Government of the People's Republic of Bangladesh

Local Government Division

Ministry of Local Government, Rural Development & Cooperatives

AKHAURA PAURASHAVA

MASTER PLAN: 2011-2031

MARCH, 2013

Technical Assistance: Local Government Engineering Department (LGED)

Government of the People's Republic of Bangladesh

Local Government Division

Ministry of Local Government, Rural Development & Cooperatives

AKHAURA PAURASHAVA MASTER PLAN: 2011-2031

STRUCTURE PLAN

URBAN AREA PLAN:

- Landuse Plan
- Transportation & Traffic Management Plan
- Drainage & Environmental Management Plan

WARD ACTION PLAN

MARCH, 2013

(PAURASHAVA Logo)

AKHAURA PAURASHAVA

AKHAURA, BRAHMANBARIA

AKHAURA PAURASHAVA MASTER PLAN: 2011-2031

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Preface

Bangladesh has been experiencing rapid urbanization in the last four decades where level of urbanization has reached from 7.6% to nearly 29% between 1970 and 2011. Multidimensional complex factors like; socio-economic, political, demographic and climatic are responsible for this higher growth of spatial transformation. The fast urbanization is putting pressure on the small towns' limited land, urban services and environment along with countries big cities. Whereas urbanization is also considered as an opportunity and an integral part of the development process. Proper development plans and guidelines with necessary legislative measures and appropriate institutional arrangement can help to achieve sustainable urban as well as rural development.
However, presently, the Paurashavas has the legal mandate to take initiatives of formulating development plans, providing infrastructure and other services and creating opportunities for people to initiate developments with sustainable and harmonic approach. In this regards, Akhaura had initiated steps to frame its' Master Plan (Physical Development Plan) by taking technical assistance from the Local Government Engineering Department (LGED). LGED under the Local Government Division of the Ministry of Local Government, Rural Development and Cooperatives initiated a project titled 'Upazila Towns Infrastructure Development Project (UTIDP)' providing all sorts of technical assistances to prepare long term physical development plan titled 'Master Plan' for Akhaura Paurashava.

Master Plan of Akhaura Paurashava has been prepared following the pre-requisite of the "Local Government ((Paurashava) Act, 2009". To prepare the Master Plan, LGED engaged consulting firm named Development Design Consultant Ltd. and set up a Project Management office (PMO) deploying a Project Director, Deputy Project Director, experienced Urban Planners as Individual Consultant and support staffs. Regular monitoring, evaluation and feedback from PMO had also accelerate the pace and quality of the master plan preparation tasks. During formulation of the Master Plan, the Paurashava authority along with the project & the Consultant ensure people's opinion, observation and expectation in various ways: conducting sharing meetings, Public Hearing etc. At the end of the formulation process, the Paurashava completed all procedures necessary for its approval as per the related clauses and sub-clauses of the "Local Government (Paurashava) Act, 2009". Pourashava Authority has submitted this Plan to the Local Government Division of the Ministry of Local Government, Rural Development and Cooperatives for final approval and gazette notification.

This Master Plan comprises of three tier of plan in a hierarchical order, these are: Structure Plan for 20 years, Urban Area Plan for 10 years and Ward Action Plan for 5 years. Urban Area Plan also comprises of three components namely; Land use plan, Traffic & Transportation Management plan and Drainage & Environmental Management Plan. This Master plan will serve as guidelines for the future infrastructure development of Akhaura Pourashava together with land use control and effective management of service facilities.

The Paurashva Authority acknowledges the full support and all out cooperation from the consultant team, the Project Management office of UTIDP, LGED, Local Government Division of the Local Government, Rural Development and Cooperatives Ministry, public representatives, other stakeholders and civil society with deepest gratitude for accomplishing this remarkable assignment.
Cooperation and participation from national to local authorities, all government institutions, private entities and people of Akhaura Paurashava will be necessary to implement this Master Plan successfully and make this Paurashava developed and livable. I hope Akhaura Paurashava will be a model Paurashava in Bangladesh through building itself green and sustainable by successful implementation of this Master Plan.

(Md. Takjil Khalifa)
Mayor
Akhaura Paurahsava

Executive Summary

It is very significant for Akhaura Paurashava to get planned way development with the support of separate Plans like Drainage and Environmental Master Plan, Traffic Management Plan and Ward Action Plan to ensure operation and maintenance of the existing infrastructure along with those facilities proposed to be built up under the future investment programme and above all, to suggest improvement of the management ability of the Paurashavas/Upazila Town Authority. The Master Plan of Akhaura Paurashava has been prepared and submitted by the consultant NRP-SARM-DEVCON-EADS-PRONAYAN consortium for the partial fulfillment of the requirements stated in the Terms of Reference (ToR) for Upazila Towns Infrastructure Development Project (UTIDP; Package 03) being implemented by Local Government Engineering Department (LGED) under the Ministry of Local Government Rural Development and Co-operatives (LGRD&C) Ministry of Government of the People's Republic of Bangladesh

Akhaura Township located at the northern part of the upazilla of Brahmanbaria District with an area of 9.76 Sq.Km. (2411.32 acres) with a population of only 36262 in the year 2011. Akhaura Paurashava designated as a Class 'C' (the term Class 'C' means Third category of the Paurashava, as the concerned ministry uses this word for fund allocation and administrative arrangement) was declared as a Paurashava through a government notification dated on 12/12/1999. Akhaura Paurashava as well as the Upazila is connected within the region by both road and railway network. The Paurashava is well connected with different regions of the country by road network. Brahmonbaria-Comilla National Highway passes through Akhaura Upazila and the paurashava is connected by Akhaura Town bypass to the national highway. Akhaura is an important Railway Junction of Bangladesh. Chittagong, Sylhet, Mymensingh and Dhaka are connected through this Junction. A railway link between Agartala, India and Akhaura has been approved by the Government of Bangladesh and India in September 2011. India-Bangladesh Highway will go through this city.

It has higher agricultural activity as 50.0% of its land is under this land use. In next 20 years, as projections show, the gross density of population will reach only 22 persons per acre. It has still a low level of economic activities and thus potentials to flourish as a vibrant urban center in the near future. Under such circumstances, a Master Plan can help creating advantages for living and working in the Paurashava and help attracting investment for economic growth leading to employment generation. There are not much development activities going on at present as there is lack of organized system of development at present. Current development emphasizes only on road and infrastructural development. Other utilities are generally neglected. The proposed Master Plan will induce such development activities that will ensure proper provisions of utility services, urban services, community facilities and social development opportunities. It will also ensure an automated governance service of the Paurashava and ensure good collection and utilization of its resources and thus enhance the development activities in the future.

The Master Plan is basically the comprehensive long-term strategy as per the requirements spelled out in the ToR of the UTIDP and suggestions given by the PMO of UTIDP. A very succinct account of the project area and its regional, national and international context is included in the report. The Draft Master Plan Report contains 3 parts and 26 chapters and starts with a brief statement of the project background, objectives and methodology.

The Master Plan is prepared in three tiers - Structure Plan, Urban Area Plan and Ward Action Plan. The Structure Plan provides the policies that will guide the future development of the Paurashava. The main output of this project is a set of Plans required to steer the future development of Akhaura Paurashava town to achieve the desired objectives of the project. It provides the information on the type of plan appropriate for Akhaura Paurashava, the development objectives which form the basis of

the Plans, the scope of the Structure Plan and a description of the study area. At present the existing trend of growth and the development problems of the Paurashava, the development control, critical planning issues and policies that are set out for the planning of Akhaura Paurashava. It also deals with the implementation issues of the Plan package. In the Structure Plan of Akhaura Paurashava, 42.96% land is kept as urban area and the remaining as agricultural, circulation network area and water body to support the future need for food and other agricultural products of the town and to facilitate the future drainage network. The Structure Plan proposes the restructuring of the organogram of the Paurashava and inclusion of town planning department comprising four town planners. This will ensure the better implementation and monitoring of the plan. It also proposes the system of periodic review and updating of the plan and the process of resource mobilization.

Urban Area Plan consists three types of Plans - Land Use Plan, Traffic and Transportation Management Plan and Drainage and Environmental Management Plan. Under the Land Use Plan, the future land use of the Paurashava is proposed according to the fixed standards during the interim phase of the Master Plan. Land Use Plan proposes 32.76% of the Paurashava land to be earmarked under Urban Residential Zone. These two zones will form the future residential areas of the Paurashava. Proposals for other land uses, like Commercial Zone (1.21%), Education and Research Zone (2.16%), Open Space (1.5), Circulation Network (12.34%) etc. are made. Under the Land Use Plan, the development proposals to support the future needs of the people are also given. It proposes one heavy industrial zone, one general industrial zone, one stadium, hospital, waste dumping ground, one vocational training institute, one bus terminals, one central park, two high schools, four primary schools, playgrounds, local parks, local markets and many other facilities.

In the Traffic and Transportation Management Plan, the Road Network Plan is proposed. The transportation facilities are proposed here in this plan. In the Road Network Plan of the Paurashava 58.12 km of road widening and 19.35 km of construction of new road is proposed. The road hierarchy is proposed in this plan too. The proposed road network will comprise of primary road (80 and 60 ft RoW), secondary road (40 ft. RoW), tertiary road (30 ft. RoW) and access/ local road (20 ft. RoW). The proposed road network and the transportation facilities along with the proposed management system will provide a good system of management for future traffic and transportation problems.

Under the Drainage and Environmental Management Plan, the drainage network of the Paurashava is proposed. This plan will analyze drainage aspects in the planning of the Paurashava, study geological fault and lineament of the project area and its surroundings, study the existing water development, flood protection and flood control project (if any) in the area and their impacts in the Paurashava plan, present planning options for drainage of the future Paurashava area, study conservation of the natural resources like parks, open space, water bodies, existing ponds etc. and conserve place of historical, architectural (if any) and agricultural importance including natural fisheries. At present, there is only 4.9 km of pucca man-made drain in the Paurashava and the natural canals and river cover 18 km. This network is not enough to support the present need and will not be suitable to support in the future. That is why the consultants proposed a comprehensive network of drains that comprises 24.67 km of secondary drain, 34.07 km of tertiary drains.

The third and final tier of the Master Plan, Ward Action Plan, is prepared including the proposals that will be implemented during the first to fifth year of the Master Plan period. Two or more Ward Action Plans will be prepared under this Master Plan to address the need of the people for the remaining fifteen year's period of the Master Plan. This first Ward Action Plan, which is described in this report, addresses the urgent needs of the people of the Paurashava and incorporates those in the Master Plan. It analyzes the immediate requirements of the people living in the nine Wards of the Paurashava and then provides facilities in a manner that it supports the particular Ward in the first

phase of the Master Plan period of twenty years.

This is the first Master Plan of Akhaura Paurashava. It is prepared by LGED under Package – 03 of the Upazila Towns Infrastructure Development Project (UTIDP). It is expected that the implementation of the plan will induce higher level of development, ensure planned life, good community and better future.

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List of Abbreviations and Acronyms

3D	Three Dimensional
AAT	Arc Attribute Table
ADP	Annual Development Plan
AgA	Agriculture Area
BBS	Bangladesh Bureau of Statistics
BIP	Bangladesh Institute of Planners
BM	Bench Mark
BS	Bangladesh Survey
BRDB	Bangladesh Rural Development Board
BWDB	Bangladesh Water Development Board
CS	Cadastral Survey
CUA	Core Urban Area
DD	Degree Decimal
DGPS	Differential Global Positioning System
DPHE	Department of Public Health Engineering
Ft	Feet
GDP	Gross Domestic Product
GIS	Geographic Information System
GO	Government Organization
Govt.	Government
GPS	Global Positioning System
H/Q	Head Quarter
Km	Kilometer
LCC	Lambert Conformal Conic
LGED	Local Government Engineering Department
LGRD & Co.	Local Government, Rural Development and Cooperatives
M	Meter
MDG	Millennium Development Goal
MIDP	Municipal Infrastructure Development Project
NGO	Non-Government Organization
NUA	New Urban Area
O-D	Origin – Destination
PCU	Passenger Car Unit
PD	Project Director
PDB	Power Development Board
PMO	Project Management office
PMU	Project Management Unit
PUA	Peripheral Area
PWD	Public Works Department
R & H	Roads and Highways Department
REB	Rural Electrification Board
RL	Reduced Level
RS	Revenue Survey
RTK-GPS	Real Time Kinematic Global Positioning System
SME	Small and Medium Enterprise
ToR	Terms of Reference
TS	Total Station Survey
UDD	Urban Development Directorate
UTIDP	Upazila Towns Infrastructure Development Project

Glossary

Khas	State owned land not specifically allocated to any government agency
Paurashava	Municipality
Kucha	Impermanent structure/ building materials
Pucca	Permanent Construction / Structure using bricks, cement etc.
Semi-Pucca	Semi-permanent structure/ building using Tin, Steel etc.
Mouza	Definite area demarcated and identified by the revenue department with a jurisdiction list number. It may be populated or depopulated.
Village	Smallest geographic area of rural area. A village may be same as mouza or there may be more than one village in a mouza. It is always populated
Ward	Smallest local administrative (local govt. unit) unit of urban area. for the operational convenience municipalities' area divided into three or more wards. The ward boundaries are specified by gazette. A ward has a ward parishad (council).
Union	Smallest local administrative unit (local govt. unit) of rural area which is composed of mouzas and villages. A union has a union parishad
Upazila/Thana	Sub-district Administrative Area
Zila/District	District Administrative Area

Note : Paura Area means the area under Paurashava control. Project Area or Planning Area are synonymous as the Structure/Land use Plan Area.

Measurements

1 acre (ac)	=	3 bighas = 4000 sq. m = 60.50 kathas = 100 dec
1 hectare (ha)	=	2.47ac. = 7.5 bighas = 10,000 sq. m.
1 square meter (sq. m.)	=	1.20 sq. yards = 10.76 sq. ft.
1 square kilometer (sq. km.)	=	247.1 ac. = 100 ha.
1 square mile (sq. ml.)	=	259 ha. = 640 ac. = 2.59 sq. km.
1 yard	=	3 feet = 0.9m
1 meter	=	3.281 feet
1 kilometer	=	1000m = 0.62 miles
1 mile	=	1760 yards = 1.61 km.

Note: Throughout the report the traditional convention of using commas to indicate the division of number into thousands, lakhs, and crores has been used, rather than the English convention of using commas to indicate the division into thousands and millions.

Chapter One: Background

1.1 General

In the developing country like Bangladesh delivering essential urban services is one of the critical issues for lack of resources concerning urban governance for ensuring equitable urban development. Again providing those necessary services is one of the key indicators of the efficiency and capacity of responsible authorities for urban area management; it needs a proper plan to keep balance in supplying resources and over demand for rapid increase of population. According to the population census of 2001, the share of urban population was about 23.29% and at present it is approximately 25%. By the year 2015, the share of urban population will be about 37% of the national population. The rapid urbanization is marked by the creation of Paurashava, whose number at present (2013) stands at 316.

Paurashava are created not only to provide urban services to their citizens, but also to create a livable environment through development of planned and environmentally sound living space. There is no proper national policy or guidelines so that to create a livable urban space to meet the present demand with considering the future upcoming Population. Due to absence of planned development, the living conditions of these small urban centers are deteriorating day by day.

A proper and implementable plan or guidelines is very much essential for provisions of all necessary services to meet the needs of those Paurashava Towns of Bangladesh. A long term Master Plan for Upazila Towns is essential for the balanced and sustainable urban development to achieve basic urban services such as better circulation network, drainage, healthcare, education, power, water supply, and sanitation is important for reducing poverty and improving welfare. 'Paurashava Master Plan' will be the guideline for future development of the Upazila Towns of Bangladesh. The Government of Bangladesh has committed to prepare the Paurashava Master Plan for ensuring the Paurashava environment livable.

Draft Master Plan for The Akhaura Paurashava is prepared accordingly considering the guidelines prescribed in the Terms of Reference (ToR) for preparation of Paurashava Master Plan under Upazila Towns Infrastructure Development Project (UTIDP; package- 3) being implemented by Local Government Engineering Department (LGED) under the Ministry of Local Government Rural Development and Co-operatives (LGRD&C), Government of the People's Republic of Bangladesh.

1.2 Objectives

According to Terms of Reference (TOR) the objective of Master Plan preparation for Akhaura Paurashava of Comilla district is set out as followings:

- Find out potential development issues of Akhaura Paurashava and make a 20-year development vision and prepare a Master Plan in line with the vision for development;
- Plan for the people of the town to develop and update provisions for better transport network, housing, infrastructures for roads, markets, bus terminals, sanitation, water supply, drainage, solid waste management, electricity, education, leisure and such other infrastructure facilities for meeting the social and community needs of the poor and the disadvantaged groups for better quality of life;
- Prepare a multi-sector short and long term investment plan through participatory process for better living standards by identifying area based priority-Drainage master plan, transportation and traffic management plan, other need specific plan as per requirement in accordance with the principle of sustainability;

- Provide controls for private sector development, clarity and security with regard to future development;
- Provide guide line for development considering the opportunity and constrains of future development of Upazila Town;
- Prepare a 20-years Master Plan to be used as a tool to ensure and promote growth of the city in line with the guiding principles of the Master Plan and control any unplanned growth by any private and public organization;

1.3 Approach & Methodology

The present planning exercise, a participatory method of planning has been followed where opinion, ideas, and needs of common people and stakeholders are accepted. The approach and methodology for planning (for Upajila Towns) that has been followed is worth mentioning here. Various studies are the integral part of the planning process, while the planning method covers a wide range of issues duly considered during the process of planning.

The methodology adopted for preparing the Master Plan/Urban Area Plan including Land Use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Plan and Ward Action Plan for Akhaura Paurashava was taken under the following sequential way.

➢ Master Plan Conceptualization

To Conceptualize the Master Plan following steps have been followed

Step 1: Preliminary Visit to the Paurashava

At first, the planning goals and objectives were conceived, preparations were made. A preliminary visit was made by the team of consultants to acquire basic idea about the areas to be planned. The goal in this step was to conceptualize the planning process and operational the activities.

Step 2: Inception Seminar

Inception Seminar was held on 16th june 2008 at the Akhaura Paurashava in which stakeholders was informed about the scope and Terms of Reference for the preparation of Master Plan. The output in this step was an Inception Report.

Step 3: Carry out Detailed Survey for Akhaura Paurashava

A number of studies were conducted in order to prepare a database and get an insight into the existing conditions. Studies, however, focused on three different but inter-related aspects; the physical condition of the city, the economic and social conditions of the people, and their perceptions about the problems and prospects of the city.

Data and information collected includes topography, physical features, physical infrastructures, land use, socio-economic and traffic and transportation situation of the study area. Detail surveys (Socio economic, Physical Feature, Traffic and Transport, Drainage and Environment) of Akhaura Paurashava area have been conducted using from the approved format of ToR. Other relevant data were also collected. These surveys and analysis of data and information helped to find out possible areas of intervention and to forecast future population of the Paurashava.

Step 4: Demarcation of the Study Area

Considering existing condition, demand of Akhaura Paurashava and potential scope for future development, study area has been delineated. The Structure Plan Area is being identified considering the growth potentiality and trend of development. for Akhaura Paurashava analyzing the present formation and considering Demand of the stakeholders, existing Paurashava area is considered, that means all uses remain as present formation for demarcation of Structure Plan Area.

Step 5: Preparation of Reports and Maps

Policies, objectives and guidelines of the Master Plan are based on the outcome of the following reports and maps:

- Inception Report
- Study Area Map (All Categories)
- Survey Data with Survey Report
- Interim Report
- Draft Master Plan Report

➢ Public Consultation Meeting

Two public consultation meetings were organized by the help of concerned Paurashava officials for preparation of Master Plan Report. These meetings were very essential for incorporating beneficiary's point of view in the planning process with utmost careful consideration. First meeting was organized as Public Consultation Meeting on Preparation of Draft Master Plan phase about to know the Development requirements of the project on the Date of 11 August, 2011. The Second one was the Final Consultation Meeting finalize the Draft Proposals of the Akhaura Master Plan which was with a group discussion and interviews with the elite groups: Mayor, Councellors, News Reporters, UNO, LGED representatives, Teachesrs from School and College, businessmen and others from the Paurashava to guess development requirements in drainage and environment, transport sector, utility services, community services and other urban facilities. The Second Consultation Meeting was held on the Date of 26th December, 2012. Under these investigations of the consultation meeting and study, Master Plan of Akhaura Paurashava was prepared and submitted with required standards as required by the TOR.

➢ Preparation of Master Plan

Master Plan at 3-levels namely Structural Plan, Master Plan/Urban Area Plan and Ward Action Plan has been developed for Akhaura Paurashava.

Structure Plan (SP) includes a full analysis of the existing scenarios, highlight the existing condition of different sectoral infrastructures, identification of sectoral issues and interventions, prescription of solution for each sector and setting proposal and recommendations for the future action to be taken within the mentioned period, say 20 years. This is a longer-term plan.

The term **Urban Area Plan (UAP)** is prepared for managing and promoting development over medium term on the basis of the strategies set by the longer-term structure plan. Basically the UAP is an interpretation of the Structure Plan over the medium term (10 to 15 years). The coverage of the UAP is existing urban areas and their immediate surroundings with the purpose of providing development guidance in these areas where most of the urban development activities are expected to take place over the next 20 years.

Transportation and Traffic Management Plan have been prepared basing on Traffic Volume and OD Survey, Speed Survey and also on existing Transport Land Use Plan, relevant Regional and National Highway Development plans, number and types of vehicles in Akhaura Paurashava. Present traffic volume forecasting of future traffic growth, identification of travel patterns, areas of traffic conflicts and their underlying causes have been considered to prepare the plan. Non-pedestrian traffic movements that are dominated by cycle and rickshaw, van etc. also have been assessed to prepare the plan. Special recommendations have been made as how to best utilize this form of transport without causing unnecessary delays to the National Highways and other vehicles. Proposals also have been considered for pedestrians and their safety, with special attention for the children. The

current land use assessed regarding road transportation, bus & truck stations etc. and recommend actions to optimize this land use. Road Network Plan of this Paurashava based on topographic conditions proposed considering the Road Hierarchy standards which will serve as a guide for the long and short term implementation of new roads and also to improve existing Road Networks.

Analyzing detailed Survey outputs regarding existing natural and man-made drains, natural river rainfall pattern of the region, assess the extent and frequency of flood were ascertained and area of intervention was identified. Besides, in-depth study of the contour and topographic maps produced by relevant agencies and also review of any previous drainage Master Plan available for the Paurashavas had been conducted. A comprehensive (storm water) **Drainage Master Plan** has been proposed on the basis of findings of the above mentioned survey. This exercise considered all relevant issues including calculation of discharge of catchment areas, design of main and secondary drains along with their sizes, types and gradients and retention areas for the proposed drainage system. **Ward Action Plan (WAP)** is called short-term plan, say 5 years. Individual Ward of the Paurashava is deserved scope of this plan. In the Paurashava, 9 Ward Action Plan is being prepared. The plan includes review of the existing situation of the Ward with respect to land use, community facilities, public services, utilities, infrastructures, etc.

Following steps have been followed for preparation of the Master Plan-

Step 1: This plan have been proposed with all suitable interventions, supported by appropriate strategic policy, outline framework, institutional arrangement for effective implementation of the plan.

Step 2: formulation of planning principles and standards addressing the landuse, infrastructures and utility services is one of the important tasks for formulation of Master Plan. This is an important stage in design process, crucial to the final functional quality of the result and its efficiency and cost effectiveness. These planning principles and standards address two distinct situations: existing urban area and new urban areas.

Step 3: Several consultations (formal and Informal) with local communities / beneficiaries and other agencies / interest groups have been considered to prepare the plan.

Step 4: All the plans have been integrated plan in this step. The integrated plan has to be formulated through the consolidation of inputs from different sectors, local leaders, interest groups, etc. At the same time assessment has to be made on future economic, social and environmental impact of the integrated plan and its financial viability. The plan has been adjusted based on the significance of these impacts.

Step 5: All development proposals have been incorporation in this step of preparation of the plan with actual design.

Step 6: Response to the community desire, planning strategies has to be set and integrated planning maps have to be prepared considering the functional quality, aesthetic quality, flexibility and environmental sustainability.

Step 7: Finally, the development proposals of the plan have to be prioritized and phasing out.

1.4 Scope of the Master Plan

The scope of the master Plan includes:

- Analysis of survey result and identification of issues;

- Identification of projection techniques;

- Review of relevant and previous Master Plan(s) of Paurashava;

- Review of relevant policies, rules and standards;

- Projections of population, utilities, economy and land uses;

- Need and Priority Assessment of the Stakeholders.

1.5 Arrangement of the Report

This Report (Master Plan) has been prepared as part of the requirement for Preparation of Paurashava Master Plan under the project UTIDP for Akhaura Paurashava", set out in the Terms of Reference. It has been prepared based on different surveys, literature study and preliminary consultation with local authority and stakeholders. The main output of this report is a set of Plan proposals required to steer the future development of Akhaura Paurashava to achieve the desired objectives of the project. In-depth consideration has been given to identify the types of plan appropriate to the situation faced by Akhaura Paurashava.

The Master Plan Report contains three parts: The Structure Plan, The Urban Area Plan and Ward Action Plan.

Chapter One contains **Introductory Part** which discuss with detailed information regarding background objectives set for the project, methodology adopted for preparation of Paurashava Master Plan and scope of the current assignment. **Part A** is the Structure Plan which contains in detail of discussion of policy on existing situation of the project area. **Part B** contains the Urban Area Plan of the report which contains in detail of the plan proposals discussion of the project. **Part C** contains the Ward Action Plan of the report which contains immediate action base details of the plan proposals discussion.

Part A: Structure Plan

The main output of this assignment is to set of Plans required to steer the future development of Akhaura Paurashava town to achieve the desired objectives of the project. Structure Planning is basically concerned with development of broad strategies for managing and promoting efficient urban development over the medium and long term and attempts to integrate economic, physical and environmental objectives. Structure Plan provides a broad framework for development activities over a long period in and around the cities. The Structure Plan sets out a long-term strategy for the development of Akhaura Paurashava. This strategy is illustrated in terms of a series of policies to be pursued. It covers the study area of some 9.76 sq. km. (**Map 2.2)**. During the study the Planning Team with close cooperation with LGED and Akhaura Paurashava had identified the Planning Area. This area has been taken as the Structure Plan area. As the Structure Plan provides guidance for development over a larger area and a longer period of time, it is of necessity expressed as policy outline and in a general term if compared with the Urban Area Plan or Ward Action Plan.

The Structure Plan addresses supply and demand for Paurashava residential development and provides for the following matters:

- the amount, location, phasing, and density of future residential subdivisions;
- utility servicing;
- demands for educational, recreational, and social services;
- transportation and drainage issues and impacts;
- impacts on nearby urban centers;
- other uses such as trails, open space, and agriculture; and
- Procedural matters dealing with plan process and plan implementation, including referrals, plan amendments, and repeal.

The Structure Plan is set out in nine chapters-Chpter 2 to Chpter 10.

Chapter 2 serves as an introduction to the setting of the Akhaura town and an introduction to the Structure Plan. It explains background of the Paurashava, philosophy of the Master Plan and vision and objectives of the Structure Plan. It includes social and economic development, physical infrastructure development, environmental growth, population study, institutional capacity of the Paurashava, urban growth area, catchment area, landuse and urban services, functional linkage of the Paurashava with the regional and national network and role of agencies for different sectoral activities.

Chapter-3 deals with the Paurashava Exiting trend of Growth. Development problems of the Paurashava have been identified in the Chapter-4. Problems of physical infrastructure development, socio-economic development and environmental consequences are the key issues of this chapter.

Critical planning issues have been identified in the Chapter-5. Issues related with the transport, environment, landuse control and disaster have been emphasized. Issues relevant with the laws and regulations in case of policy formulation are also presented.

Chapter 6 deals with projection of Future Growth by 2031. Population projection for the year 2031, identification of future economic opportunities and projection of landuse are the major discussions of this chapter.

Chapter-7 presents the Paurashava development related policies, laws and regulations. The chapter highlights urban management policy, landuse policy, housing policy, population policy, agricultural policy, transportation policy, environmental policy, industrial policy, health policy and national urban

policy. Laws and regulations related to - urban development control and Paurashava development management also indicates in this chapter. Strength and weaknesses of the existing policies also includes here. Landuse development strategies are the key elements of the **Chapter-8**. Strategies for optimum use of urban land resources, plans for new area development and areas for conservation and protection are set out in this chapter.

Dominant issues on strategies and policies for sectoral development of the Paurashava presents in the Chapter-9. Strategies and policies on economic development, employment generation, housing and slum improvement, social amenities and community facilities, tourism and recreation facilities and safety and security are under socio-economic sector. Transport, utility services, flood control and drainage are under physical infrastructure sector. Strategies and policies regarding environmental issues are natural resources, sanitation and hazards.

Implementation Issues are presented in **Chapter-10**. Emphasize has given on institutional capacity building of the Paurashava and resource mobilization.

Chapter Two: Introduction

2.1 Background of the Paurashava

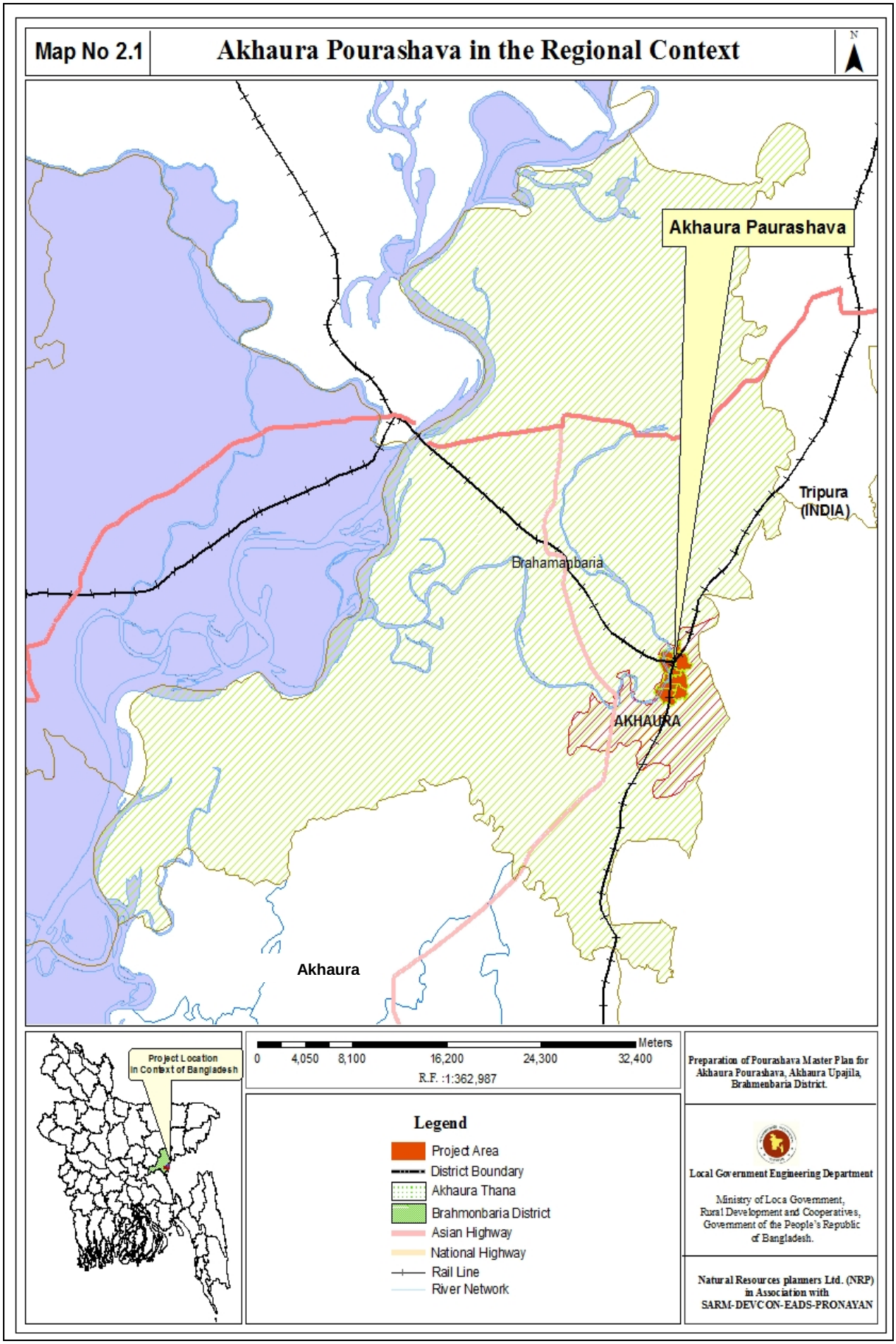
Akhaura Paurashava designated as a Class 'C' (the term Class 'C' means Third category of the Paurashava, as the concerned ministry uses this word for fund allocation and administrative arrangement) was declared as a Paurashava through a government notification dated on 12/12/1999. Akhaura Paurashava is located at Akhaura Upazila of the Brahmanbaria District. Regionally Akhaura Paurashava is located in Brahmanbaria district of Chittagong Division. Akhaura Township located at the northern part of the upazilla with an area of 9.76 Sq.Km. (Vide **Map 2.1**). The Paurashava is comprised of 9 wards and 8 mouzas. Akhaura Paurashava is located at Akhaura Upazila of the Brahmanbaria District. Geographically it is located between 23°47'and 23°54'north latitudes and between 91°07 and 91°15' east longitudes (**Vide Map 2.2**). Total area of the Paurashava is found **9.76 Sq. Km** (2411.32 acres).

Present Population of Akhaura Paurashava is found 36262 (BBS 2011) whereas it was 32374 during the year 2001 (BBS 2001). Nothing is definitely known about the origin of the Upazila name. It is said that in the long past one Tippera king named Radha Krishna Manikkya established a temple meaning Akhra in Bengali at the present area of the upazila. In course of the time the word Akhra turned into Akhaura due to phonetic corruption. It is generally believed that the upazila might have derived its name Akhaura from Akhra.

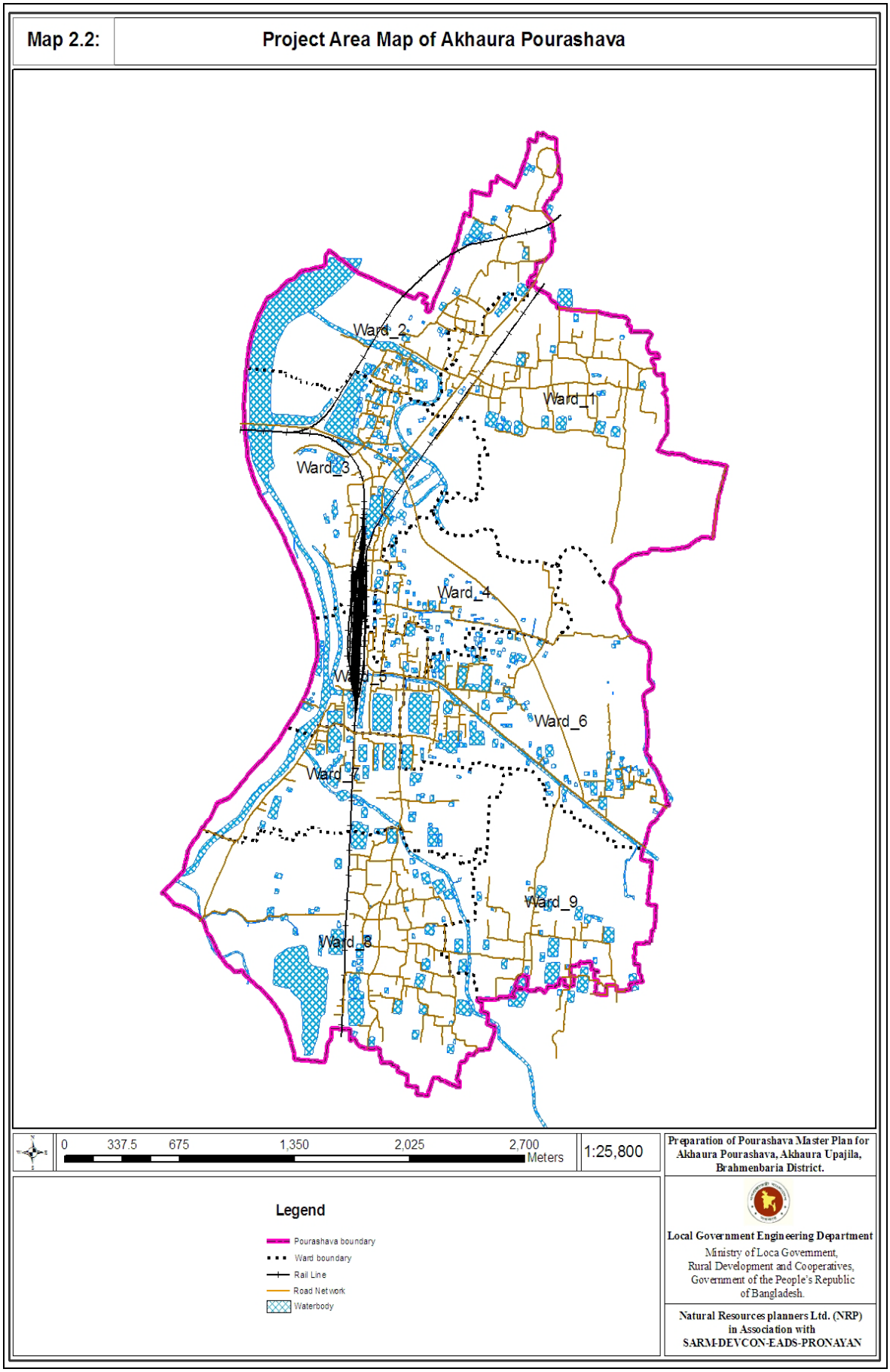
Akhaura Paurashava as well as the Upazila is connected within the region by both road and railway network. The Paurashava is well connected with different regions of the country by road network. Brahmonbaria-Comilla National Highway passes through Akhaura Upazila and the paurashava is connected by Akhaura Town bypass to the national highway. Akhaura is an important Railway Junction of Bangladesh. Chittagong, Sylhet, Mymensingh and Dhaka are connected through this Junction. A railway link between Agartala, India and Akhaura has been approved by the Government of Bangladesh and India in September 2011.

It can be said that Akhaura Paurashava can act as the gateway to the land port for Agartola (India). So its importance lies on connecting the capital of the country Dhaka with Agartola land port. Therefore, Akhaura Paurashava carries immense national importance. Like other fast growing Towns, Akhaura Paurashava also demonstrates similar symptoms of ills of urbanization such as, sprawl development, housing crisis; lack of provisions for piped water supply, sanitation, drainage and also facing the problems like lack of physical infrastructure, lack of development control regulations. Though the Town exhibits a fast rate of urbanization compared to other growing Upazila Towns, it is therefore, necessary to take up appropriate early measures before the problems become acute and difficult to address. It is expected that a minimum level of planned development can be ensured particularly in the field of drainage and road infrastructure development through working out workable urban development plans and development control.

During demarcation of planning area for Structure Plan, the urban development along both the sides of major road network and around the market places was given importance.



Map 2. 1: Location Map of Akhaura Paurashava



Map 2. 2: Project Area Map of Akhaura Paurashava

2.2 Philosophy of the Master Plan

The philosophy behind the Paurashava Master Plan lies in the very motive to community welfare through a process of spatial organization, environment improvement and provision to the future generations. Without any plan, urban development is likely to result in inefficiencies and inequalities. The purpose of the Paurashava Master Plan, like other urban plans, is therefore to reduce inefficiencies and inequalities.

Akhaura Paurashava has the best opportunities to connect with surrounding Upazilas and Districts by both Road way and rail way networks. Akhaura rail-way junction serve the region as mass transit and its importance lies on connecting the whole country. The strategies importance of Akhaura Paurashava is also very high as the Agartola land port is located in the locality. Therefore, Akhaura Paurashava carries immense national importance.

Akhaura Town Bypass Road passes through the middle portion of the Paurashava. So its importance lies on connecting nearby Upazilas and Akhaura landport. On the other hand, Akhaura has strong Railway and roadway connectivity with Sylhet, Chittagong, Bhairab, Dhaka, Narsingdi etc. area. Therefore, Akhaura Paurashava carries immense national importance. The project area is one of the important centers of economic activities within the eastern region. On the other hand, as it is located adjacent to the Indian border and it contains one of the major land port of the country, it can be trated as the agglomeration of economic centre.

It is expected that within 20 years allied important activities will be located in the Paurashava jurisdiction if any investment uses for the infrastructural development to improve Road, Drains and provision of all other Urban Facilities. Considering these views, the plan is being prepared with specific provisions of zone wise Plan policy, Implementation strategies, critical planning issues, strategies and policies as a guideline and after all development control for the development of private housing estate, land use etc.

Urban development is essentially an activity carried out by the private sector. Government plays an important role in the process – through provision of urban infrastructure, provision of community facilities and its own land development activities. Master Plan will provide an overview and guidelines of future development for Akhaura Paurashava.

2.3 Vision & Objectives of the Structure Plan

Vision:

Preparation of Paurashava Master Plan for Akhaura Paurashava under Upazila Towns Infrastructure Development Project (UTIDP) of LGED requires that one of its productions is an inclusive set of plans. The Structure Plan sets out a long-term strategy – covering the twenty years from 2011 to 2031 for urban development and the use of land in the Paurashava Town as a whole. The vision of the Plan is to create an urban physical environment, future generation that would not only be sustainable for living area enjoying but would also support to the economic prosperity of Town itself and for its hinterlands. The proposed set of plans consists of Structure Plan, Urban Area Plan and Ward Action Plan.

Structure Plan (SP) evaluates the development potentials aiming to offer maximum benefit to the people set up wide range long term sectoral goals, policies and general proposals for spatial as well as methodological development.

Objectives:

Structure planning is a tool for managing the effects and demands of development or re-development in an integrated, holistic and orderly way. To guide long term growth within the Structure Plan Area by means of demarcation of the future growth areas and indication of potential locations of major development areas includes: a) indication of important physical infrastructure; and b) setting out policy recommendations for future development. According to the ToR, following objectives have been identified as the basis of the Plans for Akhaura Paurashava.

To ensure accommodation for future population growth and economic activities: The principal objective of preparing this set of Plan for Akhaura Paurashava is to ensure that the Town transform into a place where people will like to "Live" and "Invest".

To guide the spatial distribution of urban development: Development in Akhaura Town is mostly taking place without appropriate arrangement of access and drainage. These facilities will be very difficult to put in place later. Therefore it is important that guidance is available on spatial distribution of urban development, so that, infrastructure are provided with better utilization of scarce resources.

To extend the provision of urban services and facilities: The need of urban services and facilities are already far greater than available. The expected growth of population and economic activity will make the situation worse. Given the scarcity of resources, priority also needs to be given to identify and introduce low cost methods of supplying services and facilities. To ensure effective utilization of resources multi-sectoral investment program has to be developed based on priority issue.

To ensure higher productivity and value addition to the existing products and services generated through the agro-sector, reverie network and the wetlands:

Akhaura Paurashava has a very attractive physical setting with Titas River, Canals, Ponds and agricultural hinterland. The town is the administrative center of the Akhaura Upazila and also the gateway to Agartola (India). In Akhaura Paurashava main primary occupation is Agriculture, Fishing and Farming. The main agro base products are Rice, Maize, and other home base crops like Potatoes, pulse, nuts etc. A vast acres of land is used for agricultural purpose in the Paurashava. But due to the absence preservation facilities the farmers could not preserve their agro product. So, for agricultural development special attention should be given to preserve the agricultural land transportation and preservation facilities for the agro-product produced in the area. Due to the existence of a number of a river, canals and ponds in and around the Paurashava, fishery has become a vital factor for the livelihood and economy of the region. So far this potentiality is limited to only fish catching and transportation. Measures should be taken to preserve and restore the physical characteristics and water quality of rivers, canals and water-bodies so that fishery industry can develop to its full potential through higher production and higher value addition.

To conserve common resources across the sector: Conservation of natural resources and protection of the cultural heritage of communities are some of the major issues for preparing plan for Akhaura Paurashava. In the quest for profit and economic growth, the patrons of free market usually demeand almost every other aspect of human life. Therefore Authority must take initiatives to protect and promote conservation of common resources like natural resources and heritage sites.

2.4 Structure Plan Area

The total area of Akhaura Structure Plan is 2429.7 acres where 18.38 acres of land is set as the Outside Circulation network. So the ultimate Structure Plan area is 2411.32 acres (9.76 sq km) that include total area of Akhaura Paurashava Jurisdiction Boundary (vide **Map 2.2**)

Chapter Three:
Paurashava Existing Trend of Growth

3.1 Social Development

The social development mainly deal with issues concerning the delivery of services pertaining to education, health, Marital Status, Religious Status, Occupation, Income level of the household, Social Welfare, Safety, Culture etc. which relates with the demographic characteristics of the area.

Demographic Profile

Total Population of Akhaura Paurashava is 36262 (BBS 2011) and was 32374 in the year 2001 (BBS 2001). The average household size of the project area is about 4.87 in the Paurashava according to the BBS 2011 which was 5.5 in 2001.

Religious Status

According to latest population census report (2011), 90.83% of the population of this Paurashava belongs to Muslim community and 9.16% to Hindu community. Population belonging to other religion such as Buddhist are very insignificant in number.

Marital Status

of the total male population (Among 10 years and above), 42.7% are unmarried and 56.4% are married (BBS, Population Census-2011). of the total female population (Among 10 years and above), 28.2% female of are unmarried and 63.8% are married. Among that male population, a small portion comprises with widowed and divorced. Among the total female population, 7.7% is found widowed and 0.4% is found widowed.

Educational Status

Literacy rate of Akhaura Paurashava is about 62% (BBS 2011) which was about 56% in the year 2001. In the Paurashava, 2 (two) public colleges, 4 (Four) secondary school and several public and private elementary schools exist.

Health Facilities

One Upazila Health Complex, one Railway Hospital and several private clinics and hospitals exist at the jurisdiction of the Akhaura Paurashava.

Safety and Security

The relative law and order is not only an existing potential for attaining well-being of the inhabitants of the Paurashava but also an important asset for attaining economic developments. According to Akhaura Police Station, a low crime rate is observed among the Paurashava.

Existing organizations for Social Welfare

Various civic organizations (both public and private) also exist and play there active roles for the welfare of the inhabitants of Paurashava. Some NGOs are working with their offices at Akhaura Paurashava and. Department of Women Affair, Bangladesh Rural Development Board (BRDB) and Upazila Youth Development office are also playing their vital roles for the socio-economic development of Paurashava.

In **Table 3.1** summary of the inventory of all existing facilities in the Paurashava has been shown for socio-economic development.

Table 3. 1: Summary of the Inventory of all existing Social Development Facilities in the Paurashava

Type of Facility	Number of Units
Health Facilities	Akhaura Upazila Health Complex Bangladesh Railway Hospital Al Nasir General Hasapatal And Daiagonistic Center Pvt. Ltd. Upazilla Animal Hasbendary office
Schools	Kindergarten/Nursery School-4 Primary School-7 NGO School-6 High School-4 Madrasa and Moktob-14 College-2 Research Institute-1 Technical College-1
Protective Services	Police Station-2 (Akhaura Thana) Police Inspector's office
Others	T&T office Flood Shelter Bangladesh Railway Akhaura Upazilla Election Commission office Upazilla Headquarter NGOs-3

Source: Physical Feature Survey by NRP, 2010

Migration Pattern

Migration is one of the most important aspects when analyzing the demographic pattern of a place. From the socio economic survey, about 6.7% of total migrated households were found migrated in the Paurashava from outside the Zilla. Again 73.3% of these migrated households were found to be migrated within the Upazila and 20.0% were found migrated from the places within the district. The major reasons for migration are, search for better occupation (35.7%) and business opportunities (28.6%) and service or landlessness reason (14.3%).This reflects that still no such economic activities have been developed in this Paurashava to attract people from other places.

