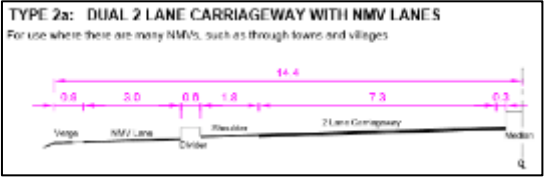
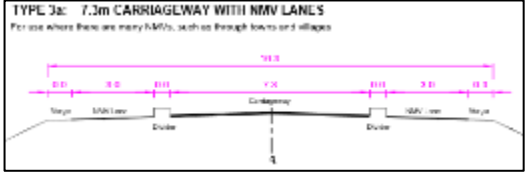
After compiling the data and information gathered during the survey, the consulting team ran several brain storming sessions to come to the conclusion that a sustainable transportation system in Mirsharai will vastly depend on strict enforcement of a land use plan. The consultants broadly divided the study area into four parts – i) the BEZA, ii) the model town to be proposed by UDD at the outskirts of BEZA with Mirsharai at its east, iii) the existing habitation of Mirsharai, and, iv) the eco-tourism zone located at the east of the Dhaka-Chittagong highway. The proposed sustainable transportation plan for the next 20 years will be based on the idea that each of these zones will be able to entertain their internal traffic demand with their internal transportation network. There will be semi access controlled roads connecting between each of these roads with the sole purpose to cater for the inter zonal traffic. Finally, each of these zones will have direct connectivity to the Dhaka-Chittagong highways. The consulting team also believes that it is imperative that the land use adjacent to the proposed transportation network is strictly maintained so that each component of the proposed network can retain its functional classification.

The possible future road network for Mirsharai proposed by the consultant team also recommends two flyovers connecting Mirsharai to Khagrachari and Fatikchari without hindering the operation of the Dhaka-Chittagong highway. Rail connectivity with the Upazila and with Economic Zone will be proposed after discussion with the Bangladesh Railway authority. For connecting the tourist spots walking/bicycle trail has also been proposed along the railway. The Figure 5-26 represents the possible future

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road network of Mirsharai. The newly proposed roads are based on three RHD design standard as presented with Table 5.5.

Table 5.5: RHD Design Standard for Proposed Road Network

<ul style="list-style-type: none"> Road Type 2: Maximum capacity: 4500 PCU/hr. 	
<ul style="list-style-type: none"> Road Type 2a: - For use where there are many NMVs, such as through towns and villages - Maximum capacity: 4500 PCU/hr. 	
<ul style="list-style-type: none"> Road Type 3a: - For use where there are many NMVs, such as through towns and villages - Maximum capacity: 2100 PCU/hr. 	

It is to be mentioned here that the consultants acknowledge that most of the roads within the project area are under the jurisdiction of LGED. At the same time, the national plans summarized in this inception report suggest that seamless connectivity should be provided between the economic zone and the national highway. Acknowledging that, for the development of the travel demand forecasting model, the consulting team will be evaluating both LGED (category 3 and 4 as shown in the table below) and RHD standards. The LGED standards are governed by the peak hour PCU as presented with Table 5.7.

Table 5.6: Road Design Standard (LGED)

Design Type	Carriageway (m)/ (ft)	Hard shoulder (m)/ (ft)	Verge (m)/ (ft)	Crest Width (m)/ (ft)
8	3.0/ 10	0.0/ 0	1.25/ 4	5.5/ 18
7	3.7/ 12	0.0/ 0	0.90/ 3	5.5/ 18
6	3.7/ 12	0.0/ 0	1.8/ 6	7.3/ 24
5	3.7/ 12	0.9/ 3	0.90/ 3	7.3/ 24
4	5.5/ 18	0.0/ 0	2.15/ 7	9.8/ 32
3	5.5/ 18	1.2/ 4	0.95/ 3	9.8/ 32

Table 5.7: Traffic Criteria for Design of Roads

Design Type	Peak hour maximum passenger car units (PCU)	Daily commercial vehicles maximum (trucks and buses)
8	(90)	50
7	(130)	100
6	(210)	200
5	(290)	300
4	530	600
3	800	

Note: For types, 5, 6, 7 and 8 the criterion should be daily commercial vehicles. For types 3 and 4 criterion should be peak hour PCU's.

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The consulting team will be evaluating the traffic demand during peak hours from BEZA by comparing the land area and traffic demand from Dhaka EPZ as BEZA is currently under construction and there is no traffic to and from it at this moment. Afterwards, it will be tested whether the design criteria are satisfied by the traffic demand. If not, then the consulting team will recommend following RHD standards. For demonstration purpose only, in this inception report, RHD standards have been followed to explain the proposed future road network. The final model will evaluate both RHD and LGED standards by calculating the LOS for various stages of the project and provide a plan to gradually upgrade the standards of the existing road network.

5.4.5 Network Connectivity with BEZA

Interchanges/Flyovers (marked as dark red circle)

Two flyovers at Baraiyar Hat (Hinguli) and Mirsharai has been proposed to avoid the congestion of these two important intersections.

East-West Highways Connecting Dhaka-Chittagong Highway (RHD Road Type 2a) (marked as dark pink line)

- These roads will connect the Economic Zone (EZ) and the Model Town of Mirsharai with the Highway.
- These roads will be heavily access controlled and North-South local traffic movement will be allowed only at intersections where North-South major highway intersects with these roads.