Monthly Income and Expenditure of the Household

The income and the expenditure pattern of an area is the index of the socio-economic status of that area. The data collected through household survey shows that most of the households fall in the low to middle income group. About 67.0% of the total surveyed population is in the income level up to BDT 15000. The income level BDT 50000 and above comprises very low percentage (3.1%) of the households in the Paurashava. The Survey also reveals that in most of the cases households have to spend all their earnings without any savings. People, earning more than BDT 20, 000, can save negligible portion of their earnings. The Paurashava is yet to develop sufficient economic activities to ensure its residents better living.

3.2 Economic Development

Akhaura Paurashava is relatively a small urban area with a vast hinterland of agro based rural area. Therefore agriculture based trade, commercial and industrial activities are the main economic activities of the Paurashava. In the following sections a succinct picture has been tried to draw about the economic activities of the Paurashava.

Industry

The number of medium and small industries is increasing gradually in Akhaura Paurashava. However, several categories of non-farm enterprises/industries have been found in the project area. It is to be mentioned here that industrial units like, Rice Mills, Bakery, Furniture Factories, Saw Mills, Husking Mills, Ice Factories, Small Engineering Workshops etc. are operated in the project area. Ward No. 5 contains the highest amount of industrial land (29.566% of total industrial land of Paurashava). Ward No. 1 contains 20.88% and Ward No. 7 contains 14.82% of total industrial land of the ward. Ward No.

4 contains the lowest amount of industrial land (3.11% of total industrial land of the ward). No such mentionable large scale industries are found in the Paurashava.

In the project area, **Agro-based industries** account to around 71.33 percent and **Food-based industries** accounts to 28.67 percent share of the total running industries. Therefore, total share of the agro and food based industries occupy around 87.37% percent share, which is very much logical because agriculture sector dominates the economy of the project area.

It has been observed that, 90 percent factories produce solid wastes. Saw mills and Rice mills produce sawdust and rice-bran respectively. Rice mills themselves use substantial amount of waste produced by them in their boilers while local residents use the entire amount of sawdust as kitchen fuel. Rice-bran is also used for production of Fire Wood. It has been found that wastes produced by them are not treated.

Industrial sectors of Akhaura Paurashava have both problems and potentialities as most of the industries in the study area depend on raw materials available within the region. Careful consideration will help to resolve those problems and adoption of necessary policy initiatives will help to flourish the existing units and draw more investors and entrepreneurs to set up new manufacturing industries, which will be based mainly on local agro-products.

Commercial Enterprise

Commerce is a branch of business which is concerned with the exchange of goods and services. It includes all those activities, which directly or indirectly facilitate that exchange. Major portion of trade and commerce of the project area is conducted through the bazaar, where agricultural products, consumer items and other farm and non-farm items are traded. The main commercial activities of the study area are accomplished through Kitchen Market, Godown, Grocery Shops, Engineering Workshop, Husking Mill, Furniture Factory, Saw Mill etc. In the project area, activities of wholesale and retail trade; hotel and restaurant; transport, storage etc. are conducted in bazaar area and Railway junction area. Therefore, the bazaar and the railway junction has significant role on the economy of the project area. The bazaar and railway junction of the project area also has the significant role to provide good number of employment and act as the economic center for the area. Again from the Household Survey business shows the dominant occupation as is revealed and percentage of the people in this occupation is 14.1%. Maximum commercial structures are concentrated at Ward No.5 (46.60% of total commercial land of Paurashava), where the Akhaura bazaar and markets are located. Akhaura Bazaar is the center of economic activities in the project area.

Due to existence of only one bazaar area in the central location people of all over of the Paurashava has to come to the central area for various needs. Therefore, neighborhood markets have to be established to provide buying and selling the local goods to the local market and also to reduce the traffic activity to the town center.

Agriculture

In Akhaura Paurashava main primary occupation is Agriculture, Fishing and Farming. According to BBS 2011, about 26% households are found to depend directly on agriculture, as the main source of income and about 50% of total land of the Paurashava is used in agricultural purpose in the project area. All the project area is basically agrarian in nature. Major agricultural products of Akhaura Paurashava are Paddy, wheat, potato, onion, garlic, chilli and vegetables etc. Fisheries, dairies, poultries sub-sector also contribute significantly to the economy through providing employment, especially employment to women of the rural areas at homestead level. Household based dairy, poultry in the villages under the project area is a subsidiary source of family income which is mainly run by the women like elsewhere in Bangladesh. Mini-poultry farms are found flourishing in the project

area and farm poultry i.e. broilers being cheaper than native chicken; there are a good number of consumers especially in the lower income families.

So, it is imperative that the agriculture sector in the project area should be nourished through providing a vegetable market for easy marketing their In order to reap maximum benefit from agriculture, attention has to be given so that high value agricultural lands are not invaded by urbanization.

Informal Economic Sectors

In the project area congregation, such informal sector activities are found concentrated. Informal sector Economic Activities of the project area covers a variety of activities and a substantial number of unskilled Labor forces are engaged in this sector. Informal sector economic activities cover a lot of activities which may broadly be classified under Trading and Services activities. Various types of mobile or immobile sales of items like food, fish, nuts, vegetables, daily household items, old cloth/garment; repairing of household gadgets, electronic items like radio, television etc. and services like hair cutting, shoe polishing, repairing, etc. are considered as informal economic activities. In the project area informal entrepreneurs mainly perform their business in Akhaura Bazaar area and Akhaura Rail Station area. Mobile sales of various products are dominant here due to the presence of Akhaura Railway junction. Males overwhelmingly dominate the informal sector in the project area. The informal sector of the project area is mostly run by the 15-50 age groups. of the various occupations, trades included sale of various food items, clothes, vegetables, meat, seed, medicines etc. and services included haircutting, shoe repairing, mobile phone servicing, tailoring etc. Most of the consumers of the informal sector are from middle-income group. It has been found all Informal entrepreneurs run their business throughout the year.

Employment

In Akhaura Paurashava main primary occupation is Agriculture, Fishing and Farming. According to the BBS report 2011, total work active population found 6853 (18.90 % of total population) where only 6.49% of total population found involved in direct employed in agriculture, Industry and other service sectors (vide **Table 3.2**). among the work active population people engaged in agriculture. Industry and Services sector found 8.89%, 0.93% &24.53%.

About 12.41% of total population found Unemployed who are work active. 0.79% of work active population found looking for works, 39.76% of work active population involved in house hold works (major portion are female population) and 25.10 % of work active population do not works. A most important factor of Akhaura population is around 66% of work active population are unemployed which indicates that initiatives should be taken in Akhaura Paurashva for employment generation is a crucial need.

In Akhaura Paurashava a number of households do secondary jobs seasonally to raise their family income and this kind of jobs include, day labouring, small business, farming and similar other occupations. Mostly the low income groups take secondary occupations during off season when they do not have any regular jobs.

The overall economic activity patterns of the Paurashava have been shown in the **Table 3.2**.

Table 3. 2: Existing Employment Scenario of Work Active Population (Population aged 7 years and above not attending school)

Pop. 2011	Population aged 7+ & not attending school			Work Active Population Employed				Pop. 2011			
	Employed	Unemployed		Employed	Unemployed		Employed	Unemployed		Employed	Unemployed
36262	2354	4499	36262	2354	4499	36262	2354	4499	36262	2354	4499
%	% of Total Population			% of Work Active Population							
	6.49	12.41		6.49	12.41		6.49	12.41		6.49	12.41

Source: Community Series (Zila: Bahmanbaria), Bangladesh Population Census-2011.

3.3 Physical Infrastructure Development

The growth started adjacent the Bazaar area and Akhaura Railway junction area. Growth direction indicates that the Middle-West part of the project area is having higher concentration of development and therefore surrounding areas of the bazaar and railway junction area of Akhaura Paurashava are highly dense and this area is identified as the core part of the Paurashava. Therefore physical development of the project area is taken place in the area centering the market place and railway junction.

Buildings and Structures

In the project area total number of building structures found 10774 and among those structures residential structures are found to be highest (90.47% of total structures). Most of the structures of the project area are one storied (97.43%) and Katcha (72%).

Out of 10759 structures in Akhaura Paurashava only 324 nos. are commercial structures. Among these 91.67% structures are one storied and 6.48% are two storied and the rest storied buildings altogether are not more than 1.85%. Most of the commercial structures are Semi-Pucca (37.04%), followed by katcha (31.79%) and then pucca structure (31.17%). Maximum (46.30%) commercial structures are concentrated at Ward No.05 which also belongs to the core area of the Paurashava.

Administrative structures of Akhaura Paurashava are mainly located in Ward No. 5 and 9 but Ward No. 5 shows the highest concentration of administrative buildings. Upazilla Head Quarterares, Akhaura Thana and Pauroshava office is located at Ward No. 06 and Ward no. 05 respectively. Most of the industrial (33.96%of total industrial structures) structures are in Ward No. 5. The core area of the town is dominated with Pucca structures and these are mostly found in Mishrail Mouza and Akhaura Mouza . Settlements with semi-pucca and Katcha structures are scattered throughout the entire Paurashava (vide **Map 3.1**).

Transport and Communication

There are 63.26 km. of road network found in the project area out of which 37.95km is Pucca, 15.37 km is semi-pucca and rest 9.94 km is Katcha (Physical Feature Survey, 2009-2010).

Along with roads railway is a mentionable way of transportation of Akhaura Paurashava. Akhaura railway station is one of the most important railway junctions of eastern part of Bangladesh, Chittagong, Sylhet, Mymensingh and Dhaka are connected through this Junction and it is also a gateway to Agartala, Tripura, INDIA -only five Km away.

In total 64 Bridges and culverts are found in the local roads of the Paurashava among those 19 bridges, 43 culvarts and 2 railway bridges exists. 1 railway over bridge also exists in the project area.

Other important feature of the physical growth pattern of the project area is most of the physical developments have taken place in elongated form along the major roads such as Akhaura Town Bypass road, Checkpost Road, Chandiura Road, Shahid Edon Khan Road, amir Hossain Road, Sahid Sarafat Ali Road, Durgapur Road and Taragaon Road. Dhaka-Chittagong Railway Line passes from North to South direction and intersects Akhaura .

To meet the future demand, road linkage with pedestrian facilities and widening the roads have to be provided to develop the traffic and transportation situation of the Paurashava.

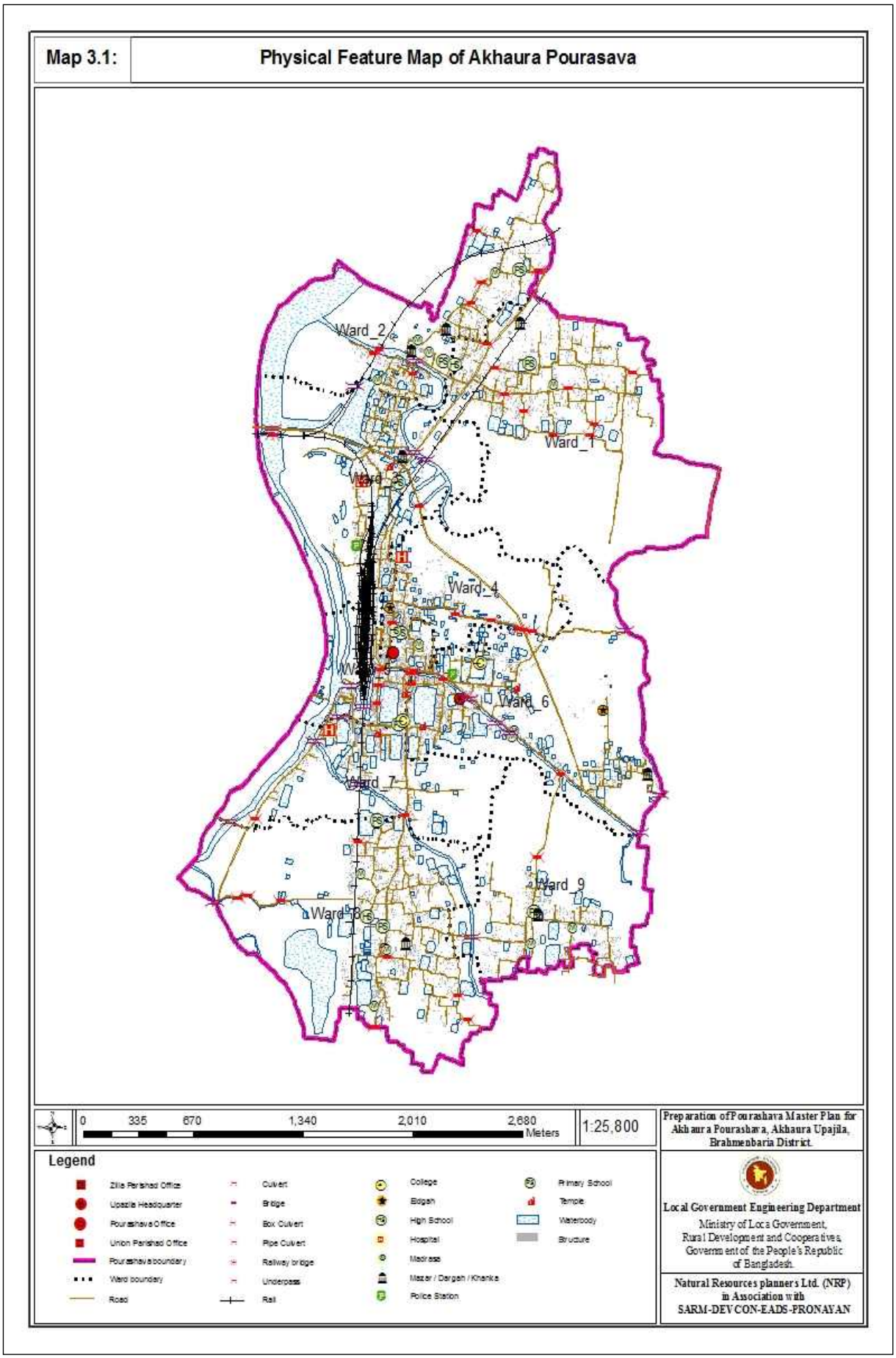
Traffic conflicts have been identified in the Paurashava due to lack of formal Bus-terminal, Tempo stand, Rickshaw stand, Parking Facilities and lack of Walkways.

Drainage Infrastructure

In Akhaura Paurashava, total length of constructed pucca drain is 13.3 km Most of the drains are constructed in isolated piecemeal manner and hence there is no continuity and existence of a connected network. Maximum drains outfall of Akhaura Paurashava are in some khals and river. Different road side area in Ward No. 2, 3, 4, 5 and 7. has been found the main place of encroachment of major canals and rivers. Titas River works as the main outfall of two major khals CNB and Shondha Tara Khal which are working as the outfalls of other tertiary and secondary drains.

3.4 Environmental Growth

Growing population implies growing demand for basic amenities of life such as food, clothing, shelter, health care, education and entertainment and on the output side, environmental qualities are being deteriorated continuously. Thus the growth process is physically constrained by the stock and flow of natural and environmental resources. Akhaura Paurashava is almost similar to any other typical Paurashava of Bangladesh. Among the identified issues of probable threat and risk, drainage problem and improper solid waste management are mentionable.



Map 3. 1: Existing Physical Feature Map of Akhaura Paurashava

Air pollution in the project area has become a serious health concern as a huge fleet of trains and other motorized vehicles emits toxic substances such as carbon monoxide (CO), oxides of nitrogen (NO_x), oxides of sulphur (SO_x), hydro-carbons (HC) and their derivatives, lead, and particulate matter. Together they cause serious irritation and infection of eye, nose, throat and lungs.

There is no provision of solid waste management system in the Paurashava. These wastes are left unattended and Part of these wastes either remain on the street or nearly open ground. Some of these wastes flow to the open drains and block the normal drainage flow. As a result water logging occurs which sometimes disrupts the normal urban life for days during monsoon. The leachate from open garbage dumps produced in rainy season causes surface water pollution around the dumping sites. Leachate from refuse which is dumped on relatively permeable soil may percolate into ground and create severe ground water pollution. Besides these There is no sewerage system in the project area.

Storm water of Akhaura Paurashava usually drains out through some natural drainage (e.g. creek and khal). But during the last few decades most of these natural drains are either filled up or encroached by human intervention. Narrow surface drains replace some of them. But the overall drainage system in the town has not been developed and maintained properly keeping in pace with urbanization The Paurashava has good natural drainage system which could help to design a proper drainage master plan. The Western part of Akhaura Paurashava is adjacent to the Titas River. A small branch of Titas River is also flowing through the Paurashava from West to East direction. The well known canals of the Paurashava are CNB Khal and Shondha Tara Khal.There are also many others small and narrow canals in the Paurashava. Apart from these canals, large number of ponds (288) ditches (97) are observed in the Paurashava area covering an area of 306.94 acres. These resources are currently being utilized for domestic, agricultural purposes. These resources are the “life blood” of the area and should be the target of environmental programs. The felt effect of water shortages can be used as the motivation to generate community participation in future water and watershed conservation efforts.

Proper measures should therefore be taken to minimize the adverse environmental impacts on land, water and air quality; preservation of biodiversity; sustainable and green transportation and waste management- both domestic and industrial; slum improvement, disaster mitigation etc. Proper enforcement of Paurashava ordinance and environmental acts is an imperative in this regard. The planning management and enforcement functions of the Paurashava need to be strengthened through providing appropriate trainings to its administrative, technical, and managerial staffs.

3.5 Population

According to the Population Census, 2011, total population of Akhaura Paurashava is about 36262 and the density of population is about 3716 persons/ sq.km. Population scenario of Akhaura Paurashava has been shown under the following **Table nos. 3.3. and 3.4**.

Table 3. 3: Population Scenario Akhaura Paurashava

Year	Population of Akhaura Paurashava			Area (Acres)
	Male	Female	Total	
2001	16558	15816	32374	2411.32
2011	17855	18407	36262	

Source: Compiled from BBS (Community Series, Brahmenbaria District) Census Reports (2001 and 2011)

Population density (gross) of the Paurashava area is found 15 population per acre (ppa) where as it was 13 population per acre in the year 2001. The highest density exists in Ward No. 5 and then lowest is found in the Ward No. 3. Maximum number of households found in the ward no 06 whereas minimum number is found in the ward no. 09 according to the BBS 2011.

Ward wise distribution of Population, household size and Density have been shown in the **Table 3.3**.

Table 3. 4: Ward wise Population, Household and Density, 2001

Ward No.	Population	Household	Density (ppa)	Density (Per Sq. km)
1	5137	1065	12	2950
2	3181	659	12	3046
3	3334	710	11	2792
4	3830	797	27	6755
5	2958	624	33	8151
6	5800	1213	18	4325
7	3767	783	20	4819
8	5158	1007	12	2964
9	3097	595	13	3140
Total	**32374**	**7453**	**(Average =) 15**	**(Average =) 3716**

Note: Community Series (Zila: Brahmanbaria), Bangladesh Population Census-2011

Size and Type of Family

The average household size of the project area is about 4.87 according to the BBS population Census, 2011. The family size consisting of 4 members is found highest (21.3%) and the family size of 5 members found second highest (19.6%) in the Paurashava. The family size consisting of 1, 2, 3, 6, 7,and 8+ are respectively 3.4%, 8.3%, 15.9%, 13.4%, 7.8% and 10.5% (BBS 2011).

Age wise Population

It is observed that young and workable population is highest than any other aged group population in all off the Wards of the Paurashava (BBS-2011). Age-group 0-4 comprises 11.7%; age-group 5-9 comprises 13%, age-group 10-14 comprises 12.3%, age-group 15-19 comprises 9.9%, age-group 20-24 comprises 9.2%, age-group 25-29 comprises 8.4%, age-group 30-49 comprises 22.6%, age-group 5-9 comprises 13%, age-group 60-64 comprises 2.6% and 65+ years comprises 4% of the total population of the Paurashava.

3.6 Institutional capacity

Main responsibility of a Paurashava to execute the administrative section and providing services, slum upgrading, infrastructure development and licensing of non-motorized transport within its jurisdiction. To perform the responsibilities efficiently as prescribed in the “Local Government (Paurashava) Act, 2009” existing capacity of the Akhaura Paurashava administration is not sufficient. The responsibility may be categorized as two broad heads named Revenue Collection including Budget Preparation and Services Delivery. Three types of management system are involved with those two responsibilities and they are Top Management, Middle Management and Supervisory Management. A general scenario is found in those three category management system of the Paurashava i.e. lack of efficient manpower. Shortage of technical manpower in the Paurashava is also an administrative problem.

Efficient urban governance for various administrative purposes and delivery of services to meet the basic needs of the people at local level is of paramount importance. A Paurashava consists of a Mayor, a number of councilors (fixed by the government) in the general seats and one third of the total number of councilors as reserved seats exclusively for women. The women councilors in the reserved seats would represent one from every three wards. The Chairman and councilors and women councilors of a Paurashava are elected by direct election. The Mayor and councilors are paid an honorarium fixed by the government.

Akhaura Paurashava has to depend on 5 personnel in the Engineering section and 14 personnel in the administrative section.

Table 13. 1: Allocated Manpower of a class "C" Paurashava and existing manpower in Akhaura Paurashava

No.	Department/ Section/ Designation	Allocated Manpower for C class Paurashava	Exists in Akhaura Paurashava	Existing Manpower Percentage (%)
Engineering Department		32	5	15.63
Executive Engineer		1	0	0
Asst. Engineer		1	1	100
Sub- Asst. Engineer		3	2	66.33
Other Staffs		27	2	7.41
Administrative Department		34	14	18.92
General Section		14	0	0
Accounts Section		4	3	75.00
Assessment Section		3	1	33.33
Tax Collection/ Licensing Section		10	1	10.00
Market Inspection Section		3	1	33.33
Education/ Cultural/ Library Section		18	0	0
Health, Family Planning and Sanitary Department		**22**	**3**	**13.64**

Source: Akhaura Paurashava, 2010.

The **Paurashava Building** is located by the side of Railway Junction just walking distance from the Railway Station. Akhaura Paurashava building is a Single storied building, is using as administrative building of the Paurashava. Some other government services, residential and commercial development is just adjacent with the Paura Building.

3.7 Urban Growth Area

The core part of the Paurashava lies along with the railway junction, where the maximum number of commercial, administrative and institutional structures exists. This area consists of Ward No. 5 and part of Ward Nos. 3, 4, 6 and 7. Most of the commercial structures are concentrated in Ward No. 5 which is the core area situated in the. Most of the markets and katcha bazars are located in Ward No. 5, which also belongs to the core area. Most of the Government offices are allocated in Ward No 6 of the paurashava. A potential urban growth area is found just outside the core area of the paurashava. Growth pressure is low in Ward Nos. 1, 2, 8 and 9 respectively.

3.8 Catchment Area

Entire Upazila for given services by the Paurashava are the catchment area of Akhaura Paurashava. The Paurashava area playing important roles serving by provision of a Bazaar area, Shopping Malls, Akhaura Railway junction, Marketing of agricultural commodities; various supportive administrative activities for entire Upazila, and movement of dwellers for rendering services.Due to the presence of Akhaura Railway junction, Akhaura Paurashava has the strong connection both Capital City Dhaka and Port City Chittagong and other part of the country. From the Paurashava, strong communication exist through both Road ways and Rail ways to all over of the Country.

3.9 Land Use and Urban Services

3.9.1 Land Use

Total existing area of Akhaura Paurashava was found to be 2411.32 acres and existing landuses have been categorized based on functional activities of Akhaura Paurashava. **Table 3.5** shows the current Land Use of the Paurashava according to its functional activity such as residential, industrial, commercial, agricultural, open space, vacant land, water body etc.

The major land use type of the Paurashava is **agriculture** which covers 1206.44 acres (50.03%) and lowest landuses found in the uses of Government Services, Service Activity, Non Government Services, Recreational Facilities, Transport and Communication, Miscellaneous / Others (Vide **Table 3.14**).

Table 3. 5: Ward-Wise Land Use Information of the Project Area (Acre)

No.	Ward No. / Land Use types	1	2	3	4	5	6	7	8	9	Total	%
1	Agricultural	252.54	102.02	130.61	81.51	11.51	161.94	100.00	221.17	145.14	1206.44	50.03
2	Circulation Network	9.42	7.01	23.87	3.90	13.15	8.22	3.70	9.10	3.04	81.39	3.38
3	Commercial	0.98	0.52	0.69	0.27	4.38	0.73	1.48	0.24	0.10	9.39	0.39
4	Community Services	0.77	4.71	1.9	0.86	0.87	2.95	1.24	4.57	6.18	24.05	1.00
5	Education & Research	0.48	3.70	2.07	0.11	1.18	1.25	0.08	2.48	0.72	12.07	0.50
6	forest Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Government Services	0.00	0.00	1.03	0.00	0.91	1.52	0.04	0.00	0.00	3.50	0.15
8	Industrial/ Manufacturing Processing	0.26	0.12	0.05	0.04	0.37	0.17	0.19	0.06	0.00	1.26	0.05
9	Miscellaneous / Others	0.00	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.42	0.02
10	Mixed Use	5.22	0.40	0.15	0.58	1.38	0.58	1.36	0.38	0.07	10.12	0.42
11	Non Government Services	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.13	0.01
12	Recreational Facilities	0.79	0.00	0.00	0.19	0.40	2.43	0.00	1.49	0.96	6.25	0.26
13	Residential	122.95	59.61	52.16	40.43	24.91	95.70	47.48	120.88	64.87	629.00	26.09
14	Restricted Area	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	Service Activity	0.19	0.27	0.08	0.11	0.28	0.21	0.05	0.18	0.04	1.42	0.06
16	Transport and Communication	0.00	0.00	1.03	0.01	1.92	0.01	0.12	0.07	0.00	3.16	0.13
17	Urban Green Space	25.01	28.41	17.09	5.45	4.85	9.69	7.64	10.55	7.46	116.15	4.82
18	Vacant Land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	Water body	11.60	51.31	64.30	6.64	23.16	45.97	29.78	58.72	15.10	306.58	12.71
Total		430.28	258.07	295.04	140.10	89.67	331.36	193.17	429.95	243.68	2411.32	100.00

Source: Land Use Survey by NRP, 2009-2010

Existing total **residential** land of Akhaura Paurashava is 629.00 acres, which is about 26% of total area. Ward Nos. 1 and 8 contain the highest amount of residential land use (19.55% and 19.22%) where as Ward No. 5 covers the lowest percentages (3.96%) of residential lands.

Total **commercial** land of Akhaura Paurashava is 9.39 acre, which is 0.39 % of total Paurashava area. Ward No. 5 contains the highest amount of commercial land use (46.60% of total commercial land of Paurashava). Ward No. 9 contains the lowest amount of commercial land use (1.04% of total commercial land of Paurashava).

Total **educational** land use of Akhaura Paurashava is 12.07 acre, which is 0.50% of total area of the Paurashava. Ward No. 2 contains the highest amount of educational land (30.63% of total educational land of Paurashava respectively). Educational land use more or less comprises all of the wards of that Paurashava.

Total **industrial** land of Akhaura Paurashava is 1.26 acre, which is 0.05% of total Paurashava area. Ward No. 5 contains the highest amount of industrial land (29.566% of total industrial land of Paurashava). Ward No. 1 contains 20.88% and Ward No. 7 contains 14.82% of total industrial land of the ward. Ward No. 4 contains the lowest amount of industrial land (3.11% of total industrial land of the ward). However, Ward No. 9 has no industrial land.

Water body comprising 12.71% of total land use categories observed in the Paurashava. Rest of the categories individually comprises very insignificant proportion of the total land available in the Paurashava altogether such as transport and communication is only 0.13%; community facilities purpose land use is about of 1.00% etc. Existing Land use Map have been shown in **Map 3.2.**

3.9.2 Urban Services

People of Akhaura Paurashava is facing serious problems by lack of basic urban services like lack of water supply, sanitation, drainage, recreational facilities, neighborhood markets, etc. Again, requirements of basic social services, public facilities and provisions of infrastructure are extending day by day as rapid growth of urban populations form previous decade to the coming decades. Akhaura Paurashava does not have any **water supply** system. Most of the residents of the paurashava use tube-well water for drinking purposes while deep tube-well and shallow tube-wells are used for irrigation

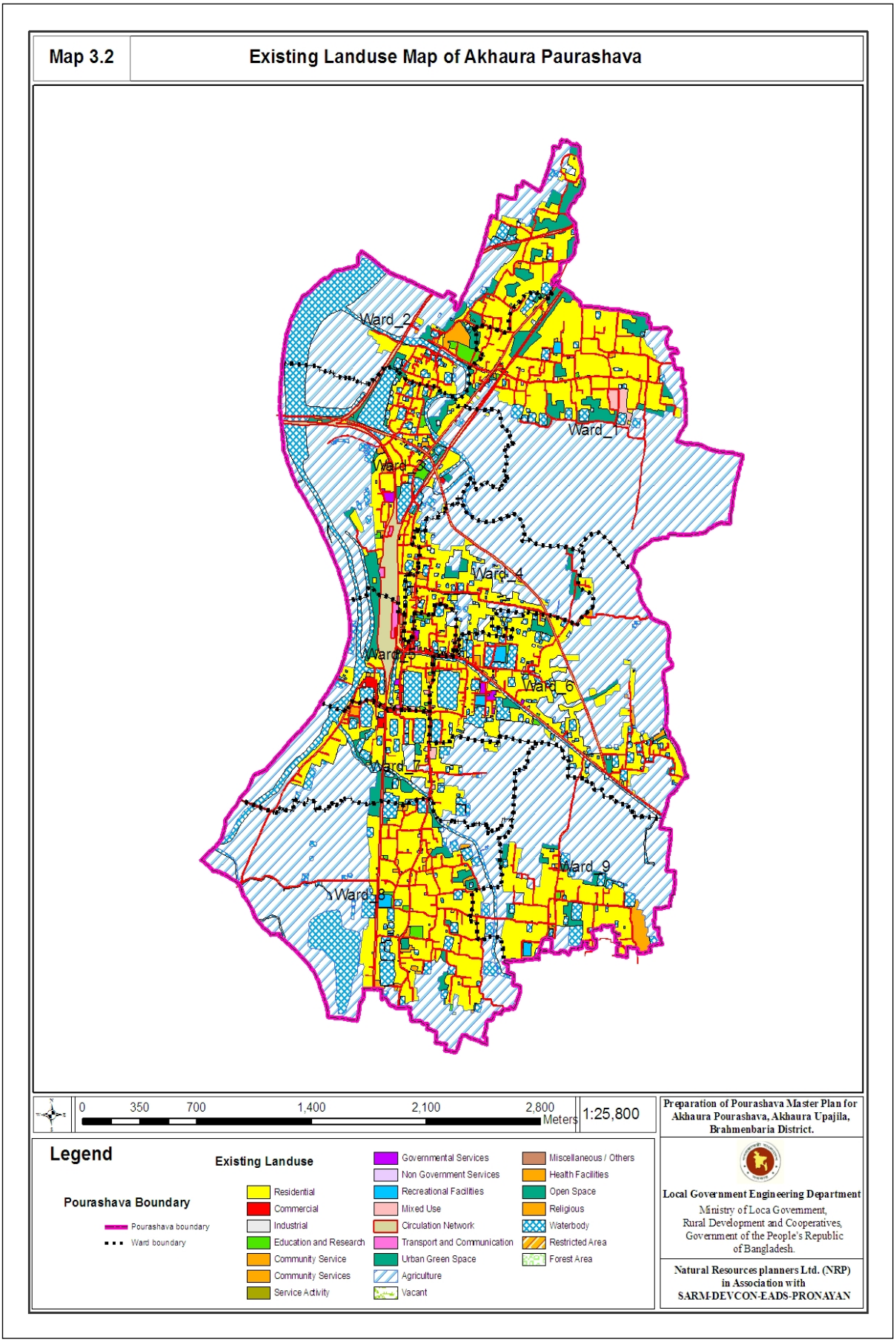
The **electricity** facility has first introduced to Akhaura during ’60 by Wabda. Later from ’61 REB is doing this job. There is no high voltage electric tower in this Paurashava. **Gas Supply** of Akhaura Paurashava mainly exists in the built up area (Middle portion of the Paurashava), which covers a little portion of total house hold. From physical feature survey it is found that 15.76km gas network available in Akhaura Paurashava. Ward Nos. 6 and 8 are fully covered by gas network. And small portion of other wards covered by Gas supply network. With the increase of households and also with the increase of commercial activities in future, the coverage of gas supply has to be extended over the entire Paurashava area to meet the growing demand.

Akhaura Paurashava has a conservancy department to manage the **solid waste** management system. The Paurashava has no solid waste disposal site of its own. Solid waste are normally dumped into low lying areas and besides of canals. The municipal authority could not take any measures to prohibit its inhabitant from indiscriminate dumping of solid wastes into the canals which results in blocking of drainage system.

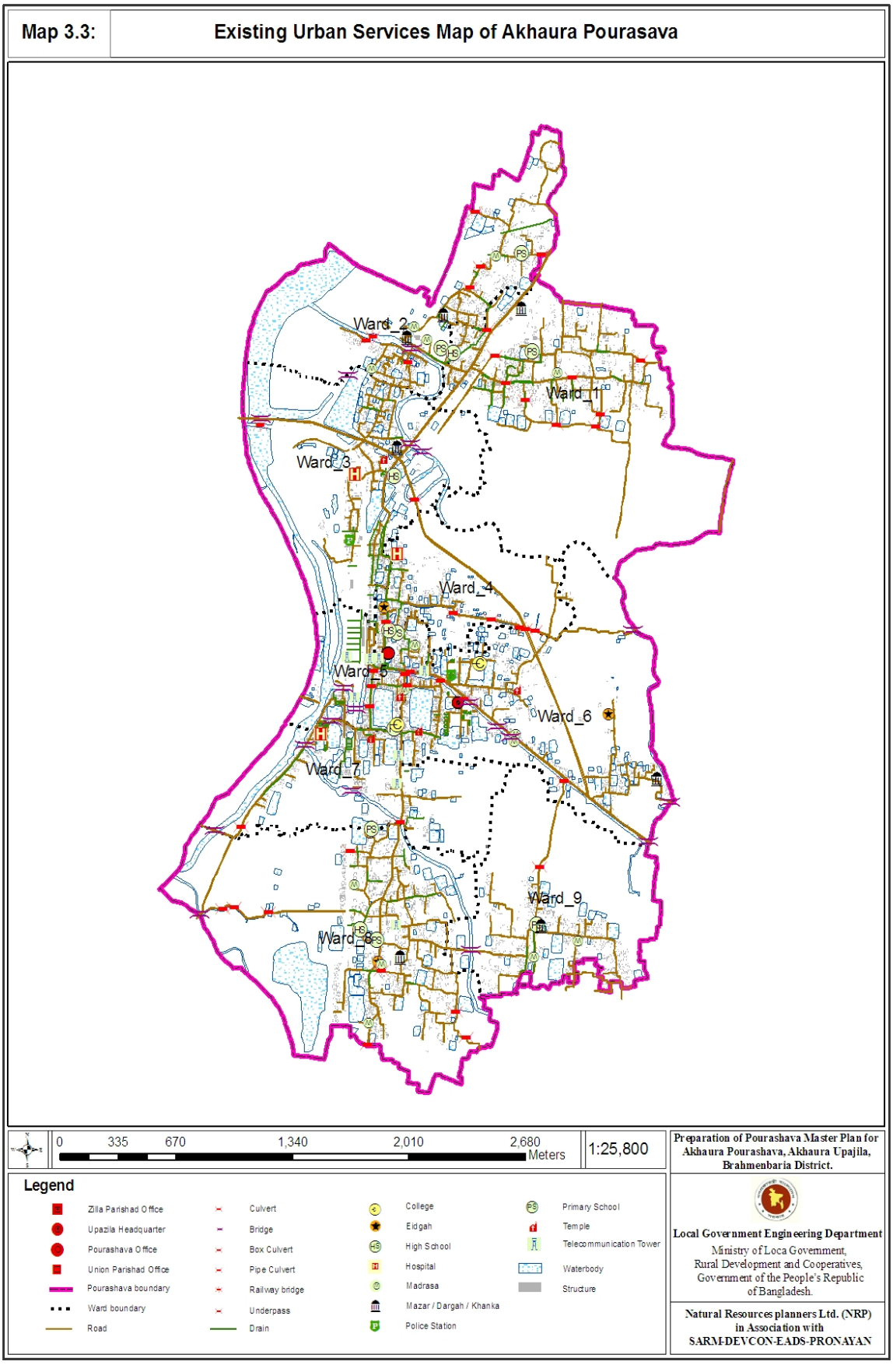
The **Telephone Exchange office** is situated in Ward No. 6. There are a very limited number of subscribers of BTCL telephone connections in Akhaura Paurashava for telecommunication facilities. Demand for land phone connections in the Paurashava has substantially reduced in recent years due to increased number of cell phone subscription.

Gas supply of Akhaura Paurashava mainly exists in the built up area (Middle portion of the Paurashava), which covers a little portion of total house hold (Core and Semi core area) of the Paurashava. From physical feature survey it is found that 15.76 km gas network available in Akhaura Paurashava. Ward Nos. 6 and 8 fully covered by gas network. And small portion of other wards covered by Gas supply network.

Existing Urban Services Map have been shown in **Map 3.3.**



Map 3. 2: Existing Land use Map of Akhaura Paurashava



Map 3. 3: Existing Urban Services Map of Akhaura Paurashava

3.10 Paurashava Functional Linkage with the Regional and National network

Regionally Akhaura Paurashava is located in Brahamanbaria District of Chittagong Division (vide **Map 1.1**). Akhaura Paurashava is located at the North-Western part of Akhaura Upazila. Akhaura Town Bypass Road runs through the Middle portion of the Paurashava. The Paurashava as well as the Upazila is connected within the region by both roadways and railways. The project area is one of the important centers of economic activities within the eastern region. It has long cultural and trading relation with Akhaura, Brahmanbaria, Narshindi, Muradnagar, Bancharampur, Kasba and Raipura. Moreover, these areas depend on each other for various raw materials and finished products. The long established easy transportation link has brought these areas closer in terms of trade and industrial activities.

Akhaura Paurashava has strong railway way network and is connected with the rest of the country. So its importance lies on connecting the capital of the country Dhaka with other regions.

Again the strategies importance of Akhaura Paurashava is also very high as the Agartola land port is located in the locality and Akhaura Paurashava will be developed as the Transit oriented development by connecting two countries (India and Bangladesh). Therefore, Akhaura Paurashava carries immense national importance. So the paurashva has a national as well as international importance considering the international trade and commerece.

Therefore, Akhaura Paurashava carries immense national and international importance.

3.11 Role of Agencies for Different Sectoral Activities

Execution of the Master plan is not a sole task or responsibility of the Paurashava authority. The proper execution of the Master Plan proposals will be the responsibilities of many different agencies belonging to different ministries. There should have proper coordination with different government and private agencies with specific assigned responsibilities to ensure planned development of the Paurashava. To avoid conflicting situation among the implementation agencies, role and responsibilities of different agencies should be clearly stated. Role of different agencies in different sectoral development activities have been identified in the **Table 10.1**.

Chapter Four:
Development Problems of the Paurashava

4.1 Physical Infrastructure

There are a number of physical constrains that must be overcome in order to develop Akhaura Paurashava and to move towards a desired spatial distribution and growth pattern. These includes transport related constrains; water supply related constrains, poor quality of social infrastructures, inadequate communication system and scattered houses. These constraints that face the Paurashava are discussed below:

Low Elevation of Lands

The project area is predominantly agricultural in character. The land under agricultural use is mostly double cropped area, which are low-lying depressions and remain under water during the monsoon flood. Average height of Akhaura Paurashava is 4.96 mPWD. A Digital Elevation Model map has sbeen shown under the following map **Map 4.2**. Most of the Paurashava areas of the Region are situated under normal flood level. External flood are caused in the low-lying areas by overflow of surrounding rivers and khals, while internal floods are caused by storm water due to rainfall and insufficient drainage facilities.

Dilapidated Road Condition

Condition of the available transportation network of Akhaura Paurashava is not satisfactory. All of the local roads of the Paurashava remain in very poor condition and some are nearly inaccessible. Market area is situated just beside of the Railway Line at Ward no 5 connected by only one road having the width of 15 feet and continuous traffic congestion is common and regular phenomena in the market area. The road network of the Paurashava area is developed without any sort of planning. Narrow widths (Vide **Map 4.1**) are unable to cater the need of growing traffic in the Paurashava area. Besides poor quality, there is insufficiency of local roads and some of these roads are inaccessible spatially during rainy seasons. Dilapidated road conditions increase travel time, reduce vehicle life span and vehicle operation and maintenance costs in turn result in increased transport costs.

Poor Transport Services

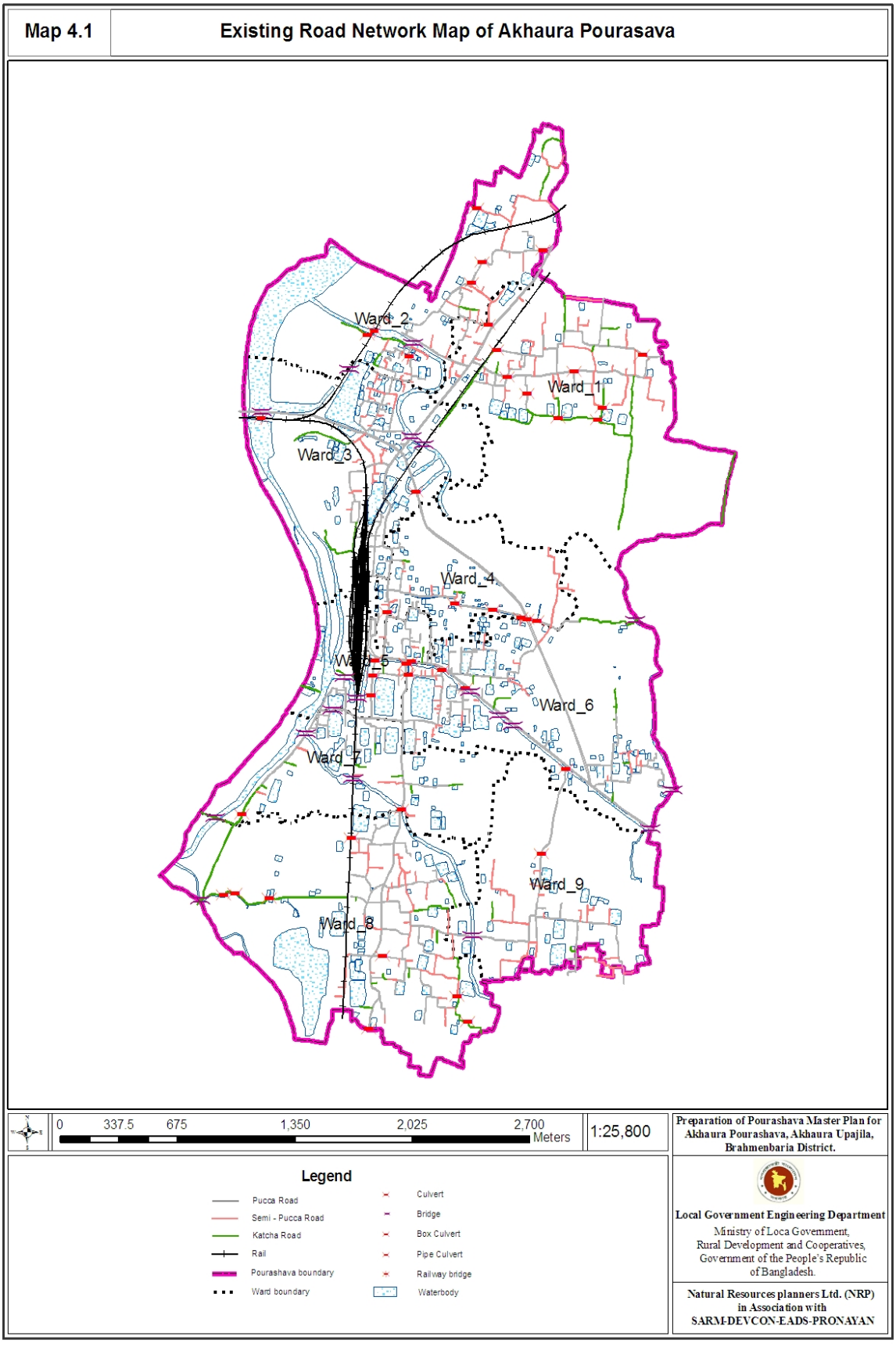
Rickshaws and CNG/battery driven Auto Rickshaws are common mode of public transportation around the Akhaura Paurashava. Buses are means of transport for intra-Upazila and other long distances. Existing public transport systems are Bus, Rickshaws, CNG/battery driven Auto Rickshaws, Nocimon/ Korimon etc. The level of service of public transport is also very low in terms of availability, reliability and convenience. There is no specific time schedule for and routs of public transport service. There is also lack of management of public transport. This existing public transport system service is not reliable proving inconvenient for the inhabitants.

Lack of Pedestrian ways

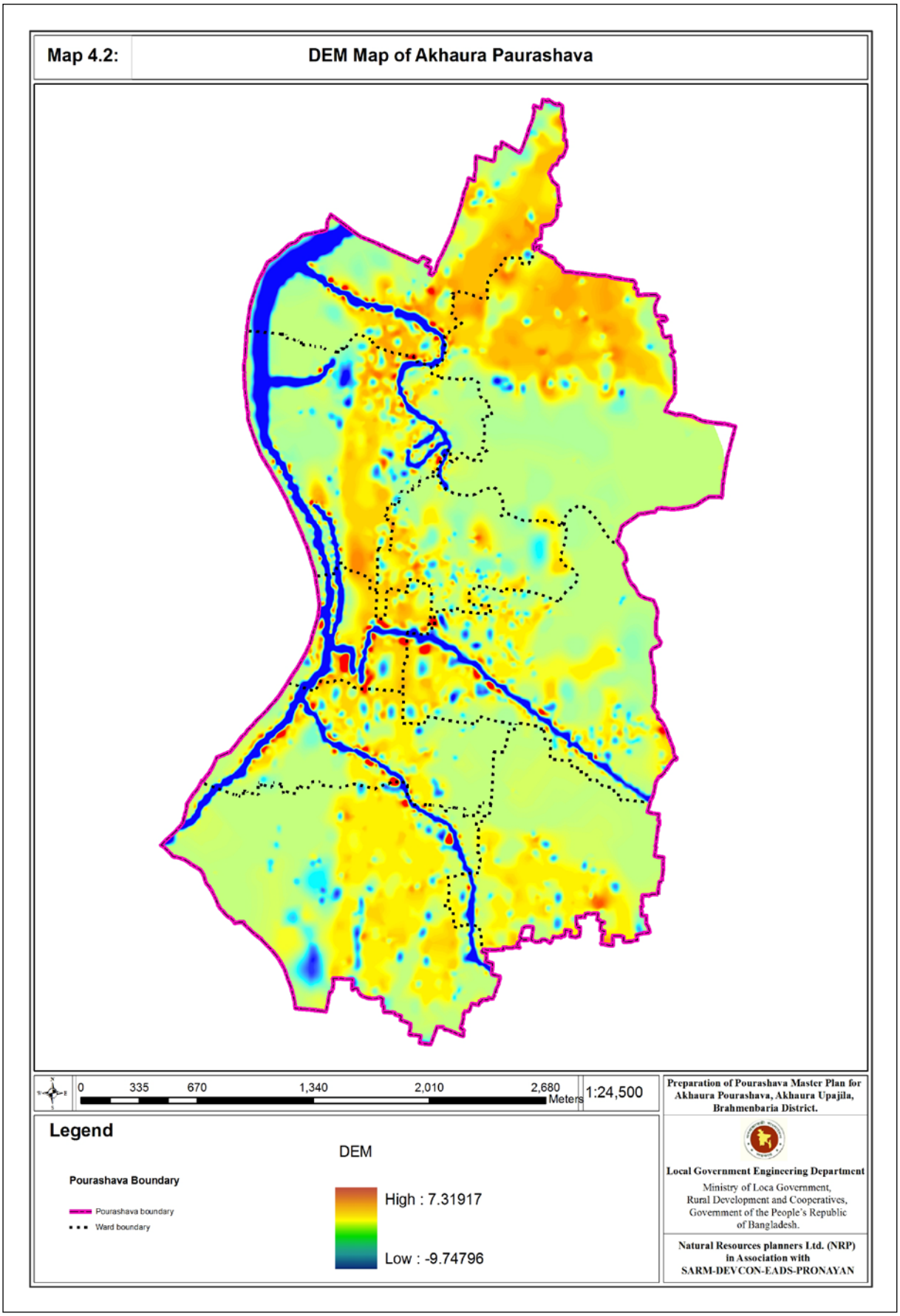
Pedestrian constitutes the major part of traffic at Akhaura Paurashava but a few footpats are found only in the rail station area. Pedestrian movements take place on the right of way of the roadside in both directions of the road. So, special attention should be provided to deliver pedestrian facilities.