The proposed road links are:

- Baraiyar Hat-Santir Hat-Golaker Hat-Azampur Hat
- Zorwargonj-Bishu Miar Hat-Osmanpur-Azampur Hat-Murhrighat Bazar-Embankment (Already been proposed by BEZA as access road to EZ)
- Mirsharai-Mithanala Bhorer bazar-Embankment
- Khaiyachara-Abu Torab Bazar-Kazir Taluk-Embankment which is now under construction

These all roads will be connected to encircled road of the proposed model town of EZ.

Marine Drive Connection

The existing embankment road is proposed as marine drive road from Mirsharai-Teknaf which is now in under construction.

Rail Road

Proposal of possible rail road connection will be planned after the discussion with Bangladesh Railway Authority.

5.4.6 Network Connectivity within Mirsharai

East-West Highways Connecting Dhaka-Chittagong Highway (RHD Road Type 2a) (marked as blue line)

- These are proposed to connect Mirsharai local traffic to Dhaka-Chittagong Highway
- Also, these routes will be used by the passenger traffic to access EZ of BEZA

The proposed road links are:

- Chowdury Hat-Katachara-Julanpur Bazar-Embankment
- Wahidpur-Domdoma Bazar-Haidkandi-Embankment
- Boro Darogar Bazar-Kamar Ali Bazar-Samaitir Hat-Embankment

North-South Highways (RHD Type 2a) (marked as medium coral light color line)

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- These roads will form artery for the local traffic generated from Mirsharai and destined to various parts of Mirsharai where trip length is high
- Through these roads local traffic will cross the East-West roads connecting Economic Zone.

The proposed roads are:

- Kamar Ali Bazar-Samaitir Hat-Gozaria Bazar-Anander Hat-Khayer Hat-Kazir taluk-Thakur Hat-Sufia Bazar-Ichak Driver Hat-Shahaje Bazar-Julanpur Bazar-Abur Hat-Bishu Miar Hat-Bangla Bazar-Golaker Hat
- Chaitanar Hat-Chowdhury Hat-Mithanala Bazar-Mithanala Bhorer Bazar-Shadhur Hat-Abu Torab Bazar-Haidkandi Bazar-Kamar Ali Bazar.

East-West Highways Connecting North-South Highways (RHD Road Type 2) (marked as red color line)

- These roads will be connected with the North-South roads to increase mobility of local traffic
- Proposed links are:

- Chitanner hat-Abur hat
- Chowdhury hat-Katachara-Shahaye Bazar
- Mithanala Bazar-Sufia Bazar
- Hadi Fakir Hat (opposite side)-Bhuiya hat-Anander hat

5.4.7 Network Connectivity with Tourist Spots

Walkway/Bi-cycle Trail (marked as gray color line)

- A paved walkway or bi-cycle trail (10 feet) has been proposed parallel to the railway track from Mohamaya Lake to Khoiyachhara and other waterfalls so that tourists can easily access the sites and enjoy the beauty of the village site.

2 Lane Undivided Road Connectivity (RHD Road Type 3a) (marked as dark green color line)

- These roads will connect Mohamaya Lake and Khoiyachhara and other waterfalls with Dhaka-Chittagong Highway
- Speed will be limited to ensure the slow movement of vehicles

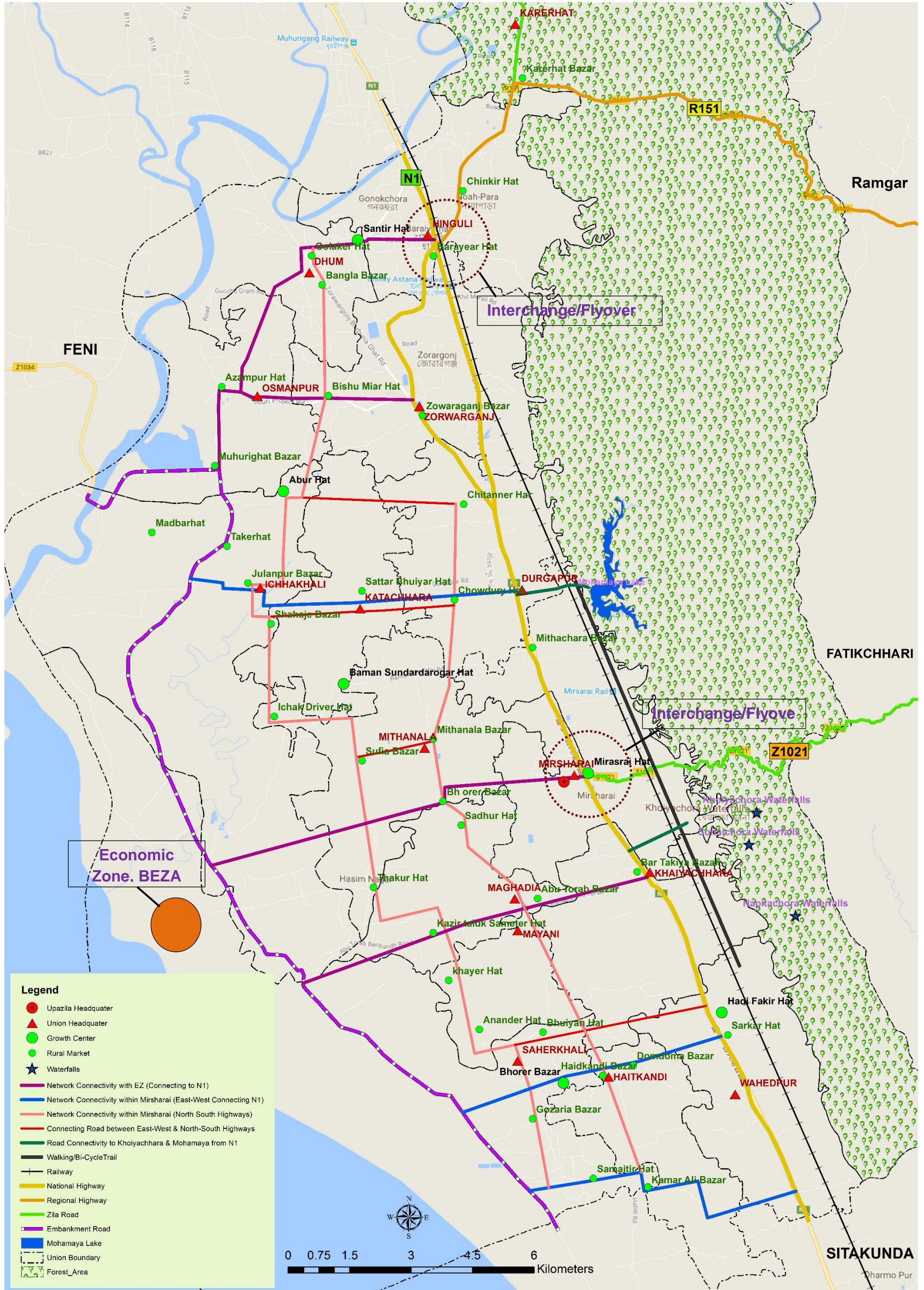


Figure 5-26: Possible Future Road Network of Mirsharai Upazila

6 NEXT ACTIONS

6.1 Planning for Surveys

One of the major objectives of the reconnaissance survey was to plan the survey to collect data to construct the travel demand forecasting model which will take land use data as input and yield the traffic loading on the network as output for various scenarios. Based on the findings of the reconnaissance survey, following survey activities were recommended (detailed methods to be followed will be outlined in the inception report):

- a. Traffic count and Origin-Destination (OD) survey: The traffic count and coordinated OD survey will be conducted on the – i) major highways (Dhaka-Chittagong; Khagrachari and Fatikchari), ii) access roads to the Dhaka-Chittagong highway, and, iii) legs of the intersections in the major growth centers. For (i) and (ii), survey will be conducted on a typical work day for 16 hours. For (iii), data of the peak hour will be sufficient as the reconnaissance survey experienced very little traffic loading within Mirsharai during the off-peak hours.
- b. Household survey: The reconnaissance survey revealed that other than the pourashabha and the growth centers, the households in Mirsharai are sparsely spaced. Hence, the consulting team concluded that dividing Mirsharai into sixteen (16) internal zones based on their union political boundary will be sufficient to construct the travel demand forecasting model. Household survey will be conducted separately in each of these unions with the objective to collect demographic (family structure, age and gender distribution), socio-economic (education, income) and trip characteristics (major OD for work and educational trips).
- c. Public Transport survey: Public transport survey will be conducted on the Dhaka-Chittagong highway at major public transport stops. The survey will be conducted to identify the frequency of service, major OD pairs, capacity of various modes used, the routes as well as the cost of travel based on mode. At the same time, a similar public transport survey will also be conducted in the major growth centers in the study area.
- d. Travel time survey: The reconnaissance survey revealed that in most of the time the volume on the study area is substantially lower than the road capacity. However, the roads were seen to contain sharp bend in frequent intervals. Therefore, travel time study will be conducted up to all upazila roads.

6.2 Preparation of the Inception Report

After submission of the mobilization report, the survey team will finalize the location of survey, detailed survey methodology along with sample size and human resource requirements which will be compiled and submitted to the client as the inception report. It will also clearly outline the support needed from the UDD site office in Mirsharai.

6.3 Finalizing the proposed future transportation network scenarios

The mobilization report accompanies a plan for a future sustainable transportation network for Mirsharai. The consulting team wishes to sit with all major stakeholders, e.g., UDD, Mayors, etc. to discuss about the pros and cons of the plan, probable solutions and eventually finalize the future transportation network plan. The travel demand forecasting for the design period will be conducted using this proposed transportation network.

6.4 Informal seminar on travel demand forecasting model

As the concept of using models for transportation planning is still at its infancy in Bangladesh, upon the request from the PD of the project, the client has agreed to do a presentation on transportation modelling in the form of an informal seminar. It is expected that relevant members from UDD and representatives from the other packages of the project will participate in the seminar. It is expected that the informal seminar will broaden the knowledge of the participants about the capabilities and limitations of a transportation model. It is expected that the informal seminar will clarify about what can be expected from a transportation model as well as how to prepare data to be entered into a travel demand forecasting model.