Poorly Maintained Railway Junction

The Akhaura Railway junction is very poorly maintained. Necessaray safety measures are not taken regularly. Accident occurs very frequently while passing the railway line by the pedestrian. On the other hand there is an absent of servicr road for railway line. Some rickshaw, autorickshawa and other slow moving vehicles usually move just beside the railway line which is a matter of concern. A very special attention should be taken to safe the railway line and railway junction area.



Map 4. 1: Existing Road Network of Akhaura Paurashava



Map 4. 2: Digital Elevation Model Map of Akhaura Paurashava

Lack of Open Space and Parks

As revealed through surveys by the Study Team the Paurashava have no attempt to create open space and Parks though it have plenty of vacant lands. In south Asian cities, like Bombay, Karachi and Calcutta the planners target at least 1 acre of open space per 1000 population. But the level of open space is much lower in urban areas of Bangladesh.

Threat of Spontaneous Growth

In the absence of any effective plan or development control system, small towns like Akhaura Paurashava generally expand haphazardly with distribution of human settlement at locations other than where they should have been appropriately located and thereby creating chaos and confusion in proper functioning of the highly dense concentration of land uses resulting mostly in inefficient land management.

This unplanned and uncontrolled land uses have serious social and environmental consequences, such as development of high density residential settlements interspaced by vacant land (often held for speculative purposes) and segregation of poor in the worst located and most dangerous areas, thus making the provisions of urban physical infrastructures and services, and their maintenance very costly and difficult.

The Paurashava area under private ownership of land, grow spontaneously. The most prominent ills of spontaneous growth is haphazard and sub-standard development of road and structures, deprivation of basic urban services, ultimately leading to a physical environment which is often found detrimental to healthy human living. Appropriate development intervention by the authorities can help create a better living environment.

Absence of Water Supply System

Akhaura Paurashava does not have any water supply system. Most of the residents of the use tube-well water for drinking purposes while deep tube-well and shallow tube-wells are used for irrigation. There is an urgent need to install water supply system all over the paurashava area.

Inadequate Communication Facilities

Communication facilities of the Akhaura Paurashava are under developed. Postal service is available, but courier service is widely used in the Paurashava. Though cell phone coverage is available in the Paurashava, it does not cover the whole area and the connectivity signal is often weak in the fringe area.

Geological Constraints

A number of low lands, ditches and ponds existed in all over of the Paurashava. Low lands just restrict to use the land for require developing aspects for the consideration of future needs of housing, developing industries and other purposes. Unnecessary and low depth small ponds and ditches existed which also creating the same problems. for lack of excavation of the river Titas it just creating chars and also make unavoidable conditions like make people using those char area for the economic purposes which also a great problem about future development.

Poor Drainage & Sewerage

There is sewerage system developed in the Akhaura Paurashava. Drainage network is found to be in very poor condition and is mainly provided for the core part of the Paurashava to carry out the household discharges. Presently, natural drainage system discharge household and storm water towards the nearby Titas River. The Paurashava requires a Drainage Network Plan to use its natural drainage system.

No Sanitary Landfill Station for Solid Waste Management

There is no formal waste collection, transport and disposal facility in Akhaura Paurashava. There is no sanitary landfill station in the Paurashava for dumping solid waste or solid waste management. Until now in Akhaura Paurashava the residents throw their waste on road side or in ditches. Open and scattered waste dumping is harmful to environment. It could affect the underground water resources used by residents for drinking and cooking.

Lack of Social Infrastructure and their Poor Structural Quality

The social infrastructures of the Paurashava are not sufficient and the structural conditions of the existing social infrastructures are not in good condition. Health centers, schools and class rooms, sports/ recreational facilities, day care centers etc. are in deteriorating condition. Due to lack of proper maintenance activities, the quality of structures is substandard.

Scattered Houses

Supply and distribution of water, power, communication and other physical services amenities and facilities ultimately depends on the magnitude and population density of the area. In fringe areas of the Paurashava, households are very scattered. This is major constraint to provide physical infrastructure service facilities in the Paurashava because of low threshold demand in fringe areas and high cost of inclusion. Scattered houses are one major problem in the provision of water, power and road etc. to all household.

No provisions of Recreational Facility

Recreational facilities in Akhaura Paurashava are minimal. No Park or Playground has been found in the core part of the Paurashava.

4.2 Socio-Economic

There are number of socio-economic problems in Akhaura Paurashava, which need to be overcome to reach socio-economic stability. Those are health problems, lack of social welfare, Educational problems, Lack of safety and protection, lack of sports and recreation and improper housing and settlements.

Lack of Health Facility

There is one Upazila Health Complex, two private clinics and a Vaterinary hospital located in the Paurashava but which are far below the necessity. In terms of medical personnel, there is great demand for medical personnel in the area. Ratio of population to the available medical personnel was very high and there was a fast turn-over of personnel as most of the physicians are not from the Paurashava. There is a need for more doctor and professional medical service provider in the Paurashava. Inadequate supply of medicine in Upazila Hospital is also hampering the effective and efficient delivery of its functions, which is one of the priorities of the health sector. The lack of supply of medicine that is not enough for patients is an example of the non-functionality and absence of health facilities and equipment.

Inadequate Social Welfare Initiative

Social welfare should care, protect and rehabilitate that segment of the population, who has least in life in terms of physical, mental and social well-being. Lack of social workers and inadequate funding and lack of coordination undermines the delivery of social welfare programs and projects. This is an issue that for social welfare the Paurashava authority has the multiple tasks of the social workers in attending to all the needs of the vulnerable groups.

Educational Problems

The educational status in Akhaura Paurashava is not very satisfactory as observed from the Household Survey. The percentage of illiterate population in the Paurashava as observed from the survey found 19.82. The percentage of the people having education at the graduation level and above is not satisfactory, which is found only 3.88%. It is also observed that there is high number of dilapidated and poorly maintained school facilities that results in a hazardous environment for learning.

Low Income Level

The maximum of the population falls within the range of low to middle income group in the Akhaura Paurashava. About 67% of the total surveyed population in the project area is in the income level up to BDT. 15000. The income level BDT. 50000 and above comprises very low percentage (5.7%) of the households in the Paurashava.

In Sanitary Toilet Facilities

Percentages of respondents using Pucca, Semi-Pucca and Katcha toilets are 57.05%, 19.93% and 23.02% respectively. Pucca Toilets are built by own initiatives of the respondents. Katcha toilets that are being used in the Paurashava area are causes of major public health and environmental threats in the Paurashava.

Lack of Recreation and Sports Facility

As a part of Social sector priorities Akhaura Paurashava should consider both recreational areas and sports facilities. There is lack of outdoor and indoor recreational facilities in the Akhaura Paurashava. Though there are some play fields/ play grounds found besides the educational institutes, no park has been found in the Paurashava.

Improper Housing and Settlements

Maximum structures of the Paurashava (71.76%) is katcha while semi pucca structures are 14.33% and pucca structures are only 13.91% of the total structures of the Paurashava.

4.3 Environmental

Among the environmental problems of Akhaura Paurashava, water logging, reduction of water body, insufficient waste management system, pollution, poor public awareness are important. These problems should be overcome for sustainable living environment.

Flood and Water logging

Akhaura Paurashava lies beside Titas River. Flood mainly occurs from April to September in this area. From the field survey it is observed that 18.18% people are affected by normal yearly flooding. Local people reported that 75% of the households are moderately affected by periodic flood which occurs at 2 to 5 years interval. Such flood events are generally concentrated in the months of June and August. Siltation of river beds and lack of embankment trigger the effect.

Reduction of Water body and other Natural land use

Urbanization concentrates people in urban growth centers and increases the demand of land for housing, industrial use, educational, office building, cultural, commercial use of land, road and infrastructures. On the other hand, these activities will reduce agricultural use of land, water bodies and other natural resources causing serious reduction in fish habitat, fish population and diversity, extinction and reduction of wildlife including birds, reptiles and mammals, loss of many indigenous aquatic plants, weeds and shrubs, deterioration of living conditions, degeneration of wetland based ecosystems, occupations, socio-economic institutions and culture.

Natural Drainage System Deterioration

Due to encroachment and throwing waste into the Canals deteriorate natural drainage system of Akhaura Paurashava. The natural drainage canals have lost their capacity to drain out discharges. Top-soil of the watersheds is washed down into the canals and also resulting sedimentation.

Absence of Waste Management System

Waste management, in particular solid waste management, becomes urgent and needs to be tackled as the population grows. At present, it has been found that there is no proper solid waste management system in the Paurashava. Throwing out all wastes here and there is the major cause of deteriorating the environment. Akhaura Paurashava needs to develop a sustainable solid waste management system for a sustainable environment.

Pollution

The main source of air pollution in this Paurashava is emission of harmful gaseous matters from vehicles and trains; open dumping of household, poultry farms, industry etc. Dumping of garbage to open land and ditches make odor. Water pollution is yet another threat to the living environment of Akhaura Paurashava. Surface water is being contaminated from improper sanitation, solid waste disposal, hospital waste, chemicals (fertilizers and insecticides) etc. Land pollution occurs due to improper management of domestic wastes. Discharge of industrial wastes and use of chemical fertilizers and pesticides have contribution to land pollution. Another major concern, the noise pollution in Akhaura Paurashava is mainly attributed to the movement of thousands of traffics through the national highway passing through the Paurashava; especially, areas adjacent to both sides of National Highway are affected by noise pollution.

Poor Public Awareness and Concern

Even though the environment is continuously deteriorating to an alarming extent throughout the province, environmental protection and conservation is not among the government priorities due to shortage of funds. There is a lack of awareness and understanding on the importance of the natural resources.

4.4 Lack of Urban Governance

Poor Urban governance found in the Paurashava which is common and frequent to the local authority of Bangladesh. Lack of manpower also creates a lot of problem to development activities.

4.5 Poor Town planning Capacity

Town planning capacity of Akhaura Paurashava is non-existent. There is no town planner working in this Paurashava. Considering current manpower and logistic situation of Akhaura there is reason to believe that the Paurashava may not support spatial planning and implementation activities unless immediate steps are taken to overcome such short comings. Proper knowledge about planning and development rules and regulations are found missing to both among people's representatives and officials of the Paurashava. Therefore appropriate trainings are required for Paurashava personnel to enable them preparing their own Master Plan and implementing the proposals of such Master Plans. Proper implementation of Master Plan proposals needs a team of professionals comprised with qualified town planner, GIS analyst, civil engineer, demographer, sociologist, and logistic support of modern survey and other equipments.

Chapter Five:
Critical Planning Issues

5.1 Introduction

Critical planning issues that are to be considered for preparing the Master Plan for Akhaura Paurashava have been discussed in the following sections. These issues have been considered for preparation of the Master Plan, if the implementation is expected to achieve the desired goal of sustainable and efficient development for the Paurashava.

5.2 Transport

The transportation and communication network at Akhaura Paurashava is not yet planned and developed to serve a town. The core part of the Paurashava is already built up and all the pattern of the growth seems not to be changeable, which is the major problems to develop traffic and transportation situations. Most of the local roads of the area grow spontaneously without following any sort of planning regulations or principles. All the local roads are too narrow (vide **Table 5.1**) and serve as the local minor collector roads. Average width of these local roads is about 7 to 12 ft. In the existing situation for the transport plan, it needs to widen all of the roads with hierarchy basis and have to propose all the standard recommendation to functionalize the road network. for this, land acquisition requires for widening the future transport sector of the Paurashava. The provision of providing public transport facilities should be emphasized on the planning of Akhaura Paurashava. However, without planning a transport network for the Paurashava area as a whole, a standard transport network and an efficient traffic management system for the future can not be ensured. The natures of problems and deficiencies in transportation sector have been discussed in the previous Chapter (**Chapter 4**). As Akhaura railway junction, one of the most important railway junction in Bangladesh, is situated in the project area, a special consideration should make to make safe the railway junction and rail line. A new service road is very important for the railway line.

5.3 Environment

Environment is one of the most important aspects of town planning. The planner needs to take a special care about the environmental concerns of an area to make the area livable and comfortable. Solid waste management is one of the important environmental concerns of town planning. At present, it has been found that there is no proper solid waste management system in the Paurashava. The people throw solid waste here and there besides there house. Throwing out all wastes here and there is the major cause of deteriorating the environment. Akhaura Paurashava needs to develop a sustainable solid waste management system for a sustainable environment. Pollution is another sort of threat for environment of Akhaura Paurashava. A special attention should be given to minimize this kind of pollution.

Drainage is an important component of a town. To ensure the living environment, comfort and beauty of a town drainage plays a vital role. The drainage network of Akhaura Paurashava is not in a satisfactory condition. Some drainage facilities are found in the Paurashava to carry out the household discharges. Presently, natural drainage system discharge household and storm water towards the nearby Titas River. This situation aggravates the natural environment to pollute.

Water bodies are very important to keep the natural system smooth. Water bodies acts as the natural reservoir for rain water and keep the area flood free. It also helps to protect the ecological balance of an area. To protect the ecological balance and environment it is needed to formulate plan for protection of water bodies in this area.

As revealed through surveys by the Study Team the Paurashava have no attempt to create open space and Parks though it have plenty of vacant lands. In south Asian cities, like Bombay, Karachi

and Calcutta the planners target at least 1 acre of open space per 1000 population. But the level of open space is much lower in urban areas of Bangladesh.

5.4 Land Use Control

Land use control is a pre-requisite for the development of a planned settlement. In the absence of any effective plan or land use control system, small towns like Akhaura Paurashava generally expand haphazardly with distribution of human settlement at locations other than where they should have been appropriately located and thereby creating chaos and confusion in proper functioning of the highly dense concentration of land uses resulting mostly in inefficient land management. This unplanned and uncontrolled land uses have serious social and environmental consequences, such as development of high density residential settlements interspaced by vacant land (often held for speculative purposes) and segregation of poor in the worst located and most dangerous areas, thus making the provisions of urban physical infrastructures and services, and their maintenance very costly and difficult.

The Paurashava area under private ownership of land, grow spontaneously. The most prominent ills of spontaneous growth is haphazard and sub-standard development of road and structures, deprivation of basic urban services, ultimately leading to a physical environment which is often found detrimental to healthy human living.

As land use control mechanism is not prevailing in the Paurashava, the private land owners usually convert the high value agricultural land in to residential or other purpose of use. Major aim of the Landuse Policy 2001 was to prevent indiscriminate conversion of agricultural land in to non-agricultural use, because such conversion may be threatened for food security of the country. Such conversion should be prohibited with the multi-sectoral use of land. Further residential expansion should be controlled through the imposition of development control. In this context, concept of cluster development and compact township approach should be provisioned in the plan. Vertical development will be encouraged rather than horizontal to save the agriculture land.

It is often found in the Paurashava that some dwellers encroaches the road by other uses. As a result the narrow road becomes narrower and which create various transportation related problems and which is a hindrance for the smooth circulation. Another problem is found in the Paurashava that some people (not all) construct various infrastructure without taking the prior permission or land use clearance from the authority i.e; Paurashava.

The important issue related to the Land Use Control is the inadequacy of Land Use Control Authority. At present, in Akhaura Paurashava there is no Land Use Control Unit. Town planning capacity of Akhaura Paurashava is non-existent. There is no town planner working in this Paurashava. Considering current manpower and logistic situation of Akhaura there is reason to believe that the Paurashava may not support spatial planning and implementation activities unless immediate steps are taken to overcome such short comings. Proper knowledge about planning and development rules and regulations are found missing to both among people's representatives and officials of the Paurashava. Therefore appropriate trainings are required for Paurashava personnel to enable them preparing their own Master Plan and implementing the proposals of such Master Plans. Proper implementation of Master Plan proposals needs a team of professionals comprised with qualified town planner, GIS analyst, civil engineer, demographer, sociologist, and logistic support of modern survey and other equipments.

5.5 Disaster

The Paurashava area including Akhaura Upazila has affected by the several natural disasters and these are Flood and Water-logging. Very few attempt has been made by the government to rehabilitate people after the natural disaster.

Urbanization is converting lands for residential use. Agricultural lands and water bodies are being chosen most frequently and the lands are being converted into urban settlement. In the Paurashava, wet lands are being filled up and agricultural lands are being converted. This has been identified as the major man-made disaster accelerating the degree of conversion year to year. Use of poisonous insecticides on the agricultural land is another man-made disaster which will affect in the long-run.

5.6 Laws and Regulations

The regulations prescribed in the "Local Government (Paurashava) Act, 2009" are not directly related with the physical development activities and their control. The Building Construction Act, 1952 is called the mother regulation to control all type of physical development but no instruction is being included in the "Local Government (Paurashava) Act, 2009" regarding BC Act, 1952. The Paurashava authority approves the building plan and excavation of tank without any regulatory control.

The regulation prescribed in the "Local Government (Paurashava) Act, 2009" on the preparation of master plan is called traditional regulation. In the modern world, the concept of master plan became obsolete. In this project, the so called master plan, as mentioned in the "Local Government (Paurashava) Act, 2009" considered as a package and the plan included in this package named Structure Plan, Urban Area Plan and Ward Action Plan, though there is no regulation in the country on the preparation and implementation of those plans.

Except the Paurashava Town (Township development areas), other areas are rural. To generate rural-based township environment, those rural areas should be preserved. Rural development components as prescribed in the section 7 (1a) of the Bangladesh Rural Development Board Ordinance, 1982, should be provisioned to control those rural areas. As prescribed in the section 7 (1a), functions of the Board shall be "to promote village-based primary co-operative societies and Thana Central Cooperative Association (TCCA) with a view to enabling them to be autonomous, self-managed and financially viable vehicles for increasing production, employment generation and rural development."

5.7 Others

The strategic importance of the town lies in the fact that the city provides important links to the main seaport of the country Chittagong with the capital Dhaka through railway network. Secondly, the town is not too far from Dhaka and also has an important regional connection by both with Road network and rail way network. However, due to lack of some strategic infrastructure, investment and political commitments the opportunities cannot be utilized.

Management of Planned Growth

The most critical issues are the administration and management of planning, where prevails a crisis situation. The root of this crisis lies in dual responsibility with regard to planning and development administration. Physical planning and development, particularly, providing services for the people in Akhaura (like in other metropolitan cities in Bangladesh) are the responsibility of a number of organizations. Coordinating the activities of such organizations is one of the critical issues. Moreover, shortage of appropriate and trained personnel in the development authorities is the main problem regarding planned way growth formation.

Constraints in using potentials

The strategic importance of the town lies in the fact that the city provides important railway connection with Nationally and have Road Connection with India by Akhaura-Agartala Land port. The town have mass transit opportunities to connect Dhaka and all over of the Couuntry. However, due to lack of some strategic infrastructure, investment and political commitments the opportunities cannot be utilized.

Location and Strategic Linkages

Location and the linkages of Akhaura Paurashava with regional Cities, Towns and growth centers make it the most important town in the region as well as the Country. The critical issue of the Master plan is that the road network and other infrastructure development related plan have to consider survival of the National Highway with its full function, improving the water way network with the correlation of internal road network plan.

Inefficient Land market

Land is a scarce resource in Bangladesh, particularly in cities and municipalities. In Akhaura municipality, although, apparently it seems that there is sufficient land for urban development, the reality is that the land market is imperfect and the supply of land for urban development is constrained for having low lands, agricultural lands, existence of numerous ponds, ditches etc. The land market is dominated by the private sector, while a large amount of land is owned by the public sector that remains mostly unutilized and are occupying by the local most powerful people. The development agencies are unable to capture unearned increment generated due to public intervention in land. Under such circumstances, the land market in the Paurashava is not supporting the housing and other urban development. Again the price of Land varies vastly in the core, semi core and fringe area.

Sense of Deprivation of People

It seems that over the time the people of Akhaura Paurashava have developed a sense of deprivation. Delay in the construction of necessary roads and drainage is one of the reasons for developing such a feeling.

Chapter Six:
Paurashava Development Related Policies, Laws and Regulations

6.1 Introduction

Present development in Akhaura Paurashava can be termed as uncontrolled or spontaneous. Absence of a suitable development activities is the main reason behind such kind of Development. Planned way development of Akhaura Paurashava must have to relate with existing policies, rules and regulations prescribed by the government. Several policies associated with national planning already exist in the context of Bangladesh. Existing policies, laws, ordinances and regulations of Bangladesh have direct implications to the local authority and in preparation of Master Plan for Akhaura Paurashava.

6.2 Indicative Prescription of Policy for Paurashava in the light of the Different Urban Policies, Laws, Regulations and Guidelines

In the following sections a brief review of the relevant legal instruments which would be useful for proper implementation of the Master Plan has been done.

Urban Land Management Policy

The Government is committed to improve quality of life in cities and urban centers, particularly for the poor, to ensure that service delivery is commensurate with population density, and that over time, these urban centers become vibrant sources of opportunity, trade and economic growth. Hence it is necessary for the local government to control the use of urban land.

The main policies of Urban Land Management is to protect sensitive land resources; manage hazard-prone lands; conserve open space; protect heritage structures and archaeological and cultural sites; control excessive urban sprawl and manage prime agricultural land; formulation of land information system, land market assessment regulations; efficient and transparent land record and registration system; increase the supply of land for the poor; adoption of taxation policies, implementation of land-banking and land-pooling programs and undertaking land readjustment projects; undertaking land-sharing schemes and tenancy reforms; allocating khas land/acquired land for housing the poor and allocating reasonable proportion of land in urban places for housing the poor.

The strategies for implementing those policies are:

- Protecting productive agricultural lands;
- Taking activities like land readjustment in the most unplanned and dense areas
- Protect cultural sites through appropriate activities;
- formulation of GIS base land information system with land market assessment.
- Preserve and conserve wetlands and Public Lands, natural canals and ponds;
- Promotion of planned development and preserve open spaces;
- Allocating lands (khas land /acquired, reasonable proportion of land) for housing the poor.
- Protect River side lands from illegal livelihood.
- Reserve lands to implement low-cost housing sites in the Paurashava;
- Protecting the floodplains areas as retention area for the Paurashava;
- Control on uses to preserve wetlands;
- Renovate and conserve the existing encroached natural canals;
- Control to preserve existing open space to use as the purposes such as recreation, Plaza and for other future use;

The Paurashava may undertake some strategies such as land pooling, land readjustment, guided land development, land sharing, sites and services schemes, etc for land development.

Landuse Policy

The ministry of Land (MoL) has prepared the National Land Use Policy (NLUP), 2001 to fill up an important policy gap in the country. The policy has aimed to minimize loss of cropland; stop indiscriminate use of land; prepare guidelines for land use for different regions; rationalize land acquisition, and synchronization of land use with natural environment. The NLUP deals with land uses for several purposes including agriculture (crop production, fishery and livestock), housing, forestry, industrialization, railways and roads, tea and rubber. the policy emphasisws on declining land productivity due to unplanned and improper uses of land and decreasing soil fertility; diminishing water land and aquatic bio-diversity; dwindling natural forest and environment.

Prohibition of the recent practice on conversion of agriculture land into non-agricultural use to ensure food security for the people is one of most important policies of the Policy. The policy stressed on most intensive and best use of scarce land resources of the country. In one of its objectives (objective 'Kha'), the policy aimed to introduce 'land use zoning' based on particular characteristics of land to make best use of land, prevent unplanned expansion of residential areas and control indiscriminate growth of industrial and commercial activities. The policy called for planned and best use of land. Preparation and implementation of national land use plan in order to ensure best use of land is a major objective of land use policy. The plan is to be based on the criteria of land productivity and land capability and land suitability, use and requirement of land by agriculture, forestry, industrialization, urbanization and housing.

About 61% land of the Akhaura Paurashava is under the agricultural practices. By managing the future land use demand of the Paurashava maximum portion of those agricultural lands should be preserved as agriculture land. for such preservation, following strategies have to be considered.

- Manage existing residential area as vertical expansion than horizontal;
- Manage existing spontaneous growth by land readjustment to perfect use of land by the guidelines of future land use directions;
- Controlling the use of land but providing the land use zoning;
- Control to protect irregular pattern of land uses

Housing Policy

The emphasis of the national housing policy was on land development, building inexpensive housing units for people in the low and middle-income groups in the cities, and multi-storied buildings for government employees and hostels for working women, low cost housing in the coastal belts and inducting the private sector into the housing sector. The National Housing Policy (NHP) was formulated keeping in focus the basic objectives of providing housing to people at all strata, especially to the low and middle income groups and to those having no access to housing. The Global Strategy for Shelter by the year 2000 adopted by the United Nations in November, 1988 calls upon governments to take steps for formulating a National Housing Policy, 2004 in the light of "the enabling approach" for achieving the goals of the strategy.

The housing policy stressed on useful and effective strategy to tackle growth of unplanned and unhealthy habitations. It encouraged private developers in land development, infrastructure development and house construction. It is commitment to provide government assistance on participatory housing infrastructure development involving the community, NGOs, CBOs, private developers and social welfare organizations; to assist in introducing new infrastructure development method based on leasing; to provide necessary assistance to local governments in recovering

investments in infrastructure and services and provide necessary training to their staff and employees to increase their efficiency.

About the roles and responsibilities of the government, the policy said that in housing activities the government will continue to remain as a facilitator. The government will provide housing only to the poor and the rootless classes of the society.

Population Policy, 2004

The Population Policy-2004 of Bangladesh responds to the critical need to deal with the complex national population problem in a holistic way. It also aims to build national consensus and synergy among institutions: public, private, civil society and NGOs about the problem. Factors that influence population stabilization efforts are affected by the works of several ministries such as Health and Family Welfare, Education, Labor and Employment, Social Welfare, Women and Children's Affairs,Youth and Sports, Cultural Affairs, Local Government Rural Development and Co-operatives, Planning etc.

The objectives of the National Population Policy are to improve the status of family planning, maternal and child health including reproductive health services and to improve the living standard of the people of Bangladesh through making a desirable balance between population and development in the context of Millennium Development Goals (MDGs) and Interim Poverty Reduction Strategy Paper (IPRSP). The following major policy objectives to address the future challenges are reduce Total Fertility Rate (TFR) and increase the use of family planning methods among eligible couples; stabilize population around 2060; ensure adequate availability and access of Reproductive Health Services, specially family planning services to all including information, counseling and services for adolescents; improve maternal health with emphasis on reduction of maternal mortality; prevent spread of HIV/AIDS; reduce infant and under five mortality rates; reduce maternal and child malnutrition; promote and actively support programs for elimination of gender disparity in education, health and nutrition; ensure Early Childhood Development (ECD) program; ensure and support gender equity and empower women; develop the human resource capacity of planners, managers and service providers; support measures to provide food and social security and shelter for the disadvantaged including the elderly, destitute, physically and mentally retarded persons; support measures to regulate and reduce rural to urban migration; support measures for environmental sustainability with emphasis on access to safe drinking water; support poverty alleviating strategies and conducive environment for improved quality of life; ensure coordination among relevant Ministries in strengthening population and development linkages and making their respective mandates and implementation strategies more population focused.

Agriculture Policy

National Agriculture Policy was formulated in the year 1999 by the Ministry of Agriculture of Government of the People's Republic of Bangladesh. The overall objective of the national agriculture police is to make the nation self-sufficient in food through increasing production of all crops including cereals and ensure a dependable food security system for all.

The principle objectives of the national agriculture are to ensure a profitable and sustainable agricultural production system and raise the purchasing power by increasing real income of the farmers; preserve and develop land productivity; reduce excessive dependence on any single crop to minimize the risk; increase production and supplies of more nutritious food crops and thereby ensuring food security and improving nutritional status; preserve existing bio-diversity of different crops; take up programs for the introduction, utilization and extension of bio-technology; take necessary steps to ensure environmental protection as well as 'environment-friendly sustainable agriculture' through increased use of organic manure and strengthening of the Integrated Pest

Management (IPM) programme; take appropriate steps to develop an efficient irrigation system and encourage farmers in providing supplementary irrigation during drought with a view to increasing cropping intensity and yield; establish agriculture as a diversified and sustainable income generating sector through strengthening of 'Farming System' based agricultural production and agro-forestry programs; take effective steps to ensure input supplies to the farmers at fair prices in a competitive market and remove difficulties at the farmers' level which have arisen out of the privatization of input distribution system; develop marketing system to ensure fair prices of agricultural commodities; produce and supply of agricultural commodities as required by the industrial sector; reduce imports of agricultural commodities and find out newer opportunities for increasing exports as well; create opportunities for establishing agro-processing and agro-based industries; protect interests of the small, marginal and tenant farmers; and develop contingency management system to combat natural disasters.

Government has the primary responsibility of ensuring optimum use of land. Although land is a privately owned property in general, its use has to be compatible with the overall social goals and utility. Moreover, it is important to consider that the interests of small arid marginal farmers and the sharecroppers are protected, as they constitute the majority of farmers. According to the policy the steps that will be taken to ensure planned utilization of land for crop production are:

- Land zoning programme will be taken up by the Soil Resources Development Institute (SRDI) on a priority basis. Integrated approach of SRDI will be further strengthened for this purpose.
- To ensure maximum utilization of land, bottom up planning through people's participation and its implementation will be started from the mouza or village level.
- In most areas the same land is suitable for more than one crop. Therefore, farmers will be encouraged to grow more profitable crops as an alternative to only rice-rice cropping pattern.
- Fertile agricultural land is going out of cultivation due to its use for non-agricultural purposes such as private construction, house building, brickfield, etc. Appropriate measures will be taken to stop this trend in the light of the Land Policy of the government.
- Maximum utilization of land will be ensured through promotion of inter-cropping with the main crops.
- Acquisition of land in excess of requirement for non-agricultural purposes will be discouraged.
- Programmes will be taken up to motivate the landowners not to keep their land unused without any acceptable reason.
- Appropriate measures will be taken in the light of the Land Policy so that the interests of small and marginal farmers and the sharecroppers are protected and that the agricultural land is not kept fallow for a long period.

Transportation Policy

A precondition of development is good infrastructure. A Land Transport Policy is essential to ensure the proper physical and institutional infrastructure transport in order to achieve national development. Roads and transport are inseparable part of man's livelihood. The people of Bangladesh spend a significant part of their time and money on transport, in search of a livelihood. The Land Transport Policy-2004 has been formulated in the light of the Government pledge to establish a transport system which is a safe, cheap, modern, technologically dependable, environment friendly and acceptable in the light of globalization. The National Land Transport Policy (NLTP) has been prepared for a long term vision of at least 30 years to make the role of transport in economic activities more significant and underpin continued economic and social development. Following are the policy objectives of NLTP:

1. To provide a safe and dependable transport service;
2. Removal of unnecessary control and formulation of laws and regulations conducive to providing service;
3. Fare control.
4. Determining the roles of the Government sector and the private sector;
5. To maintain an economic and environmental balance;
6. To ensure maximum utilisation of Government funds;
7. Expansion of the role of transport in the ever increasing economic activities;
8. Reduction of transport cost of goods for export;
8. Growth of traffic commensurate with economic development;
9. formulation of transport system for Dhaka city (Greater Dhaka);
10. Introduction of an integrated transport system;
11. Provision of alternate transport systems;
12. Creating of awareness regarding better standard of life and safety;
13. Poverty alleviation.

The policy makes discussion and recommendation of such issues as road, road transport and traffic, non-motorized traffic, railway and integrated issues. Strategic measures of the transport policy cover the following:

- Encourage greater private sector participation with national ownership of road and rail infrastructure; lease of infrastructure may be allowed on long term basis; encourage private sector in infrastructure development.
- Better coordination to be established between the Ministries and Departments under its control; policy/rules & regulations will be formulated to achieve the goal of creating better working links between the Government and the public and private sectors.
- Creation of discussion and consultation forums will be created for policy implementation.
- Government to promote clearer objectives and responsibilities for each sector in order to create more integrated working relationships.
- The Government will examine how best the interests of users can be represented within the existing national government and local authority system; The Government will establish a user role within its transport planning process.
- The Government makes arrangements to realize cost of transport operation and road maintenance from road users through new fiscal policies; to protect public interest, the Government will regulate tariffs for passenger and goods both in road and rail transport.
- The government should allow subsidy to the transport sector only on consideration of public interest.
- Make people aware of the national transport policy.

Environment Policy

Government declared Bangladesh National Environment Policy in 1992 with a view to safeguard the national environment. The main objectives of the policy are:

- To promote natural balance and overall development by means of conservation and development of environment;
- To save the country from natural disaster;

- To identify and control all sources of pollution and degradation;
- To ensure environment friendly development in all sectors;
- To ensure sustainable, long term and environment friendly use of all national resources;
- To get involved with all international initiatives on environmental issues.

for the fulfillment of every component of Environment Policy, it has divided in to 15 sectors. Those sectors are – Agriculture, Industry, Health, Energy, Water Development, Flood Control and Irrigation, Land, forest including flora and fauna, Fish and Livestock, Food, Seashore and Maritime, Transport and Communication, Housing and Urbanization, Population, Literacy and awareness, Science, Technology and Research, Legal framework and Institutional framework. The policy has provided guidelines for all the sectors. The major sector-wise guide lines are as follows

Agriculture: Environmentally sound agricultural practices are to be encouraged and ensured for attainment of self-sufficiency in food. Among the various specific measures, use of natural fertilizers and insecticides is encouraged as opposed to the application of agro-chemicals and artificial materials exerting adverse impact on the environment.

Industry: Environmental Impact Assessment (EIA) for new industries, corrective measures for polluting industries, ban on establishment of polluting industries and development of environmentally sound and appropriate technology is required for sustainable and efficient utilization of natural resources.

Health and Sanitation: Healthy environment for rural and urban area, prevention of activities, which are harmful to public health and healthy workplaces for workers are to be ensured.

Water: Environmentally sound water resource management is suggested in utilization and development of water resources, construction of irrigation network and embankments, dredging of watercourses and in taking measures against river pollution. EIA is required before undertaking projects related to water resource development and flood control measures.

Land: Activities that cause or result in land erosion, salinity and alkalinity, and loss of soil fertility are prohibited. Compatible land use systems for different ecosystems and environmentally sound management of newly accreted land are recommended. forest, Wildlife and Bio-diversity: Conservation and expansion of forest zones, conservation of wildlife and biodiversity and conservation of wetlands are recognized as priority areas for action.

Fisheries and Livestock: Conservation of fisheries and livestock, mangrove forest and others ecosystems and prevention of activities that diminish the wetlands and natural habitats for fishes are the basic objectives in this sector.

Transport and Communication: Road, rail, air and water transport systems should be operated without polluting the environment. EIA is required before undertaking any projects in these sectors.

Housing and Urbanization: Environmentally sound planning and development of housing and urban centers is required. Existence of water bodies in the cities is recommended for maintaining environmental and ecosystem balance in the urban areas.

Education and Public Awareness: Eradication of illiteracy through formal and non-formal education, building and raising public awareness of the environmental issues, dissemination of environmental knowledge and information are the policy guidelines for the conservation, improvement and sustainable use of natural resources.

To reinforce the policy, the Government of Bangladesh formulated Environmental Conservation Act in 1997 that was subsequently amended in 2000. for the implementation and leadership, the Ministry of Environment and forest (MoEF) was assigned to play the role of lead agency. A National

Environmental Committee was created with the Prime Minister as the as the Chairperson to give overall direction for implementation of this policy. The policy emphasized that the MoEF would take timely steps for appropriate amendment and modification of this policy on the backdrop.

Industrial Policy

Industrial Policy of Bangladesh was published by the government in the year 2005. The major objectives of Industrial Policy-2005 are: to set up planned industries; promote private initiatives as the main driving force of economic development and uphold the government's facilitating role in creating a favorable atmosphere; cratering the needs for local and foreign market and also for consumer satisfaction of the local products; measures to be undertaken (a) produce world class quality products, (b) diversification of goods, (c) introduce cost-effective management in the production system, (d) more value addition in the industrial sector, and (e) provide support for enhancing productivity by using continuous, appropriate and advanced technology; provide assistance to augment the industrial sector's contributions to the GDP of the national economy, meet the general demands of local consumers and earn more foreign exchange; provide inspiration for the speedy expansion of cottage industries and SMEs and for further investment in these sectors; prioritize the expansion and development of agro-based and agricultural processing industries, and assist in the expansion of poultry, dairy and goat-sheep industry as agricultural industries; provide women entrepreneurs with all necessary assistance in establishing industries in various sectors; Increase productivity at enterprise level; produce high-value added products step by step through development and application of appropriate technology and increase of export through export diversification; provide all necessary assistance for producing environment-friendly product; expand the local market and establish more backward linkage industries in order to accelerate the export of high value-added garments produced in the export-oriented garment industries and other relevant industrial sub-sectors; enrich the industrial sector with the proper utilization of the country's various natural and mineral resources.

To achieve the objectives of Industrial Policy-2005, some strategic options have been formulated. The major options are: ensure full utilization of current production capacity in the industrial sector; provide special facilities as well as infrastructural support to Cottage and Small and Medium Enterprises (SME); provide financial, technical, technological and infrastructural facilities in order to inspire setting up and developing agro-based industries; take action to use solar power and municipal refuse to generate electric power in order to run small and cottage industries; provide assistance to waste management development in order to ensure proper waste minimization and waste removal and produce pollution-free goods; provide assistance to waste management development in order to ensure proper waste minimization and waste removal and produce pollution-free goods; consider highly developed technology-based seed breeding, production and development, and agricultural goods processing activities as industries.

The Akhaura Paurashava is agro-based urban area. To reduce poverty and generate employment opportunities, more efforts are needed to establish agro-based industries in the light of Industrial Policy, 2005. This effort will ensure protection and fair price of agro-products and employment opportunities for unemployed people. In order to create further employment opportunities beyond the agricultural sector, initiatives should be taken to setup small, medium and large industries across the country. A well organized linking among those industries in case of raw materials and supply of labor will be needed. If these types of industries setup in a planned way, unemployment rate will decline and poverty alleviation will be accelerated.

National forest Policy

National forest Policy 1994 has incorporated the following targets and goals for sustainable forest that will contribute to maintain sound environment reduce the effect of global warming process, combat the disastrous effect of cyclones and floods and also promote national economic development. Policy

directives which have implications in the preparation of Master Plans for the Paurashava are discussed below;

- Coordination among government, NGOs and mass people will be maintained in order to materialize government's afforestation programs;
- Afforestation will be conducted in rural areas, newly accreted chars, in denuded State forest areas of Chittagong and Barind tract of northern zone because in this area have limited forest lands;
- Tree plantation on fallow land, homestead, office and institutions premises, road side etc. will be encouraged.
- Special afforestation programs will be implemented in every city, municipality, town and other urban areas to prevent pollution.
- Ensuring tree plantation/afforestation will be emphasized while plans for residential areas are done;
- forest resource based labour intensive small scale and cottage industry will be encouraged in the rural areas;
- Women will be encouraged to participate in homestead and farmland participatory afforestation programs.

Fisheries Policy

The role of fisheries resources in national economy is very important. Fisheries being a major source of protein to the people of the country bear a significant role in food constituents. In the riverine country like Bangladesh fisheries resources a Fisheries Plan need to be created to ensure the sustainable use of this resource. There is an appropriate reflection of the above-mentioned matters in this policy. The objectives of the National Fisheries Policy-1998 are

- Enhancement of fisheries production;
- Poverty alleviation through creating self-employment and improvement of socio-economic conditions of the fishers;
- Fulfill the demand for animal protein;
- Achieve economic growth through earning foreign currency by exporting fish and fisheries products;
- Maintain ecological balance, conserve biodiversity, and ensure public health providing recreational facilities.

In order to ensure a strong base of the development process of fisheries resources in an integrated way, proper attempts should be imposed on the following aspects:

- Policy for procurement, preservation and management of fisheries resources of the open water bodies;
- Policy for fish culture and management in closed freshwater bodies;Policy for culture of shrimps in coastal regions;
- Policy for exploitation, conservation and management of marine fisheries resources.

Health Policy

The Bangladesh National Health Policy was published in 2011 and adheres to the following principles:

- Every Citizen has the basic right to adequate health care. The State and the government are constitutionally obliged to ensure health care for its citizens.
- To ensure an effective health care system that responds to the need of a healthy nation, a health policy provides the vision and mission for development.
- Pursuance of such policy will fulfill the demands of the people of the country, while the health service providers will be encouraged and inspired. People's physical well-being and free thought process have proved to be a precondition for the growth and intellectual enrichment in today's human society.

The objectives of National Health Policy are: to make necessary basic medical utilities reach people of all strata and develop the health and nutrition status of the people; to develop a system to ensure easy and sustained availability of health services for the people, especially communities in both rural and urban areas; to ensure optimum quality, acceptance and availability of primary health care, and governmental medical services at the Upazila and Union levels; to reduce the intensity of malnutrition among people, especially children and mothers; and implement effective and integrated programmes for improving nutrition status of all segments of the population; to undertake programmes for reducing the rates of child and maternal mortality within the next 5 years and reduce these rates to be acceptable level; to adopt satisfactory measures for ensuring improved maternal and child health at the union level and install facilities for safe and clean child delivery in each village; to improve overall reproductive health resources and services;

To ensure the presence of full-time doctors, nurses and other officers/staff, provide and maintain necessary equipment and supplies at each of the Upazila Health Complexes and Union Health and Family Welfare Centers; to devise necessary ways and means for the people to make optimum usage of the available opportunities in government hospitals and health service system and to ensure satisfactory quality management, cleanliness of service delivery at the hospitals; to formulate specific policies for medical colleges and private clinics, and to introduce appropriate laws and regulations for the control and management of such institutions including maintenance of service quality; to strengthen and expedite the family planning program with the objective of attaining the target of Replacement Level of Fertility; to explore ways to make the family planning program more acceptable, easily available and effective among the extremely poor and low-income communities; to arrange special health services for mentally retarded, the physically disabled and for elderly populations; to determine ways to make family planning and health management more accountable and cost-effective by equipping it with more skilled manpower and to introduce systems for treatment of all types of complicated diseases in the country, and minimize the need for foreign travel for medical treatment.

National Urban Policy

The draft National Urban Policy 2006 aims to strengthen the aspects of urbanization and at the same time effectively deal with its negative consequences in order to achieve sustainable urbanization. Diffusion of urbanization and rural-urban linkages is an important issue in this regard. There is need for decentralization of power from central to local government. The major objectives of National Urban Sector Policy for Bangladesh will aim to:

- Ensure regionally balanced urbanization through diffused development and hierarchically structured urban system;
- Facilitate economic development, employment generation, reduction of inequality and poverty eradication through appropriate regulatory frameworks and infrastructure provisions;

- Ensure optimum utilization of land resources and meet increased demand for housing and urban services through public-private and other partnerships;
- Protect, preserve and enhance urban environment, especially water bodies;
- Devolve authority at the local urban level and strengthen local governments through appropriate powers, resources and capabilities so that these can take effective responsibility for a wide range of planning, infrastructure provision, service delivery and regulatory functions;
- Involve all sectors of the community, in participatory decision-making and implementation processes;
- Ensure social justice and inclusion by measures designed to increase the security of poor people through their access to varied livelihood opportunities, secure tenure and basic affordable services;
- Take into account particular needs of women, men, children, youth, the elderly and the disabled in developing policy responses and implementation;
- Assure health, safety and security of all citizens through multifaceted initiatives to reduce crime and violence;
- Protect, preserve and enhance the historical and cultural heritage of cities and enhance their aesthetic beauty;
- Develop and implement urban management strategies and governance arrangements for enhancing complementary roles of urban and rural areas in sustainable development;
- Ensure good governance by enhancing transparency and establishing accountability.

6.3 Laws and Regulations

6.3.1 Urban Development Control

The following issues are to be addressed strongly in order to control new orderly developments:

- Development control should be administered by the local government i.e; Paurashava Authority;
- All new development should be required to obtain planning permission from the local government authority;
- The permitting system should be as simple as possible yet able to limit the excess of unplanned development;
- Development control should be as least resource demanding as possible, given the shortage of skilled manpower available in local government bodies.

Following development control principles are indicative of those appropriate in general urban areas:

- Residential Development
  - ❖ Residential growth should be controlled according to the Land use zoning of the Master Plan;
  - ❖ limited residential development growth would be allowed in the mixed use, and administrative zone area and no residential growth would be permitted able to the agricultural land, open space and water bodies (Canals, ponds which area more than .15 acres);
- Community Market Development

- ❖ Location should be optimally selected.

- Corner shops besmall shops

  - ❖ No corner shop should be allowed to settle irregular pattern and should not be placed within **100 meter** of any small or large shops or bazaar area.

- Local (primary) schools/kindergartens

  - ❖ No new primary school should be established near major roads or Highways.
  - ❖ All kindergartens and primary school should be developed with play field no less than 1 acre.
  - ❖ All existing and new primary school should be provided with better infrastructure facilities.

- Mosques or other religious facilities

  - ❖ Ensuring community based central mosques or other religious facilities.
  - ❖ Restrict to develop more than 3 mosques in one community.

- Recreational Development

  - ❖ To develop the recreational facilities open space, park and play ground should be provided with better landscaping.
  - ❖ Proper plantation should be done in all embankments cum roads in the river and canal-side which will serve as the recreational facilities.

- Local Health Facilities

  - ❖ Community based health facilities should be developed.
  - ❖ Private health facilities like diagnostic center should be developed in the core part of the Paurashava.
  - ❖ Proper waste management facility has to be developed by the hospital authority to manage the hospital waste.

- Small scale industries development

  - ❖ for the core area small scale office will be allowed which would have employees not more than 15 person;

- Workshops

  - ❖ for the core area small scale workshops, with operations only in daylight hours and low traffic generators, will be allowed which would have employees not more than 5 person. Workshop includes- tailors shop, small bakeries, small car repair shop, handicraft shop, electrical repair workshop, small furniture makers.

- Open Space (playgrounds, parks etc.);

  - ❖ Each and every community should be provided with play ground.
  - ❖ Khas land could be used for the park and play ground.

- Circulation network

  - ❖ All the roads should be widened according to the hierarchy and land use zone with provisions of walk ways and other facilities.
  - ❖ The railway network should be made safe.

- Utilities
- Drainage channels

There are few legal instrument exists in Bangladesh to control development. With the promulgation of "Local Government (Paurashava) Act, 2009", some of development control issues at local government level have been tried to address.