7 CONCLUSION

The main purpose of the project is to develop land use integrated new and improved affordable and effective transportation network for Mirsharai Upazila using modern transportation modelling software after a thorough traffic survey carried out in the project area. To fulfill the purpose of the project, Urban Development Directorate (UDD), the Client has taken initiatives and vested DevConsultants Limited (DevCon), Bangladesh with the responsibilities of required consultancy services. On the way of the mission, the following progresses have been made so far:

- Finalization of project start up activities: team building, setting up office, finalizing work schedule
- Identification of secondary sources from whom data relevant to the project can be obtained
- Identification of stakeholders and ongoing as well as future projects to be carried out within the study area which will have impact on the travel demand forecasting
- Conducted reconnaissance survey which has achieved the following objectives:
 - Identification of the road network to be considered in travel demand forecasting model building
 - Identification of major intersections and growth centers
 - Determination of survey requirements along with sites to be surveyed
- The meetings with stakeholders have achieved the following objectives:
 - Relationship building with stakeholders
 - Role, power and potential of the stakeholders
 - View and view point of the stakeholder in relation to the future development of Mirsharai

Combining all these data and information, a preliminary transportation network has also been proposed and the mobilization report is being submitted.

Appendix-A: Secondary Data Review

Some of the essential data collected so far from the secondary sources mentioning in which part of the project the data will be employed have been discussed in the following:

- **Bangladesh Bureau of Statistics (BBS), Population Census, Community Series: Chittagong, 2011:**

Administrative unit: Mirsharai Upazila consists of 2 municipality, 16 unions, 109 mauza and 208 villages. The following figure shows the mauza boundary of Mirsharai Upazila.

Demographic data: Total population of Mirsharai upazila is 3, 98,716 and total household size is 79,545. Population density of the upazila, 826 persons per square kilometer. Urbanization rate of the upazila is 7.83% and literacy rate is 55.1%. Table 1 represents the area, households, population and density of the project area.

Main sources of income: Agricultural laborer 38.93%, non-agricultural laborer 3.61%, industry 0.57%, commerce 13.26%, transport and communication 2.93%, service 18%, construction 1.19%, religious service 0.34%, rent and remittance 8.84% and others 12.33%.

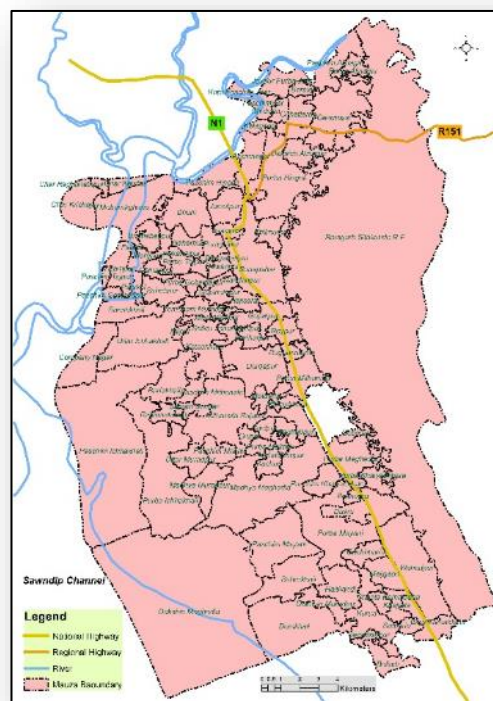


Figure 1: Mauza Boundary of Mirsharai Upazila

- **Local Government Engineering Department (LGED), Bangladesh**

In Mirsharai upazila there is Upazila pucca and katcha road, Union pucca and katcha road, Village road. Dhaka-Chittagong National Highway, Regional Highway and Zila road connect the Mirsharai with other district. The Upazila consists of 16 km railway and two rail station. The consultant team collected existing road network data in *GIS format* (both hard and soft copy) from LGED for better understanding the project area's road network. The road network within the project area is shown in the following.

Table 1: Area, No. of Households, Population and Population Density of the Project Area

Paurashava/Union	Area (ac)	No. of Households	Population	Population density (per sq. km.)
Baroiyarhat Paurashava		2399	11602	
Mirsharai Paurashava		3507	16218	
Dhum	5587	3419	16770	742
Durgapur	3742	4351	21128	1395
Haitkandi	3271	3700	19051	1439
Hinguli	4562	5889	29133	1578
Ichhakhali	15754	5205	27980	439
Karerhat	39144	7362	35467	224
Katachhara	3446	4366	23596	1692
Khaiyachhara	1483	4879	23423	3903
Mayani	4590	3549	18285	984
Mirsharai	2816	3164	16828	1477
Mithanala	5338	4445	23109	1070

Maghadia	2626	4832	23406	2203
Osmanpur	5034	3046	14645	719
Saherkhali	8609	3049	16912	485
Wahedpur	4682	4752	24981	1319
Zorwarganj	5517	7631	36182	1621

- **Feasibility Study for Mirsharai Economic Zone, Bangladesh Economic Zones Authority (BEZA)**

The proposed *Mirsharai Economic Zone (EZ)* will be the first multi-sector EZ in the country, which will contribute to the economic development of the country by attracting Foreign Direct Investment (FDI) and Domestic Investment (DI).

Approach/Access road:

Two approach/access roads has been suggested in EZ plan. One is from Dhaka-Chittagong old highway, with the intersection to the highway at Borotakiya Bazar, distance from Borotakiya Bazar to the site is about 9.30 Km, and another approach/access road is from Zorawargonj intersection to Muhuri Project Embankment. The distance from Zorawargonj to Muhuri Project Embankment is about 7 Km. BEZA suggests to extend the road up to 4-lanes. According to BEZA there are some possibilities and constraints of the existing two access roads.

Rail access:

Closest rail station at Borotakiya RS from Chittagong railway station is available and it may be used in future for rail connectivity to EZ.