In "Local Government (Paurashava) Act, 2009" some guidelines have been mentioned which may be the indicative prescription or act as the guidelines for the preparation of Paurashava Master Plan. Relevant sections of other laws and regulations relevant to the Preparation of Paurashava Master Plan and control development in the Paurashava along with agencies entrusted with enforcement of such regulations have been listed in **Table 6.1.**

Table 6. 1: Legal Instruments for development control

Legal Instruments	Relevant development control aspect	Implementing Agencies	Role of Paurashava
Local Government (Paurashava) Act, 2009	According to the section 32 of **"Local Government (Paurashava) Act, 2009"** Paurashava may, and if so required by the prescribed authority shall, draw up a Master Plan for the municipality within five years of its establishment. According to the section 45 (sub section 1) of **"Local Government (Paurashava) Act, 2009"**, By government approval Paurashava can acquire adjacent or Neighboring land of the road for greater public interest. According to the section 45 (sub section 2) of **"Local Government (Paurashava) Act, 2009"**, Paurashava will bear all cost of land by the defined law in case of land acquisition under sub section 1. Also according to section 33 (2) of **"Local Government (Paurashava) Act, 2009"**, Paurashava can acquire land for land development purpose within the Paurashava. According to section 95 **"Local Government (Paurashava) Act, 2009"**, may, Government shall, prepare and implement development plan, which will be subject to the sanction of the Prescribed Authority and will provide for the prevention of environmental pollution. According to the section 35 no persons can construct or re-construct any building before approval of site selection and design of the building by Paurashava authority. If any anyone violet the provision of law related to Building construction under **"Local Government (Paurashava) Act, 2009"**, Paurashava can demolish that illegal structure by own Agency and Paurashava can Impose the cost for destruction of structure as tax to the law violator.	Paurashava Authority	Should take appropriate measures for enforcement.
Play Field, Open Space, Garden And Natural Lake Conservation Act, 2000	Restriction on Change of the Land Use of Play field, Open space, Park and Natural Water Reservoir (those are marked in the Master Plan) (Section 5) According to the act, nobody can change, use or sell the marked play field, open space, garden and natural lake. **Appeal (Section 6)** However, any landowner having any land with above mentioned use may apply to the appropriate authority to have permission to change the use. The authority shall convey the results of appeal within 60 days of the appeal. **Punitive Action (Section 8 with below sub section)** Any person violating the act may be liable to punishment upto 5 years of imprisonment or BDT 50,000 fine or both. If one changes the nature of a land or parcel of land by violating the rules, then the authority has the power to stop their work by a notice and give order to break their construction work and for that no compensation will be given to the owner. If the structure is constructed by violating the Act, then the authority (Paurashava) have the power to confiscate the structure.	Paurashava Authority Department of Environment (DoE)	Regular monitoring under provision of Act. Take legal steps to ensure the enforcement of Act. Inform responsible authority in case of any violation of the Act.

Legal Instruments	Relevant development control aspect	Implementing Agencies	Role of Paurashava
The Building Construction Act 1952	The Building Construction Act, 1952, (amended 1987) is considered a legal document for development control. Rules, regulations and ordinances of the City Authorities are also being exercised for this purpose. Every construction requires permission as per provision of `The Building Construction Act 1952 (amended 1987) (BC Act 1952)'. The developing agencies are empowered for planning permission and approval of building plans and prevent illegal constructions in the metropolitan areas.	Paurashava Authority	Regular monitoring under provision of Law. Take legal steps to ensure the enforcement of Act. Inform responsible authority in case of any violation of law.
Bangladesh National Building Code, 1993	It outlines the administrative requirements necessary for enforcement of the code. The code illustrates general planning and architectural requirements of building with occupancy and fire resistance. Is also illustrates the requirement for the fire prevention and protection measures in buildings. The code specified the requirement of governing structural design of buildings that ensure safety and serviceability. It sets the standard of materials to be used in building construction. The code ensures the safety of life during construction and minimization of construction hazards. It sets standard of minimum requirement for the various services required. It sets the earthquake resistant design guideline.	Deputy Commissioner, all Development Authorities and Local Authorities	Regular monitoring under provision of Law. Take legal steps to ensure the enforcement of Act. Inform responsible authority in case of any violation of law.
Land Development for Private Housing Project Act, 2004	The Act was enacted on 1st March 2004 to control land under private housing and develop accordingly. The authority who has prepared master plan, the Act will be enforced on those areas. It is said in the section 1(2) of this Act that, this Act will be enforced under the jurisdiction of the master plan areas prepared under the guidance of The Town Improvement Act, 1953 (E.B.Act XIII of 1953) and The Building Construction Act, 1952 (E.B.Act II of 1952).” According to the regulation prescribed above, the private housing construction in the Paurashava area may be controlled through this Act.	All Development Authorities and Local Authorities	Regular monitoring under provision of Law. Take legal steps to ensure the enforcement of Act.
Building Construction Rules, 1996	**Building Construction:** The Paurashava Authority is the custodian and enforcement authority of the Building Construction Act, 1952 and Building Construction Rules, 1996 for any construction in the Paurashava premises. Section 3(1) of the Act presents control on building construction in the country. Mostly approval system of the building plan prescribed in the Rules and punishment for the breach of regulation presented in the Act. But the approval system is lengthy and volume of punishment is poor. **Density Control:** Section 12(1) of Building Construction Rules, 1996 sets a formula for building height determination based on the width of the front road. This rule imposes a limit on the building height as long as the front road is less than 75 ft. (22.87 meter). Indirectly this limits the number of family or the size of population in a building. Setback rule of the building and approval system of the building plan also prescribed in the Building Construction Rules. **Excavation of Tank:** Section 3(2) of the Act presents control on the excavation of Tank in the urban area. Approval for such excavation will be needed from the concerned authority. The regulation mostly enforces by the Development Authority and the Deputy Commissioner enforces on the areas other than the jurisdiction of Development Authority. **Raging of Hill:** Section 3(3) of the Act presents regulation on the raging of hill. In the Act it is prescribed that anybody is not authorized for raging of hill without approval from the concerned authority. Development Authority and Deputy Commissioner is the concerned authority.	Paurashava Authority	Regular monitoring under provision of Rules. Take legal steps to ensure the enforcement of Rules. Inform responsible authority in case of any violation of Rules.

Legal Instruments	Relevant development control aspect	Implementing Agencies	Role of Paurashava
THE CANALS ACT, 1864	According to section 16 0f the Canal Act 1864, Any person who shall willfully cause or shall aid in causing any obstruction to any line of navigation, or any damage to the banks or works of such line of navigation, or who shall willfully omit to remove such obstruction after being lawfully required so to do, shall be punished with simple imprisonment which may be extend to one month, or with fine which may extend to fifty taka, or with both, and shall also be liable to pay such fine as may be sufficient to meet all reasonable expenses incurred in abating or removing such obstruction, or in repairing such damage.	Ministry of Water Resources (MoWR) Bangladesh Water Development Board (BWDB)	Regular monitoring under provision of Law. Take legal steps to ensure the enforcement of Act. Inform responsible authority in case of any law violation.
The Embankment And Drainage Act, 1952	According to the section 16 of the Embankment And Drainage Act 1952, Authority can remove any trees, houses, huts or other buildings, situated between a public embankment and the river, is necessary, or that land is required for widening an existing embanked tow path, or for construction of a new embanked tow-path. Acquisition of land can be done with the provisions of the Land Acquisition Act, 1894, or other law for the time being in force for the acquisition of land for public purposes. According to the section 57 of the Embankment And Drainage Act 1952, if anyone cuts through or attempts to cut through any public embankment, or destroys or attempts to destroy any such embankment, or opens or shuts or obstructs any sluice in any such embankment or any public water course, shall be liable to imprisonment of either description for a term which may extend to one month or to fine which may extend to two hundred rupees. According to section the 58 of the Embankment And Drainage Act 1952, for diverting rivers or grazing cattle on embankments will be punished by both imprisonment and fine.	Ministry of Water Resources (MoWR) Bangladesh Water Development Board (BWDB)	Regular monitoring under provision of Law. Take legal steps to ensure the enforcement of Act. Inform responsible authority in case of any law violation.
Acquisition and Requisition of Immovable Property Ordinance, 1982	for any physical development activities, acquisition of land is needed primarily. In the Paurashava premises, for acquisition of land, the Paurashava Authority will request to the Deputy Commissioner to acquire the land needed. It is said in the section 3 of the Acquisition and Requisition of Immovable Property Ordinance, 1982, whenever it appears to the Deputy Commissioner that any property in any locality is needed or is likely to be needed for any public purpose or in the public interest, he shall cause a notice to be published at convenient places on or near the property in the prescribed form and manner stating that the property is proposed to be acquired.	Deputy Commissioner, all Development Authorities and Local Authorities	Take legal steps to ensure the enforcement of Act.
Conservation of Environment Act, 1995	According to the Act, government can declare ecologically critical area through Gazette Notification (section 5(1). Such critical environment may be created through human activities or climatic disturbances. Control on motorized vehicles who exhausts smoke dangerous for human health has prescribed in the section 6. Punishment for violation of any order presented in the Act may be 5 years imprisonment or fine with Tk. 1, 00, 000 or with both.	Directorate of Environment, all Development Authorities and Local Authorities	Take legal steps to ensure the enforcement of Act. Inform responsible authority in case of any law violation.
IWTA Ordinance	According to the ordinance 150 ft. of the river bank from its highest water level will have to be cleared of any physical development.	IWTA Paurashava Authority	The Paurashava could take at-forestation on the restricted zone to prevent any unlawful development other than the proposals of Master Plan.

Paurashava Development Management

From the year 1977 to 2009, Paurashava Ordinance, 1977 enforces by the Paurashava authority and the name of the statute was Paurashava Ordinance, 1977. After promulgation of the same statute, name of the Ordinance has changed as “Local Government (Paurashava) Act, 2009”.

for the management of all physical development activities, a wide range of functions have been prescribed. for efficient management of development, three major activities are prescribed and they are –

- Town Planning;
- Building Construction; and
- Development.

According to the Second Schedule, functions in brief are presented in the following **Table 6.2**.

Table 6. 2: Functions in brief prescribed in the “Local Government (Paurashava) Act, 2009”

Major Activity	Specific Functions	Functions in Brief
Town Planning	Master Plan	The Paurashava shall draw up a master plan for the city which shall provide for a survey of the Paurashava including its history, statistics, public services and other prescribed particulars. Development, expansion and improvement of any area within the city; and restrictions; regulation and prohibitions to be imposed with regard to the development of sites, and the erection and re-erection of buildings within the Paurashava.
	Site Development Schemes	Where a master plan has been drawn up and approved by the government, no owner of lands exceeding such area as may be specified in this behalf in the master plan, shall develop the site or errect a building or any plot of land covered by the provisions of a site development scheme sactioned to area in the prescribed manner. Among other matters, a site development scheme may provide for- (a) the division of the site into plots; (b) the street, drains and open spaces to be provided; (c) the land to be reserved for public purposes and to be transferred to the Paurashava; (d) the land to be aquired by the Paurashava; (e) the price of plots; (f) the works that shall be excuted at the costof the owner or owners of the site or sites; and (g) the period during which the area shall be developed.
	Execution of Site Development Schemes	If any area is developed or otherwise dealt with in contravention of the provisions of the sanctioned Site Development Scheme, the Paurashava may by notice require the owner of such area or the person who has contravened the provisions to make such alteration in the site may be specified in the notice as where such alteration is not made or for any reason cannot be carried out, the Paurashava may, in the prescribed manner require and enforce the demolition of the offending structure; and notwithstanding anything to the country contained in any law, no compensation shall be payable for such demolition.
Building Construction	Building Construction and Re-Construction	Without approval of the building site and plan by the Paurashava, nobody can construct, re-construct any building in the Paurashava area. The Paurashava will approve the plan within sixty days or refund it within that specified time frame; otherwise the plan will be considered as approved.
	Completion of Construction and change, etc.	After completion of the approved building, the owner will notify to the Paurashava within 15 days. The Paurashava may inspect the building and if found any violation of the provision prescribed in the Master Plan or in the Site Development Scheme, the Paurashava may demolish the building and the demolishing cost may be incurred from the building owner.
	Building Control	If any building or anything fixed thereon, be deemed by the Paurashava to be in a ruinous state or likely to fall or in any way dangerous to any inhabitant of such building or any neighboring building or to any occupier thereof or to passers-by, the Paurashava may be notice required the owner or occupier of such building to take such action in regard to the building as may be specified in the notice, and if there is default, the Paurashava may take the necessary steps itself and the cost incurred thereon by the Paurashava shall be deemed to be a tax levied on the owner or occupier of the building. If a building is in dangerous condition, or otherwise unfit for human habitation, the Paurashava may prohibit the occupation of such building till it has been suitable repaired to the satisfaction of the Paurashava.
Development	Development Plans	The Paurashava shall prepare and implement development plans for specific time. Such Plans shall provide for- (a) the promotion, improvement and development of such function or functions of the Paurashava as may be specified; (b) the manner in which the plans shall be financed, executed, implemented and supervised; (c) the agency through which the plans shall be executed and implemented; and

Major Activity	Specific Functions	Functions in Brief
		(d) such other matters as may be necessary.
	Community Development Projects	The Paurashava may, sponsor or promote community development projects for the Paurashava or any part thereof and may in this behalf perform such functions as may be prescribed.
	Commercial schemes	The Paurashava may, with the previous sanction of the Government, promote, administer, execute and implement schemes for undertaking any commercial or business enterprise.
Street	Public Streets	The Paurashava shall provide and maintain such public street and other means of public commutation as may be necessary for the comfort and convenience of the inhabitants of the Paurashava and of the visitors thereto.
	Streets	No new street shall be laid out except with the previous sanction of the Paurashava. The Paurashava may by notice required that any street may be paved, matalled, drained, channeled, improved or lighted in such manner as may be specified in the notice, and in the event of default, the Paurashava may have the necessary work done through its agency, and the cost incurred thereon by the Paurashava shall be deemed to be a tax levied on the person concerned.
	General Provisions about Streets	The Paurashava may assign names to streets and paint the names or fix the nameplates on or at conspicuous places at or near the end corner or entrance of the street. No person shall destroy, deface or in any way injure any street, name or name plate, or without the previous permission of the Paurashava, remove the same.
	Street Lighting	The Paurashava shall take such measures as may be necessary for the proper lighting of the public streets and other public places vesting in the Paurashava.
	Street Watering	The Paurashava shall take such measures as may be necessary for the watering of public streets for the comfort and convenience of the public, and for this purpose, maintain such vehicles, staff and other apparatus necessary.
	Traffic Control	The Paurashava shall make such arrangements for the control and regulation of traffic necessary to prevent danger and ensure the safety, convenience and comfort of the public.
	Public Vehicles	No person shall keep or let for hire or drive or propel within the limits of the Paurashava any public vehicle other than a motor vehicle except under a license granted by the Paurashava, and in conformity with the conditions of such license. No horse or other animal shall be used for drawing a public vehicle within the limits of the Paurashava except under a license granted by the Paurashava.
Water Supply and Drainage	Water Supply	The Paurashava may provide supply of wholesome water sufficient for public and private purposes. Frame and execute water supply scheme for the construction and maintenance of such works for storage and distribution of water.
	Private Sources of Water Supply	All private sources of water supply within the Paurashava shall be subject to control, regulation and inspection by the Paurashava. No new well, water pump or any other source of water for drinking purposes shall be dug, constructed or provided except with the sanction of the Paurashava.
	Drainage	The Paurashava shall provide an adequate system of public drains in the and all such drains shall be constructed, maintained, kept, cleared and emptied with due regard to the heal and convenience of the public. All private drains shall be subject to control, regulation and inspection by the Paurashava
	Drainage Scheme	The Paurashava may prepare a drainage scheme in the prescribed manner of the construction of drains at public and private expense. The drainage scheme as approved by the government shall be executed and implemented within specified period.
	Bathing and Washing Place	The Paurashava may from time to time set a suitable place for use by the public for bathing, washing cloths, or for drying cloth. Specify the time at which and the sex of persons by whom such places may be used. No person shall establish, maintain or run a bath for public use except under a license granted by the Paurashava.
	Dhobi Ghat and Washer men	The Paurashava may provide dhobi ghats for the exercise of their calling by washer men, and may regulate the use of dhobi ghats and levy fees for their use.
	Public Water-Course	The Paurashava may declare any source of water, spring, river, tank, pond, or public stream, or any part thereof within the Paurashava, which is not private property, to be a public watercourse.
	Public Ferries	The Paurashava may by by-laws provide for the licensing of boats and other vassals plying for hire in a public water-course to be a public ferry and may entrust the management thereof to the Paurashava, and there upon the Paurashava shall manage and operate the public ferry in such manner and levy such tolls as prescribed.
	Public Fisheries	The Paurashava may declare any public watercourse as a public fishery, and there upon the right of fishing in such water course shall vest in the Paurashava which may exercise such right in such manner as may be prescribed.

Source: "Local Government (Paurashava) Act, 2009"

6.4 Strength and Weaknesses of the Existing Policies

The Consultant has identified following weaknesses in the existing policies. These are –.

The primary motive is to exercise control over unorganized development and promotion of planned infrastructure development to accommodate future urban growth. The Paurashava will be developed as a self-contained town in rural environs.

To increase the agro-product and use them in income generating activities, a vast agriculture land will be used and at the same time, the existing agriculture land should be preserved. Further residential expansion should be controlled through the imposition of development control. In this context, concept of cluster development and compact township approach should be provisioned in the plan. Vertical development will be encouraged rather than horizontal to save the agriculture land.

Chapter Seven:
Projection of Future Growth by 2031

7.1 Introduction

One of the major challenges in the project area is the promotion of planned growth. The physical growth of the project area should be planned to embody efficiency, productivity, beauty and environmental sustainability. Indicators of development are directly or indirectly related to the size and structure of the population. The growth of population and the physical, or the area expansions of an urban area are interrelated aspects. On the other hand, the important basis of estimating the amount of land under each land use type is the size of population in different periods of the Master Plan. for planning purposes it is vital to be able to anticipate the size of the future population. Population growth is derived from natural increase and net migration. Natural increase, the difference between the number of births and the number of deaths, is the most stable and predictable component of population increase. Net migration is the difference between the number of arrivals from elsewhere in Akhaura Paurashava and number of departures to other areas. It is uncertain how these aspects of human behavior will change in future years. However, by looking at past and current trends, reasonable assumptions can be made concerning the number of babies women will bear, the life expectancy of the population and the number and age of people leaving or arriving in the area. These assumed rates of change are applied to the current population.

This Chapter presents future growth of the Paurashava according to the population, economic opportunities and landuse. The projected period for those components has been considered for the year 2011 to 2031.

7.2 Projection of Population

According to BBS 2011, Population growth rate of Akhaura Paurashava found 1.14%. But this growth rate is relatively very low considering the overall urban population growth rate of Bangladesh and Brahmaonbaria Urban population growth rate (3.31%). So the consultant has collected the nerarby Brahmonbaria Paurashva population growth rate which is 2.90% (BBS 2011). Finally the planning team has considered the growth rate for Akhaura Paurashva is 2.02% (the average of Akhaura Paurashava Growth rate 1.14% and Brahmonbaria Paurashava Growth rate 2.90%). The Paurashava area consists of both Urban and rural characteristics and population growth rate cannot be assumed similar to rural and urban part of the Paurashava. Therefore population growth rate is considered as 2.02 to forecast the future population of Akhaura Paurashava. for population projection, the annual growth rate 1.14% will be the minimum rate according to the development prescribed in the Urban Area Plan. Therefore, it is justified that the annual growth rate of 2.02% for the calculation of population projection up to the year 2031.

Table 7. 1: Population Scenario Akhaura Paurashava

Year	Population of Akhaura Paurashava			Area (Acres)
	Male	Female	Total	
2001	16558	15816	32374	2411.32
2011	17855	18407	36262	2411.32

Source: Compiled from BBS Census Reports, 2001

As ward wise population data for the year 2011 for Akhaura Paurashva is available from BBS, the population data of 2011 has ben considered as the base year data.

The following formula has been used to calculate the future population. By the formula population in any requisite year can be projected using the following equation.

$P_n = P_o (1+R/100)^n$

Here,

P_n =Projected population

P_o =Current population

R=Growth Rate

n=number of years

The growth rate as presented (2.02) is considered for the preparation of population projection. Ward wise projected population have been shown in the following Table

Table 7. 2: **Ward wise Projected Population (2011-2031)**

Ward No.	Ward area (Acre)	Pop. 2011	Density 2011 (ppa)	Pop. 2016	Density 2016 (ppa)	Pop. 2021	Density 2021 (ppa)	Pop. 2026	Density 2026 (ppa)	Pop. 2031	Density 2031 (ppa)
1	430.28	5137	12	5677	13	6274	15	6934	16	7663	18
2	258.07	3181	12	3516	14	3885	15	4294	17	4745	18
3	295.05	3334	11	3685	12	4072	14	4500	15	4974	17
4	140.10	3830	27	4233	30	4678	33	5170	37	5714	41
5	89.67	2958	33	3269	36	3613	40	3993	45	4413	49
6	331.36	5800	18	6410	19	7084	21	7829	24	8652	26
7	193.17	3767	20	4163	22	4601	24	5085	26	5620	29
8	429.95	5158	12	5700	13	6300	15	6962	16	7695	18
9	243.68	3097	13	3423	14	3783	16	4180	17	4620	19
Total	2411.32	36262	(Av. =) 15	40075	(Av. =) 17	44290	(Av. =) 18	48948	(Av. =) 20	54095	(Av. =) 22

Source: BBS community series, 2011.

Note: Population projected (for the year 2016, 2021, 2026, 2031) considering the growth rate 2.02 according to the Community Series (Zila: Brahmonbaria), BBS, 2011.

The projection shows that the population of the Paurashava will be 40075 in 2016, 44290 in 2021, 48948 in 2026 and 54095 in 2031. In the year 2031 total population of the project area would be 1.5 times higher than in the present population of 2011.

7.3 Identification of Future Economic Opportunities

The project area is one of the important centers of economic activities within the eastern region. Akhaura Town Bypass Road runs through the Middle portion of the Paurashava. The Paurashava as well as the Upazila is connected within the region by both roadways and railways. It has long cultural and trading relation with Akhaura, Brahmanbaria, Narshindi, Muradnagar, Bancharampur, Kasba and Raipura. Moreover, these areas depend on each other for various raw materials and finished products. The long established easy transportation link has brought these areas closer in terms of trade and industrial activities.

Akhaura Paurashava has strong railway way network and is connected with the rest of the country. The Akhaura railway passes just through of the Paurashava. So its importance lies on connecting the capital of the country Dhaka and other regions. As agartola landport is also connected via Akhaura Paurashva, so the paurashva has a national as well as international importance considering the international trade and commerece. The future economic opportunities of Akhaura Paurashava could be identified as following;

One of the most important features of Akhaura Paurashava population is that around 19% (vide Table 7.1) of the total population are work active and who are aged over 7. Among the Work active population about 26% population are unemployed. So, it can be said that there is an ample

opportunity of getting unskilled labor at the area with cheap labor cost. This factor is favorable for the development of industries in the area. On the other hand, as the Paurashava is well connected with capital Dhaka and industrial capital Chittagong, the town is very suitable for industrial expansion. Various small and medium enterprises, small manufacturing industries and cottage industries could be established here for the availability of cheap manpower and well regional and national connectivity. At present around 50% of the land area is used for agricultural purpose. These agricultural lands could be used for various agricultural productions. Further, various agro based light industries could be established where those agro products could be used.

Table 7. 3: Possible Future Employment Scenario of Akhaura Paurashava

Year	Total Population	Population aged 7+, not attending school											
		Work Active Population			Employed			Unemployed (Looking for Work and Do not Work)			Household Work		
		Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both
2011	36262	2975	3878	6853	2140	214	2354	808	966	1774	27	2698	2725
2031	54095	4438	5785	10223	3192	319	3512	1205	1441	2646	40	4025	4065
Total % (for 2031)		8.20	10.69	18.90	5.90	0.59	6.49	2.23	2.66	4.89	0.07	7.44	7.51

Source: BBS community series, 2011.

As the Paurashava has well transport opportunities both by Road and Rail way network the people of Paurashava will get ample opportunities trade and business. Again the Paurashava have ample opportunities for agro base industries, firming fishing etc. There is opportunity to flourish home-based poultry, diary, and kitchen gardening based on local raw materials. These micro-entrepreneurs will also provide employment to the unemployed and the housewives who mostly are engaged in household works only. So skill population, infrastructural facilities and financial facilities will promote people to find the economic opportunities.

7.4 Projection of Landuse

Future Landuse has been projected on the basis of planning standard prescribed by UTIDP. On the process of Landuse projection the issues of development control has been considered. The land use projection and estimation was mainly based on the growth of population.

Existing population of Akhaura Paurashava is 36262 on 9.76 sq. km of land. The projected population of Master Plan Area will stand at 54095 in the year 2031 so considerable amount of lands have to be absorbed to accommodate additional 17883 populations by the next 20 years. Estimated future land use requirements according to the Planning standard have been shown in **Table 7.4** along with existing landuse.

Table 7. 4: Existing and proposed landuses including standard

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement for 2021 (acres)	Land Requirement for 2031 (acres)	Additional Requirement for 2031
Population	-	**36,262**	**44,290**	-	54,095	-
Residential		**629**	-	-		-
General Residential	1.00 acre/ 100	629.00	442.90	-	540.95	-

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement for 2021 (acres)	Land Requirement for 2031 (acres)	Additional Requirement for 2031
	pop.					
Administration	**-**	**1.85**	**-**	**-**	**-**	**-**
Upazila Complex	15 acres/ Upazila HQ	1.50	15.00	13.50	15.00	13.50
Paurashava office	3 acres/ Upazila HQ	0.35	3.00	2.65	3.00	2.65
Commerce		**7.59**	**54.22**	**46.63**	**65.01**	**57.42**
Wholesale Market	1.00 acre/ 10000 pop.	0.21	4.43	4.22	5.41	5.20
Retail sale Market	1.00 acre/1000 pop.	6.38	44.29	37.91	54.10	47.72
Neighborhood Market	1.00 acre/ Neighborhood market	1.00	4.00	3.00	4.00	3.00
Super Market	1.50 acres/ super market	0.00	1.50	1.50	1.50	1.50
Industry	1.50 acres/ 1000 pop.	1.26	66.44	65.18	81.14	79.88
Education		12.07	67.01	54.94	67.32	55.13
Primary School	2.00 acres/ 5000 pop.	4.20	17.72	13.52	21.64	17.44
Secondary School	5.00 acres/ 20000 pop.	3.90	11.07	7.17	13.52	9.62
College	10.00 acres/ 20000 pop.	0.76	22.15	21.39	13.52	12.76
Vocational Institute	5.00 acres/Upazila	0.00	5.00	5.00	5.00	5.00
Others (Madrasa)	5.00 acres/ 20000 pop.	3.21	11.07	7.86	13.52	10.31
Health Facilities		**1.8**	**18.86**	**17.06**	**20.82**	**19.02**
Upazila Health Complex/ Hospital	10 acres/ Upazila HQ	0.80	10.00	9.20	10.00	9.20
Health Center/ Maternity Clinic	1.00 acre/ 5000 pop.	1.00	8.86	7.86	10.82	9.82
Open Space/ Recreation	**-**	**5.84**	**103.33**	**97.49**	**124.42**	**118.58**
Playground	3.00 acres/ 20000 pop.	5.84	6.64	0.80	8.11	2.27
Park/ Open space	1.00 acre/ 1000 pop.	0.00	44.29	44.29	54.10	54.10
Neighborhood Park	1.00 acre/ 1000 pop.	0.00	44.29	44.29	54.10	54.10
Stadium	7	0.00	7.00	7.00	7.00	7.00

Facilities	Standard (LGED)	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement for 2021 (acres)	Land Requirement for 2031 (acres)	Additional Requirement for 2031
	acres/upazila HQ					
Cinema	0.5 acre/ 20000 pop.	0.00	1.11	1.11	1.11	1.11
Community Facilities	**-**	**23.97**	**14.06**	**-**	**16.5**	**-**
Utility Services	**-**	**0.14**	**8.49**	**8.35**	**10.2**	**10.06**
Telephone/ Telegraph Exchange	0.50 acre/ 20000 pop.	0.00	1.11	1.11	1.35	1.35
Electric sub-station	1.00 acre/ 20000 pop.	0.14	2.21	2.07	2.70	2.56
Garbage Disposal	1.00 acre/ 20000 pop.	0.00	2.21	2.21	2.70	2.70
Waste Transfer Station	0.25 acre/waste transfer Station	0.00	0.75	0.75	0.75	0.75
Water Supply	1.00 acre/ 20000 pop.	-	2.21	2.21	2.70	2.70
Transportation Services		**1.32**	**4.42**	**3.32**	**5.41**	**4.16**
Bus Terminal	1.00 acre/ 20000 pop.	0.00	2.21	2.21	2.70	2.70
Truck Terminal	0.50 acre/ 20000 pop.	0.00	1.11	1.11	1.35	1.35
Tempu Stand	0.25 acre/ 20000 pop.	0.75	0.55	-	0.68	-
Rickshaw Stand	0.25 acre/ 20000 pop.	0.57	0.55	-	0.68	0.11
Roads	15% of the built-up land	45.87	119.19	73.32	119.19	73.32
Urban Deferred	10% of the total built-up area	0.00	79.46	79.46	79.46	79.46

In Akhaura Paurashava population growth rate is considerably low. In the year 2031 total population will increase just 1.5 times higher than the present population. The planning team has considered present growth rate according to the BBS, 2011 for Akhaura Paurashava. Again the growth trend of any urban areas vastly depends on the economic opportunities living environment, and urban facilities. So the exact growth trend can be analyzed by revising time to time.

In some aspects the planning team proposed to expand vertically than horizontal expansion of the city. The Planning team tried to all possible optimum locations to provide the facilities according to the client provided planning standard. The considerable land uses have been shown in the right column of the **Table 4.3**.

All the landuses proposals have been discussed in the Landuse Chapter (Chapter 11)

Chapter Eight:
Land Development Strategies

8.1 Introduction

Requirement of new area of urban land to development depends on the estimated growth of population. Except the core area rest of the Paurashava is still very thinly developed. Most of the estimated growth of the population can be accommodated through infilling of the existing urban area and its vicinity. With an estimated population of 54095 in next twenty years the town will not require any more land for residential purpose. As a total of 629 acres of land is occupied by residential use whereas a total of 540.95 acres of land is required for this purpose considering the net density of 100 person per acre.In recent past there was no initiative for development of residential land. As there are large tracts of land still unused or underused in the existing urban area it is rational in terms of investment to provide infrastructure on these lands to achieve desired density by accommodating the growing population.

To guide, attract and manage investment in land development of Akhaura Paurashava suitable policies and strategies have to set out for the implementing authorities.

8.2 Zone of Structure Plan Area

The Structure Plan Area needs to demarcate into several classifications to guide future growth areas and indication of potential locations to manage future growth. Akhaura Paurashava area is classified into seven categories considering the development zones broadly. **Table 8.1** shows the Structure Plan area zones, its area and percentage coverage. Details of the description of structure planning zones are given in the following paragraphs. Map 8.1 and Appendix-1 shows the structure plan of Akhaura Paurashava.

Table 8. 1: Structure Plan Policy Zoning

Zoning	Description of the Zone	Area (acre)	Percentage (%)
Core Area	This area is also known as built-up area. This is defined as the area which has the highest concentration of services; it also has the highest population concentration and density. It will absorb most population growth during the Land use Plan period.	158.91	6.56
Peripheral Area	This is the zone where a slow trend of urbanization is continuing in Unplanned manner. The area identified in the Structure Plan as the likely choice for new urban development beyond the core area. Ideally, it might be reasonable to provide primary infrastructure networks in this area to foster development and encouraged to enable a more rapid urbanization in a planned way.	489.15	20.09
New Urban Area	This zone will be the required additional area for future planned urban development as per population projection. New facilities and services like road, drains, footpath, waste transfer station and other civic services will be provided. This area is proposed to grow within 2031.	397.28	16.31
Agriculture	Agricultural land (also agricultural area) denotes the land suitable for Agricultural production, both crops and livestock. It is one of the main resources in agriculture. The land under annual crops, such as cereals, other technical crops, potatoes, vegetables, and melons; also includes land left temporarily fallow; land under permanent crops (e.g.,fruit plantations); areas for natural grasses and grazing of livestock.	801.66	33.16
Water body	Water body containing an area equals to or more than 0.25 acres excluding those of khal, irrigation canal and river will be treated as this category.	290.36	11.92
Major Circulation	Major circulation contains major road network and railways linkage with Regional and national settings.	292.01	11.99
	Total	2411.32	100.00

8.2.1 Core Area

Total 158.91 acres of land, which covers 6.56% of Structure Plan area, is declared as Core Area (Map 8.1). The area covers Ward No. 5 wholly and Ward No. 3,4,6 and 7 partially(vide **Map 11.1**). It includes the highest concentration of service area and it has the highest potentiality of development. Because the town developed based on the Akhaura Bazar and Akhaura Railway Junction.

8.2.2 Peripheral Area

A total of 489.16 acres of area, which covers 20.09% of Structure Plan area, is declared as Urban Peripheral Area (**Map 8.1**). Peripheral area is in Ward nos. 01, 02,07,08 and 09 in Northern and Southern part of the Paurashava. This zone is developing areas that will take a longer time to reach the population densities of the urban core area. Low initial densities in these areas do not justify supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources. (vide **Map 11.1**).

8.2.3 New Urban Area

Total 397.29 acres of land covering 16.31% of Structure Plan area is declared as New Urban Area. The area covers partially Ward No. 02, 03, 04, 06, 07 and 08 and which is located just outside of the core area. This zone will require additional facilities for future planned urban development. New facilities and services like road, drains, footpath, waste transfer station and other civic services should have to be provided.

8.2.4 Agriculture

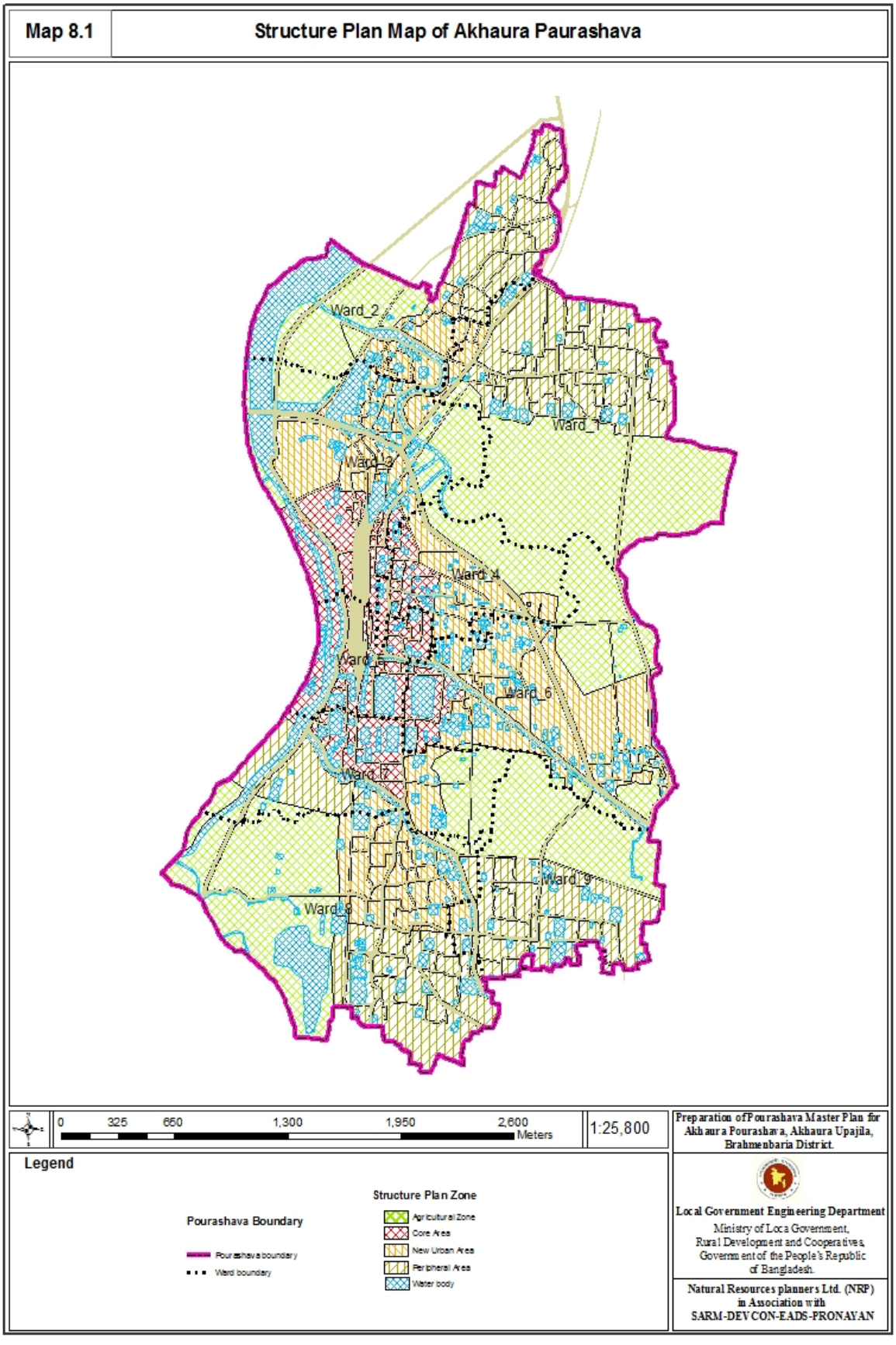
Total 807.55 acres of land covering 33.16% of Structure Plan area is declared as Agriculture Area. (Vide **Map 8.1**).

8.2.5 Water body/Retention Area

Total 290.36acres area, which covers 11.92% of Structure Plan area, is declared as water body **(Map 8.1**). It includes all the ponds with an area equal to or more than 0.25 acres and all the canals and river within the Paurashava. More detail information is provided in drainage and environmental plan in Chapter 13.

8.2.6 Major Circulation Network

It contains major road network and railway network for maintaining internal and regional communication of the Paurashva.Total 292.01acres of land which covers 11.99% of total structure plan area.



Map 8. 1: Structure Plan Map

8.3 Strategies for Optimum Use of Urban land Resources

LuD.01: Land use change to be guided and controlled in accordance to overall objectives set in the Master Plan.

At present there is no planning control in Akhaura Paurashava. Due to the absence of an integrated urban management plan there is no control over land use changes. Planning control is a very effective tool to achieve the goals set in an urban management plan.

LuD.02: Development density of urban land has to be balanced by providing infrastructure facilities to the fringe and semi-urban area.

Development density needs to be restricted into the limit of the infrastructures carrying capacity in the core part and have to increase in the semi-core and fringe area by providing infrastructural with other urban facilities. There is a slow process of rural-urban land use conversion in the urban periphery. However, though this process is adding to the urban space it does not make substantial contribution to urban population due to slow rate of population migration. This is due to low level of access to capital and low level of affordability of the people, lack of infrastructure and services, increasing land value lengthy land development cycle carried out mainly by the under-capitalized informal sector operating under infrastructure scarce investment.

LuD.03: Optimization of land resource should be through sustainable use and equitable distribution of land.

Land is one of the scarce resources in Bangladesh; therefore optimization of this resource is a vital strategy for this plan set.

LuD.04: Ensure that serviced land is made available for all income groups.

LuD.05: Promote urban up-gradation projects through slum up-gradation, urban conservation and redevelopment, land readjustment etc.

Large part of the existing town area is less developed. But those areas can accommodate more people even with better living standard, if proper urban up-gradation programs are under taken and infrastructures improved.

LuD.06: Discourage the development to agricultural or vacant land within existing urban area.

LuD.07: Discourage land speculation and urban sprawling into the fringe of the existing urban area.

LuD.08: Identify zones with especial economic value and ensure most efficient use of them.

Identify zones like river banks, both sides of canals and highly accessible land by the side of the National Highways to be evaluated and identified for especial investment.

8.4 Plans for New Area Development

LuD.09: Use fiscal and infrastructural tools to guide the growth of the town towards the area which are regarded as suitable for development and away from those areas which are considered as unsuitable.

LuD.10: Identify and reserve land for future infrastructure development.

8.5 Areas for Conservation and Protection

LuD.11: Identify ecologically sensitive and culturally valuable sites and protect them.

Ecologically sensitive and culturally valuable sites need to be protected by law and the cost of protection must come from public exchequer.

LuD.12: Identify ecologically sensitive areas and protect them from encroachment, pollution and change of land use.

Land for agricultural use is becoming scarce due to the pressure of population growth and unplanned sprawling of urban area. for food security and ecological protection rural land and ecologically sensitive areas need to be protected from haphazard and unplanned urban encroachment.

LuD.13: Ponds, canals and wetlands to be identified and preserved as vital resources for development of agro-economy and tourism.

The objective of Structure Plan is to build a strong and sustainable economy, based on the existing livelihood pattern of the people of Akhaura Paurashava. In persuasion of this policy agro-industry, tourism and water transport need to be given priority; for development of these sectors ponds, canals and wetlands must be identified, recovered and protected.

Chapter Nine: Strategies and Policies for Sectoral Development of the Paurashava

9.1 Socio Economic Sector

9.1.1 Population

The future growth of population needs to be taken into account for planning of Akhaura Paurashava. The Strategies and policies in relation to population are set as below.

POP.01: Expected population growth and changes in its socio-economic and age-structure should be taken into account for future development initiatives.

Prediction of population growth should be reviewed from time to time, in the light of new evidence, to track the new trends in migration, age and income structure.

POP.02: Initiatives should be taken for rational distribution of population within the Structure Plan area through making land available by ensuring infrastructure facilities, housing and community facilities.

To ensure rational distribution of population within the planned area is one of the main objectives of the development plan. This distribution of population has to be in relation to the availability and suitability of land and other urban activities.

The Authority will assess and monitor the effectiveness of the policies, changes and review the strategy as and when necessary.

9.1.2 Economic Development

Economy is the most vital issue for urban growth and development. The Paurashava has been a major center of trade and commerce since long. To gain the Economic Development, following sectoral strategies are set.

Agricultural Sector

ED.01: Promotion of regional agriculture

Promotion of agriculture would help raising income and savings. The main objective of agriculture sector will be to increase production and simultaneously ensure value addition.

ED.02: Developing Agro based Industries and Markets to Paurashava Area

Due to existence of available agricultural land, the land may be used for different agricultural production and those productions may be used for the input of agro-based industries.

Again the Upajila is renowned for Maze and Vegetables based cultivation. An industrial estate and Trading Centre based on those raw agro-products may be established in the Paurashava area. Nearness of the Toll Plaza of the High way (about 1.5 km. away from the Paurashava Bazaar) for trading of those productions will encourage to be flourished of those trading centers and industries. These proposed industrial sites will be linked with the Boat Ghat Area to get water way transportation facilities by the proposed embankment cum road.

Industrial Sector

ED.04: Developing and Establishment of agro-based industries especially SMEs and agro-based industrial Center in the project area

The project area has been serving as an important trading and business center for the Akhaura Paurashava and also surroundings of Akhaura Upazila. Adoption of this policy will create opportunities for developing basic agro-based industries in Akhaura Paurashava using the agricultural products as input at a comparatively cheaper price. Agro-based industries especially SMEs will help the existing producers to increase their earnings through product diversification and value addition. This policy will also help to increase the employment opportunity without disrupting the existing social setting.

ED.05: Identify locations for new Industrial and trading areas

Presently, core city area is occupied with manufacturing units, commercial and trading activities, and also by residential areas making the core part of the town is not acting as habitable. In the future all heavy and noxious industrial and trading activities, service providing establishments should be set up in locations selected according to the suggestion of Structure Plan.

ED.06: Encourage central government to decentralize the industrial facilities from Dhaka

Central Government has control over the location of many industrial facilities which are currently located in Dhaka, such as Government departments, the headquarters of nationalized or Government banks and other infrastructural facilities for industrial development. The Paurashava will encourage Central Government to offset the current strong tendency towards centralization of facilities in the Capital by relocating some of these facilities to Paurashava / Upazila / Zila.

Services Sector

ED.07: Human resource development through trainings to be provided by Ministry of Youth and Sports and Ministry of Women and Children Affairs.

ED.08: Extension of gas network to the whole project area and ensure sufficient power supply for smooth operation of proposed manufacturing and other commercial and trading activities.

ED.09: Establishing internet and telecommunication Facilities

Ensuring proper functioning of the existing digital telecommunication system; Establishing high speed data communication and broadband Internet service are to be ensured.

9.1.3 Employment Generation

Generating employment opportunities in the Paurashava would require integration of local economic development. The Paurashava area covers a vast area of Agricultural Lands, Low Lands, Rural areas, besides a small urban center of the town. The Dhaka-Chittagong Railway Line passes through the Paurashava and the major development occurs besides the railway line and railway junction. On the other hand the most of the areas of the paurashava are rural in nature. This indicates general feature of the planning area as a mixture of rural and semi-urban nature. Entrepreneurs of the Paurashava area are facing the following problems for investment on any economic activities:

- Absence of better Infrastructure facilities
- Lack of useable Lands
- Lack of energy (gas supply).
- Electricity supply is not reliable.
- Absence of skilled manpower

Unethical Practices are available to set up any economic related activities like; encroachment, filling low lands; connection use of lands; etc. due to the lack of systematic Government Procedures in setting up industries, and other commercial components

In order to achieve employment generation the following policies and strategies have to be followed:

Development Authorities have to pursue growth paths like attempt to attract investment through economic and social infrastructure investments; support infrastructure development in areas where private sector investment is growing and bringing coordination system among these aspects for supporting growth in investment. This will encourage labor intensive sectors of the economy, support small, medium and micro-enterprises (SMMEs) and enforce a regulatory framework that creates an environment conducive to investment.

Selection of Suitable Location in the Paurashava area and Improve industrial areas and ensure their full utilization.

Urban Development Grants may be provided by the national government as bridging finance to stimulate urban development activities. Such grants may be used for development and maintenance of infrastructure and services, e.g. ensuring good, reliable and cost effective municipal service delivery, efficient infrastructure maintenance, provision of social amenities, etc.

Allowing Small firms development will be the form of backbone of the economy for the Paurashava Town Centers as these will create jobs far more efficiently than large, capital intensive industries etc. However, their expansion and development are hindered by inappropriate regulations, particularly those that restrict access to formal credit. Access to formal capital for these firms should be facilitated. Other initiatives to assist them include counseling, training, provision of space and facilities for commercial activities, information centres, etc.

Encouraging the Local Entrepreneurs is important for the Employment generation through the creation of new industries, SMEs, small Firms etc. which are vastly depends on active activations of the Government' role, Financial institutions in Banking Purposes, NGOs as the facilitator of entrepreneurial promotion,

Professional Associations for arranging and providing training and mentorship on technical and business matters with formulation of related policies with the local government dealing with local economic development

Human resource development through training under Ministry of Youth Development in collaboration with child and Women Affairs Ministry

Extension of gas network up to the project area and also ensuring sufficient power supply for smooth operation of proposed manufacturing and other commercial and trading activities.

Establishing internet and telecommunication facilities

Ensuring proper functioning of the already set up digital telecommunication system; Establishing high speed data communication and broadband Internet service are to be ensured.

9.1.4 Housing and Slum Improvement

One of the important issues to determine the future demand for housing is population growth rate. The density of population of Akhaura Paurashava is yet very low. Still there is lots of scope for planning and developing the Paurashava.

The policies for the fulfillment of the above vision are:

H&S.01: Better housing provision should be available for all

It is necessary to undertake policy to improve housing conditions for all. It will discourage people to construct more houses to the core part of the Paurashava and restrict to slum developments. Public and private housing sector should work initially with close co-ordination to prepare better housing situations to meet the future demand for housing.