Access Road 1: Zorawargonj intersection to Muhuri Project Embankment (possibilities and constraints)

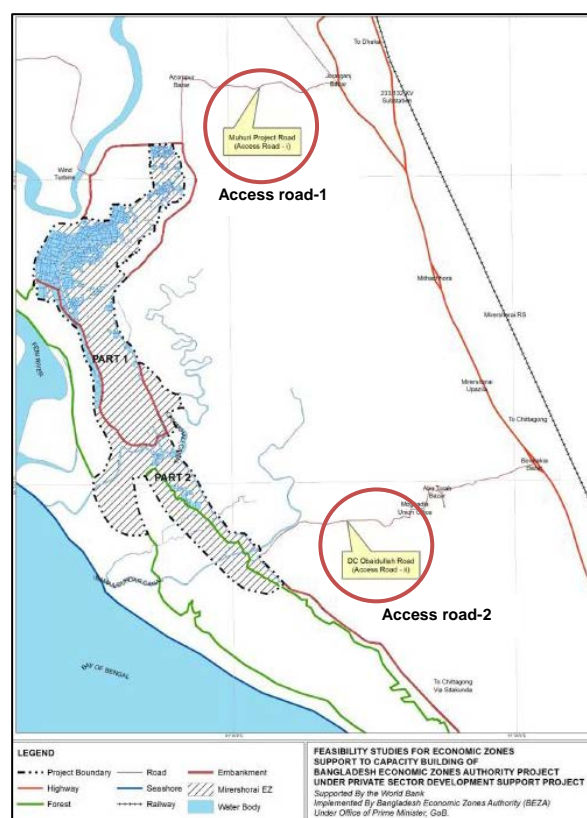


Figure 2: Approach road of Economic Zone, BEZA

Possibilities	Constraints
<ol style="list-style-type: none"> 1. Widening the road is possible up to 60 ft. (18.30 m) to make a 4-lane road. 2. Most of the road is straight with minimal curve. 3. No by-pass is required. 4. The cost for acquisition of land for road widening would be cheaper due to pond, ditches (water body). 5. The resettlement cost would be minimal. 6. The Muhuri Project Embankment and BWDB Embankment would be used for road network in an extended way. 7. The CDSP Embankment constructed in 2005 is very close to this approach/access road. 	<ol style="list-style-type: none"> 1. Not possible to widen to accommodate rail connectivity. 2. The land filling cost would be more due to ponds or ditches (water body) along the road.

Access Road 2: From Dhaka-Chittagong old highway, with the intersection to the highway at Borotakiya Bazar (possibilities and constraints)

Possibilities	Constraints
<ol style="list-style-type: none"> 1. The present road width is 5.5 m with some RCC rigid pavement and some bituminous carpet (BC). 2. Widening the road is possible up to 60 ft (18.30 m) to make 4-lanes with filling of existing canals. 3. Along the road about 1/3 portion is paddy land. The resettlement cost would be minimum. 4. The existing railway station Borotakia is about 1 km apart from the Borotakia Bazar intersection. 	<ol style="list-style-type: none"> 1. The borrow pit is used as canal for flow of the tidal water. 2. The provision for canal to be made for flowing tidal water. 3. A by-pass would be required at Abu Torab Bazar. 4. The road is not straight at present; but with widening to 4-lane, it can be straightened. 5. The roadway and railway should not be proposed at the same alignment due to non-availability of land along the existing road. 6. The intersection point of the old Dhaka Chittagong highway and Borotakia Bazar is not wide. The intersection point should be widened after demolishing some shops, houses etc.

Sustainable Transport System: A Road to Development (Ministry of Road Transport and Bridges Road Transport and Highways Division):

Mirsharai –Teknaf Marine Drive Road Project: The proposed Mirsharai-Teknaf Marine Drive is a route along the sea shore. The route will connect Asian Highway network as well as India, Myanmar and China especially Kunming. The route passes beside the largest sea port of Bangladesh and the largest ship breaking yard of the world. The project road will contribute to the development of tourism in the area and facilitate regional connectivity. It is now under construction and it is directly connected to the *Economic Zone of Mirsharai*. After completion of this road the connectivity with Mirsharai will be improved, economic development will be flourished in home and abroad.

Cross-Border Road Network Improvement Project: RHD has plan to take upgrading of Ramgarh-Heako-Baraiyarhat road section project to establish improved connectivity between Bangladesh and North-East Indian states. The proposed commencement of civil work is January 2019 and the completion of civil work is December 2021. This project will improve the connectivity of Mirsharai with North-East Indian states and make the area an important industrial hub and also improve the eco-tourism.

Dhaka Chittagong Expressway Project on PPP Basis: The project aims at construction of a 217 kilometers expressway along Dhaka-Chittagong corridor on public private partnership basis. The expressway is proposed to be constructed parallel to National Highway, N1. When the expressway will be completed and opened the development of Mirsharai will be flourished, land use pattern will change, congestion will be reduced, regional, national and international road connectivity will be improved. Mirsharai EZ will also be benefited.