H&S.02: No housing development permission should be given to destroy natural resources which need to be identified and conserved.

Critical natural resources (water body, Canals, River side area, Agricultural Lands, habitat for the migratory birds etc.) need to be identified and no residential development permission will be given for building construction and/or site and service projects in those areas and alter or destroy the current use of those lands.

H&S.03: Planning permission in Commercial, Industrial and Mix Land use Zones should be given considering the Development Control.

Planning permission in Commercial and Mix land use zones will be issued based on different guidelines provided in the Urban Area Plan (Part C). Permission for non-residential activities in Mix-Use Zone will be controlled by the Guidelines given in the Paurashava Development Related Policies, Laws and Regulations Chapter of the structure Plan. Residential use should be reduced in the Commercial, Administrative and Industrial zones. Commercial or industrial activities will be permitted based on the demand of the people living in those areas and on the list of industrial category of Department of Environment (DOE) (Appendix-A).

H&S.04: Initiatives should be taken to launch re-settlement programs to get rid from the existing Spontaneous growth and for the purpose of better use of Lands and the utility facilities

H&S.05: Building construction rule and safety regulation need to be formulated and followed during construction of building.

formulation and monitoring on building construction rules and safety regulations have to be made to ensure safety on the construction site. Precautions have to be taken on construction site to provide safety for the labors and others. Access for fire fighting vehicles, emergency exit, etc. has to be provided to ensure a safe construction site.

A building code focusing the local practice and culture needs to be prepared for the design and construction of houses. Provisions outlined in the National Building Code, 1993 should be strictly followed till the preparation of such code.

H&S.06: Provision of low income group housing has to be made mandatory for any type of real estate development programme- both public and private initiatives

Local and national level policy has to be made for the low income group to get special cooperation from the real estate development sector - both public and private. Any real-estate development program may proportionate facilities for the low income group to obtain planning permission. A proportional distribution of the land, houses and financial support will ensure that the low income group will get their chances to get a house and healthy living environment.

H&S.07: Monitoring mechanism needs to be developed to ensure proper and maximum utilization of land and houses.

Proper monitoring system needs to be developed to monitor the demand and supply of the housing. Policy needs to be formulated to ensure proper and maximum utilization of the lands and to restrict artificial raise of price of the land.

H&S.08: Undertake appropriate tax policy on both urban property and housing to avoid the unfair distribution of land and vacant houses.

Paurashava authority needs to undertake appropriate tax policy to prevent unfair distribution of land and houses. Tax policy should be made in such a way that low and middle income group will have the maximum benefits and can afford to own a land or house within the area. Policy should also be taken to restrict the vacant houses. To discourage the ownership of real-estate for speculative business tax

need to restructured and staggered on urban real estate property instead of building and income category.

9.1.5 Social Amenities and Community Facilities

Social Amenities and Community Facilities particularly education, health, recreation facilities, shopping and markets, etc. are the key aspects for the growth of an urban territory. Social Amenities and Community Facilities planning and management have become important for the extra population in the next twenty years for the Akhaura Paurashava. To attract and control investment in community service planning, following policies are chalked out.

CF.01: A planning and coordination unit has to be introduced in Paurashava for providing, coordinating and managing different types of social amenities and community facilities.

CF.02: Setting the standards and location of social amenities and community facilities

The social amenities and community facilities (school, playground, neighborhood market, primary health care center, etc.) should be within the walking distance. There has to be defined standards for different social amenities and community facilities that should include the necessary features that a facility must provide.

CF.03: Ensure a kitchen market/ Neighborhood Market for every communities

CF.04: Establish internet-based information center at urban growth center and rural hat-bazaar and E-governance to be adopted by the Paurashava.

Information center is that place where people can get all kinds of up-to-date information through electronic communication. People can also send and receive personal messages and mails electronically through the information center. By the adoption of e-governance the inhabitants of the Paurashava will get various information related to the services of the Paurashava from the website.

CF.05: All the service providing authorities will develop E-network system and provide their services by using internet.

Service providing Local agencies (e.g. PDB, WASA) and different institutions (e.g. schools, colleges, university, etc) to come under internet network and they will develop an internet based network system to serve their stakeholders efficiently for payment of electricity bill, school fees, city corporation tax, water bill, etc.

CF.06: Strengthening and expansion of existing major educational facilities

The existing educational facilities have to be expanded to increase the capacity to facilitate more student admission and with sufficient play grounds.

9.1.6 Tourism and Recreational Facilities

Recreational facilities like Playground, Community Parks, Sports facilities, Cinema Hall, Theater, Shishu Park, Picnic spot, etc. are included in this category. Along with the Policy for tourism and recreational facilities of Bangladesh, the following policy guidelines are formulated for the development of Tourism and Recreational Facilities in the Paurashava.

T&R.01: Identify the potential recreational places

The Canals are the local natural resources that should be protected against harmful activities. The banks of these canals can be built as recreational sites. People can go there for getting a fresh

breath. Suitable places should be identified for Community Parks. Different types of plantation can be done there. These facilities can be maintained by ward councilor's offices (**Map 9.1**).

T&R.02: Ensure play lots and play ground with the community centers and schools

T&R.03: Create a Sports and Recreation zone

To accommodate different types of formal sports a sports and recreation zone should be identified and a stadium can be developed at the Paurashava. Cinama hall, theater and other recreational facilities could be accommodated in this zone.

9.1.7 Safety and Security

A systematic development may ensure the safe and secured environment and keep the town away from all aspects of hazards like environmental degradation, Social cohesion, urban inequalities which does not exist in the Akhaura Paurashava. Upgraded living conditions and empowered communities are the main outcomes sought by the type of integrated development which will achieve through the systematic development.

-Bringing Good Governance and Practice

So to achieve safety and security of Akhaura Paurashava the Paurashava authority will act the major roles by starting planned way development by the Guidelines of the proposed Master Plan with allowing the meaningful participation of the urban dwellers in planning and designing their urban public space, a more effective policing, and other features of the built environment that allow for self-protection.

-Safer road design hase to be prepared to avoid the traffic accident near the Highways,

-Infrastructures like Roads Drains have to be prepared considering height the average flood level to avoid the water logging etc.

9.2 Physical infrastructure Sector

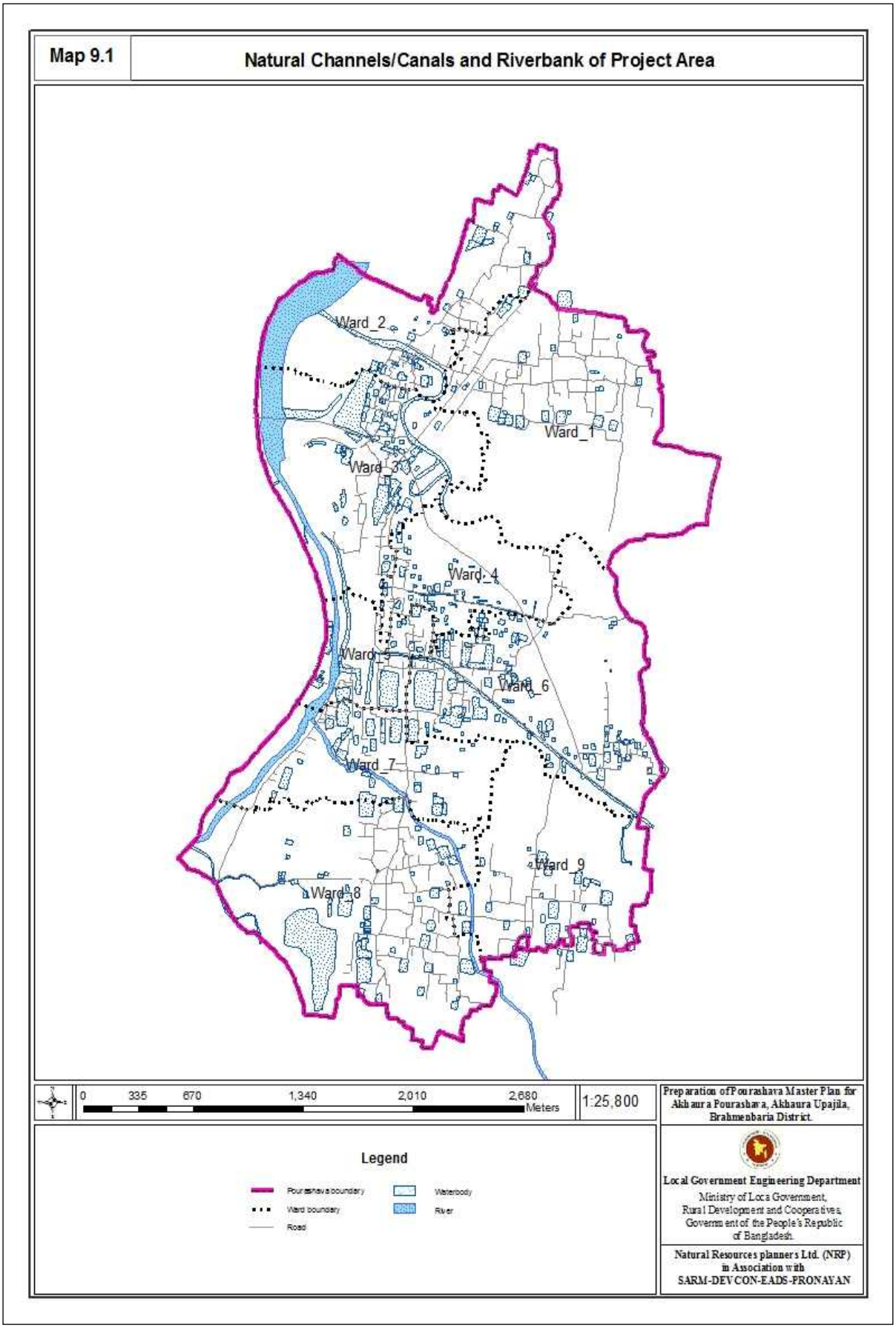
9.2.1 Transport

The transport plan is more of a preventive nature than a curative one for more economic activity directly implies to more need to travel. Though transport infrastructures form a very fundamental part of a human habitat, when it is functioning properly, it is an absolutely inseparable component for any community. Akhaura Paurashava has not yet reached a stage of congestion and breakdown. But the core part of the Paurashava is characterized by high density and agglomeration of commercial and residential land uses. Sensible policies and decisions can create and sustain a system that would plays an instrumental role in improving people's lives rather than creating problems for the Paurashava. The policies and strategies and their rationale are depicted in the following sections

Travel Demand Management

TR.01: Effective road network design has to be considered for the mixed land-use areas that provide both places to live and work

Mixed land-use creates vibrant, lively communities and reduces the need for longer distance travel and commuting. Short distances travel also encourages use of sustainable alternatives like walking and bicycling. Mixed land use provides the commercial base for supporting viable public transit. for providing effective road network the consultants have proposed different road cross section for different road categories (vide **Figure 12.1**)



Map 9. 1: Natural channels/ Canals and Riverbank of the project

TR.02: Avoid dispersed and scattered development patterns

Dispersed and scattered type of development promotes 'sprawl' and increases time for travel. It raises the need for more and more transport corridors inducing ever greater traffic. Therefore, avoiding and discouraging this kind of development by various policy measures would help reduce creating new trips.

TR.03: Consider traffic impact of land use and occupancy of structure while giving building construction and land use permit

As transport is basically a function of land use, any proposed development should be examined with respect to the traffic impact it has on the locality. Kind of use for the any structure has to be clearly defined. 'Transportation Clearance' should be given considering the structure size and proposed use and has to be a compulsory criterion for receiving building permit.

TR.04: Ensure connectivity among all administrative wards and major land uses with the Paurashava area.

TR.05: Provide parallel service roads along the major roads and Ensure less Use of those major roads from Local Travel Purposes

The major arterial roads have to be kept free as far as possible from local use. Direct connections of all local access roads should be stopped. Strict access control of pedestrian, cattles should be enforced. Foot over bridges should be provided to facilitate pedestrian movement from either side. Tea stalls, vegetable markets adjacent to the roads should be removed.

TR.06: Establishment of an embankment-cum-Road

To save the river bank of Titas River from river erosion an embankment-cum-road has been proposed along River. At the same time embankment-cum-road has been proposed to protect the natural canals of the paurashava.

TR.07: Control of on street parking

On street parking in major roads should be made prohibited. Different designated parking spaces should therefore be provided for different types of vehicular traffic. This is expected to ease out congestion and facilitate smooth vehicular movement in the Paurashava Area.

Pedestrian First

TR.08: formulating plans and actions that give highest priority to pedestrians

As far as the short trips that are dominant in the core part of project area are concerned, walking forms the most healthy and economically viable choice suited to the locality. All major roads of the project area have to be provided with pedestrian way.

TR.09: Priority to pedestrians when planning infrastructure use and road-space sharing

Allocation of resources is a crucial factor in development of economy. Therefore, taking up new schemes in the transport would require careful prioritization. Focusing on the pedestrians in this respect would set the course to create vibrant, lively local communities.

TR.10: Creating walkways as multi-functional social spaces

The major idea here is to make the street, especially local ones, not only a zone for movement but also a place that would induce greater social interaction. There can be provision for road-side small traders or hawkers that would provide safety for pedestrians in addition to providing utility. The walk ways can also design with lamping, street trees.

TR.11: Ensure safety and accessibility in walk trips

When taking actions that have the potential to induce greater number of high speed traffic into a road section, consideration has to be made as how it might affect the safety and usability of pedestrians using that section.

Connectivity & Accessibility

TR.12: Creation of major linkage

As the Town grows and the traffic intensifies on the streets, an efficient network of roads has to be built based on major links. This would ensure direct connection between different curial nodes of the network and help to reduce both travel length and time. This is a nonstop process and will be closely in interaction with the spatial development policies for the city.

TR.13: Development & availability of Public Transport (PT)

This should form the major share of the motorized vehicle. PT has to be available within comfortable walking distance from any part of the Paurashava. Maintenance of an efficient public transport provides a cheap and accessible solution for mass movement.

Traffic Management

TR.14: formulate Traffic and Transport Management Committee

Designing, modeling and at last managing traffic and Transport is not an easy task. It needs important decisions of policy makers from both Public and Private Representatives. In Upazila Towns Mayor is the key decision maker for all development activities. Traffic and Transport related decisions require coordination among technical professionals and public representatives. for efficient management of traffic and transportation of small municipalities like Akhaura Paurashava, Traffic and Transportation Management Committee headed by the honourab;e Mayor and taking representative from Ward Councilors, Town Planner of the Paurashava and Engineers from local offices of LGED and RHD is therefore suggested.

TR.15: Developing an Integrated Transportation System

As there is no transport studies conducted before for the Upazila Towns, no serious effort has been made for the functional integration of different modes of transport. However, it is well understood that without effective integration of transportation systems, economic benefit, convenience and comfort from transportation services cannot be derived.

TR.16: Establishment of 'Road Hierarchy'

A hierarchy of roads should be created based on their dominant use and significance on urban context. According to the Planning Standard of this Project the consultants have proposed the hierarchy of roads for Akhaura Paurashava (vide **Figure 10.1**)

TR.17: Road space allocation

Road space should be allocated among different mode and use based on the hierarchy of the road and its adjacent land-use. This is essential for safety and effectiveness of the use of road.

TR.18: Control the growth of private motorized transport

Private motorized vehicles should be discouraged as they waste road space. This is especially relevant for urban areas of Bangladesh where available road space is limited. Many mechanisms can be used including taxation, rationing of road etc. Public transport should be encouraged as they carry large volume of traffic within very limited space.

TR.19: Lane-based traffic management

The aim of Lane-based traffic management is to determine number of lanes on every street and their individual capacity. Lanes can be designated for different modes. Use of every segment of the road has to be pre-designed and clearly defined e.g. movement, parking, pedestrian crossing etc.

TR.20: Intersection management

The intersections, especially where major roads meet or cross have to be treated with special attention. They create major points of conflict and also are at the root of creating congestion. Strong regulation is required at these places to keep the flow smooth. Standard geometric design should be adopted for the construction of intersection.

Management of Railway Line and Railway Junction

TR.21: Ensure safety at Railway Junction

Railway junction is one of the most important area of Akhaura Paurashava. for the safety of railway junction a well managed safety plan has to be formulated to safeguard the railway track and the lives of the pedestrian and railway passenger.

TR.22: Provide A parallel road to the Railway Track

As many of the existing roads are directly linked with the railway track, there is a risk for collision of vehicles with train. So to protect the railway track safe the road intersection should be minimized and a parallel road to the railway track is essential.

Eco-friendliness and Sustainability

TR.23: Ensure in-depth analysis of socio-economic and environmental impact of transport projects

Any new scheme like a major road construction may improve connectivity and expand economic activities. But, at the same time, it may evict hundreds of people and cause critical change to the surrounding ecology. Therefore socio-economic and environmental impact assessment should be made mandatory for such project.

TR.24: Promote use of FFT (Fuel Free Transport) and discourage FDT (Fuel Dependent Transport)

Use of fossil fuel and harmful emissions are a major environmental issue all over the world. FFT can play a vital role in reducing vehicular emission. . Modes like walking, bicycling are in general called ‘green transport’ for their environmental friendliness. Promotion of these means of mobility can eliminate long-term negative impacts of fuel-based vehicles and enhance health and safety of the inhabitants.

TR.25: Provide equitable opportunities for short and long distance travel

Short trips dominate the transport scenario of Akhaura. Moreover, access is the major function served by roads apart from the few main corridors. Therefore, road space has to be allocated in a way that caters the greater proportion of the road users.

TR.26: Transportation for all

Transport facilities have to be planned in a way that provide maximum accessibility for different segments of the society especially the less advantaged groups e.g. the poor, aged, women and children, physically handicapped etc.

TR.27: Facilitate 'Smart Choice' for travelers

'Smart Choice' is the decisions people take about traveling that help reduce congestion, pollution and create better environmental conditions like using certain space-efficient and sustainable modes, making intelligent route choices etc. Contemporary transport management gives priority to such measures. They can make best use of time, space, money and all other resources involved.

9.2.2 Utility Services

Urban utility services are the lifeline for healthy urban development. However, supply of Infrastructure like water supply, power, gas etc. cannot be unlimited. Therefore the issue needs to be addressed from both supply and demand side. Since supplies of utilities require payment of bills by the consumer in one hand and operation and maintenance and cost of establishment by operators, there should be a balance for its long time sustainable use.

UTI.01: Provide Direct Utility Services where there is no provisions of Utility Service Facilities

UTI.02: Identify the demand for Utility Services to meet the demand of present and forecasted population.

UTI.03: Identify appropriate agencies and funding including private investment to ensure that infrastructures are provided sufficiently in time.

UTI.04: Implement a coordinated and sequential investment plan based on the local demand to provide utility services.

Water Resource Management and Supply

Water resources play key role in the livelihood pattern of the local inhabitants with a complex set of relationships. An efficient management of this resource can promote the quality of life of the local people to a great extent.

The water requirement for Upajila towns is generally estimated to be about 100 lpcd considering 20% technical loss and 20% demand of Industrial and commercial purpose.

Based on this general rule water requirement per day for the Paurashava at present is about 36,26,200 Liters and it will be 54,09,500 liters by the projected year 2031.

UTI.05: The built-up area should be provided with supply water as early as possible

At present, there is no piped water supply system available at the Paurashava. Therefore the entire project area should be provided with supply water as early as possible.

UTI.06: Existing Surface water should be kept clean and hygienic.

Surface water quality is being degraded from indiscriminate use of pesticides in agricultural fields, dumping of waste and human excreta from hanging latrines and water vessels etc. Attention should be given so that these practices are stopped and quality of surface water is prescribed.

UTI.07: The sole dependency of water supply system should be shifted from ground water extraction to treated surface water.

The existing water supply system in the Paurashava is in a dismal situation. There is a shortage in supply since network coverage is of only 3 wards out of 9 wards in the Paurashava area. This supply is entirely met from ground water extracted through production wells. The surface water treatment plant should be implemented as soon as possible.

Electricity

Electricity is an important issue for urban growth and development. Steady and uninterrupted flow of energy can make a city fast growing towards the desired goals. Mainly electricity supplied to Akhaura is from National Grid. However, Renewable energies from sources like solar panels and biomass can be effectively used in Akhaura to make up the existing shortage.

UTI.08: Uses of energies from renewable sources like Solar Panels and Biogas plants should be promoted.

Bangladesh is tropical country and has got a good coverage of solar radiation round the year. Akhaura Paurashava can meet a great deal of her energy demand through rooftop photo voltaic cells. Moreover extensive use of biogas plant can supply a significant amount of energy needed for cooking.

UTI.09: New industries should have a provision of providing a specific amount of energy from their own source, preferably from renewable sources.

This policy can help the city to cope with the shortage of power supply and promote the trend of use of alternatives sources of energy.

Gas

Natural Gas is mainly used for household cooking purpose. Gas supply of Akhaura Paurashava mainly exists in the built up area (Middle portion of the Paurashava), which covers a little proportion (mainly in the core and semi core area) of the total households of the Paurashava.

UTI.10: Whole area of the Paurashava should be connected to the national gas network in shortest possible time.

Telecommunication

Communication is heart of trade and commerce. Effective communication is the prerequisite for the comfort in urban life.

UTI.11: High-speed wireless Access to the Internet should be provided for all in Akhaura Paurashava.

A wide range of communication forms can be based on Internet like e-mail, net to phone and video conferencing, which can make catalytic impact on trade commerce and education.

UTI.12: Towers for mobile phone service provider should be located in optimum distance to avoid health hazard.

It is said that there are health hazards with the signal propagation from mobile phone towers. So they should not be placed too close from one another.

Sewerage

Seweage generated from the urban dwellers should be treated in such a way that it cannot leave any negative impacts on the environment.

UTI.13: Sewer disposal to be managed using low-cost technologies and ubiquitous materials

Akhaura Paurashava is lack of comprehensive sewerage network so providing a comprehensive sewerage network is a very costly option and takes considerable time for implementation. Low-cost technologies for liquid waste treatment and disposal (such as, septic tank, small bore sewerage system, soak pit etc.) could be achieved. Conversion of human waste into compost and thus realizing its economic and environmental value should be encouraged and facilitated.

Solid Wastes

Solid wastes generated from urban dwellers can be a cause of degradation of environment if not properly managed. This issue is to be dealt with due importance in order to maintain a good quality of environment.

In Akhaura Paurashava area the daily amount of solid waste generation is about 9.07 metric ton (considering a generation rate of 0.25 kg/person/day). Estimated figure of solid waste generation for the year 2031 is 13.52 metric tons per day.

According to the planning standard it will require 0.25 acres /per waste transfer station and 5 – 10 acres land will be required for Solid waste disposal site.

UTI.14: Solid wastes are to be segregated at the sources in a number of categories like bio-degradable, metals, papers and so on.

Biodegradable wastes can be transformed into compost using low cost local technology. Likewise metals and papers can also be reused in industries.

UTI.15: Solid wastes should be recycled to the maximum extent.

Poly bags or environmental friendly containers can be provided for sorting wastes at the household level. This will sort out different types of solid waste in desired categories for recycling. Separation at the source can be done successfully by building public awareness in the project area.

9.2.3 Flood Control and Drainage

At present inundation is occurred due to localized storm rainfall (internal flood) and also due to other causes affecting drainage system in Akhaura Paurashava. The reason behind this occurrence of flooding is mostly man made.

The following policies are suggested for flood control and drainage development measure:

F&D.01: Encroachment of exiting natural channel/khals to be identified and removed

F&D.02: Unauthorized cultivation on the bed of the khal or channel to be identified and stopped.

F&D.03: Construction of roads may be provided alongside of the canals with natural strips and should ensure that they don't obstruct natural flow of water and movement of fish species.

F&D.04: Identify and conserve big ponds. These water bodies will work as flood retention pond resource for fish cultivation and vital components to retain ecological balance.

Now a days, big pond or water shed are filled up for residential building or industrial purposes. To address the urban flooding, ponds at strategic locations has been identified under the Natural Water Body Protection Act 2000. Map 7.4 shows the location of those ponds.

F&D.05: Identify points of uncontrolled disposal of solid wastes into the exiting drainage channel and take measures to stop these.

F&D.06: Preserve and enforce right of way over existing natural channel.

F&D.07: An embankment-cum-Road should be constructed along the River bank to protect the Paurashava from River Bank Erosion and to serve as an Important Road for the Paurashava with Recreational Facilities.

F&D.08: A drainage Master Plan have to be prepared for The Paurashava

9.3 Environmental Issues

9.3.1 Natural Resources

Indiscriminate uses of pesticides and chemical fertilizer are very harmful for the wetland ecosystem. Some portion of used pesticides usually washed away into the near by water bodies. The organic and inorganic compounds are then gets into the food web affecting different forms of lives living there. So use of pesticides and chemical fertilizer has to be strictly controlled. Taking care of wetland ecosystem can enrich the water bodies with resources can help Fish Sanctuaries which will provide safe breeding ground for endangered species of fish. Industrial discharge contains toxic chemicals and heavy metals. If those wastes are not treated properly they can get involve into the aquatic lives and ultimately can affect different species of lives. Industrial waste should be treated according to the national standard before discharging into the water bodies. It is alarming that human waste from the toilets of water vessels like launch, steamer and ferry are directly thrown into the water which make serious water pollutions. This mal practices can often trigger the outbreak of many water borne diseases like cholera and diarrhea. There are open unsanitary hanging latrines which pose another great threat to water pollution. Disposal of human excreta into the water of rivers and canals from water vessels and hanging latrines should immediately be stopped. The following strategies are formulated to protect the Natuaral Resources of Akhaura Paurashava.

ENV.01: Necessary planning and management measures to be adopted for preservation and enhancement of surface water quality

Proper planning and management measures aimed at preserving and improving the quality of surface water resources. Restrictions should be imposed on discharge of untreated domestic and industrial sewage (liquid waste) into surface water sources. Also use of chemical fertilizers and insecticides in agricultural fields should be restricted so that storm water runoff from these fields cannot result in pollution of nearby surface water bodies.

ENV.02: Productive use of ponds to be promoted in order to enhance their role in economic development

There are more than numerous ponds within the study area. Emphasis should be placed on the use of these ponds for fisheries and duck raising and integrate them with cattle rearing and poultry farming. Such integration will lower the costs of pisciculture since wastes generated from poultry and cattle rearing can be used to produce fish food and applied in the ponds.

ENV.03: Sustainable management of wetland resources to be integrated with livelihood of local communities

ENV.04: Initiatives to be taken for preservation of khals in order to enhance their functions of drainage and recharging ground water reserve

ENV.05: Conservation of local ecosystem and biodiversity should be addressed in every development scheme

ENV.06: Identification and conservation of ecologically sensitive areas with unique ecosystem and rich biodiversity to be emphasized

Areas with unique ecosystem and rich biodiversity will be identified as ecologically sensitive areas. Relevant authorities will take necessary measures for conservation of such areas.

9.3.2 Sanitation

ENV.07: Sewage disposal to be managed using low-cost technologies and ubiquitous materials

This can be achieved by adopting low-cost technologies for liquid waste treatment and disposal (such as, pour-flush pit latrine, septic tank & soak pit etc.). Untreated sewage should by no means be allowed to be discharged in adjacent surface water bodies. Conversion of human waste into compost and thus realizing its economic and environmental value should be encouraged and facilitated.

9.3.3 Hazards

ENV.08: Development of brick fields and physical structures along the river bank and fringe areas to be controlled

River banks must be protected from uncontrolled activities from environmental point of view.

ENV.09: Location of noxious industries should be subject to strict control in order to prevent industrial pollution and hazards.

9.3.4 Environmental Aspects

ENV.10: Solid waste management to be focused on resource recovery and employment generation

There is no disposal site situated in the area and present method of disposal is traditional open dumping. No sanitary land filling or scientific resource recovery is done here. Major portion of the waste generated is organic that can be converted to compost very easily. As an interim measure a sanitary-landfill site will be required for next 5 years, which can serve the Paurashava within 1.5 km radius, to cover 10 tons of waste daily. Landfill sites have many associated disadvantages. Usually landfill sites require very large sites. After one site gets filled up, another site has to be found for maintaining continuity of the operation and yet another one after it gets filled up too. But keeping in mind the scarcity of and ever-growing demand for land, this never-ending quest for landfill sites cannot be allowed.

ENV.11: Community based waste collection system to be promoted and sustained

ENV.12: Land filling material for all land development projects must be supplied from within the project area

All types of land development projects e.g. site and service scheme for housing, industrial, commercial or other activities require land filling. This results in disruption in the sphere of surface water through reducing surface water retention capacity and/or drainage run-off etc. To reduce these types of adverse impacts, digging of ponds, lakes and canals in the project area can give manifold benefits e.g. help enhance the water retaining capacity, supply land fill material and preserve the micro-climate etc.

ENV.13: Excavations of Canals, River have to be started as early as possible

Chapter Ten: Implementation Issues

10.1 Institutional Capacity Building of the Paurashava

10.1.1 Introduction

The most critical problem in urban development process in the Paurashava of Bangladesh is the weak or even non-existent coordination amongst development partners and due to complicacy in the legislative support. It is generally believed that poor funding, lack of coordination, poor stuffing, poor or non-existence of urban planning capacity, poor or non-existence of logistic support is a serious problem in urban development activities like implementation of long term master plan.

10.1.2 Legal aspects

The legal provisions of planning and planning administration is not smoothly going in Akhaura Paurashava. Planned development activities are expedient to regulate in the interest of public and legal aspects is the major issues behind planed urban development. To bring the legislative support the Paurashava authorities have to be activated by giving wide range of responsibilities with power providing instead of highly centralized control by the government.

- ⇒ for effective urban governance, decision making opportunities have to be devolved to the Paurashava through actively use the power that given through the Local Government (Paurashava) Act 2009 and other relative local Laws and regulations. There are penalty provisions in Local Government (Paurashava) Act 2009 for violation of plan provisions which may be too little an amount to force people abides by laws. To check violation of plan provisions in future standard penalties have to provide through the municipal law.
- ⇒ There are several government and semi-government agencies exists under different ministries who work directly or indirectly for development of municipalities should work avoiding the overlapping job by proper coordination.
- ⇒ The municipal authority have to act as a custodian to save drainage channels like khals (so that water can easily get drained out) and rivers and ponds (to serve as water retention and detention areas) thus reducing the risk of flooding by regular excavation procedure also have to protect open space for park and recreational center.
- ⇒ Legal framework for procedure of Development Control System including reference to existing separate laws where with respect to planning permission, regulating new construction and other land uses should be made which will be the provisions from the Structure Plan Policies.
- ⇒ for undertaking of projects of the master plan Paurashava authority has to seek for regular fund from the government and approval of government fund is always time consuming, and for unconsciousness of local needs government sometimes rejects important projects. for this purposes the master plan implementation concerned authority should have to alert enough to implement the plan with the proper funding in time.

10.1.3 Financial Capacity

Akhaura Paurashava like other ‘C’ class Paurashava are known as suffering from fiscal deficits and dependent too much on central government grants of different types. To bring the sustainable financial capacity Paurashava may follow the followings. To implement the plan Paurashava authorities require enough resources which are not available to them. The Paurashava Law 2009 gave emphasis on preparation and implementation of Master Plans.

- ⇒ The Paurashava authorities have to be activated by giving wide range of responsibilities and funds and accounted for successfully completed the assigned job with sincerity, honesty and transparency of expenditure instead of highly centralized control by the government and without provisions of any specific authorities to them.
- ⇒ Full confidential responsibilities have to handover to the mayor to take up initiative in tax assessment, its collection or updating the tax structure and rates (holding taxes, leased property etc adjusting inflation rate).
- ⇒ The holding tax information can be updated and holding tax reassessment (Individual buildings, their height, types of structure, etc.) can be carried out through the use of Geographic Information System and remote sensing which is s feasible reassessment methodology.
- ⇒ Paurashava authorities have to provide civic amenities at desired level of the dwellers without central assistance to collect required holding taxes and other fees comfortably.
- ⇒ Account section of the Paurashava should manning with appropriate Personnel's who should be well conversant with relevant rules/regulations so that Budgeting and Accounts Keeping is the nerve of the financial management.
- ⇒ The Paurashava authority should be better able to recover the cost of water supply by providing user fee for water supply service where DPHE builds the water supply network for the municipalities and then transfers the system to Paurashava without charging any capital cost.
- ⇒ Leasing arrangement should be made on annual basis by setup well established Bazaar, Bus and Truck terminals etc.
- ⇒ Audit should hold annually on time by private sector auditor concurrently with the Government Auditors.

10.1.4 Staffing

Akhaura Paurashava like other 'C' class municipalities in Bangladesh is remaining under-staffed which is the major problem to successfully complete the massive task of urban development.

- ⇒ Much greater investment should be made for building a cadre of trained professionals within the system of urban governance and management who are specially equipped to manage these local entities and respond to its development challenges.
- ⇒ Master plan implementation also depends on the planning and engineering department of the Paurashava where there is no provision of planners in Akhaura like other 'C' class Paurashava in Bangladesh.
- ⇒ A planning unit must have to run with provisions of urban planner with sufficient assistance and logistic support to regular monitoring and reporting about schedule base implementation procedures of master plan.

10.1.5 Town Planning Capacity

The Paurashava do not have any Town Planning section, and other technical man power to prepare or implement the master plan, as there are no provisions to appoint town planner. However, strengthening of the Town Planning Unit is a pre-requisite for successful implementation of the Structure Plan. Following organogram of the Town Planning Unit is proposed for staffing capacity building of this Unit.

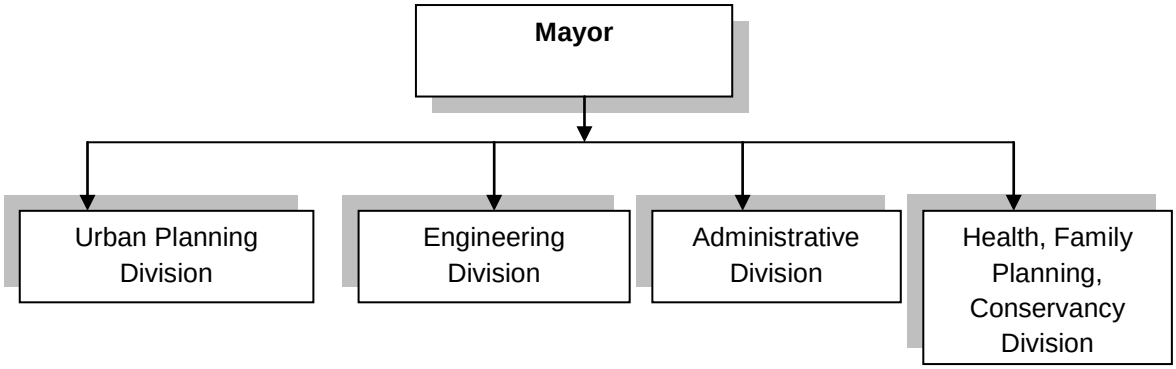


Figure 10. 1: Organogram for a "C" Class Paurashava

⇒ To implement the master plan and also to guide the developing activities the Paurashava must have a full set-up of a town planning team consists of an urban planner (with provisions of assistant town planner/ transport Planner) with GIS analyst with other Provisions like have an office of urban planning units with defined responsibilities with all the logistic support.

⇒ The Paurashava Development Plan will be approved by the Urban Planning Authority and will be effectual from a date as prescribed by the government and notified in the Gazette.

⇒ A team of consultant may provide by the Client for master plan implementation period in the purpose of regular checking and monitoring the phase wise implementation of master plan as an executive committee and with sufficient power to show because the local concerned authority for cause of any violation of master plan implementing. Almost no effort was made to develop the town in a planned and systematic manner.

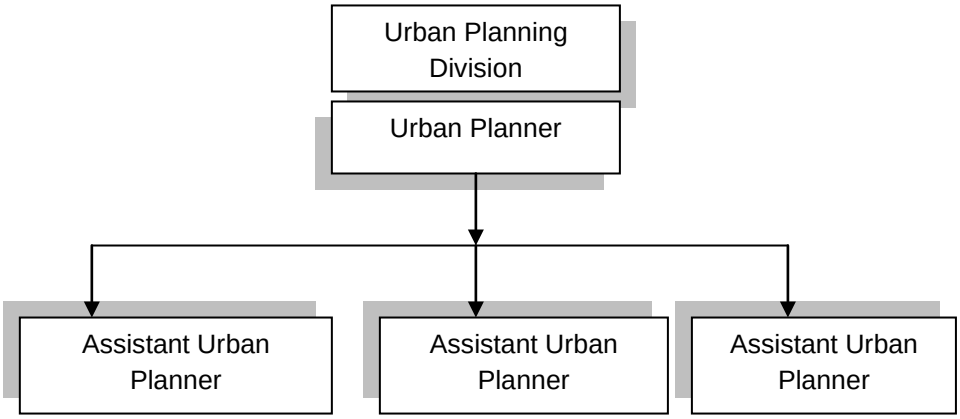


Figure 10. 2: Proposed Urban Planning Division for "C" Class Paurashava

10.1.6 Monitoring and Evaluation Capacity

To implement the master plan, regular monitoring & evaluation of the Master plan is a prerequisite. Although there is a provision of reviewing Ward Action Plan (WAP) in every five (5) year within the Plan period (2011-2031), there also need to monitor & evaluate the implementation steps in yearly basis.

for this purpose, here need to establish a strong "Monitoring and Evaluation Cell (MEC)" under Ministry of Local Government to monitor & evaluate the implementation steps & deviation or violation of Master Plan in different Paurashava. MEC should have the eventual authority to take legal steps against the deviation or violation of Master Plan, considering the Planning notion. Paurashava Town

Planning department will have the individual responsibilities to prepare a Report on Implementation Trend of The Master Plan yearly directly to the MEC.

Monitoring and Evaluation of the Master plan will be based on the framework presented in the following sections:

⇒ The "Monitoring and Evaluation Cell (MEC)" has the ultimate responsibility for monitoring & evaluation of the Master plan.

⇒ Town Planning department of the Paurashava will have individual responsibility to monitoring & evaluation of the Master plan and have to accountable to the MEC.

⇒ A Committee for Monitoring and evaluation of the Master plan will be formed at Town Planning department of the Paurashava with the following responsibilities:

⇒ Develop a reporting template and other ministerial M&E tools.

⇒ Receive, analyze, summarize and consolidate reports and promptly forward them to the MEC every year.

⇒ Monitoring and evaluation activities, and in particular, annual surveys and evaluations will be financed through budgeted provisions. The costing has to include in the annual budget of the Paurashava.

10.1.7 Instrumental Capacity

Without having ample Instrumental carry or building instrumental capacity within Town planning department at Paurashava level, it is not possible to maintain a balanced town planning team with a Paurashava to. In this regard, to build up instrumental capacity following have to ensure at Paurashava:

⇒ A well equipped town planning section with modern computer facility.

⇒ Paurashava should have all Survey equipments to carry out survey activity when required.

⇒ Maintenance & update of Data base of the Master Plan in regular basis, for the purpose need enough technical & tactical support in Paurashava.

⇒ Need high-speed internet connection at Paurashava for Paurashava official.

⇒ Arranging different training agenda and attending in different training curriculum to enhance skill of town planning department.

10.2 Execution of the Plan Proposals

The government must recognize that planning is an integral part of government administration. It should not be expected that planned development would be highly remunerative in the immediate future. But it is sure that execution of development proposals, in the long run, will pay handsome dividends in the form of improved environment, health and happiness of the citizens and increased efficiency in living and working. Most important aspect of Master Plan Implementation decision is that the plans are very much time bound. If the proposals are not executed in time they will lose their viability. Not only that over the time the proposals will be unfit for execution but also that it would be very difficult to find vacant land for physical development which would mean continuation of unplanned and haphazard development deteriorating urban physical and social environment.

10.2.1 Resource Mobilization

The government must recognize that planning is an integral part of government administration. It should not be expected that planned development would be highly remunerative in the immediate future. But it is sure that execution of development proposals, in the long run, will pay handsome

dividends in the form of improved environment, health and happiness of the citizens and increased efficiency in living and working. Most important aspect of Master Plan Implementation decision is that the plans are very much time bound. If the proposals are not executed in time they will lose their viability. Not only that over the time the proposals will be unfit for execution but also that it would be very difficult to find vacant land for physical development which would mean continuation of unplanned and haphazard development deteriorating urban physical and social environment.

10.2.2 Publicity and Circulation of the Plan Documents

The plan documents must have wide circulation to ensure greater access of the general people to the plan. This is necessary to create awareness among people about urban area planning and development. The plan document should be sent to every public office. Copies of plans and reports in Bangla should be made available for purchase by people in general.

10.2.3 Plan Implementation Agencies

Execution of the Master plan is not a sole task or responsibility of the Paurashava authority. There should have proper coordination with different government & private organizations in light of given responsibilities to ensure planned development of the Paurashava. To avoid dual conflict role among the implementation agencies, here need to indicate the responsibility of all agency.

The actual execution of the Master Plan proposals will be the responsibilities of many different agencies belonging to different ministries. Many projects will be executed by the Paurashava itself and many others will rest on private agencies or individuals. The name of the Plan implementation agencies have shown under the following **Table 10.1**.

Table 10. 1: Major Activities under Master Plan Proposals by Broad Sector and the Implementing Agencies

Development Sector	Major Activities	Implementing Agency
Housing	Providing Housing Facilities	Municipal Authority, National Housing Authority (NHA), Private Real State Developer
	Providing Assistance to the government to develop housing scheme	Municipal Authority, Other development agencies in the public sector
	Providing Assistance to the private sector to develop housing scheme	Municipal Authority, Private Real Estate Developer
	Providing affordable housing for low income people	Municipal Authority, National Housing Authority
	Providing Infrastructure Facilities	Municipal Authority, LGED
	Planning Intervention for spontaneous development,	Municipal Authority, LGED
	Upgrading slums and squatter settlements	Municipal Authority, LGED and other Donor Agencies
	Monitoring land and housing market	Municipal Authority, NHA AC, (Land)
	Facilitation Investment for Housing Sector	HBFC, Private Sector Housing Financing Agencies
	Peoples Participation in Housing Sector	NHA, Private Real Estate Developer
	Providing appropriate Technology for low income people	HBRI, Private Sector, NGOs
Traffic & Transportation	Incremental road network development	Municipal Authority, RHD
	Introducing efficient city bus service	BRTA, District Authority, Bus Owners Association, RHD, Municipal Authority
	Establishing bus terminal/ station for local bus	Bangladesh Railway – west Bus Owners Association
	Establishing Truck Terminal	Municipal Authority, Truck Owners/ Operators Association
	Standard Road Network	Municipal Authority, RHD, LGED

Development Sector	Major Activities	Implementing Agency
	Hierarchy Neighborhood Level Road Development	Municipal Authority, RHD
	Widening of existing road	Municipal Authority
	Developing Ferry Ghat/Water Way Ghat	IWTA, RHD, DC
	Developing Transport Stands	Municipal Authority, Baby Taxi, Tempo & Rickshaw Owners Association
	Developing Air Transport	Civil Aviation Authority
	Promoting Public Transport	RHD, Municipal Authority
	Properly regulated slow moving traffic	Municipal Authority
	Coordination within different organization and agencies	Municipal Authority, District Administration LGED, NGO's
Drainage	Developing Strom Water Drainage Improvement Plan	LGED, Municipal Authority
	Developing Phase Wise Drainage Improvement Plan	Municipal Authority, LGED
	Improving environmental condition through improved drainage system	Municipal Authority, LGED, DoE
	Maintaining Proper Drainage System	Municipal Authority, LGED & RHD
	Improving O&M of drainage system	Municipal Authority, LGED, DPHE, NGO's, CBO'S, MOL, District Administration
	Participation of different agencies	Municipal Authority, LGED, NGO's, CBO's District Administration
Water Supply	Improving of existing piped water system	Municipal Authority, DPHE
	Exploring new sources of ground water	Municipal Authority, DPHE
	Exploration new source of surface water to reduce dependency on ground water	Municipal Authority, DPHE
	Developing independent agency for water supply and sewerage management	GoB
	Proper investigation on Arsenic, Iron, Salinity contents of the ground water	
Sanitation	Providing sufficient production and supply of components of single and twin pit latrines	Municipal Authority, LGED NGO's
	Promotion Public toilet facilities throughout the city	Municipal Authority, LGED, NGO's
	Building awareness for hygienic sanitation at school level	Municipal Authority, Directorate of Primary Education, Bangladesh Text Book Board, LGED, NGO'S
	Development of an integrated sanitary sewerage network with treatment plants	Municipal Authority, LGED
Solid Waste Management	Improvement of waste collection efficiency	Municipal Authority, NGO'S
	Management of toxic wastes from hospital, clinic, industry	Municipal Authority, DoE, Directorate of Health
	Recycling of solid waste	Municipal Authority, NGO'S, Poverty Alleviation Programmed of the Government, Environmental improvement Programs of the Government
	Increasing the role of NGO in household waste collection	Municipal Authority, NGO'S
	Treatment of industrial liquid waste before disposal into river	DoE, Directorate of Industries, National Board of Investment, Concerned industries
	Introduction of controlled dumping/ sanitary landfill	Municipal Authority
	Monitoring of solid waste management	Municipal Authority, NGO'S Local's Peoples Committee
Social Services Health	Improving general health infrastructure	Directorate of Health, International Development Partners, NGO's, CBO's, Municipal Authority
	Increasing the access of the poor to health	Directorate of Health, International Development

Development Sector	Major Activities	Implementing Agency
	service	Partners, NGO's, CBO's Municipal Authority
	Providing primary health care facilities at the neighborhood level	Directorate of Health, International Development Partners, NGO's CBO's, Municipal Authority
	Strengthening preventive health care measures through the improvement environment and building awareness	Directorate of Health, Primary Education Directorate, NGO's, CBO's
	Creating health awareness among the common people	Directorate of Health, Primary Education Directorate, Non-formal Education Programme, NGO's, CBO's, Municipal Authority
	Providing public sector health facilities	Directorate of Health, Municipal Authority
	Private sector health facilities should established in the master plan designated locations	Directorate of Health, Municipal Authority
Education	Providing sufficient number of quality nursery and primary school	Directorate of Primary Education, Municipal Authority
	Providing sufficient space in every school	Directorate of Primary Education, Municipal Authority
	Providing education infrastructure for primary, secondary, tertiary levels and vocational institute	Various Directorate of Education, Municipal Authority
Law and Order Situation	Improving law and order services for all citizens	Municipal Authority, Ministry of Home, Upazila Police Station, Local Community
Open Space and Recreation	Creating urban forest,	Municipal Authority, DoE, NGOs, CBOs, Local People
	Creating highway forest	Municipal Authority, DoE, RHD, NGOs, CBOs, Local People
	Creating botanical garden	Department of forest and Environment, Municipal Authority
	Developing public park	Municipal Authority, NGOs, CBOs, Local People
	Developing play ground/ stadium	Municipal Authority, Department of Sports & Culture
	Providing open space for public sector housing estate	Municipal Authority, National Housing Authority, Private commercial and Cooperative Housing Companies and Societies
	Providing other recreation facilities	Municipal Authority, Ministry of Religion and Culture
Industry	Creating industrial incentive zones	Municipal Authority, Ministry of Finance and Industry Investment Board, Chambers of Commerce and Industry
	Gradual relocation of environmentally harmful industry	Municipal Authority, DoE
	Organizing foot loose industry	Municipal Authority, NGOs Industry owners and labor Association
	Encouraging small scale industry	Investment Board, BISCIC Chambers of Commerce and Industries
	Reorganizing and restructuring of large scale industries	Ministry of Industries
	Control industrial location and standard	Municipal Authority, DoE
Conservation of Urban Heritage	Conservation of old prestigious area	Municipal Authority, Department of Archeology Bangladesh Parjatan Corporation
Environmental Management	Proper management of solid waste	Municipal Authority, NGOs, Private Sector
	Proper treatment of water logged area	Municipal Authority, BWDB, LGED
	Enforce law requiring the treatment of waste water before dispose off into the surface	Municipal Authority, DoE, DPHE
	Protection and maintenance of surface	Municipal Authority, BWDB, DoE

Development Sector	Major Activities	Implementing Agency
	water bodies	
	Making legal provisions for gradual relocation of polluting and red industries	Municipal Authority
	Promotion and development of a functional and harmonic nature of landuse in the Paurashava	Municipal Authority
	Ensuring the strict implementation and enforcement of environmental law	DoE Cooperation with other agencies

10.3 Concluding Remarks

Akhaura Paurashava authority should be the lead institution for the Master Plan implementation and monitoring. The team likes to mention that Master Plan being one component of urban management, the institution or authority, in this case the authority is charged with the responsibility for urban management needs 'to negotiate continuously and strike consensus and fruitful partnerships' between Upazila and among other authorities, agencies, stakeholders and civil society.