Figure 3: Mirsharai-Teknaf marine drive



Proposed Dhaka-Chittagong Expressway

Development Projects in Mirsharai, Master Plan Bangladesh Railway:

According to BR's master plan there are already two on-going projects over the Mirsharai Upazila:

- Construction of double line between Laksham-Chinki Ashtana, Mirsharai (JICA funded)
- Modernization of 11 station's signaling system in between Chinkiashtana, Mirsharai-Chittagong (EDCF)

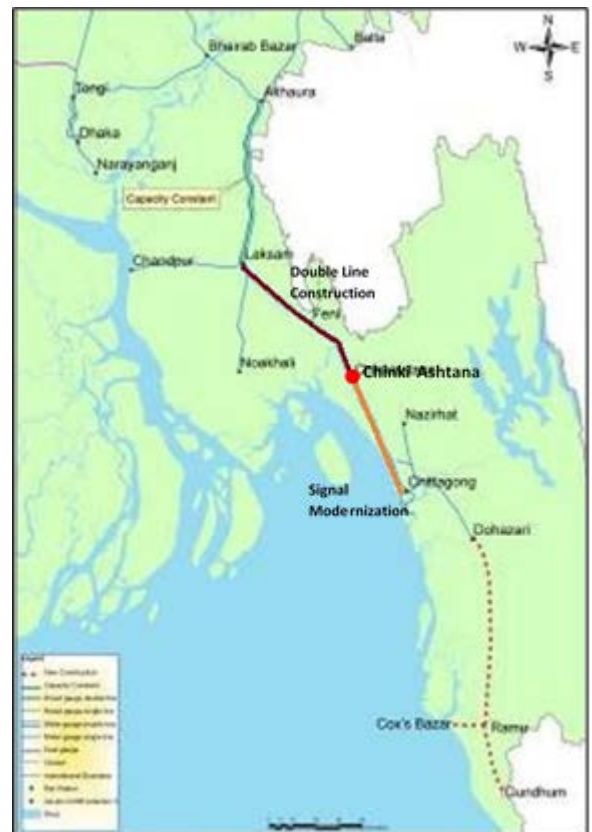


Figure 4: Rail line development scenario



Figure 5: Existing Road Network of the Study Area

Appendix-B: Notes of Stakeholder Meetings

Notes of Start-up Meeting with Project Director (MUDP), UDD

Location: Urban Development Directorate (UDD) HQ, 82, Segunbagicha, Dhaka- 1000.

Date & Time: Wednesday, November 22, 2017; 11:00 am

Present:

Ahmed Akhtaruzzaman, Project Director (MUDP), UDD

Ahsan Habib, Asst. Planner & PM (MUDP), UDD

Sultana Razia, Transport Survey Supervisor, DevCon

Hamim Ahmed, Project Coordinator, DevCon

- 1) This was the first meeting that took place between the UDD officials and the team members of DevCon, thus the participants of the meeting introduced themselves.
- 2) The Project Director, Mr. Akhtaruzzaman briefly described the nature of the project, its goal and UDD's approach towards the MUDP. He also pointed out the development opportunities of Mirsharai Upazila considering the two important aspects of (i) Economic Zones and EPZ those are being constructed by BEZA and BEPZA; and (ii) Tourist Spots on the South-Eastern part of Mirsharai.
- 3) With the help of a printed GIS map of Mirsharai and the road network map LGED, PD identified the access road to the EZ sites that is already under construction by RHD along the Abu Torab Bazar road previously owned by LGED. He also added that this alignment has some drawbacks such as:
 - The has a number of sharp bents since the road is being constructed on the same alignment as that of the previous, it will reduce driving comfort, increase chances of accidents and limit the average speed of vehicles
 - An important canal is being filled up for the construction of the road, which will in turns cause drainage problem in the surrounding area,
 - The alignment passes through an important marketplace (Abu Torab Bazar) and thus there will be traffic congestion on the access road near the built up area; this will result in a long travel time.

Considering the above, Mr. Akhtaruzzaman emphasized on proposing alternative access routes to the Economic Zones

- 4) The PD asked the consultants to exploit all possible options and propose a multi-modal transport network for the study area with both improved local and regional connectivity; taking into account the rail connectivity, waterways and even MRT. He also mentioned a direct connectivity from the EZ sites to Shonagazi, Feni can be established.
- 5) The consultants were asked to visit the tourist spots and propose better access to the spots and direct connectivity in between different ones, and innovative but practical ideas for introduction of modern facilities for tourists such as safety for hiking, ropeway etc.
- 6) The PD also sought solution for keeping road transport operational within the Mirsharai city area during the recurring seasonal flush floods.
- 7) The consultant team members shared the reconnaissance tour program with UDD counterparts when Mr. Ahsan Habib discussed the consultants about the important checkpoints (of Mirsharai) to visit during reconnaissance, make arrangement for logistic support (including issuance of letter) and initiated communication with one of the Mayors and the local representatives of UDD in Mirsharai who would assist the survey team in field.

- 8) At last, the PD requested the consultant team members to arrange a demonstration of the Transport Modelling Software that will be used in this project.

Notes of 1st Meeting with UDD Officials in Mirsharai Office

Location: MUDP Project Office (UDD), Mirsharai.

Date & Time: Saturday, November 25, 2017; 11:00 am

Present:

Md. Saifur Rahman, Planner, UDD
Md. Monir Hossain, Nokshakar
S M Saidul Islam, Nokshakar
Md. Shahinur Rahman, Nokshakar
Md. Nazrul Islam, Nokshakar
Renu Miah, Rekhakar
Dr. Moinul Hossain, Team Leader, DevCon
Sultana Razia, Transport Survey Supervisor, DevCon
Hamim Ahmed, Project Coordinator, DevCon

- 1) The Team Leader (TL) introduced the team with the UDD local representatives and started the meeting,
- 2) Using the maps already prepared in consultant's Dhaka office, the TL discussed purpose of the reconnaissance field visit and places to visit to obtain the remarks and suggestions from the local staff,
- 3) The UDD officials shared their views regarding the field visit and recommended important locations to visit and helped fine tune the tour program. They also assigned two persons- Mr. Monir and a local volunteer to be with the team and provide all necessary logistic support and guidance throughout the tour.
- 4) It was also assured that the traffic survey team during the thorough field surveys would get local community support as much as needed, and introduced the team with the Co-founder of the 300-member strong local student association, USAM.
- 5) On request of the TL and as per earlier instruction of the PM (UDD), Mr. Ahsan Habib; Mr. Saidul Islam arranged an appointment with the Honourable Mayor (Mirsharai Pourashava) Mr. Gias Uddin at the day's end.