Part B: Urban Area Plan

Part B contains the Urban Area Plan (UAP) for Akhaura Paurashava as par the ToR. The Urban Area Plan (UAP) is being prepared for managing and promoting development over medium term on the basis of the strategies set by the longer-term Structure Plan. The outline of the Urban Area Plan gives guidance to the Paurashava as to how it can develop the roles i.e. to promote development, to co-ordinate development and to control development.

Goals and Objectives of UAP

Basically the UAP is an explanation of the Structure Plan over the medium term (10 to 15 years). The coverage of the UAP considers existing urban areas and their immediate surroundings with the purpose of providing development guidance in the areas where most of the urban development activities are expected to take place over the next 20 years. Delineation of the UAP is based on the urban growth area identified in the Structure Plan. It contains more details about specific programs and policies that require to be implemented over the medium term. According to the Terms of Reference (TOR) the Urban Area Plan will consist of the following plans:

- Landuse Plan
- Transportation and Traffic Management Plan
- Drainage and Environmental Management Plan and
-Plan for Basic Urban Services

Methodology and Approach to Planning

The plan includes some systematic approaches. At the **beginning** of the planning process, collection of information offered by relevant higher-level plans is the first task. But no higher level plan is found for the Paurashava. Based on the existing landuse, the landuse plan is being prepared according to the guidelines given by the ToR.

The planning starts from formulation of strategies to issues like functional quality (meeting of space requirements for different functions, relation between functions etc., aesthetic quality, flexibility, deviation, public agency support etc.) for plan implementation. The planning in detail also covers the delineated existing urban area and the new urban area.

The base map supporting for land use survey was obtained from the physical feature survey that contained all categories of physical features within the planning area. During physical feature survey, all structures and the functions of principal buildings were picked up and depicted on the map. The physical features were superimposed on a mouza maps. Later on landuse features was identified and classified using the recorded code and separated in different layers during data processing stage, from where the category-wise landuse map has prepared using the identification layers of each landuse features. The Landuse Plan preparation is based on the landuse survey basically records the use of land by its functional activity such as residential, industrial, commercial, health, cultural, etc. Urban Land Use Plan is aimed to guide the physical development of Akhaura town including its economic and social activities. This plan adheres to the policy directives spelled out in the Structure Plan.

The current Urban Area Plan is akin to the traditional Master Plan approach prevalent in the country that designates plot-to-plot use of land apart from infrastructure development proposals. Thus it will also serve as a development control mechanism/instrument. Making a land use plan on a cadastral map makes the Urban Area Plan more rigid. The landuse map has prepared indicating the broad categories of landuse described in the ToR. The landuse map has prepared on Mouza maps at scale 1”=165’ (RF 1:1980) prescribed on ToR. Landuse is divided into different categories and

subcategories approved from the project monitoring office under supervision of the PD of the Project. Landuse colours and legend were also fixed by the project monitoring office. As per suggestion of the pmo for fixed legend and approved format for landuse, Consultants have prepared existing landuse maps. Spatial information or data of all existing landuses from landuse survey was processed and stored under a comprehensive GIS database component.

The objectives of the Urban Area Plan have been attained

-Orderly location of various urban land uses;

-location of appropriate transportation and drainage network; and orderly location of services and facilities.

Delineation of Planning Areas

In order to delineate the boundary, reconnaissance survey has been done in the entire Paurashava area including those areas which have future potential growth. The 1999 Gazette has declared Akhaura Urban Area as Paurashava composed of nine Wards where the adjoining areas are still rural in character; not having significant urban development trend. Finally the Planning Team has considered 9.76 sq. km. with nine Wards as the planning area with the assistance and advises received from Akhaura Paurashava Mayor, Councilors and other professional staffs.

Content and form of Urban Plan

The Urban Area Plan is concerned only with the area where the greatest change is expected in the medium term and has a ten to fifteen years' time-frame from 2011 to 2021 or 2026. The UAP comprises a report and maps (Land Use Map, Transport Planning Map and Drainage Master Plan Map).

The Urban Area Plan (Part-B) has been divided into four main parts contains from **Chapter Eleven** to **Chapter Fifteen**.

Chapter Eleven contains the Land Use plan which identifies approaches of planning, existing and projected landuse and proposed landuse. Requirement of land for different purposes, landuse zoning and plan implementation strategies are also included here.

Chapter Twelve Contains the Transportation and Traffic Management Plan which includes existing conditions of transportation facilities, intensity of traffic volume, degree of traffic congestion and delay, analysis of existing deficiencies, travel demand forecasting for next 20 years, future traffic volume and level of services and transportation development plan. Moreover, transportation system management strategy and plan implementation strategies are also presented in this plan.

Chapter Thirteen Contains Traffic Management Plan and Environment and Drainage Master Plan. Chapter Fourteen of Urban area Plan contains the urban facilities management plan.

Chapter Fourteen is subdivided into two parts – drainage part and environment part. Existing drainage network, land level and topographic contour, plan for drainage management and flood control and plan implementation strategies are the components of the drainage part. Existing environmental condition, solid waste and garbage disposal, environment pollution, water logging, natural calamities and localized hazards, plan for environmental management and pollution control and plan implementation strategies are the key issues of the environment part.

Chapter Fifteen is the fourth part of this report and it contains Plan for Urban Services. Existing condition and demand of the Services, projection on existing and proposed Urban Services, Proposals for Urban Services and Implementation, monitoring and Evaluation of the Urban Services Plan are the key issues of this part.

Chapter Eleven: Land Use Plan

11.1 Introduction

Land use planning of Master Plan is an important element under the present system of planning and development control. It lays down the land use zoning plan and infrastructure development proposals at town level. Urban Area Plan (UAP) is the mid-level plan which starts with Land Use Plan that covers practically. The land use plan is to provide a general pattern for the location, distribution and character of the future land uses within the projected growth area of the Paurashava. The land use master plan works together with the comprehensive plan and other plans and programs to provide for the Town.

11.2 Existing and Projected Land Uses

The existing land uses (vide **Map 11.1**) of the project area are shown in **Table 11.1**. In the land use pattern of the Paurashava, 19 types of land uses are found.

Table 11. 1: Existing Land Use of the Project Area

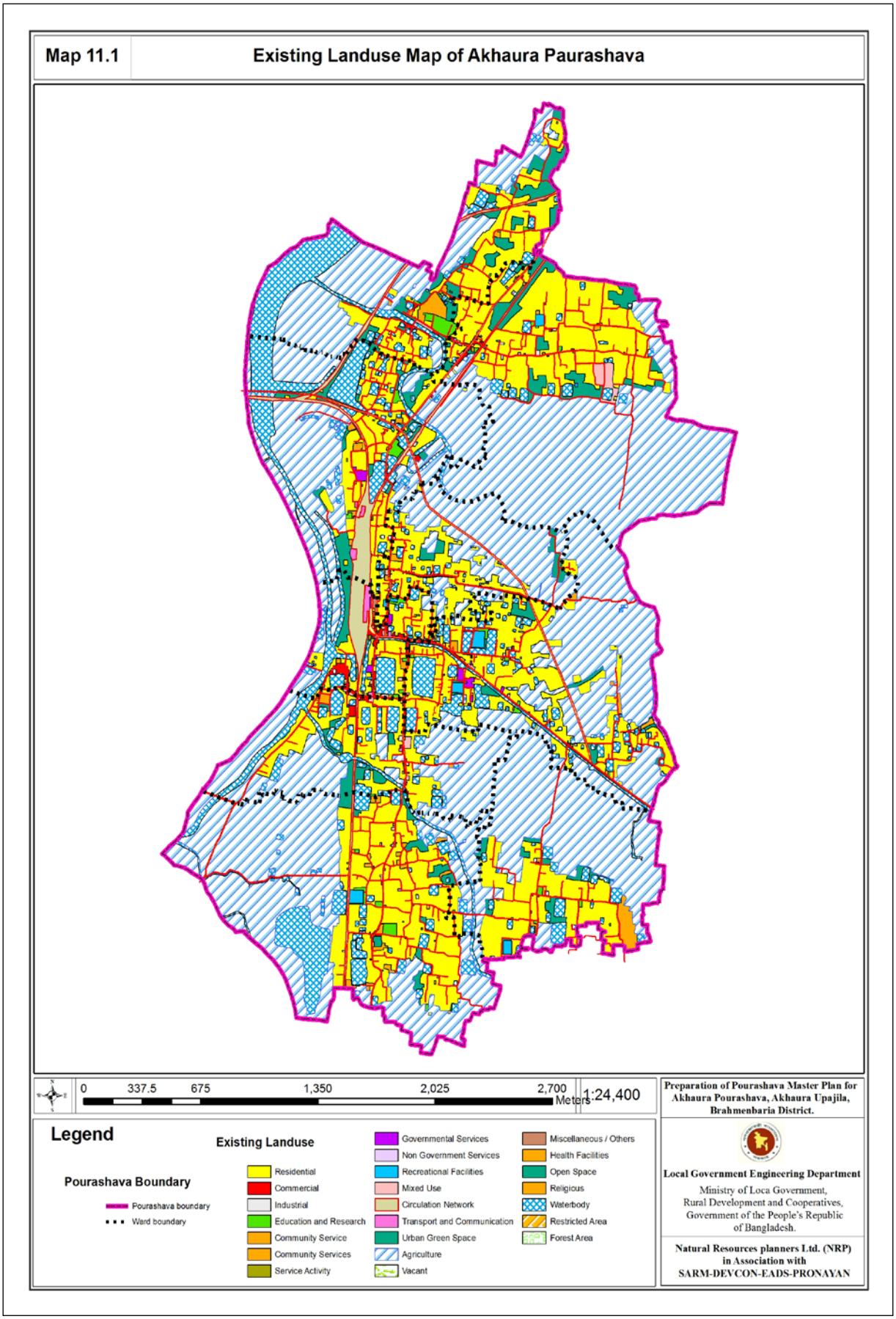
No.	LANDUSE	Area (Acres)	Area (Sq.Km)	Area (%)
1	Agricultural	1206.44	4.88	50.03
2	Circulation Network	81.39	0.33	3.38
3	Commercial	9.39	0.04	0.39
4	Community Services	24.05	0.10	1.00
5	Education & Research	12.07	0.05	0.50
6	forest Area	0.00	0.00	0.00
7	Government Services	3.50	0.01	0.15
8	Industrial/ Manufacturing Processing	1.26	0.01	0.05
9	Miscellaneous / Others	0.42	0.00	0.02
10	Mixed Use	10.12	0.04	0.42
11	Non Government Services	0.13	0.00	0.01
12	Recreational Facilities	6.25	0.03	0.26
13	Residential	629.00	2.55	26.09
14	Restricted Area	0.00	0.00	0.00
15	Service Activity	1.42	0.01	0.06
16	Transport and Communication	3.16	0.01	0.13
17	Urban Green Space	116.15	0.47	4.82
18	Vacant Land	0.00	0.00	0.00
19	Water body	306.58	1.24	12.71
Total		**2411.32**	**9.76**	**100**

Source: Land Use Survey by NRP, 2009-2010

It is clearly evident from the table that agricultural land use (almost 50 %) dominates the Paurashava area, followed by residential (almost 26%), water bodies (more than 12%).

11.2.1 Requirements of Land for Different Land Uses

Future projection of different types of land uses depend mainly on the projected future population of the town. Estimated future land use requirements according to the Planning standard have been shown under the following table (**Table 11.2)** with existing land use in brief. Detail Land use projection have been shown in the **Table 7.4.**



Map 11. 1: Existing Landuse Map of Akhaura Paurashava

Table 11. 2: Future Land Requirements for Akhaura Paurashava

Facilities	Existing Land of 2011 (acres)	Land Requirement for 2021 (acres)	Additional Requirement for 2021 (acres)	Land Requirement for 2031 (acres)	Additional Requirement for 2031
Residential	629.00	442.90	-	540.95	-
Administration	1.85	18	16.15	18	16.15
Commerce	7.59	54.22	46.63	65.01	57.42
Industry	1.26	66.44	65.18	81.14	79.88
Education	12.07	67.01	54.94	67.32	55.13
Health Facilities	1.8	18.86	17.06	20.82	19.02
Open Space/ Recreation	5.84	103.33	97.49	124.42	118.58
Community Facilities	23.97	14.06	-	16.5	-
Utility Services	0.14	8.49	8.35	10.2	10.06
Transportation Services	1.32	4.42	3.32	5.41	4.16
Roads	45.87	119.19	73.32	119.19	73.32
Urban Deferred	0.00	79.46	79.46	79.46	79.46

Source: Study Team of Master Plan

This section of the report proposes land use zoning plan for different land uses of the future town. The land use consideration have been made from land use projection (Planning Standard approved by the client), growth pattern of the Paurashava, and existing land use characteristics of the Paurashava. Category wise land allocations are provided below.

❑ Housing

Housing is the most significant segment of urban development scenario. With the planning standard, the estimation shows, the maximum land required (considering 100 ppa) to accommodate total projected population (54095) in the year 2031 will be 540.85 acres. It is identified from Existing land use survey that 629.00 acres of land is using currently under residential purposes with a moderate density of population (about 58 ppa). The net density will be 86 ppa. The planning team, therefore, consider the projected landuse according to the recommended Planning standard for the future population of the Paurashava in 2031 and considered the standard for general housing as 100 persons/acre. Considering this standard, the land requirement for residential use will be 796 acres. **Table 11.3** shows the detail.

Table 11. 3: Estimation of Housing Land Requirement

<table>
<tr><th rowspan="2">Use/Facility</th><th colspan="5">Land in Acre</th></tr>
<tr><th>Projected Landuse</th><th>Existing Land</th><th>Add. Requirement</th><th colspan="2">Future Landuse Consideration by the Planning Team</th></tr>
<tr><td rowspan="2">General Housing</td><td rowspan="2">540.85</td><td rowspan="2">629</td><td rowspan="2">No extra land will require for this purpose</td><td>Urban</td><td rowspan="2">796</td></tr>
<tr><td>Rural</td></tr>
</table>

Source: Study Team of Master Plan

According to the population projection in the year 2031 problem relating to the housing are mostly concerned with the poor community. Due to accommodate vast number of low income people the planning team consider low cost housing area and propose 7.61 acres of land with all urban facilities.

❑ Commerce and Shopping

Market facilities are usually provided privately on commercial basis depending on the trend of sale of goods. So it is not possible to fix a standard or project actual area for these services. The standard for commercial use can only be applied if ever these facilities are provided by the Paurashava. However, for the sake of current planning, land as per standard at appropriate location is earmarked, where commercial facilities may be developed privately or publicly. The total commercial land in 2031 has been fixed at 29.36 acres. **Table 11.4** shows the detail.

Table 11. 4: Estimation of Land Requirement for Commerce and Shopping

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Commerce and Shopping	59.49	9.39	50.10	29.36

Source: Study Team of Master Plan

❑ Industry

According to approved planning standard, the total land for industries is estimated to be 135.21 acres. The planning team considered 41.54 acres of land for industrial purpose uses considering the opportunities of existing industrial growth in the regional context. **Table 11.5** shows the details.

Table 11. 5: Estimation of Land Requirement for Industries

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Industrial	135.21	1.26	133.95	41.54

Source: Study Team of Master Plan

❑ Education

Estimation of land according to standard indicates that there will be a land requirement of 83.42 acres to accommodate educational facilities by the year 2031. If we deduct the already available 12.07 acres of existing land uses under various education facilities, there will be need of additional 52.44 acres of land for education facilities which is not the normal tasks to provide huge land for the educational purpose. The planning team therefore considers the suitable optimum location to set-up required educational facilities. During the projected period of 2031 educational building will expand vertically to accommodate future student rather horizontal expansion. The team of Consultant propose total 52.44 acres of lands (vide **Table 11.6**).

Table 11. 6: Estimation of Land Requirement for Education Facilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Education & Research	83.42	12.07	71.35	52.44

Source: Study Team of Master Plan

❑ Health

According to approved planning standard, the total land for health facilities is estimated to be 20.82 acres. The planning team considered 5.19 acres of land for health facility purpose uses. **Table 11.7** shows the details.

Table 11. 7: Estimation of Land Requirement for Health Facilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Health Facilities	20.82	0.00	20.82	5.19

Source: Study Team of Master Plan

❑ Administration

Estimation of land according to standard indicates that there will be a land requirement of 29 acres to accommodate administrative facilities by the year 2031. If we deduct 1.85 acres of existing land under various administrative facilities, additional 18.15 acres of land for these facilities will be required. **Table 11.8** shows the details.

Table 11. 8: Estimation of Land Requirement for Administration

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Governmental	20.00	1.85	18.15	7.91

Source: Study Team of Master Plan

❑ Community Facilities

for various community facilities, the total land requirement has been fixed at 15.14 acres. **Table 11.9** shows the details.

Table 11. 9: Estimation of Land Requirement for Community Facilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Community Facilities	17.02	24.05	Not Required	15.14

Source: Study Team of Master Plan

❑ Open Space/ Recreational Facilities

In the study area total open space found 116.15 acres but not using as designated play field, park or other recreational facilities. So for the recreational aspects 121.71 acres of land will require for the projected period and that is why extra 56.55 acre land requires for the recreation facilities recommended by client. The facilities include, play field/ground, parks of various categories and stadium/sport complex.

Table 11. 10: Estimation of Land Requirement for Open Space and Recreational Facilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Recreational Facilities	2.70	0.00	2.70	2.20
Open Space	121.71	116.15	7.84	36.52

Source: Study Team of Master Plan

❑ Utilities

for various utilities, like Water supply, Gas, Solid wastedisposal site, Waste transfer station, the total land requirement has been fixed at 10.15 acres. **Table 11.11** shows the details.

Table 11. 11: Estimation of Land Requirement for Utilities

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Utility Service Facilities	13.52	0.00	13.52	10.15

Source: Study Team of Master Plan

❑ Transport and Communication

Estimation of land according to standard indicates that there will be a land requirement of 7.51 acres to accommodate transport and communication facilities by the year 2031. If we deduct the already available 3.16 acres of existing land uses under various facilities, an additional 4.35 acres of land is required for this category of land use. **Table 11.12** shows the details.

Table 11. 12: Estimation of Land Requirement for Transport and Communication

Use/Facility	Land in Acre			
	Projected Landuse	Existing Land	Add. Requirement	Future Landuse Consideration by the Planning Team
Transport Facilities	7.51	3.16	4.35	8.43

Source: Study Team of Master Plan

The important basis of estimating the amount of land under each land use type is the size of population in different periods of the master plan. The Core urban area is of densely populated areas, which consist of Akhaura Bazaar, Upazila Police Station, Upazila Complex, Paurashava Complex, Mixed Commercial, Mixed Residential and Residential area.

Land use projections for different types of land depends on the required land for different residential, commercial, industrial, educational and service (including Government, Non-Government and community services) activities based on certain specific standards for each of the use- types.

11.3 Land Use Proposals

11.3.1 Introduction

The major Land use proposal decisions have been considered with the existing topographic constraints, urban growth pattern, local people demand, and sector wise future land requirements according to the planning standard. Total planning area is mainly of three parts and these are core urban area, New Urban Area and Agricultural land and Peripheral area as rural settlements. Proposals have been made considering the future using purposes with existing land use conditions in these core, semi core and rural settlement areas.

11.3.2 Designation of Future Land Use

Designation of future Land use illustrates the preferred future growth and development vision for the Paurashava through creation of a Land Use Plan Map. The proposed plan was carefully made to achieve an urban area from which will adjust with overall situation of the area. It is also conceived to make it a feasible plan so that it could have a long term application. The land use proposals area made on the following criteria of land uses residential, commercial, industrial, educational, community service, recreational facilities, transport and communication, circulation network, plantation, agricultural, service activity. In Akhaura Paurashava no land found using as miscellaneous, restricted purposes. There is no forest or beach area existed in the Paurashava area.

11.3.3 Land use Zoning

The land use zoning regulation gives the power the authority or the protection of the public health, welfare and safety. It can control the shape and density of buildings that occupy the land.

It forms the urban structure. It defines the standards of population density, the design of circulation system, and the amount and location of open space, and physical facilities for business and residence. It also provides a program for developments in the city, the location, design, and installation of utilities, Schools, Park, the extension of subdivision development and redevelopment of blighted areas.

The study team of the Project divides the entire Master Plan area into 24 land use zones linked by circulation system, primarily, road network and secondly by Drainage network. Table 9.13 Shows the detailed statistics on land use zoning derived from the Master Plan land use provisions.

Types of Land Use Zoning

Land use zoning is a legal instrument by application of which a Paurashava can control,

-The height of building/structure,

-The area of a land parcel that must be left vacant, and

The use of a buildings and land;

Zoning can be of three types, area zoning, density zoning and height zoning.

Area Zoning

By area zoning an area is divided into zones suitable for that particular area. The main objectives of such zoning are done mainly from environmental point of view that accrues other social benefits.

Density Zoning

The aim of the density zoning is to limit the size of population in any particular area by means of density control. The size of population has bearing on the capacity of designed utility facilities and amenities and traffic volume and crowding, especially in the residential areas. Such zoning is done to ensure a healthy and enjoyable community living.

Height Zoning

Height zoning restrict the height of buildings structures in any particular area. This zoning is aimed to promote the proper and sound development of areas. Height zoning is of particular importance in airport areas to ensue take off and landing of aircrafts.

Considering the existing level of development and development prospects, the consultant recommends to follow the area zoning only. Zoning is only a part of development control regulations. A prospective developer in a Paurashava has to comply with other rules and regulations, like, Building Construction Rules, 1996 under Building Construction Act 1952, Bangladesh National Building Code 1993 and other conditions of construction method, building safety and associated issues.

11.3.4 Classification of Land Use Zoning

After a detailed consultation between the client and the consultants of the project, the land use classification for the Paurashava Master Plan is finalized as shown in **Table 11.13**. **Map 11.2** shows the Land Use Plan of Akhaura Paurashava.

Table 11. 13: Proposed Land Use Categories for Urban Area Plan of Akhaura Paurashava

SL.	Land use Category	Remarks	Area	%
1	Urban Residential Zone	Urban Residential area is a land use in which housing predominates. These include single family housing, multi-family residential, or mobile homes. Zoning for residential use may permit some services or work opportunities or may totally exclude business and industry. It may permit high density land use.	796.00	32.76
2	Rural Settlement	Rural settlement includes the low dense residential area which is scattered and rural in nature. It may permit only low density uses. Aiming to control the growth in this zone, less service and facilities will be provided.	0.00	0.00
3	Commercial Zone	The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "business". Even though these commercial activities use only a small amount of land, they are	29.36	1.21

SL.	Land use Category	Remarks	Area	%
		extremely important to a community's economy. Commercial land includes established markets and areas earmarked for markets.		
4	Mixed Use Zone	Mixed land use refers to the area without a dominant land use (Residential, commercial, industrial etc.).	8.73	0.36
5	General Industrial Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	41.54	1.71
6	Heavy Industrial Zone	Other toxic and pollutions Industries (Orange B and Red categories as per The Environment Conservation Rules, 1997)	0.00	0.00
7	Government office	All kinds of educational institutes like Primary/secondary/ other Schools/ Colleges etc are mentioned to calculate the land use for education and research purpose.	7.91	0.33
8	Education & Research Zone	All kinds of educational institutes like Primary/secondary/ other Schools/ Colleges etc are mentioned to calculate the land use for education and research purpose.	52.44	2.16
9	Agriculture Zone	Agricultural land denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. It includes productive land (single, double and triple cropped), seed bed, fisheries, poultry farm, dairy farm, nursery, horticulture etc.	779.14	32.06
10	Waterbody	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	305.52	12.57
11	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with	36.52	1.50
12	Recreational Facilities	Utility services include Overhead Tank ,Power office/Control Room, Public Toilet, Sewerage office, Waste Disposal ,Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc.	2.20	0.09
13	Circulation Network	Road and Rail communication	282.83	12.34
14	Transportation Facilities	Under transport and communication land use both transport and communication services are considered. This category includes airport, bus terminal/ stand, ferry ghat, filling station, garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc.	8.43	0.35
15	Utility Services	Utility services include Overhead Tank ,Power office/Control Room, Public Toilet, Sewerage office, Waste Disposal, Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc.	10.15	0.42
16	Health Facilities	Utility services include Overhead Tank ,Power office/Control Room, Public Toilet, Sewerage office, Waste Disposal ,Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc	5.19	0.21
17	Community Facilities	All community facilities including funeral places and other religious	15.14	0.62
18	Historical and Heritage Site	The entire mentionable historical and heritage site.	0.00	0.00
19	Restricted Area	A Restricted Area is an area where no one but certain people can enter. Here the areas which are not accessible for the general public except some high ranked personnel are considered as restricted area.	0.00	0.00
20	Overlay	If the consultant justify any area that should not be defined as other given definitions but the facility(s) may not be avoidable, they may use this category	0.00	0.00
21	Urban Deffered	Optional depending on the Paurashava and the Consultant's judgment	31.52	1.30
22	forest	Designated forest Area	0.00	0.00
23	Beach	Sea Beach	0.00	0.00
24	Miscellaneous	Any other categories which are not related to above 23 categories.	0.49	0.02
Grand Total			**2411.32**	**100.00**

Source: Study Team of Master Plan

It should be mentioned here that total land area of Akhaura paurashava is 2411.32 acres but in urban Area Plan the toal area is shown as 2430.80 acres because 19.2 acres of land under circulation network fall outside of the paurashava boundary to show the connectivity of the regional road network.

Urban Residential Area

The settlement patterns of the project area are still now spontaneously growing which should have to be stopped with the provisions of resettlement or land-subdivisions with planned way development of infrastructural facilities and municipal services. The core area is densely developed comparing to other urban areas of the Paurashava and the roads, drains and other infrastructure has become inadequate. High Density Residential Area has been proposed in the core urban area and in the New Urban Area where residential facilities have to be provided with resettlement and with provisions of infrastructural facilities and municipal services (vide **Map 11.2**). Some residential settlement also exist as the mix use as mix commercial with residential, mix administrative with residential etc. and these parts have been proposed as mix use purposes where limited residential use will allowable with provisions of sufficient facilities.

Urban residential zone refers to all categories of urban residential areas, including exiting zones and the residential land use proposed under the present Master Plan. In total, this zone covers 796.00 (24%) acres of land delineated up to the year 2031.

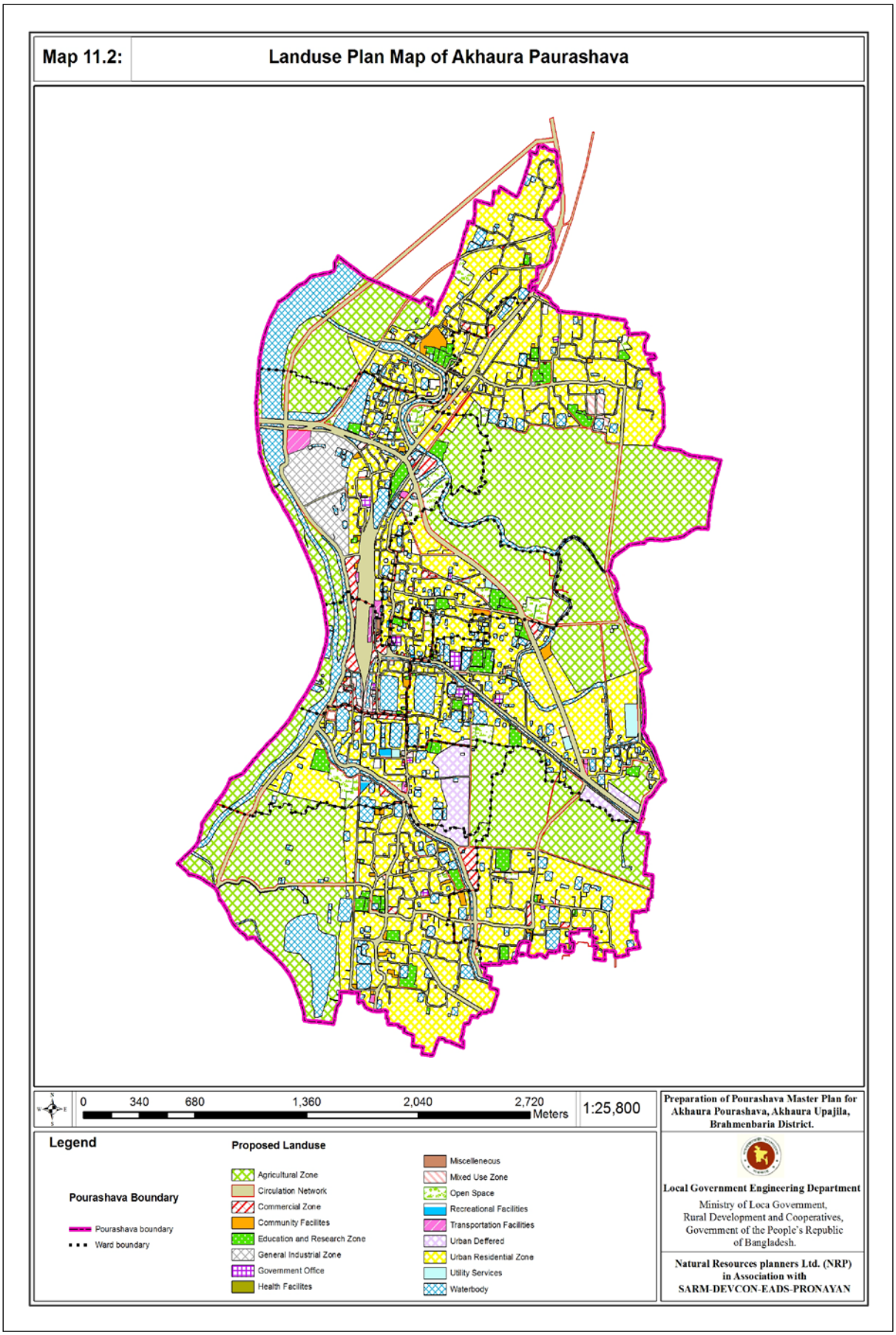
Table 11. 14: New Proposals for Commercial Improvement

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Low Cost Housing	3.152	1	Durgapur	99999	1st	Municipal Authority, National Housing Authority (NHA), Private Real State Developer
	0.124	3	Kasba	61	1st	
	4.329		Kharampur	548, 549, 554, 555, 556, 562, 564, 569, 574, 712,	1st	
Resettlement Zone	5.93	4	Kasba	22, 25, 139, 162, 175, 456, 462, 463, 469, 477, 491, 521, 522, 529, 530, 532, 535, 545, 549, 566, 568, 571, 572, 574, 584, 585, 728, 806	1st & 2nd	Municipal Authority, National Housing Authority (NHA), Private Real State Developer
Total	13.535					

Source: Study Team of Master Plan

Rural Settlement

The rural base area of Akhaura Paurashava generally have grown with some limited infill development rely on individual well/septic systems, no provisions of GAS, and Power, Poor maintenance of infrastructure and municipal service. Rural Residential areas are also growing spontaneously where regular or re-adjustment require with the provisions of infrastructure and other municipal facilities. These rural settlements mainly serve as the firm house which is very important for the local economy and need to provide with good transportation facilities, provisions of GAS and power but not should only allow for continued build-out and infill of the existing lots/subdivisions and should not be expanded into surrounding agricultural properties.



Map 11. 2: Land use Proposal of Akhaura Paurashava.

To reduce unplanned and overcrowded growth of housing, infrastructure such as road, water supply, power and drainage etc. should be developed in newly developing areas, particularly in the peripheral areas. These infrastructures can guide the development of peripheral areas in a planned manner. Such vital infrastructure has already been proposed in the Structure Plan and Master Plan maps. Residential purpose land use has been shown under the **Annexure-2** and mouja plot schedule has been shown in the **Appendix B (Table B.1)**.

Commercial Activity

Commerce is an important land use for urban centers that demand selective locations. New commercial land uses have been chosen in those areas where possibilities of commercial growth is greater which include, city centre and adjacent area, major road intersection, town centre, established market places. The Commercial designation provides for general retail, small-scale office, business/personal service uses, and highway services etc. Existing bazaar area is only the market for the project area which consists of both retail and wholesale market and this bazaar area has been proposed to serve as the main bazaar for the project area.

This zone has an area of 29.60 acres (0.90%) designated up to 2031 and zone will allow commercial uses as listed in **Table 11.15** Though as per planning standard it requires 61 acre land for commercial activity.

Six Neighborhood Market have been proposed (vide **Map 11.3 and Annex-2**) which will require 2.6 acres of lands and a Wholesale Market has been proposes with 2.9 Acres of land with infrastructural facilities. The proposed commercial purpose land use plan recommends focusing General Commercial uses within community areas insists of existing isolated commercial uses. Mouja plot schedule of proposed Commercial area has been shown in the **Appendix B (Table: B.2)**

Table 11. 15: New Proposals for Commercial Improvement

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Neighborhood Market	0.56	1	Durgapur	72, 76, 99999,	1st & 2nd	Municipal Authority
	0.89	4	Kasba	181, 382, 407, 410, 427, 430, 692, 706,		
	0.61	7	Debgram	901, 902, 903		
	3.02	8	Debgram	677, 678, 729, 730, 731, 732, 733, 734, 735, 745, 1027,		
	0.41	9	Taragon King	585, 586, 587, 588		
Total	5.49					

Source: Study Team of Master Plan

General Industry

General Industrial Zone is intended to provide locations, where manufacturing and processing industries can be set up and function without creating hazards to surrounding land uses. There is scope to establish Green and Orange-A category industry as per mentioned in *The Environmental Conservation Rule, 1997*.As a small urban center, it is unlikely that any major industrial development will take place here in the near future. for small-scale manufacturing the preferred sites are NUA. These areas are compatible for small-scale industrial units apart from good transportation facilities and supply of cheap labor. As Akhaura Paurashava has strong opportunities to grow up with SME's and agro based industries these locations have been proposed as the industrial base. The study team has identified around 45 acres of land (1.39%) up to 2031. Though as per the planning standard provided by PMO office Akhaura Paurashava require 135.24 industrial lands (**Table 11.3**).

According to the planning standard about 133 acres additional land will be requirde during the urban area plan period which will require about 6 percent of the total Master Plan Area to set-up Industries. Existing industries, like, all kinds of furniture making, bakery, Husking mill, laundry, Ice-cream Factory, Sawmill, small-scale readymade garments flour/rice mills are installed spontaneously mainly in the core part and new urban area which have to re-settle according to the level of Pollution which mentioned in the structure plan policies. These service and processing units should be treated liberally and can be accommodated in mixed as well as in commercial areas. Polluting industries, like, sawmill, Husking mill, Edible well-mill, metal fabricating, engineering workshop should be carefully sited and has been proposed in the NUA besides of the River. The Paurashava authority is mainly responsible to develop a planned and well manageable market area, community bazaar area and also to develop the corner shops, super mall etc. The plot schedule of the Urban area plan to develop Commercial base with industries the propose activities have been shown under the **Table B-3** of **Appendix-B.**

Education and Research Area

Education facilities for various levels are scattered all over the Master Plan Area. for the projected period it needs some extra Nursery, primary and secondary schools which have been shown in the **Annexure-2** and mouja Schedule have been shown in the **Appendix-B, Table B.4**.

In the planning of Education and Research the planning team tried to expand the areas of existing educational institutes where posiisible. Some new primary schools and secondary schools has been proposed to provide access to education for all the part of the paurashava.

The total area under this use has been determined as 52.43 acres that includes existing 12.07 acres and proposed 40.30 acres land uses as listed in **Table 11.16**. Mouja plot schedule of proposed Educational area has been shown in the **Appendix B (Table: B.4)** Total four new primary schools, one new secondary school , one new vocational training institute and one new college will be established in this land.

Table 11. 16: New Land Proposals for Education Improvement

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
College Extend	0.10	5	Mishrail	209	1st Phase	Directorate of Primary Education, Municipal Authority, Various Directorate of Education; NGOs
	2.10	6	Mishrail	135, 137, 138, 139, 140, 148, 149,	1st Phase	
College	3.17	1	Durgapur	53, 54, 55, 56, 57, 58, 59, 60, 61, 175	1st & 2nd Phase	
Primary School Extend	1.70	1	Durgapur	61, 62, 71, 104, 149, 150, 167,	1st & 2nd Phase	
	1.21	2	Kharampur	310, 314, 315, 316, 317, 318		
	0.70	2	Tanpara	84, 85, 135, 136,		
	1.00	3	Kharampur	223, 224		
	1.20	4	Kasba	197, 340, 361, 617, 782		
	0.16	5	Kasba,	321		
	2.46	6	Mishrail,	54, 55, 115, 325, 334		
	1.08		Naryanpur	294, 299, 300, 301		
	1.38	7	Debgram,	574, 575, 576		
	3.13	8	Debgram,	744, 747, 748, 749, 750, 751, 752, 826, 827, 828, 829, 830, 1102, 1103, 1104, 1105, 1107,		
	0.15	9	Taragon King	446, 578,		
Primary School New	2.68	1	Durgapur	198, 199, 200, 201, 202, 203, 204, 205, 206, 284, 387, 567,	2nd & 3rd Phase	
	0.54	6	Mishrail	53, 116		
	2.90	7	Debgram	15, 16, 17, 18, 19, 20, 24, 25,		
	2.36	8	Debgram	357, 433,		

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Secondary School Extend	1.19	8	Debgram	1096, 1098, 1100, 99999	1st Phase	
Secondary School New	1.87	4	Kasba	190, 202, 209, 310, 345, 608, 666, 781,	2nd Phase	
Secondary School Present	0.69	8	Debgram	1096, 1100, 99999	1st Phase	
Vocational Institute	0.26		Kasba,	82, 719	2nd & 3rd Phase	
	1.72		Kharampur,	601, 609, 610, 611, 615, 712		
Total	33.75					

Source: Study Team of Master Plan

Health Services

According to approved planning standard, the total land for health facilities is estimated to be 20.82 acres. Total 5.19 acre land 0.25% of total land will be used for this purpose as listed in **Table 11.17**. Along with this community based health facilities will be provided at ward center. Annexure-2 shows the planning schedule of Health Services in Akhaura Paurashava.

Table 11. 17: New Land Proposal for Health Services

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Maternity Clinic	0.46	1	Durgapur	94, 96	1st & 2nd Phase	Directorate of Health, International Development Partners, NGO's, CBO's, Municipal Authority
	0.75	2	Kharampur	321		
	0.56	4	Kasba	25, 161, 456,		
	0.54	7	Debgram	521		
	0.32	9	Taragon King	447, 453		
Total	2.63					

Source: Study Team of Master Plan

Administrative Zone

Administrative zone covers all kinds of government and non-government offices in the town. Existing Upazila Complex, Paurashava Complex, Akhaura Police and other public offices has been set-up mainly in the core area and new urban area of the Paurashava. According to the Planning standard it will require about 29 acres of Land to give potential services to the projected population for the Upazila Complex, Paurashava Complex and for the Akhaura Police Complex, whereas only 3.51 acres of land are covered for these purposes as listed in **Table 11.18**. According to the Planning standard about 25.50 acres of land will require if this complex may require extending to meet the public demand. To set up other government offices CUA and NUA has been proposed (vide **Map 11.2**) as this parcel of land is already used as for administrative purpose with few residential and Commercial uses. Besides these a ward councillor's office has been proposed in each of the ward of the paurashava so that the people can easily communicate with the councilors and get access to the information needed for them.

Mouja Schedule and proposed administrative zone has been shown in the Appendix AG & Annexure-2.

During the Structure plan to develop existing Administrative area with required new Government offices the propose activities with the responsible authority have been shown under the **Table 11.18.**

Table 11. 18: Proposals for Administrative Improvement

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Paurashava office extend	0.49	5	Kasba	236, 299	1st Phase	Ministry of Electrification; Upazila Authority

Source: Study Team of Master Plan

Mixed Use Area/Mixed Use Zone

Mixed use has been determined as another dominant land use in the proposed Master Plan. There are many land uses that cannot be distinctively classified under the usual system of urban land use classification. In such cases giving land use clearance by Municipal Authority becomes extremely difficult. Mixed use provision will enable to put diverse land uses in one class. In the Mixed Use Developments side are to be proposed for the office/Research/light Limited Industrial to support business, professional and corporate office uses as well as research and development uses. Some portion of the Core part designation would also be eligible for the Mixed Use Development (MXD) like Mixed commercial (Commercial+ Residential) which would allow for a mix of employment, commercial, and residential uses in an integrated development. In this part of the project area high rise building would be permitted where infrastructural facilities have to provide with all the municipal services. This designation provides opportunities for warehousing, wholesaling, limited manufacturing uses in addition to corporate office and research/development uses. In the Map CUA and NUA, NUA- and PA has been proposed as in these types of use.

During the Urban area plan to develop mixed use area the propose activities with the responsible authority have been shown under the **Table 11.19.**

Mixed use zones have been recommended to allow some flexibility in development. In a small town like Akhaura, as the trend shows, an exclusive commercial land use is unlikely to function. This land use will allow flexibility of development, instead of restricting development. Total area for mixed uses has been put to 8.73 acres, including both, existing and proposed land uses. Mixed use area will be multipurpose uses to provide facilities like, residential, commercial, health and administrative facilities through establishing corner shops, post box, police box, club and social organization and other facilities as per the requirement of the locality. This zone will allow residential structures together with commercial uses as listed in **Table 11.19**, **Appendix B (Table B.1)** presents the proposed land uses and their phase-wise development proposals.

Table 11. 19: Proposals for Housing Improvement

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Ward Center	0.23	1	Durgapur	109	1st & 2nd Phase	Ministry of Electrification; Upazila Authority,
	0.12	2	Kharampur	324		
	0.15	3	Kharampur	491		
	0.20	4	Kasba	178		
	0.10	5	Mishrail	186		
	0.60	6	Mishrail	288		
	0.26	7	Debgram	541		
	0.40	8	Debgram	808		
	0.14	9	Taragon King	600		
Total	2.2					

Source: Study Team of Master Plan

Open Space

Open Space is applied to lands primarily under public ownership for local parklands. It is also applied to public owned open space lands devoted to watersheds that protect public water supplies. It may also be applied to large property holdings under private ownership, which have some degree of protection from development. Open space is a new but a major land use in the proposed Master Plan. Major open space land use provision includes natural green, park, and playground. Municipal park, natural green and stadium have been put in locations where sufficient vacant land is available for such uses. Every school side play ground has been proposed for the open space facility and also

community base open space has been proposed. Again all rural agriculture area must have some open space Facilities to provide cultural and playground facilities to the people. Community base proposed public parkland has been shown under the **Annexure-2.**

This zone has been provided to meet the active and passive recreational needs of the people and at the same time, conserve the natural resources. The total area estimated for this zone stands at 54.03 acres (1.64%). The proposed mouja Schedule have been shown in the **Appendix-B. Table 11.20** shows the phase wise details of new land proposal for open space proposal in Akhaura Paurashava. Six playgrounds, one stadium, one central park and seven neighbourhood parks will be established in this proposed open space in 36.51 acre area.

Table 11. 20: New Land Proposal for Open Space

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Central Park	3.42	3	Kasba	11, 34, 49, 91, 109, 117, 128, 501, 502, 505, 697, 801	1st Phase	Municipal Authority, DoE, RHD, NGOs, CBOs, Local People, Ministry of Religion and Culture
	2.68		Kharampur	617, 619, 620, 621, 622, 623, 625, 626, 627, 628, 629, 630, 633, 634, 637, 638		
Neighborhood Park	1.09	1	Durgapur	137, 151, 989	1st & 2nd Phase	
	0.17	3	Kasba	4, 7		
	4.42		Kharampur	222, 223, 227, 228, 231, 236, 244, 279, 280, 281, 287, 528, 529, 530, 533, 534, 537, 538, 539, 540, 543, 544, 545, 559, 560, 561		
	1.29	4	Kasba	187, 384, 607, 683		
	6.31	7	Debgram	105, 106, 113, 116, 117, 118, 499, 501, 502, 559, 565, 99999		
	0.61	8	Debgram	759, 760, 1176		
	0.41	9	Debgram	758, 759, 760, 1176		
Play Ground	0.91	1	Durgapur	699, 700, 701, 702	1st, 2nd & 3rd Phase	
	2.66	2	Tanpara	149, 150		
	2.34	3	Kasba	8, 10, 38, 40, 41, 92, 109, 118, 122, 123, 124, 125, 129, 130, 131, 132, 134, 135, 146, 494, 496, 497, 498, 507, 511, 513		
	1.01	5	Kasba	216, 331		
	3.06	6	Mishrail	311, 323, 324		
	0.73	8	Debgram	838, 839, 840, 841, 842,		
	0.76	9	Taragon King	337, 338, 339, 356		
Stadium	4.62	4		191, 208, 209, 319, 338, 344, 616, 619, 624, 650, 659, 660, 665, 786, 790	1st & 2nd Phase	
Total	36.49					

Source: Study Team of Master Plan

Utility Services

It incorporated all utilities and service facilities except the health service. for an example water treatment plant, water reservoir, water pump house, public toilet, fire service, waste disposal, sewerage office, power office. In survey stage this type land use was define as service activity. Total 10.4 acres land has been proposed for this purpose which covers 0.41% total area of Akhaura Paurashava (vide **Map 11.3**). Total Seven waste transfer stations, one waste dumping station, four water pump and one surface water treatment plant will be newly established to fulfill the desired need of Akhaura Paurashava. Appendix- B (**Table B.8**) shows the planning schedule of Utility Services in Akhaura Paurashava. **Table 11.21** shows the phase wise details of new land proposal for Utility Sertvices in Akhaura Paurashava.

Table 11. 21: New Land Use Proposal for Utility Service

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Central Waste Disposal	3.58	6	Naryanpur	109, 110, 111, 112, 113, 114, 115, 116, 117, 121, 122, 123, 125, 126, 127, 128, 130,	1st Phase	Municipal Authority, LGED, DoE, NGOs, CBOs, Local People, Ministry of Religion and Culture
Fire Service Extend	0.28	4	Kasba	177, 419, 600	2nd Phase	
Public Toilet	0.02	1	Durgapur	673	1st Phase	
	0.03	3	Kasba	99, 756		
	0.00	4	Kasba	653		
	0.02	5	Kasba	630		
	0.03	6	Mishrail	265		
	0.17	8	Debgram	869, 99999		
	0.01	9	Taragon King	344		
Surface Water treatment Plant	0.03	4	Kasba	433, 434, 605, 687,	3rd Phase	
Waste Transfer center	0.24	1	Durgapur,	127, 636, 637	1st Phase	
	0.20	3	Kasba	503		
	0.25	4	Kasba	394, 746		
	0.07	6	Mishrail,	265		
	0.93	8	Debgram,	869, 99999		
	0.12	9	Taragon King	344		
Water Pump	0.08	1	Durgapur	700	1st, 2nd & 3rd Phase	
	0.17	4	Durgapur	435		
	0.22	8	Debgram	714, 715		
	0.25	9	Taragon King	459		
Total	6.7					

Source: Study Team of Master Plan

Agriculture Area/ Agricultural Zone

There are vast agricultural land in the periphery and outskirts of the Urban Centre. Total land under agriculture have been estimated as 50% and about 70% percent of these (Agriculture) lands have been allowed to remain as their current use not only as a source of food supply but also as reserve land for future urban use. This land can also be used for future urban land use and hence can also be termed as urban deferred. Out of this 840 acres of agricultural land 108 acres has been proposed for urban deferred and the rest 688 acres has been kept unchanged for agricultural use. Detail of land use with mouja Schedule is presented in **Appendix B** (**Table B.9**), Annexure- 1. Annexure-D shows the planning schedule of Agriculture Area in Akhaura Paurashava.

This designation is applied to areas outside of the Community Growth Area's that includes active farmland under the Agricultural zone. As a development staging mechanism the Agricultural/Rural designation is also applied to land within the future development potential generally beyond the 20-year time frame of the Plan. These areas would be described as Future Growth Areas. The corresponding zoning district is Agricultural (AG). In addition to permitting agricultural activities the Agriculture zoning district does permit limited residential subdivision for original.

Community Facilities

Community services include community centre, club house, religious centres, other community services etc. In additionally all funeral places and other religious uses incorporated in this category. Total 15.14 acres land which covers 0.63% of total planning area will be used for this purpose (vide

Map 11.3). **Annexure-D** shows the planning schedule of Community Facilities in Akhaura Paurashava.

Table 11. 22: New Land Use Proposal for Community Facilities

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Community Centre	0.22	1	Durgapur	688	1st & 2nd Phase	Municipal Authority, LGED, Ministry of Religion and Culture
	0.74	4	Kasba,	627		
	0.73	9	Debgram	753		
Total	1.69					

Source: Study Team of Master Plan

Transportation Facilities

Transportation facilities incorporate transport and communication services. for an example Bus and terminal/ stand, Boat Ghat, filling station, Rickshaw/Tampo stand, post office, and passenger shed, telephone exchange, ticket counter, transport office etc. Total 8.43 acres land (0.35% of total area) will be used for this purpose. **Appendix-B** (**Table-B11**) shows the planning schedule of Transportation Facilities in Akhaura Paurashava. **Table 10.22** shows the new transportation facilities for Akhaura Paurashava.

Table 11. 23: New Land Proposal for Transport Services

Propose Activities	Area in acre	Ward No.	Mouza Name	Plot No.	Phase	Implementing Agency
Bus & Truck Stand	4.09	3	Kasba	6	1st Phase	Municipal Authority, LGED, RHD
Rickshaw & Tempo Stand,	0.03	5	Mishrail	177, 179		
	0.39	7	Debgram	564		
Tempo Stand	0.39	3	Kasba	92, 116		
	0.50	6	Naryanpur	197, 198, 199, 204		
	0.33	8	Debgram	351		
Total	5.73					

Source: Study Team of Master Plan

Water Body

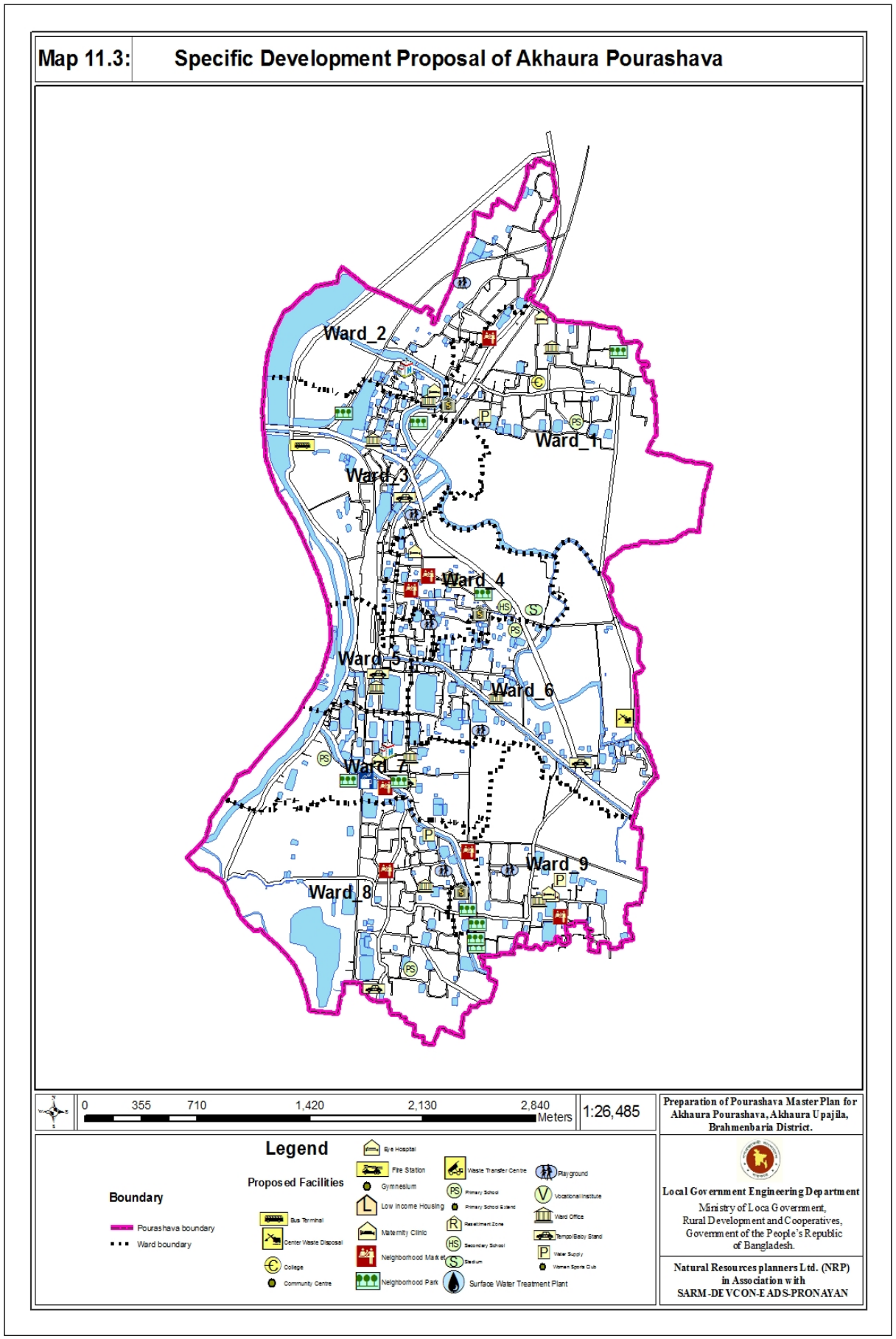
Water bodies within the Master Plan Area cover all categories of ponds, khals, water channels river branch, marsh lands, etc. The total land under this category has been found 305.01 acres.

In Akhaura Paurashava natural resources like river, Canals and the ponds area are main natural resources to be conserved whereas no historical important area or natural heritage found to be conserved. Again many natural canals area already occupied which have to re-excavate to obligate the natural stream flow. Some ponds and low lying area are important for retention purpose again some are very important for fishing purposes. The ponds which are important for retention and with other importance like depth and local importance have been considered to protect and also have been shown under the **Map 11.2.** Some ponds and low lying area are important for retention purpose again some are very important for fishing purposes. The ponds which are important for retention and with other importance like depth and local importance have been considered to protect the planning suggests preserving most of these water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.25 acres will be preserved as the water retention ponds. There will be permitted uses in this zone as stated in **Table B.12**, **Appendix- B** and some other uses may conditionally be permitted as stated in Annexure-A shows the planning schedule of Water Body Area in Akhaura Paurashava. (Vide **Table 11.24**)**.**

Table 11. 24: **Proposals for Conserved area Purpose Land uses**

Land Use Development Sector	Propose Activities	Implementing Agency	Phase
Natural Water Bodies	Excavate and keep free existing Natural Canals Riversides and Ponds.	Municipal Authority, DoE	**Phase 1:** 2011 to 2016 **Phase 2:** 2017 to 2021
	Establish Embankments cum Road with nature strip besides of the Canals and river	Municipal Authority, DoE, LGED, NGOs	
	Providing Infrastructure Facilities	Municipal Authority, LGED	

Source: Study Team of Master Plan



Map 11. 3: Development Proposals (all types) of Akhaura Paurashava.

Urban Deferred

The Urban Deferred refers to lands lying outside of the urban growth boundary and identified as Urban Reserve. The total area under this use has been proposed as 31.52 (1.30%) acres that include existing and proposed land uses. Appendix-B (Table-B:13) shows the planning schedule of Urban Deferred Area in Akhaura Paurashava. The following are permitted *Uses* within the Urban Reserve (UR) *Zone*:

- Agriculture, Livestock based
- Agriculture, Vegetation based (mushroom farms shall not be permitted)
- Existing facilities up to the date of gazette notification of the Master Plan. Condition is that, no further extension will be permitted

Circulation Network

The road network is mainly considered as circulation network. National highway, pucca/ semi- pucca/ katcha road, footpath, flyover, over- bridge, underpass, bridge, culvert, railway, railway bridge all are include in circulation network. Total 299.83 acre land which covers 12.34 % of total planning area of Akhaura Paurashava has been proposed for circulation network in a view to provide access to all people. At present only 81.39 acres of land uses for circulation network in this Paurashava. Planning schedule of Circulation Network in Akhaura Paurashava have been shown in the Traffic transportation Chapter (Chapter 12).

11.4 Land Use Permission

The existing Development proposals have been proposed on the basis of Planning Standard and Public action meeting in the Paurashava. These proposals will be finalized after Stake holder Meeting. Detail Land Use Permission have been shown in the Appendix-C

One of the major purposes of land use zoning is to restrict an area for a particular use meant for the zone. This is intended to maintain a disciplined land use distribution and development. But there are many uses other than the use meant for the zone that are considered for permit in the zone. Sometimes such applications are accommodated to support or assist the area, with conditions imposed in giving land use permit, sometimes strict restrictions are maintained by refusal of applications.

11.5 Plan Implementation Strategies

This section deals with the issues of implementation of land use plan. Discussion is made on development regulation and recommendation on implementation, monitoring and evaluation of urban land use plan.

Land Development Regulations to implement the Land Use Plan

Urban planning regulations are necessary for the smooth functioning of land use plan. The land use regulations impact on planned development and result in social benefits and costs depending on their nature and the specific contexts in which they are applied. Careful reforms of these regulations can result in a lower cost for urban development and for housing. An additional benefit could be in terms of a more functional spatial organization of the town. Regulations and processes that facilitate land availability and uses for planned development at affordable costs need to be continued. Regulatory and process reforms can lead to

- more compact towns, containment of urban sprawl, more efficient urban forms, less costly urban infrastructure,
- more market-friendly development of urban land;

- more intensely used central areas, better efficiency of public transportation systems and decrease in trip length and transportation costs;
- less violations in zoning, sub-division and building regulations, and reduction in non- conforming and non-compatible uses and slums;
- Reduction in difference between what is allowed under regulations and what is financially feasible due to land use reforms leading to reduced opportunities for corruption;
- generally lower land prices in city/town but higher prices in some prime commercial and business districts driven by market forces;
- average urban population densities likely to stay constant as more efficient land use consumption.

The following measures of Land Development Regulations should strictly be followed for the proper implementation of the Land use Plan.

a. Restriction on Use of Land Contrary to the Master Plan

No person shall use any land for any purpose other than that laid down in the land use zoning of the Master Plan approved by the Government. All future developments and constructions, both public and private within the area of Structure Plan shall be in conformity with the Master Plan approved by the Government. No compensation shall be payable to any person owing to demolition of any construction developed in violation of the Master Plan provisions.

b. Building Permission and Construction Approval

Development control mechanism will be one of the major plan implementation instruments to be carried out through the Building Construction Rules under Section 17 of the BC Act 1952 and the land use provisions of the Master Plan.

c. Building Permission in Proposed Development Areas

The Master Plan proposes a number of development projects. Many of the lands under these development projects are under private ownership. No development in these lands by their owners will be allowed. They will remain in the present form till they are taken over by the respective authority for development or the development project is abandoned.

d. Parking in Commercial and Mixed Use Areas

for parking, BC Rules, 1996 has specific provisions for housing and commercial areas. But no provision has been suggested for mixed use areas. According to the rules for commercial area, 23 sq.m areas, has to be reserved for every 200 sq.m of commercial space. The consultant suggests that for mixed areas, BC Rules, 1996 meant for commercial area should also be applied to the mixed areas under the current plan.

f. Rules for Realization of Betterment Fee

The Ordinance enables Paurashava to charge betterment fees on land owners or any other person having interest in it for an increase in land value due to execution of any development scheme by the Authority. The Authority should develop appropriate procedures in this regard and get them approved to start charging betterment fee. Due to failure of execution of the powers of charging betterment fee, all benefits of land value enhancement due to Paurashava development projects goes to the land owner at the cost of the community. So it is not irrational for the road developer to demand a share of the benefit accruing to the land owner following road development.

g. Planning Rules for Real Estate Companies

With the increase in population, there will be further rise of land based real estate activities. But

there is no provision in the Paurashava Ordinance to control the activities of real estate companies. It is needed that infrastructure and services provided in the housing plans of the real estate projects be standardized to secure interest of the buyers. Strict vigilance is needed against any fraudulent practices that might affect public interest.

However, any control imposed on the housing companies must be imbued with a positive approach, so that it does not affect the housing promotion activities of the private sector. The intention would be to allow them function under certain control that would secure public interest and at the same time will not discourage private investment in housing. The infrastructure, services and facilities provided in a housing project must be standardized. Road width and the land allocated for community facilities must be adequate to meet requirements of the future inhabitants. The infrastructure provided therein must follow minimum standard as some day these housing estates would become parts of the future town and the infrastructure provided therein would be used by a wide range of population of the town.

To control apartment development, the national rules under BC Act 1952 will be applied. The rules for land based real estate projects exist for Dhaka only. In anticipation of expansion of real estate projects, there is an urgent need to prepare a set of rules for small towns. The real estate companies seeking approval for their housing project layout plan must fulfill certain conditions as set in the rules. The set of rules is clearly described in the Private Residential Land Development Rule-2004.

h. Minimum Road Width

Building Construction Rules, 1996, should be amended in the following way by incorporating the minimum road width standard. To ease future traffic movement, it is necessary to keep provision for wider roads in the present plan. It is an uphill task to widen roads after development has taken place along the road. So it is wiser to reserve wider right of way for new roads now. Building Construction Rules, 1996 has determined the minimum road width as 12 ft. or 3.65 meter for roads in general and approximately 10 ft. for private roads. The consultants feel that this standard is not enough in view of future increase in population density and traffic. for safeguarding and easing future traffic movement the consultants have set the minimum width for any road for common use as 20 ft. or 6 meter. However, in the built up areas, where development has already blocked the scope for developing such wide roads, the consultant recommends the to follow the Hierarchy base Road width which will be implement in future where no new building would be permitted in the present edge of the road rather to the proposed edge (Hierarchical).

In the areas, where there already exist roads of less than 20 ft., the land owners on either side of the road will equally share the space needed to increase the road width to 20 ft. The land owners must leave the space vacant for taking it over by the Paurashava for widening of the road at some later date. No proposal for construction should be permitted on the vacant space reserved for road widening though the land will remain under its current ownership till it is taken over by the authority. In the light of the above recommendations, necessary amendment will have to be brought in the BC Rules, 1996 applicable to the secondary and small towns only.

i. Low Land, Pond and Drainage Path

No low land that retains water for certain period of the year can be filled up and no obstruction to natural or man made drainage system shall be allowed. Prior permission of Akhaura Paurashava will be required for filling up of any low lands. The Paurashava shall accord such permission based on prevailing laws. All ponds should not be allowed to be filled up as they are a good source of urban water supply as well as serve as open space. As per the Wetland Conservation Act 2000, the use of these water bodies can not be changed without prior permission of the authority.

k. Radio, Television, Water Treatment and Pump Station and Power Station Sites

The key point installations including radio, television, water treatment and pump station and power station sites will have to be safeguarded from any possible undesirable development around these areas that can endanger their security. No building except vegetation should be allowed within 183 meters around the transmission towers.

11.6 Implementation, Monitoring and Evaluation of the Land Use Plan

Monitoring and evaluation is a very important part of plan implementation. Monitoring helps check if the plan is being implemented properly. It also measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to put the execution on track. After expiry of any plan, evaluation is made about the errors and omissions. Such evaluation helps take corrective measures in the next plan. Such monitoring and evaluation must be carried out from within the Paurashava. But Akhaura Paurashava is not equipped with qualified manpower to make such evaluation. Monitoring and evaluation of a plan is essentially, the responsibility of qualified and experienced planners. As there is no planner in the Paurashava, its monitoring of plan implementation will be seriously affected. However, plan evaluation can be accomplished by means of out sourcing.

Updating of Plans

The plan package needs to be updated regularly to make it respond to the spatial changes over time. But such updating would require relevant technical professional and fund that are highly lacking in Akhaura Paurashava. There is no planner or planning section in the Paurashava. Updating would require service of senior level planners that Paurashava would not be able to provide. This service will have to be procured by out sourcing and the Paurashava is not even capable to accomplish this financially either. This will create problem when the plans or its components gets obsolete or need to be changed. Another problem would arise when the duration of plans ends. A new set of plans would have to be prepared replacing the old ones. This problem, however, can be overcome by undertaking another planning project by LGED. So, for regular updating and changes and plan implementation monitoring, the Paurashava should immediately move for setting up a planning section with planner(s) and other staff. The section will not only look after planning, but will also be responsible for development control, estate management and project preparation. Since the planners would be qualified and skilled in computer operation, they can also help achieving automation of the Paurashava functions.

Residential areas have been earmarked in those parts of the Master Plan areas where there already exists housing and the areas which offer the greatest possibility of growth residential areas in the immediate future. The determining factors are accessibility, location and build ability. It is obvious that densification in areas closer to the activity areas will be greater. It is proposed that in housing zones certain ancillary services should also be permitted along with housing. The proposed residential zone already consists with some Agricultural low land, in this purpose no action should be taken to fill-up those lands and build-up residential area whereas for first phase (2011 to 2016). In the First phase residential development may activate just besides of the roads. An existing highland where residential development can be easy access. Again to control density for residential area no more than 10 families/acre should be permitted.

Chapter Twelve: Transportation and Traffic Management Plan

12.1 Introduction

Traffic and transportation planning and design help to shape an area's economic health and quality of life. Not only does the transportation system provide for the mobility of people and goods, it also influences patterns of growth and economic activity by providing access to land. for Upazila towns, sustainable development in traffic and transport is very important as transport planning recognizes the critical links between transportation and other societal goals.

12.1.1 Approach and Methodology

To initiating the transport plan of Akhaura Paurashava the basic approach was to provide a conflict free and comfortable transportation for all of the travelers of the Paurashava. A good network of roads and other transportation mode coupled with an efficient transport management system makes a substantial contribution to the "working efficiency" of towns and enables them to become catalysts for social and economic development. On the other hand, the impact of a poorly designed urban transport system is manifested in terms of traffic congestion, delays, accidents, high energy consumption, high pollution of the environment and inequitable access to services. A well-planned transportation system results in orderly urban growth, greater use of urban public transport, lower vehicular pollution, and shorter auto trips.

A comprehensive transportation study is undertaken to investigate the existing transportation infrastructure, transportation modes and modal share scenario of Akhaura Paurashava and to estimate the anticipated transportation needs of the town up to the year 2031. Accordingly, the transportation study is conducted to determine the present travel patterns and the characteristics of existing transportation facilities to forecast the future travel demand and develop a transportation plan. Standard methodology was followed for traffic study in the project area as per the Terms of Reference. A traffic counting was conducted to assess the traffic volume at the most important traffic point, and Intersections and other important link roads of the town at Akhaura Bazaar Area. An origin- destination (O-D) survey was also conducted at the same point where origin and destination of the traffic passing through this point of the town were recorded. Speed and Delay survey has been done at the important nodes on major local roads.

Data on road pattern and condition of roads with their problems and road width were collected from the physical feature survey and verified through field visit. Data were also collected from socio-economic survey of the households. Information on road ownership was collected from the Paurashava, LGED and RHD. The same sources also provided information about future road projects in and around the Paurashava. Information about traffic conflict and accident were collected from the field and from Thana (police station). Mapping of major roads has been done using physical feature survey data and by thorough reconnaissance survey of roads.

12.2 Existing Conditions of Transportation Facilities

Existing Traffic and travel situations are not in satisfactory level in the Town. All the roads of the Town are narrow in width and no footpath or padestrian way exists in those Roads. The Paurshava transportation system based on Road way network though the water based transportation system exists in the Paurashava. Railway transport plays a significant role in Akhaura transportation system as the paurashava have to depends on Rail Way transportation. Roadway Characteristics and Functional Classification

There are three types of road in Akhaura Paurashava- Pucca, Semi-Pucca and Katcha. Haphazard parking, temporary markets in RoW of the roads, absence of footpaths are the main causes for continuous traffic congestion in town roads.

Out of 63.26 km of roads, Pucca road is 37.95 km, Semi-pucca road is 15.37 km and Katcha Road is 9.94 km.

Tanpara Road to Shaheed Edon Khan Road which passes through the middle of the Akhaura Paurashava directed towards North to South is linked with the Akhaura Tpwn By-pass Road. There are three types of road in Akhaura Paurashava- Pucca, Semi-Pucca and Katcha. Haphazard parking, temporary markets in RoW of the roads, absence of pedestrian footpaths are the main causes for continuous traffic congestion in town roads. There is no public bus service available for intra-zonal movement in Akhaura Paurashava. Intra-zonal movement is mostly carried out through bicycle, rickshaw, rickshaw-van, motorcycle, Auto Rickshaws. Akhaura Paurashava has two major transport infrastructure – Checkpost Road and Akhaura Bypass Road is the main road network for communication through other districts. Other major roads are-

- Amir Hossain Road (Old Lalbazar Road) Connecting Lalbazar and Paurashava bazaar.
- CNB Road Connecting Paurashava bazaar and Debgram
- Akhaura- Chandpura Road Connecting Paurashava bazaar and Bypass Road Intersection.
- Tanpara Road Connecting Tanpara and Durgapur Road

These roads have poor performance as the average width of these roads is about 7 to 12 ft (vide **Table 12.1 and Map 12.1**). The major road intersection within Akhaura Paurashava area is Bypass Road intersection among Bypass road and Durgapur road.

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12.2.2 Mode of Transport

There is no public vehicle service available for intra -zonal movement in Akhaura Paurashava. for inter-zonal/ regional movement, bus services are available from Akhaura to the following destinations Paurashava.

- Akhaura-Comilla
- Akhaura-Dhaka
- Akhaura-Noakhali
- Akhaura-Chittagonj etc.

Intra-zonal movement is mostly carrying out through bicycle, rickshaw, van, motorcycle, try auto rickshaws. With the expansion of the road network linkages, the sector is gradually achieving higher level of importance in Akhaura Paurashava. The auto rickshaws are convenient modes for the communication for both inter and intra-zonal

The auto rickshaws are convenient modes for the communication in Paurashava and Upazilla level. Auto Rickshawas ply over the following routes;

- Akhaura- Gazimura
- Akhaura- Satsaria
- Akhaura- Bagmara
- Akhaura- Daulatpur Bazar
- Akhaura- Monohorgonj
- Akhaura- Naerpatua

Table 12. 1: Existing Road Network Information (functional classification, width, problem and solvency)

No.	Name/ Location (From - to - via) of the Road	Functional Hierarchy base Road Classification	Mean Width (ft)	Problem With the Roads	Plan for Improve Existing Conditions
1.	Bypass Road	Artery Road (Major)	20	More access roads adjoin to the artry road; Free passenger and Vehicle Over-crossing; MT & NMT confliction.	Save from local Access, Reduce Connector Roads, Reduce or remove all types Local Road side activities It should widened up to 100 fts according to the Local needs,
2.	Durgapur Road	Secondary Road	20	Loading and Unloading of Goods in market area; Haphazard Parking of rickshaw, auto van, Nocimon Corimon, Small Trucks; No pedestrian way; path	It should widened up to 60 fts according to the Local needs,
3.	Akhaura-Chandpura Road		18		
4.	Checkpost Road		15		
5.	Amir Hossain Road	Local Roads	13	Too narrow to use; Haphazard Parking of rickshaw, auto van,	Should be Widen with other traffic facilities
6.	Shahid Edon Khan Road		15		
7.	Taragaon Road		10		
8.	Sahid Sarafat Ali Road		13		

Source: Traffic and Transport Survey by NRP, 2009-2010

12.2.3 Intensity of Traffic Volume

Traffic volume varies over different hours of the day depending on the location importance of the Passenger. In this context, the peak hour flow has a special meaning. The highest peak hour traffic is usually taken into account in determining the adequacy of the road section, i.e. to determine whether the road section gets congested at certain hours of the days. It is noted that motorized traffic is much lesser than the Non-motorized traffic in all of the Roads of Akhaura Paurashava.

Depending on the location and land use around that location, traffic flow varies over different periods of the day. In this context, the peak hour flow has a special meaning. Depending on the land use and socio-economic characteristics of the town, traffic flow of 18 hours (from 6 am to 12 am) was divided in to 5 periods according to the peak and off peak period of traffic flow. The periods were 6 am to 8 am (off- peak); 9.00 am to 1.00 pm (Peak); 1.00 pm to 4.00 pm (peak); 4.00 pm to 8 pm (Peak) and then 8 pm to 12 am (off- peak). There could be more peak periods in a day. The highest peak hour traffic is usually taken into account in determining the adequacy of the road section, i.e. to determine whether the road section gets congested at certain hours of the days.

12.2.4 Existing Travel Scenario

In Akhaura Paurashava Akhaura bazaar is the most common place of gathering by all of the local people. Akhaura bazaar has the main agglomeration of different activities of Akhaura Paurashava. Akhaura Upazila Porishad, Akhaura Police Station, Banks, AC Land office and other administrative office are located besides of Old Highway.

Most of the passenger trips either originates or destined-

- Within the Paurashava
- Within the Upazila and
- Other longer Distances

form the Origin-Destination frequency it seems that about 64.52% trips occurs within the Paurashava for different purposes (**Table 12.3**).

Table 12. 2: Origin-Destination Frequency

Distance	Origin %	Reported Location	Destination (%)
Short Distance Trips	3.23	Gouripur, Comilla	23.33
	64.52	Within the Paurashava	36.67
Long Distance Trips	12.90	Dhaka	6.67
	6.45	Within the Upazila	13.33
	3.23	Comilla	13.33
	3.23	Chittagong	3.33
	12.90	Other Long Distance	3.33
	100.00		100.00

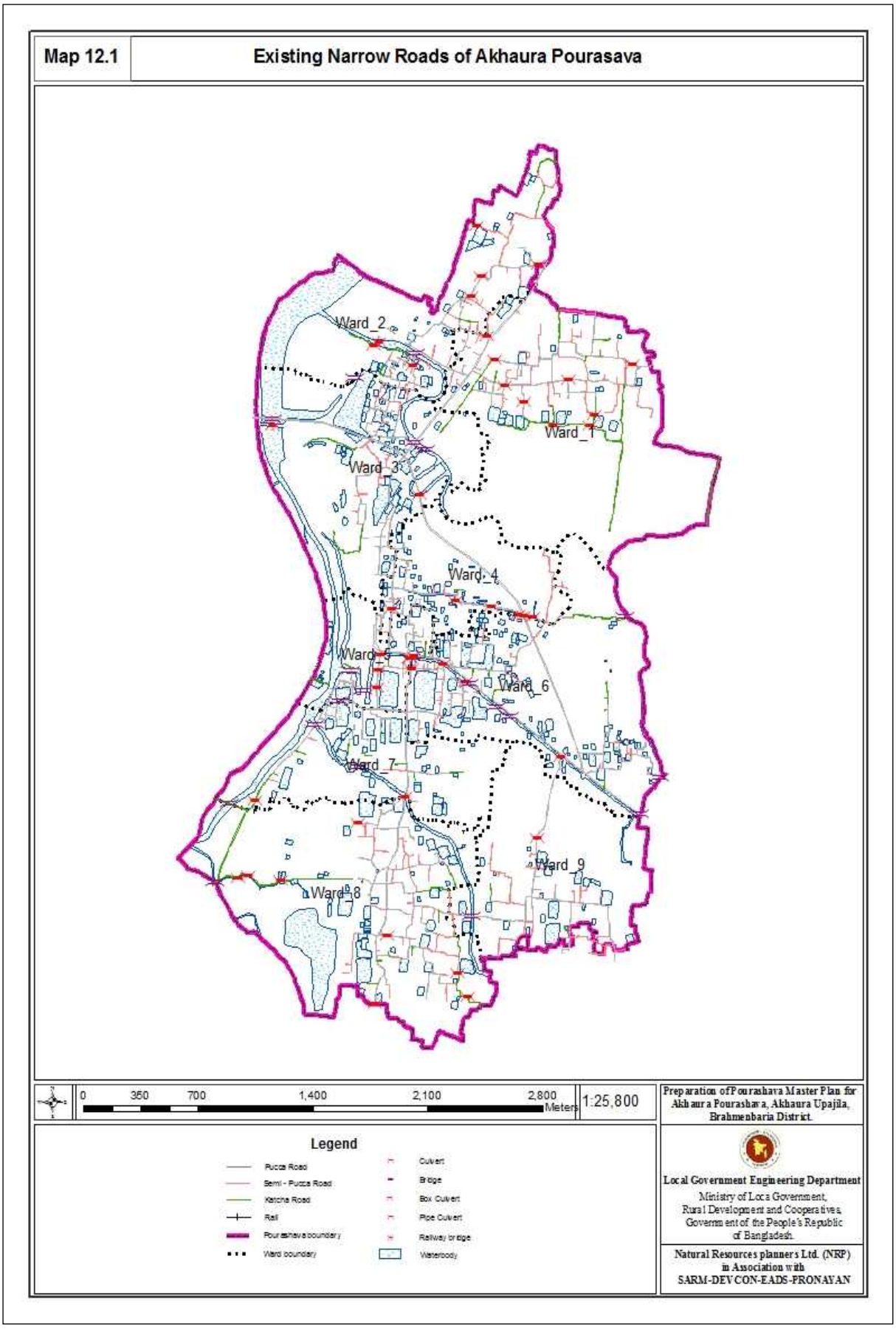
Source: Traffic and Transport Survey by NRP, 2010

12.2.5 Degree of Traffic Congestion and Delay

Capacity of a roadway largely depends on number of lane, road width and roadway condition. In Akhaura Paurashava all the local roads are narrow in width can not be classified functionally as all the roads have lower than 10 ft in width. All the local roads of the Paurashava can service only for non motorized transport but for motorized or heavy transport movement. Again all the local roads have poor surface conditions without any pedestrian way, without any parking and without any demarcated stands for rickshaws or other vehicles. As a result, congestion with NMT and pedestrian traffic is regular in the core area.

12.2.6 Facilities for Pedestrians

There is no defined parking facility in Paurashava. The buses /trucks /minibuses are parked exclusively for taking fuel etc. in Petrol pump station. All moving trucks /buses/ microbuses/ Power tiller / rickshaws/ vans etc. park on road side curbs. These create unexpected accidents. No footpaths are found in the project area. Pedestrian movements take place on the right of way of the roadside both directions of the road.



Map 12. 1: Existing Narrow Roads of Akhaura Paurashava

12.2.7 Analysis of Existing Deficiencies

12.2.7.1 Roadway Capacity Deficiencies

In Akhaura Paurashava for lack of wide roads, no vehicles (either MT or NMT) can move in the road with their full speed. Hindrance of the traffic movement at required speed is the main problem in the Paurashava for lack of traffic and transportation management.

Table 12. 3: Existing Deficiency in Different Roads

SL. No.	Road Name	Total Length (Km)	Crest width (m)	Reason for Deficiency
1	Bypass road	3.16	5.85	More access roads, Free passenger and Vehicle Over-crossing; MT & NMT confliction;
2	Durgapur road	0.88	6.01	Haphazard Parking of rickshaw, auto van, Nocimon Corimon, Small Trucks; No pedestrian
3	Akhaura-Chandpura road	0.38	5.23	Loading and Unloading of Goods in market area; Haphazard Parking of rickshaw, auto van, Nocimon Corimon, Small Trucks; No pedestrian way, Roadside; path holes; Adjoining Shop
4	Checkpost road	1.71	4.53	Loading and Unloading of Goods in market area; Haphazard Parking of rickshaw, auto van, Nocimon Corimon, Small Trucks; No pedestrian way, Roadside; path holes; Adjoining Shop
5	Amir Hossain road	0.33	4.05	No pedestrian way, Roadside; path holes; Adjoining Shop
6	Shahid Edon Khan road	1.34	4.51	No pedestrian way, Roadside; path holes; Adjoining Shop
7	Taragaon Road	0.85	3.03	way, Roadside; path holes; Adjoining Shop
8	Sahid Sarafat Ali Road	0.83	4.04	No pedestrian way, Roadside; path holes; Adjoining Shop

Source: *Traffic and Transportation Survey of Akhaura Paurashava, 2010.*

12.2.7.2 Operational, Safety, Signal and other Deficiencies

There is no safety or signal based traffic management system exists in the Paurashava. Major commercial area of the town exists along both sides of Akhaura-Chandpura road and Checkpost road which is the reason for traffic related problems. The situation might aggravate in future if proper measures are not taken. Considerable number of local narrow roads of the Paurashava is directly connected with both new and old Highway and slow moving local traffic also uses these highways ultimately creates traffic congestion and accident also.

12.2.8 Condition of other modes of transport (Rail/Water/Air)

Air

There is no air way exists in the Paurashava.

Rail

Along with roads railway is a mentionable way of transportation of Akhaura Paurashava. The Paurashava is connected with other areas with railway tracks. There are various routes for railway. The junction has railway tracks up to Chandpur, Feni, Noakhali, Comilla, Laksham, Habiganj etc and thus the junction has connected with Dhaka, Sylhet, Comilla and Chittagong region with railway track.

Akhaura railway station is one of the most important railway junctions of eastern part of Bangladesh, Chittagong, Sylhet, Mymensingh and Dhaka are connected through this Junction and it is also a gateway to Agartala, Tripura, INDIA -only five Km away.

Table 12. 4: Train Name and Passengers of Akhaura Rail Station

T.No	Train Name	off Day	Start Station	Start Time	Destination Station	Arrival Time	Passengers
703	Mohanagar Ghuduli	-	Chittagong	15.00	Dhaka	21.35	55
722	Mohanagar Ghuduli	Sunday	Dhaka	15.00	Chittagong	21.45	40
721	Mohanagar Provati	Sunday	Chittagong	07.15	Dhaka	13.55	65
719	Pararika Express	Monday	Chittagong	08.30	Sylhet	17.00	30
720	Pararika Express	Saturday	Sylhet	10.20	Chittagong	19.40	35
723	Udayan Express	Saturday	Chittagong	21.00	Sylhet	06.00	30
724	Udayan Express	Sunday	Sylhet	21.10	Chittagong	05.45	30
711	Upokul Express	Wednesday	Noakhali	14.15	Dhaka	20.40	45
712	Upokul Express	Wednesday	Dhaka	07.00	Noakhali	13.20	40

Source: Traffic and Transport Survey by NRP, 2008-2009

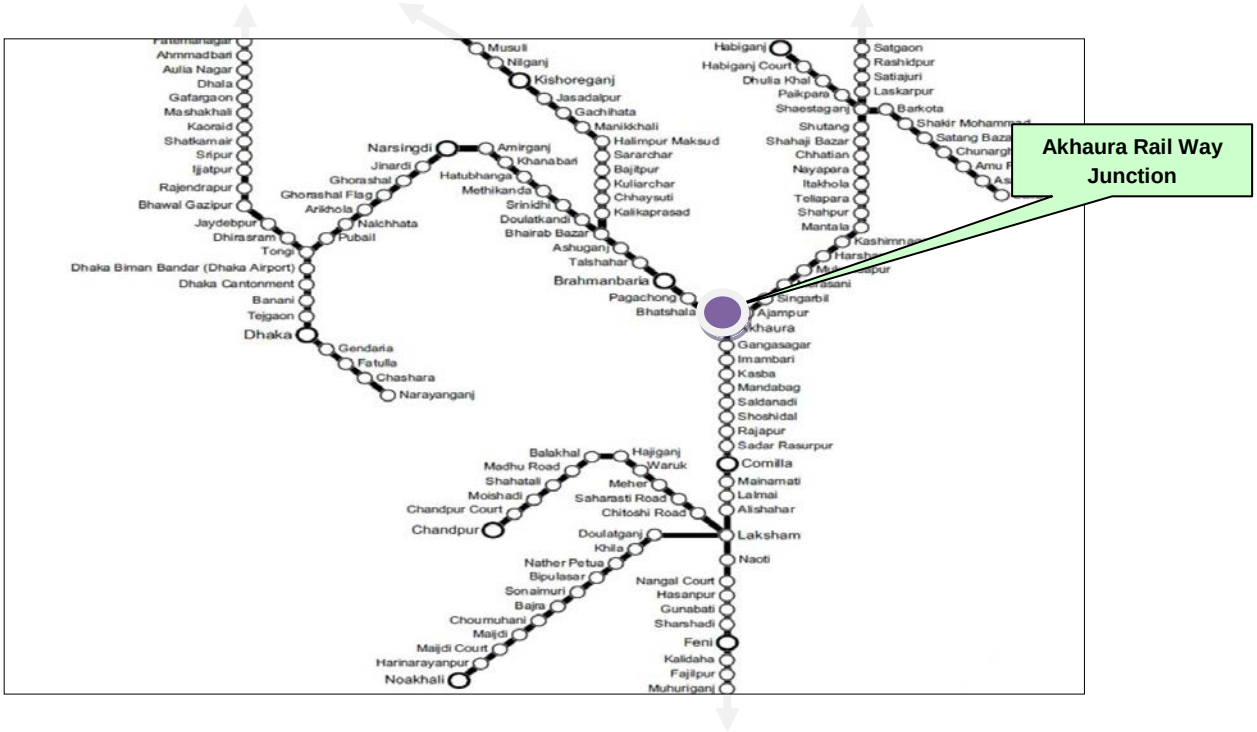


Figure 12. 3: Train Network of Akhaura Rail Junction

Waterway

There is no waterway network available in the Paurashava.

12.3 Future Projections

Future projection for road way network for Akhaura Paurashava vastly depends on the Existing road way Capacity, Traffic volume, average daily traffics, and future land uses, etc. Land use affects transportation demand through generation and distribution of trips. The effect of land use on transportation demand is not necessarily a one-way effect but rather a part of cycle in which land use changes transportation needs which in turn change land use.

12.3.1 Travel Demand forecasting for Next 20 Years

The travel demand forecasting is mainly to calculate the daily trips (Vehicle/day and than Passengers/day) that will generate in near future with the same routes. Daily trips depend on the number of travelers from the inhabitants of the Paurashava, people from other outer area and official people who comes at day time and leave in the evening.

Road is one of the most critical areas of the current planning project under UTIDP. The main problem of present road network in the Paurashava is that there is no systematic planning of the roads, whether highway or local roads. There is no logical links of roads and no plan to link the important activity areas where mobility is high. Reviewing different previous planning proposals in Bangladesh and other similar countries and after discussions with experts and LGED officials of this project a set of standard for basic infrastructure and services at Upajila level towns has been finalized. Accordingly different standards have been suggested for different types of Paurashava Roads at Akhaura Paurashava, which are as follows:

Table 12. 5: Geometric Design Standards of Roads Proposed by LGED

Types of Road	Recommended width
Paurashava Primary Roads	150-100 feet
Paurashava Secondary Roads	100-60 feet
Local Roads	40-20 feet

Source: UTIDP, LGED.

Akhaura is a small town with a very low volume of internal and external traffic movements. So the planning team have established a road hierarchy based on the functional area within the Paurashava and as well as the external and internal linkage. This hierarchy will be established as per the geometric design standard provided by the PMO office of LGED and suggestion of the consultation with the Paurashava.

To extrapolate the transport demand, it is necessary to accumulate data on employment, vehicle ownership, trip distribution, etc. Though some categories of data mentioned above have been collected through Socio-economic Survey, yet these data are highly inadequate to forecast future travel demand.

Furthermore, the traffic survey conducted as per ToR was intended to give an overall picture of traffic movement pattern in the project area. The collected data are not detailed enough to allow extrapolation of traffic data. So, it is not possible to develop any traffic model and to forecast future traffic demand.

The complexities of traffic in the study area, as per observation are assumed to be insignificant. It is considered that at this level of traffic in the town current measures are sufficient. Detailed traffic study reviews on the transportation and traffic management plan for future.

12.3.1.1 Requirement to Meet the Demand

From the forecasting result of traffic demand of Akhaura Paurashava the study team analyze the following requirements to meet the future demand with improvement of present scenario.

- All the roads have to be widened according to the hierarchy based importance of the local roads.
- Road side walkways, separate lane for NMT and road side plantation have to consider for major roads.
- To make good Circulation Network and to meet the future demand new roads (connector roads, local access roads etc.) have to provide.

- To save the Major arterial roads Service roads (on both sides) will have to be provided with proper plantation and to reduce direct access roads to the High way

- Some embankment-cum-roads have to provide to save the river and also to save the canals that exists in the entire Paurashava.

- Auto rickshaw and rickshaw stands have to provide to get free from spontaneous parking scenario of those modes.

12.4 Transportation Development Plan

Integration of traffic type or system within the framework of environmental and social considerations along with the travel behavior pattern is very much important for considering traffic and transport Development Plan. Safety and efficiency must be considered together for developing Traffic & Transport sector of Akhaura Paurashava

12.4.1 Plan for Road Network Development

In the aspect of future Road Network Development of the Paurashava to reduce existing congestion and also to make the future demand, hierarchy base road network designs have been considered. The road hierarchy that should consider designing the road network has been shown under the following **Table 12.6.**

Table 12. 6: Proposal for Roads in the Project area

Roads 11.77 % of the total Built up Area	
Roads	Width
Paurashava primary roads	ROW 60-80 ft
Paurashava secondary roads	ROW 40ft
Access Road/ Local Road	ROW 25-30ft

Source: *Planning Standard of Upazila Towns Infrastructure Development Project* and Proposed by Consulting Firm,

Land uses, parking, safety, integration of public modes, impact and equity, etc. have been taken in to consider the Designing and evaluation of road way network of Akhaura Paurashava.

The right of way (RoW) of all neighborhoods (mahallah) roads may be in between 20 ft. to 40 ft wide depending on their functions. All urban roads should have flexible pavements. The road intersection should be designed to allow easy movement of vehicles. At bridge, the road design should provide for an adequate sight distance and a smooth riding. Each category of road has its particular functions to perform. Access road carries traffic from buildings to the collector road and collector road carries traffic to the major road and vice versa. In reality, however, it is almost impossible to maintain this hierarchical use of roads except in an entirely planned area. However, functions will not be dependent on the road width, rather on the location of the road, surrounding land use and the link it is providing or the volume of traffic it is carrying.

12.4.1.1 Road Network Plan

for improvement of the existing roads of the Paurashava all basic needs have been proposed to meet the demand of future road network like Width of the roads, Pedestrian way, plantation, street lamping, sign and signal marking, cover drain beside of the roads, Round about etc.

- **Widening the existing roads** of the Paurashava according to the hierarchy and the existing demand basis has been prioritized to improve the future road network condition of the Paurashava.

- **Pedestrian walkways with covered drain** have been proposed for all the existing roads of the Paurashava.

- **Bypass Road** has been considered as the major roads for the Paurashava and major Distributor road from the Highway to the Paurashava area. All major collector roads will be linked with this road.

And that's why this road has been proposed as the primary road for Paurashava with all the major roads facilities like walkways, separate lane for NMT, Covered drain facilities, street lighting, Road side plantation etc.

- Separate lanes, street lighting, walkways, proper parking system, Rickshaw/ Auto-rickshaw stands, Bus-Bay, Truck terminal, proper road side tree plantation also have been proposed for those local roads according to the hierarchical importance of those roads.

Consideration of Right of Ways

Paurashava Primary Road

By Pass Road of Akhaura Paurashava is the existing primary road of 3.16 km length and 20ft of width. This road act as the major distributor road for all of the local collector roads and also provides land access service and traffic circulation within residential neighborhoods, commercial areas. It penetrates residential neighborhoods, distributing trips from the arterials through the area to the ultimate destination. Conversely, this street also collects traffic from local streets in residential neighborhoods and channels it into the arterial system into the core part of the Paurashava. This road has been proposed 80 ft of RoW. Other than this road to provise the accessibility of the people a toal of 3.35 km of new primary roads has been proposed where 1.15 km are to be 60 feet and 2.20 km are to 80 feet. On the other hand a total of 20.46 km of existing roads are proposed to be widened as this type. Among thius 20.46 km roads 11.55 km to 60 feet and rest 8.91 km to be 80 feet. This roads also contains some embankment cum road to protect the natural water bodies.

The cross section of the Paurashava primary road has been shown in the **Figure 12.2.**

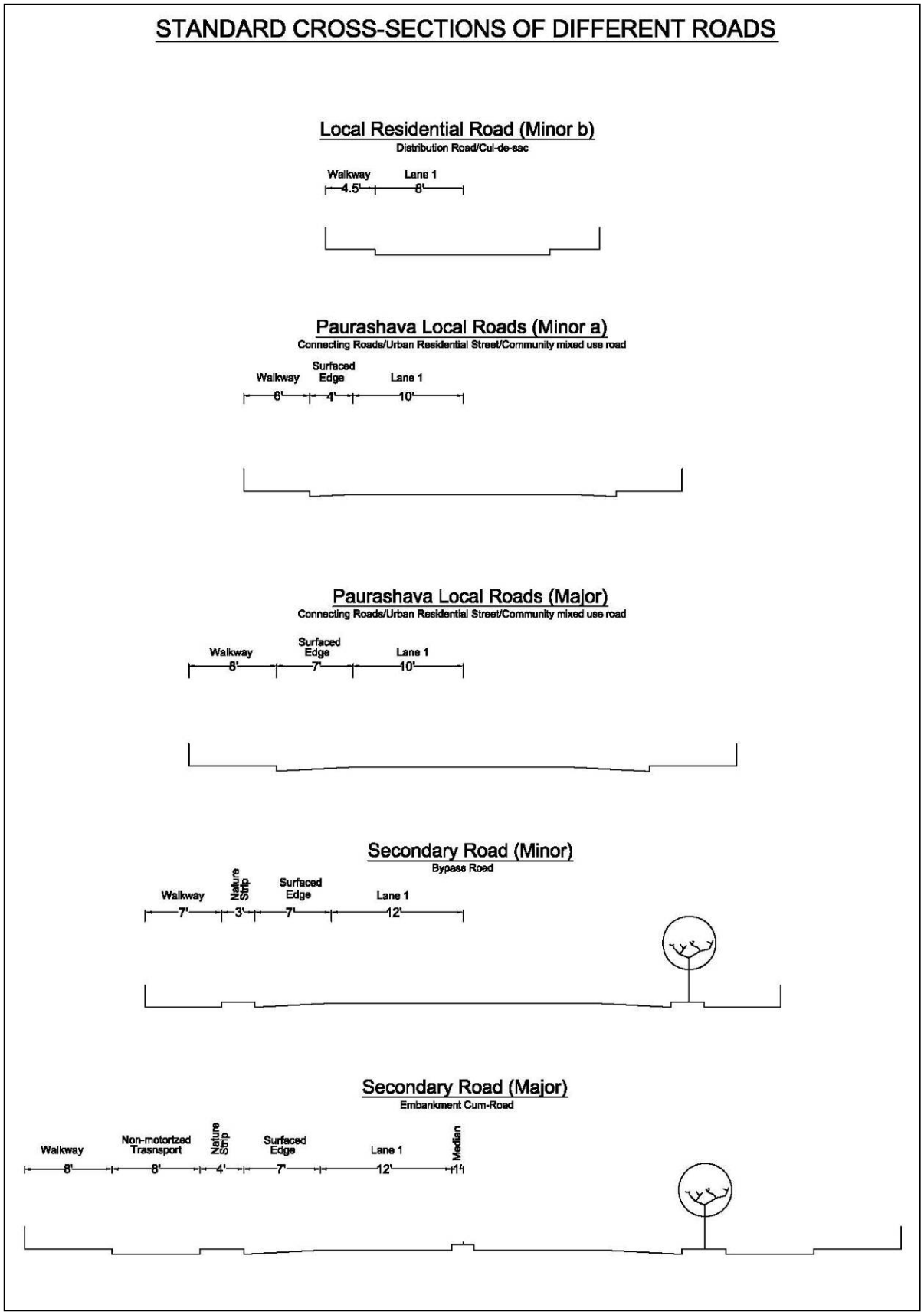
Paurashava Secondary Road

Total 0.17 km of new roads have been proposed as secondary road and 9.70 km of existing roads have been proposed to be widened as the secondary road of 40 ft RoW.