Notes of Meeting with USAM (University Students Association of Mirsarai)

Location: MUDP Project Office (UDD), Mirsharai.

Date & Time: Saturday, November 25, 2017; 11:30 am

Present:

Md. Nahid Mahamood, Co-founder, USAM

Dr. Moinul Hossain, Team Leader, DevCon

Sultana Razia, Transport Survey Supervisor, DevCon

Hamim Ahmed, Project Coordinator, DevCon

- 1) Mr. Nahid, the Co-founder of University Students Association of Mirsharai introduced himself with the transportation consultants and briefly described the visions & activities of their group.
- 2) Upon sharing the purpose of the reconnaissance, Mr. Nahid confirmed that as a local resident of Mirsharai, he can take the team to all the sites to visit within the available time and suggested the best route plan for the visit.
- 3) The TL briefed about the nature and extent of the traffic surveys to be carried out under the Package-4 assignment and asked how the local community could assist in that. In response, Mr. Nahid mentioned their association has 300 active members ready to provide any voluntary field support during the surveys and being students of various universities and colleges, they could also take part in the survey activities as well.

Notes of Meeting with Mayor, Mirsharai Pourashava

Location: Mirsharai Pourashava Office, Mirsharai.

Date & Time: Saturday, November 25, 2017; 4:00 pm

Present:

Md. Gias Uddin, Hon. Mayor, Mirsharai Pourashava

Ward Councillors of 2 wards

Sub-inspector, Mirsharai Thana

Md. Monir Hossain, Nokshakar (UDD)

S M Saidul Islam, Nokshakar (UDD)

Md. Nahid Mahamood, Co-founder, USAM

Dr. Moinul Hossain, Team Leader, DevCon

Sultana Razia, Transport Survey Supervisor, DevCon

Hamim Ahmed, Project Coordinator, DevCon

- 1) The Mayor in spite of his other activities managed time for the meeting with the consultant team and a number of other important city persons were present in the discussion. The formal introduction was done by the UDD representatives present in the Mayor's office.
- 2) The Team Leader shared his observations after visiting various places of significance within the Mayor's jurisdiction and most importantly the EZ sites. After that, he sought suggestions from the Mayor for possible road network improvement and his visions regarding Mirsharai.
- 3) In response, the Mayor had the following remarks:
 - The proposed access road from Bar Takiya towards Mirsharai EZ may create huge traffic congestion in the area. Also, there are 4 large/ small markets/ GCs which will understandably be affected due to widening of the road. Again, the zigzag geometry of the road creates difficulties. Moreover, the existing canal, which contains the floodwater, is being filled up. Instead of the extension of this road Mayor proposed to extend road Mithachara to EZ via Baman Sundar Hat GC. He also added that the surrounding area of that alignment is mostly vacant- devoid of any notable development and will not require much resettlement work and land acquisition is very much possible to widen the road up to 100 feet.
 - The Fatikchhari road (Z1021) from Mirsharai is too narrow and encroached by bazars, shops and residential buildings. These developments are mostly in unplanned, which makes the situation worse. Moreover, this is the only road toward the Fatikchhari. Mayor has the interest to widen this existing road and improve the connectivity between two Upazilas.
 - It is very significant to widen and straighten the RHD regional road R151 (Hinguli-Kararhat-Ramgarh Rd.) which connects the Ramgarh Land Port and there are about 42 nos. of bridges that need to be rehabilitated or reconstructed.
 - There is a proposal of construction of a new canal from Mohamaya lake towards the EZ that is waiting for the ECNEC approval
 - The area under his jurisdiction especially Ward nos. 11, 12 and 13 suffer from flooding and waterlogging; the Mayor required solutions to solve the problem and stated that the roads within this area need to be raised.
 - In reply, of the TL's query, the Mayor mentioned about an available space for possible terminal of the public transports.

- 4) The Team Leader noted all the comments from the Mayor and promised to evaluate these options while planning the road network for Mirsharai.
- 5) The meeting ended with a nice arrangement of Lunch by the Mayor and followed by photo session and tea.

Notes of Discussion at Mohamaya Eco Park, Mirsharai

Location: Mohamaya Eco Park, Mirsharai.

Date & Time: Sunday, November 26, 2017; 10:00 am

Present:

Md. Gholam Kabir, Forest Beat Officer, Forest Department

Tour Operator, Mohamaya Eco Park

Representatives of BWDB

Person in-charge, Parking Area, Mohamaya Eco Park

Dr. Moinul Hossain, Team Leader, DevCon

Sultana Razia, Transport Survey Supervisor, DevCon

Hamim Ahmed, Project Coordinator, DevCon

- 1) Mr. Kabir, representative of the Forest Department took the team to points of interest within the Eco Park and briefed about different facilities like food, accommodation, connectivity, recreational activities etc. for the tourists.
- 2) It was noted that the recreational activities such as boating, kayaking, fishing, kayaking etc. including the parking area; are leased to private parties on yearly basis. The leasing is done and managed by the Department of Forest. However, the rates for the tourists vary from season to season and are different for the local indigenous people living nearby.
- 3) The local representatives of the BWDB stated that the lake's discharge is controlled by a sluice gate built and operated by BWDB, and there are boats reserved for the department which the survey team could use if required.
- 4) The FBO also mentioned that there is a proposal for development of the Mohamaya Eco Park submitted to ECNEC for budget allocation which will comprise various touristic facilities improvement such as Ropeway, Cable car, Cottage etc.
- 5) The parking area in-charge told the team that the Eco Park has insufficient parking facility. During the off season the tourist cars are limited but during the season, it is multiplied many times and they cannot accommodate all the vehicles coming to the spot. The surplus vehicles then take place in the access road which is also very narrow and create congestion.

Notes of Wrap up Meeting at UDD Field Office, Mirsharai

Location: UDD Field Office, Mirsharai

Date & Time: Sunday, November 26, 2017; 12:30 pm

Present:

Md. Saifur Rahman, Planner, UDD

Md. Monir Hossain, Nokshakar, UDD

S M Saidul Islam, Nokshakar, UDD

Md. Shahinur Rahman, Nokshakar, UDD

Md. Nazrul Islam, Nokshakar, UDD

Renu Miah, Rekhakar, UDD

Dr. Moinul Hossain, Team Leader, DevCon

Sultana Razia, Transport Survey Supervisor, DevCon

Hamim Ahmed, Project Coordinator, DevCon

- 1) The reconnaissance survey team was invited for lunch to the MUDP Project Office at Mirsharai, and a short discussion took place following lunch.
- 2) The Team Leader shared his observations from the reconnaissance up until then and briefed the UDD officials about the next actions and preliminary planning for the traffic survey. He also sought their assistance when the team visits Mirsharai next for detailed planning and surveys. In addition, he expressed the need for an office and housing space for the survey supervisors and enumerators to visit Mirsharai for survey purpose.
- 3) Mr. Saidul and Mr. Monir confirmed that they will assist in finding a rental accommodation for office and housing in the earliest and that they will arrange for any local support and logistics, which might be required during execution of the traffic surveys.
- 4) Mr. Monir then arranged an appointment with the Mr. Foyz Ahmed, Secretary to the Mayor of Baroiyar Hat Pourashava with the Mayor not being at the station.
- 5) The discussion ended with tea and handshakes.

Notes of Meeting with Baroiyar Hat Pourashava

Location: Baroiyar Hat Pourashava Office, Mirsharai

Date & Time: Sunday, November 26, 2017; 3:00 pm

Present:

Mr. Foyz Ahmed, Secretary to Mayor

3 nos. of other staff of the office

Dr. Moinul Hossain, Team Leader, DevCon

Sultana Razia, Transport Survey Supervisor, DevCon

Hamim Ahmed, Project Coordinator, DevCon

- 1) The meeting was brief and started with a formal introduction among participants. Mr. Foyz greeted the team with snacks and tea and started the discussion.
- 2) As the Team Leader described the nature and objectives of the assignment, the Secretary shared his following remarks in accordance with the vision of his Mayor:
 - The regional road (R151) is desired and proposed to be widened up to 4 lanes to accommodate higher volume of traffic when the land port and the EZ are fully operational
 - A Flyover is envisioned across the Hinguli intersection carrying the traffic from the EZ towards the land port in Ramgarh
 - Two options could be there for accessing the EZ sites; which are (i) Hinguli-Santir Hat-Dhum-Azampur Hat-Muhurighat Bazar-EZ Embankment; and (ii) Zorwarganj-Bishu Miar Hat-Azampur Hat-Muhurighat Bazar-EZ Embankment
 - A 247 crore worth project is already in place for establishing direct connectivity with Noakhali over the sluice gate through Shonapur Road which will reduce 50km of distance to that if the highway is taken
 - Widening is required for the municipal (LGED) roads to eradicate traffic congestion
 - The Zorwarganj-Borburia Ghat Road can be reconstructed and made operational with a bridge across the river Feni to connect with the national highway bypassing the Hinguli intersection, Santir Hat and Baraiyar Hat GCs.
- 3) The Team Leader took notes of the comments from the secretary and promised to consider all these options while planning.

Notes of Tea Stall Meetings

Location: Various locations, Mirsharai

Date & Time: November 25-26, 2017; 10:00 am-3:00 pm (intermittently)

Present:

Local people at different locations, Mirsharai

Md. Monir Hossain, Nokshakar, UDD

Md. Nahid Mahamood, Co-founder, USAM

3 nos. of other staff of the office

Dr. Moinul Hossain, Team Leader, DevCon

Sultana Razia, Transport Survey Supervisor, DevCon

Hamim Ahmed, Project Coordinator, DevCon

- 1) The UDD officials took active part in setting up the discussions and briefed the locals about the MUDP Project after introducing the consultant team.
- 2) These meetings held at various locations of the existing road network with local people as available.
- 3) The output of such discussions were mainly key information regarding nearby growth centres, markets, available modes of transport and other important places for the road network.
- 4) The local people shared the facilities they already enjoy and the problems encountered in road communication.
- 5) The Team Leader welcomed the demands of the public regarding the improvement of the transport facilities.