Access Road/ Local Road

About 42 km of roads have been proposed as the Local roads where abot 28 km of local roads have been proposed to be widening of 25 ft RoW and 13.59 km of new roads has been proposed as local roads . Figure 12.1 shows the layout design of Access or local roads with 20 ft RoW.

Figure 12. 4: Proposed Road Categories for Akhaura Paurashava



12.4.1.2 Proposal for Improvement of the Existing Road Networks

In Akhaura Paurasahva Most of the local roads are too narrow to flow the traffic. To improve this situation 58.63 km of existing roads is proposed for widening (vide Map 12.2). The highest 28.71 km (49.41%) road is proposed for widening up to 25 ft, which will function as access road/local road. Then 10.76 (18.52%) km road is proposed for widening up to 60 ft, which will function as primary road. Again 9.70km (16.68%) road is proposed as secondary road and is proposed for widening from 40 ft. Finally, 8.94 km is proposed for widening to 80 ft, which will function as primary road. Table 12.8 shows the summary of road widening proposal.

Table 12. 7: Summary of road Existing Roads widening proposal at Akhaura Paurashava

Road Width (in ft)	Length (in meter)	Length (in km)	Percentage	Road Type
25	28713.91	28.71	49.41	Access/Local Road
40	9695.66	9.70	16.68	Secondary Road
60	10762.64	10.76	18.52	Primary Road
80	8943.01	8.94	15.39	
Total	58115.21	58.12	100.00	-

Detailed scenario of road widening proposal of Akhaura Paurashava along with width of the existing roads has been shown in the Map 12.2 and Appendix B, Table No.B-15.

12.4.1.3 Proposal for new Roads

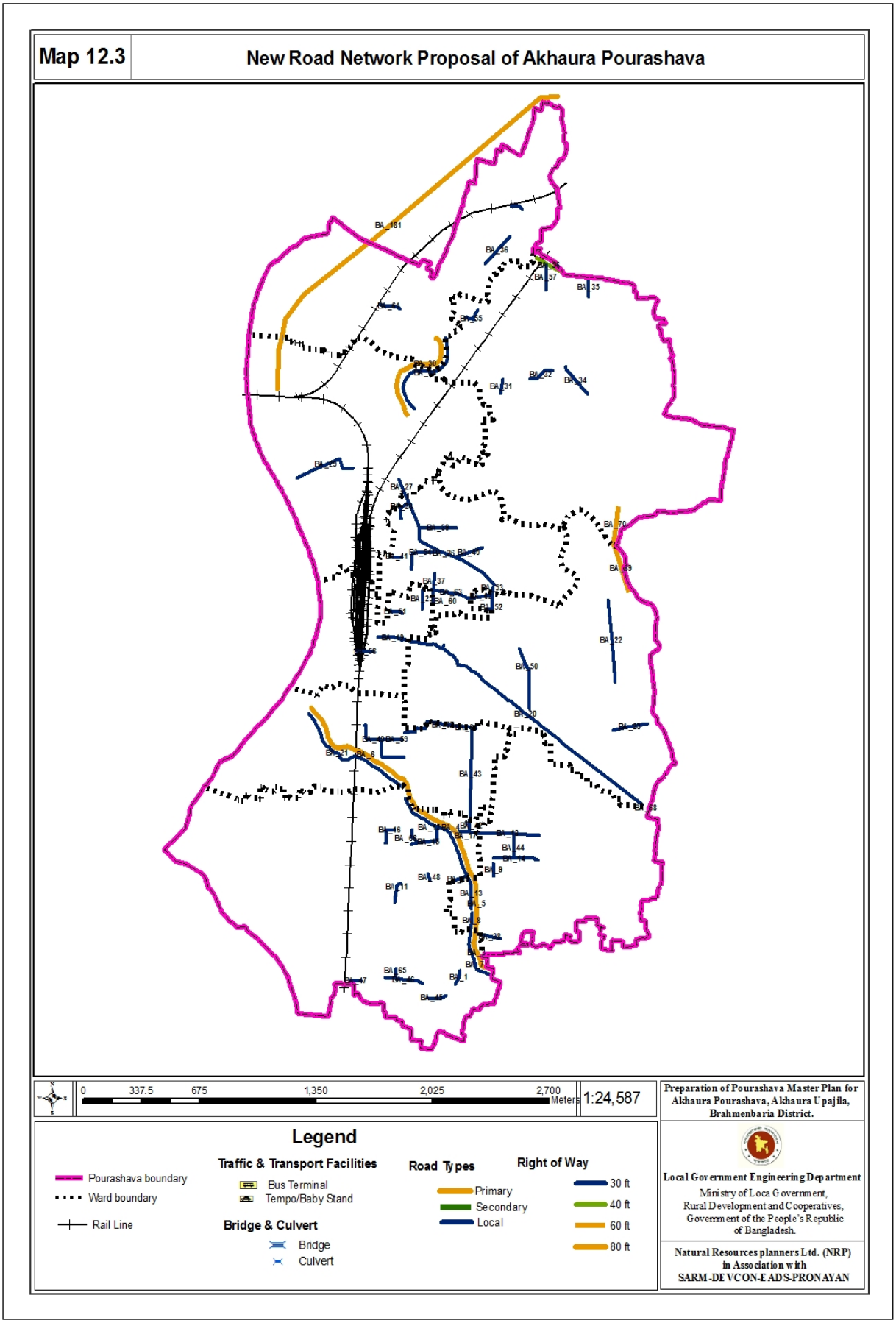
Various categories of new roads have been proposed under the Master Plan within the framework of Structure Plan. In the riversides of the Paurashava an embankment cum-road have been proposed which will play an important roles to protect from river-side erosion, to circular way communication of Paurashava and proper plantation also have been proposed to both sides of the embankment which may play an important role for the recreation of the Paurashava. Embankment cum roads also have been proposed for some important canals to save from illegal filling up for commercially use and also for the purpose of recreation (Vide **Map 12.3**). Other community minor Roads have been proposed to interlink the major roads as the local distribution road (Vide **Map 12.3**). Some Local Roads also have been proposed inside of the residential areas to bring easy communication of the local people and also to easy access to the nearby distributor Roads and then to the Primary roads.

The Right of Way of these road networks has been shown under the **Table 12.9**. The roads have been suggested with the long term perspective for linking the areas within Structure Plan. The length of all the proposed roads have been shown under the following Table 10.6 of all categories (embankment cum road, Service Roads of the Highway and major residential roads).

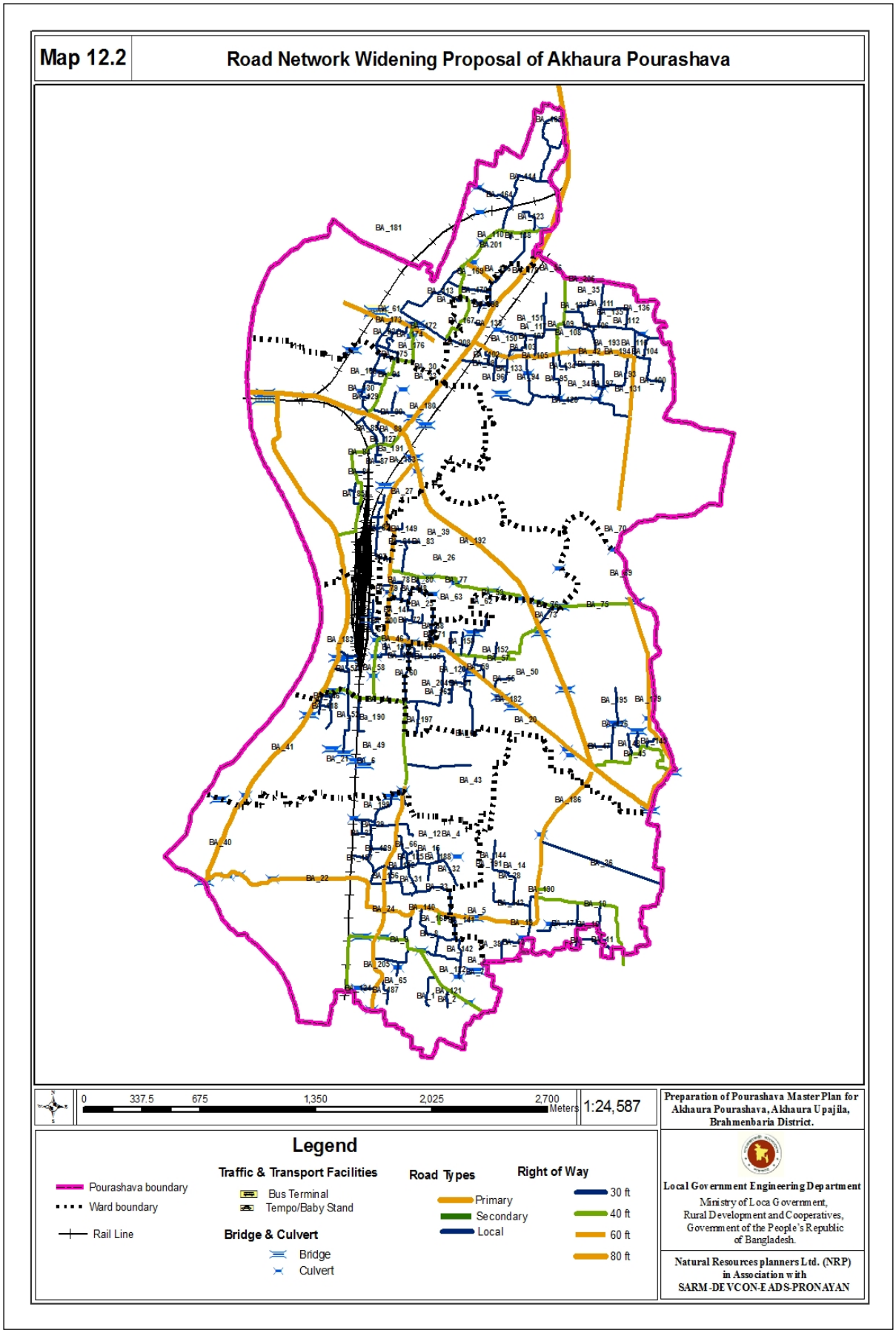
Table 12.9: Summary of new road proposal in Akhaura Paurashava

Road Width (in ft)	Length (in meter)	Length (in km)	Percentage	Road Type
25	13587.96	13.59	70.24	Access/Local Road
40	174.07	0.17	0.90	Secondary Road
60	1152.70	1.15	5.96	Primary Road
80	4430.73	4.43	22.90	
Total	19345.46	19.35	100.00	-

Detailed scenario of new roads proposal of Akhaura Paurashava along with its length, new road id, road type and right of way (RoW) have been incorporated in the Appendix B, Table No.B-16**.**



Map 12. 2: Road Net-Work widening Proposal Akhaura Paurashava



Map 12. 3: New Road Net-Work Proposal of Akhaura Paurashava

12.4.2 Plan for Transportation Facilities

Proposed Transport facilities for Akhaura Paurashava has been shown under the following table 12.9 (Vide Map 12.4)

Table 12. 8: Proposed Transport facilities

Proposal	Area (Acre)	Ward No.	Mouza Schedule	
			Mouza	Plot No.
Bus & Truck Stand	4.09	3	Kasba	6
Tempo Stand	1.22	3, 6, 8	Debgram	351
			Kasba	92, 116
			Naryanpur	197- 199, 204
Rickshaw Stand	0.42	5, 7	Debgram	564
			Mishrail	177, 179

12.4.2.1 Parking and Terminal Facilities

Parking Facilities

There are no provisions of Parking provisions in the Paurashava. Parking spots have been identified at suitable locations in busy areas of the town. The Study Team has proposed lands for parking and also for Rickshaw and Auto-Rickshaw stands at different places near traffic flow surrounding of the Paurashava (vide **Map 12.4**).

Bus Terminal

There is no formal bus stand exist in Akhaura Paurashava. Buses usually park here and there of different road side of the paurashava. Future increasing travel demand and growth of the town requires a specific place for bus terminal. On the other hand There is no provisions for the Truck terminal in the Paurashava, but due to the expansion of the town, increasing of economic activity, manufacturing and processing activity, scope of increase trade with other regions will increase movements of truck. So, truck terminal will be required to meet the future needs.

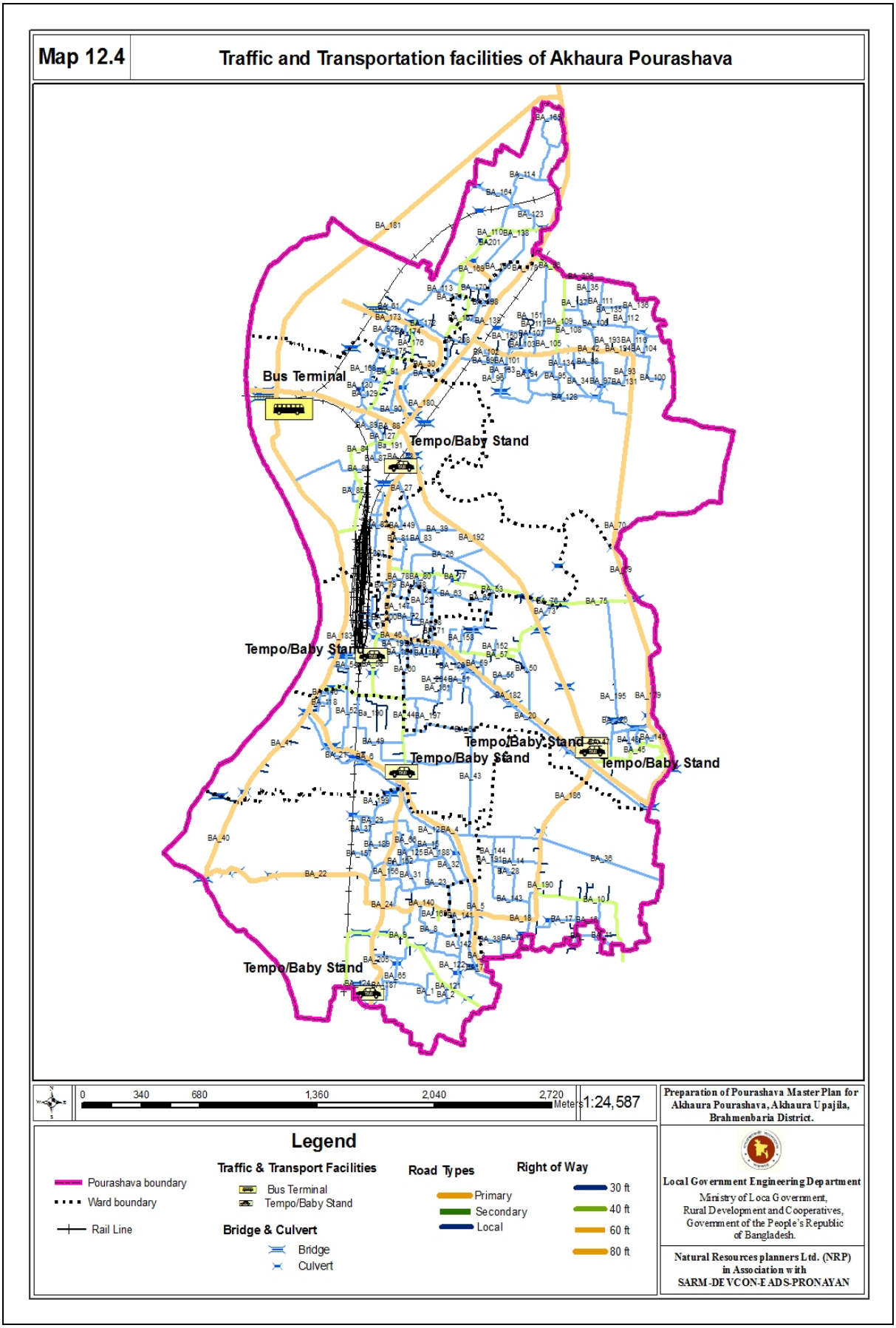
Considering this demand, 4.10 acres land has been proposed for bus and truck terminal beside bypass road at the entrance of the Paurashava. Location of bus cum truck terminal is given in Map 12.4 and Table 11.17 (Chapter, 11, Landuse Plan, Part-B).

Tempo Stand/Auto-rickshaw/Easy Bike Stand and Rickshaw Stand

The major mode of the Town is Rickshaw, Auto Rickshaw, tamo and Easy Bike. As per the growth trend additional modes will be increased in the town. Due lack of any designated stand these modes area parked and stored haphazardly surrounding of the Town. Considering the Demand the Study team has proposed 1.65 acres of land for Tampo, Auto Rickshaw, Easy Bike and Rikshaw Stand.

12.4.2.2 Development of Facilities for Pedestrians, Bicycles and Rickshaws

Walking, cycling and Rickshaw is only the means of travel for the majority of the Paurashava dwellers. The interfaces between these modes are poorly designed with rickshaws and cycle stopping in the same areas causing congestion and disorder. In this study, the following plans have been proposed to meet the demand for pedestrian way and also for NMT.



Map 12. 4: Traffic & Transport Facilities Map of Akhaura Paurashava

- In this plan, construction of properly designed and continuous footpaths with well-defined and maintained pedestrian routes in the Paurashava have given (vide Figure 10.1) the first priority with the provision of pedestrian crossing facilities giving the pedestrian priority over all other traffic and the prohibition of unauthorized encroachment on the footpath by street vendors and others.
- Hierarchy basis road network Plan have been proposed (Vide Table 10.6) to widen the existing roads where Non-motorized transport can operate with sufficient free space on the roads.
- Road network design have been proposed for a separate lane on the major roads for the NMT like Rickshaws and also for improved safety standards (vide Figure 10.1).
- Rickshaws will be encouraged and assisted to ply on the lanes and Local Residential Roads to serve local neighborhood demands and to provide feeder services from the neighborhoods to the Secondary roads.
- It is very important to identify and promote market areas of the Paurashava as MV free zones and provide the necessary facilities to make them pedestrian friendly to avoid unnecessary traffic jam.
- It is very important to initiate awareness program as a part of the implementation of a road safety campaign with special emphasis targeted at children, women and disabled persons. The Paurashava authority will design and encourage a program of training and an awareness campaign for the rickshaw pullers in order to improve their knowledge of traffic rules and road behavior. The Paurashava authority will launch a stringent program of investigation into the present system of licensing of Rickshaw pullers in order to prevent non-approved pullers from operating vehicles.
- Bicycles will be recognized as a mode of transport and separate lanes and crossings will be provided within the city in order to make bicycle journeys safe and pleasant**.**

12.4.2.3 Other Transportation Facilities

The greatest efficiencies in operating transportation systems are achieved when the sub-modes act together. In the present systems, the passengers suffer due to the lack of inter-connection of modes and poor scheduling. The systems should be planned so that all modes of transport are integrated. People frequently travel on more than one mode (river to rickshaw, or walk to bus for example). The following proposals should have to follow for improvement the transport quality of Akhaura Paurashava.

- To launch integrated transport system some MV like mini bus or Human Hauler have to operate systematically to serve the passengers to make journey within the Paurashava.
- A proper Bus stand have to provide for long routed Bus just besides of the high way
- A bus bay has to provide to serve the High way

12.4.3 Waterway Development / Improvement Options

As there is no waterway network available in the Paurashava, no new waterway development proposal have been provided.

12.4.4 Railway Development Options

Along with roads railway is a mentionable way of transportation of Akhaura Paurashava. The Paurashava is connected with other areas with railway tracks. There are various routes for railway. The junction has railway tracks up to Chandpur, Feni, Noakhali, Comilla, Laksham, Habiganj etc and thus the junction has connected with Dhaka, Sylhet, Comilla and Chittagong region with railway track. Akhaura railway station is one of the most important railway junctions of eastern part of Bangladesh, Chittagong, Sylhet, Mymensingh and Dhaka are connected through this Junction and it is also a gateway to Agartala, Tripura, INDIA -only five Km away. As Ministry of Railway is the sole authority for planning of railway related issues so no specific proposal has been provided here. But as railway is one of the major means of iter transport for this locality a well managed railway junction is proposed

here with adequate passenger and safety facilities. Besides these, it is proposed that the land of railway would be kept free from illegal users or occupant. for, the betterment of the Railway passenger necessary infrastructure will be developed in the designated area of railway.

12.5 Transportation System Management Strategy (TSM)

Traffic Management for Akhaura Paurashava is not just to consideration of vehicle movement rather considering the suitability to walk comfortably, to ride bicycle, distance consideration, easy access to market, parking facilities, etc. Traffic management context for a local Town can be reconsidered as the following Figure:

12.5.1 Strategies for Facility Operations

- **Creation of major linkage**

As the town grows and the traffic intensifies on the streets, an efficient network of roads has to be built based on major North-South and East-West links. This would ensure direct connection between different curial nodes of the network and help reduce both travel length and time. This is a nonstop process and will be closely in interaction with the spatial development policies for the Town.

- **Lane-based traffic management**

Determining number of lanes on every street and their individual capacity and rooting the traffic management and any future expansion on that capacity assessment. Lanes can be designated for different modes. Use of every segment of the road has to be pre-designed and clearly defined e.g. movement, parking, pedestrian crossing etc.

- **Promote use of FFT (Fuel Free Transport) and discourage FDT (Fuel Dependent Transport)**

Use of fossil fuel and harmful emissions are a major environmental issue all over the world. That's where FFT can play a vital role. Modes like walking, bicycling are in general called 'green transport' for their environmental friendliness. Promotion of these means of mobility can eliminate long-term negative impacts of fuel-based vehicles and enhance health and safety of the inhabitants.

- **Promote Plantation on the Walking way besides of the Roads**

Embankment cum Roads and other major roads have been proposed for promoting plantation with street furniture.

- **Providing Properly Designed Pedestrian Ways**

Akhaura Paurashava has no provisions of pedestrian ways, which is one of the major crucial problems for the Town in Transport sector. All necessary facilities should be provided for the pedestrians. A designed pedestrian ways must be integrated closely with other transportation elements so that walking becomes a recognized mode and becomes a pleasure and a place for brief social gatherings for the Paurashava dwellers.

- **Road space allocation:**

Road space should be allocated among different mode and use based on the hierarchy of the road and its adjacent land-use. This is essential for safety and effectiveness of the road.

- **Development & availability of Public Transport (PT)**

This should form the major share of the motorized vehicle. PT has to be available within comfortable walking distance from any part of the Paurashava. Maintenance of an efficient public transport provides a cheap and accessible solution for mass movement.

- **Minimizing Transfer Times**

The present deficiencies in the inter-modal integration of the transport system are economically unsustainable in the long run. The current systems are time consuming to travel by more than one mode for the Town of Akhaura Paurashava.

- **Integrating the Management of Land Use and Transportation in Akhaura Paurashava**

The growth of the Town still concentrated to the core part of the area adjacent to the bazaar area which is just North Portion of the Municipality. To bring out a proper traffic and transport design core part of the town have to manage with high consideration and the semi core and fringe area should have to design for future projection basis.

12.5.2 Strategies for Traffic Flow and Safety

The following strategies have been identified for Traffic flow and safety

- **Avoid dispersed and scattered development patterns**

Dispersed and scattered type of development promotes 'sprawl' and increases for travel. It raises the need for more and more transport corridors inducing ever greater traffic.

- **Consider traffic impact of land use and occupancy of structure while giving building construction and land use permit**

Kind of use for the any structure has to be clearly defined. 'Transportation Clearance' should be given considering the structure size and proposed use and has to be a compulsory criterion for receiving building permit.

- **Effective road network design has to consider for the mixed land-use areas that provide both places to live and work**

Mixed land use provides the commercial base for supporting viable public transit. for providing effective road network design the study have been proposed the road cross section according to the road categories (vide **Figure 12.1**)

- **Widening the existing Roads**

All existing Roads have to be widen according to the Land use Importance (Vide Map 12.3)

- **Separate lane for NMT**

Provisions pf Separate lane for NMT will help to avoid traffic jam and conflicts.

- **Pedestrian First**

All the roads of the Paurashava necessary facilities should be provided for the pedestrians. A designed pedestrian ways must be integrated closely with other transportation elements so that walking becomes a recognized mode and becomes a pleasure and a place for brief social gatherings for the city dwellers.

- **Parking Provision**

Auto Rickshaw, Rickshaw stoppage will be provided on the suitable place for the present need and also for growing future demand. Set up Rickshaw or Auto Rickshaw stops on street corners and other suitable locations.

12.5.3 Strategies for Traffic Management

The following strategies have been identified for Traffic Management

- **formulate a Local Area Traffic Management Unit (LATMU)**

Designing, modeling and at last managing traffic and Transport is not an easy task. It needs important decisions of policy makers from both Public and Administrative representatives. for the Upazila Towns Mayor is the principle for taking any decisions whereas traffic and Transport related decisions require a Coordination Board where high official's opinion is very much important. for this purpose a **small Town Transport Planning and management unit** is require to manage traffic and transport situations.

- **Integrating the Management of Land Use and Transportation in Akhaura Paurashava**

As transport is basically a function of land use, any proposed development should be examined with respect to the traffic impact it has on the locality. Kind of use for the any structure has to be clearly defined. 'Transportation Clearance' should be given considering the structure size and proposed use and has to be a compulsory criterion for receiving building permit.

The growth of the Town still concentrated to the core part of the area adjacent to the bazaar area which is just North Portion of the Municipality. To bring out a proper traffic and transport design core part of the town have to manage with high consideration and the semi core and fringe area should have to design for future projection basis. Mixed land-use creates vibrant, lively neighborhoods/communities and reduces the need for longer distance travel and commuting. Short distances travel also encourages use of sustainable alternatives like walking and bicycling. Mixed land use provides the commercial base for supporting viable public transit. This would also imply restricting development of new strictly single-use zones (like residential, commercial etc.)

Dispersed and scattered type of development promotes 'sprawl' and increases for travel. It raises the need for more and more transport corridors inducing ever greater traffic. Therefore, avoiding and discouraging this kind of development by various policy measures would help reduce creating new trips.

- **Developing an Integrated Transportation System**

As there is no transport studies have conducted before for the Upazila Towns, no serious effort has been made for the functional integration of different modes of transport. However, it is well known that without effective integration of transportation systems, economic benefit, convenience and comfort from transportation services cannot be derived.

- **Avoid dispersed and scattered development patterns**

Dispersed and scattered type of development promotes 'sprawl' and increases for travel. It raises the need for more and more transport corridors inducing ever greater traffic. Therefore, avoiding and discouraging this kind of development by various policy measures would help reduce creating new trips.

- **Need for Integration between Modes**

The main challenge in the area is to identify and link together the most appropriate modes for any journey. Unfortunately the existing modes (BUS -Try Auto Rickshaw -NMT) are acting independently of each other. As a result the passengers suffer due to the lack of inter-connection and scheduling and freight traffic faces delays and increased costs particularly when it is carried by waterways from outstations for destinations inside of the Paurashava. There is an urgent need for integration between modes for economic reasons and for convenience and comfort of the passengers. Traffic management is the It encompasses traffic engineering, but also includes policy making, planning and consultation processes and that's why a traffic management unit has to be launched. One traffic management unit will launch which will be under the Upazila parishad and must be merged with the Paurashava for regulation, organization, guidance and control of all kinds of stationary and moving road users, and vehicles, including pedestrians, cyclists, motorcyclists, truck and cars, respecting the needs of

abutting land uses.

- **Aspects of Access Control**

Maximum use should be made of the existing infrastructure before new roads are contemplated. In moving towards areas of vehicle restrictions and the management of demand a number of measures will be necessary in order to reduce congestion and pollution in the core part of the Town.

- **Minimizing Transfer Times**

The present deficiencies in the inter-modal integration of the transport system are economically unsustainable in the long run. The current systems are time consuming to travel by more than one mode for the Town of Akhaura Paurashava.

12.6 Plan Implementation Strategies

12.6.1 Regulations to implement the Transportation Plan

There is no specific policy provided for the local urban traffic and transport management for the small town of Bangladesh though there exists National Land Transport policy for Bangladesh. for this purposes to implement the transport plan national land transport policy can be followed. Again a traffic transport management authority must have to provide merge with Paurashava urban planning sector to manage transport related development and implementation.

The roles of the municipality will be largely unchanged. Their functions will still be to provide essential services for the population including in the transport sector – public transport, traffic management signal systems, parking control and management and street lighting. The development of transport systems and infrastructure within the municipalities will be in accordance with the Structure Plan that will be provided under the Master Plan.

- **Effective co-ordination in transport**

Better coordination to be established between the Upazila parishad and Departments under its control; & regulations will be formulated to achieve the goal of creating better working links between the Government and the public and private sectors. A committee has to develop to monitor the entire development project of the Paurashava to analysis about transport sector violation.

Government to promote clearer objectives and responsibilities for each sector in order to create more integrated working relationships.

- **Promoting the role of the transport users**

The Government will examine how best the interests of users can be represented within the existing national government and local authority system; The Government will establish a user role within its transport planning process.

- **Transport users should pay for the costs of services**

The Government makes arrangements to realize cost of transport operation and road maintenance from road users through new fiscal policies; to protect public interest, the Government will regulate tariffs for passenger and goods both in road and rail transport.

- **Subsidies for transport services**

The government should allow subsidy to the transport sector only on consideration of public interest.

12.6.2 Implementation, monitoring, Evaluation and Coordination of the Plan

In Urban area planning the most significant role will be played by Paurashava planning section. The Planning Section will carry out the entire work of project initiation and plan formulation. These works are complicated and time consuming, and require multidisciplinary professionals. But there is no provision of Planning Section in Akhaura Paurashava. It is not possibly by the existing Paurashava personnel to undertake UAP programme after discharging all its regular office functions. This would necessitate strengthening of the institutional capacity of the traffic and transport Planning Section. Under the reorganized orga gram of the Planning Section, a Planning Unit can be created to deal with all affairs of area planning for the 'C' category Paurashava.

Under the current government policy regarding public sector agencies, it is unlikely that a major reshuffling can be achieved in improvement of existing manpower position of the Planning Section. As a result a large part of the planning process may have to be done through private consultancy.

According to the Local Government Act (Paurashava) Act -2009, Paurashava will, in the prescribed manner, prepare and execute a Road Maintenance and Development Program. A Paurashava also maintain the measures on Street lighting, street watering, traffic control, and public vehicles. They will maintain such public streets and other means of public communication as may be necessary for the comfort and convenience of the inhabitants of the municipality and of the visitors thereto.

Chapter Thirteen: Drainage and Environmental Management Plan

13.1 Drainage Plan

13.1.1 Introduction

Analyses of current and future Drainage situations of the project area have been carried out to get useful input in the Master Plan preparation. On the basis of the findings from these analyses a drainage network has been proposed for preparation of master plan. Unplanned distribution of different activities and human habitation across the entire project area has caused encroachment on water retention areas and natural drainage path in the project area. Inadequate drainage networks, natural siltation, absence of outlets, disposal of solid waste into the drains and lack of proper maintenance of the existing drainage system are the major causes of drain blockage and water logging in the project area. The Drainage master Plan is formulated in order to provide measures to be taken to make the project area free from flooding and water logging.

13.1.2 Goals and Objectives

The Goal of this Drainage Master Plan is to provide a road map of how to develop drainage infrastructure in a coherent manner. The objectives to attain the above mentioned goal are

- To develop a drainage network plan
- To formulate strategies to implement the Drainage Master Plan

13.1.3 Methodology and Approach to Planning

In implementing various infrastructural developments, drainage is generally given less priority and is normally considered to be the last or final steps for development. Such scenario is particularly true for Bangladesh; although different types of drainage infrastructures are among others by far the heaviest impact on physical infrastructure network. As a result, physical environment, health, hygiene and standard of living suffer seriously. In development projects, Government, Semi-government and Public sector allocated funds are mostly spend on buildings, roads and other more visible infrastructures and drainage comes as the last item of development. By the time, drainage development begins to start, there appears shortage of fund, consequently as a matter of policy-do little or do-nothing situation appears and as eyewash very little is done for drainage development. In case of urban development, if drainage is not given priority, sufferings of the inhabitants will continuously increase with the passage of time.

Drainage development for urbanization should start with drains. Drains can be classified as Plot drains, Block drains, Tertiary drains, Secondary drains and Primary drains. Other natural drainage infrastructure is lowland, outfall areas, khals and rivers. Man-made drains are Plot, Block, Tertiary, Secondary and Primary drains and others are natural drainage infrastructures. In planning for drainage network, care has given on road network in terms of conflict of drainage and waterways with roads. It appears from the physical feature survey. Environmental survey was followed the proto-type questionnaire supplied and suggested by the LGED.

13.1.4 Existing Drainage Network

13.1.4.1 Introduction

The drainage system in the study area can be classified into two types. One is the Natural Drainage System that has emerged as a natural process following the natural slope of the ground, for the movement of storm run-off mainly without human intervention. The flow moves from high to low lying areas. The other is the Man-made Drainage System that is provided by the municipal authority or any

other local government agency to drain out the domestic wastewater or storm water from the urban area.

13.1.4.2 Existing Drainage System/ Network

Man-made Drains

In Akhaura, Paurashava most of the drains are open. All drains are discrete in nature Total length of that natural drainage network of the Paurashava is 15.16 km. In Akhaura Paurashava, total length of constructed pucca drain is 4.9 km (Vide Map 13.1). These drains are similar in terms of width, and depth. The existing drainage system of the project area has three distinct features and these are:

- Road side pucca drainage network in the core part of Paurashava
- Residential katcha drains
- Natural drainage by rivers and khals

Table 13.2 shows the important drainage network of Akhaura Paurashava.

Table 13. 2: Important Drainage Network of Akhaura Paurashava

Drain Type	Status	Width(In Meter)	Length (m)
Pucca Drain	Covered Drain	0.7 to less then 1	949.24
Pucca Drain	Covered Drain	1 to 1.2	604.60
Pucca Drain	Open Drain	0.4 to less then 1	1910.09
Pucca Drain	Open Drain	1 to more	1469.89
Total			4933.83

Source: Environment Survey by NRP, 2010

Natural Canals

Drainage system of Akhaura Paurashava is being managed by a natural drainage system (composed mainly by Titasi River and khals) and a few man-made drains. The Western part of Akhaura Paurashava is adjacent to the Titas River. A small branch of Titas River is also flowing through the Paurashava from West to East direction. The well known canals of the Paurashava are CNB Khal and Shondha Tara Khal.There are also many others small and narrow canals in the Paurashava. During survey encroachment of different canal and Titas road was noticed in Ward No. 2, 3, 4, 5 and 7. According to the inhabitants encroachments has taken place gradually over the years in Akhaura Paurashava. Poor drainage capacity of the existing khals and water bodies cause water logging for long periods in the inland areasand creates environmental hazards.

Apart from the constructed drains, Akhaura Paurashava has Titas River. However, unplanned spatial development activities and growth of rapid settlements due to rapid population growth are causing encroachment on these water bodies, watercourses and natural drainage paths. In Akhaura Paurashava encroachment has taken place in different parts of this Paurashava mainly.

Unplanned development activities are creating obstacles to natural drainage, reducing retention basins and reducing drainage capacity. Poor drainage capacities of the existing canals and water bodies cause long-lasting flood duration in inland areas, aggravate the flood damage, and creates ecological imbalance situation.

River

The Paurashava is situated beside the Branch of Titas River. Beside its importance from drainage perspective, Titas River is a huge opportunity for Akhaura Paurashava in proving water way transportation and connectivity with other areas of the region. During the monsoon its average width is about 100 to 350 m to the bank of it. But during the winter it shrinks and becomes fordable at most places.

13.1.5 Analysis of Topography

Western portion of the Paurashava are in higher elevation and these areas belong to Ward Nos. 1, 4, 6, and 9. Commercial development grew mainly in the middle part of the Paurashava and both sides of the Checkpost Road. Other areas are rural settlements developed in a scattered manner and surrounded by agricultural lands. Most of the lands of the Paurashava go under water during heavy rain due to lack of poor or no drainage system. Most of the drains are constructed in Ward No. 1 and these drains outfall into nearby canals.

The lowest and highest spot values of the study area observed as -9.29 mPWD and 8.60 mPWD among the total spot value. The lowest value is found at a waterbody in Kharampur (Plot 710, Ward No. 2) which has the area of 49.54 acres and the highest value is found on Akhaura Town Bypass Road in Kasba (Plot 02, Ward No. 3) with total length 3.16 km and average width as 5.89 m. It is observed that highest percentage of spot heights found in the range of 3.51-5.50 and it is about 63.59%. Average height of Akhaura Paurashava is 4.96 mPWD (including all the spots taken from Natural Canals, Ponds, and Roads) and range between the extreme values found as 8.162. All the local roads of this Paurashava go under water during heavy rainfall only as because of poor or no drainage system. A Land Elevaton Map is shown in the **Map No. 13.2**.

Average height of Akhaura Paurashava is 4.96 mPWD (including all the spots taken from Natural Canals, Ponds, and Roads) and range between the extreme values found as 8.162. Spot heights of agricultural land, circulation network, water body and other surface land have been shown in the Table 3.2.

Table 13. 3: land Use Category with Mean Spot Heights (in meter)

Land Use Category	Mean Spot Height (mPWD)
Agricultural Land	4.85
Roads/ Circulation Network	6.50
Water body	-0.66
Other Surface Land	5.98

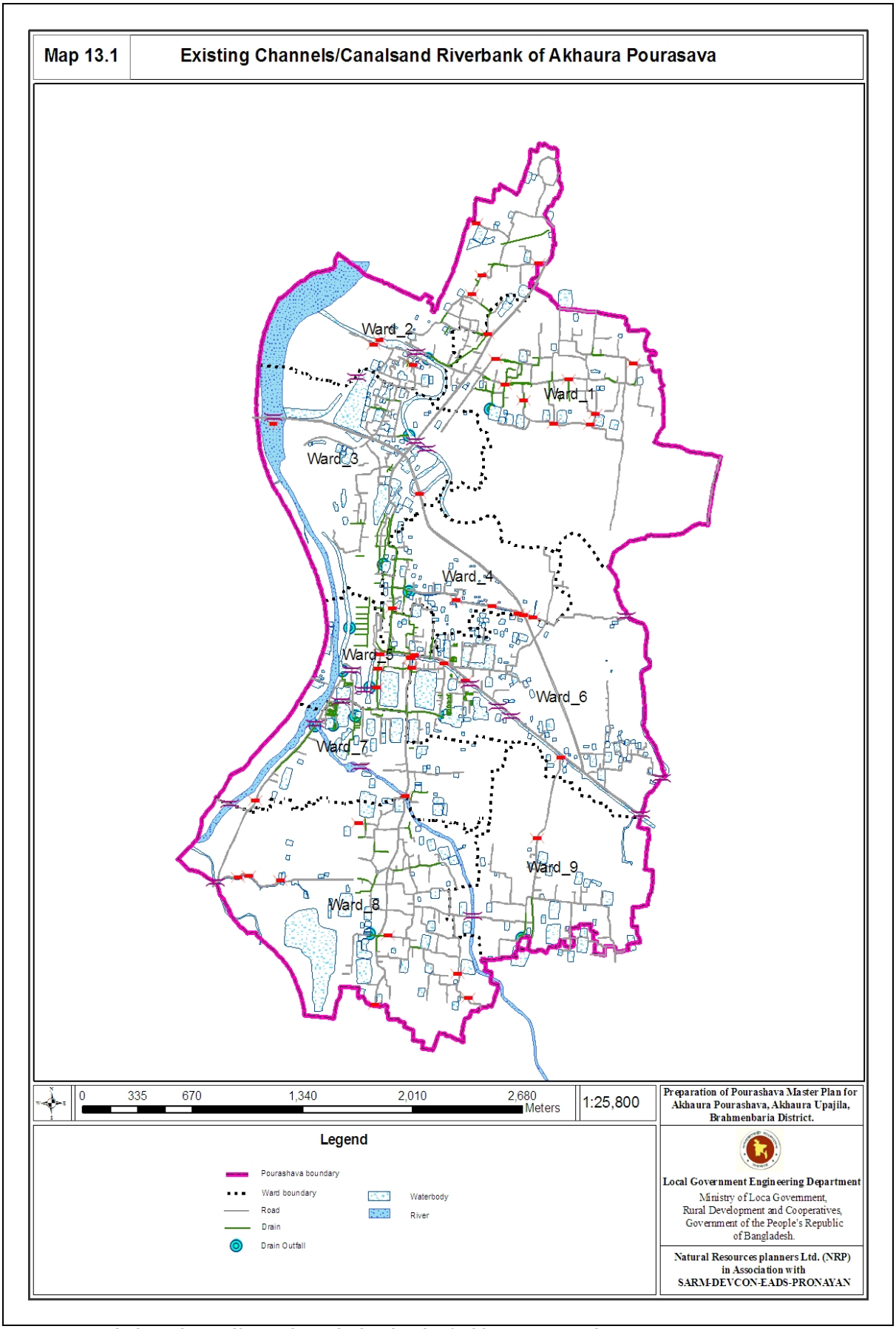
Source: Topographic Survey by NRP, 2009-2010

The topographic data was used to develop the slope direction as shown in the Map 13.1. Slope directions are of great importance in avoiding the alignment of drains in reverse slope. These slope directions were duly considered in preparing the horizontal alignment of the drainage network. However, as the proposed drainage network is supposed to follow the existing/proposed road network some inconsistencies with the natural slope were unavoidable.

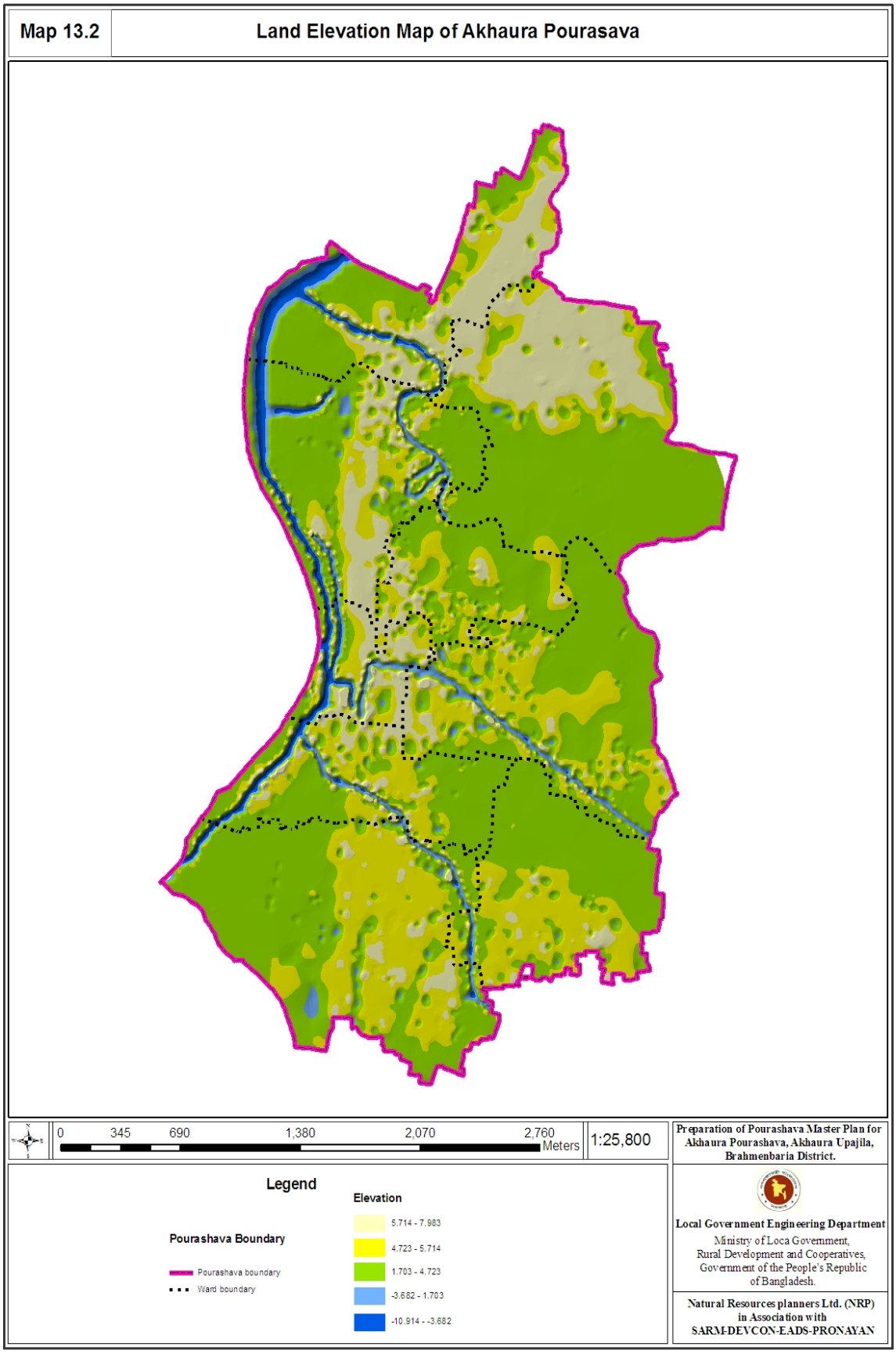
13.1.6 Analysis of peak hour run off Discharge and Identification of drainage outfalls

Bangladesh is characterized by a tropical monsoon climate with three distinct seasons. Akhaura is in the Old Meghna Estuarine Floodplain region. The climatic condition of Akhaura Paurashava falls into mainly three seasons namely winter, summer and monsoon. It is obvious that the flooding at Brahmanbaria district is not due to the local monsoon precipitation alone, but rather results from rainwater transported and retained by the Meghna River and its tributaries from northern regions to the south.

Existing khals and other water bodies of the Paurashava would act as receiving water bodies for most of the drainage outfalls. Performances of these outfalls require detailed study involving the analysis of water levels of outfalls and receiving water bodies during the monsoon. Analysis is also necessary regarding the assessment of waste water quality and requirement of any treatment facility which is not covered in this exercise. Further study is recommended in this regard. The adjacent Titas River is the outfall of all natural and man-made drained water.



Map 13. 1: Existing Channel/ Canals and Riverbank of Akhaura Paurashava



Map 13. 2: Land Elevation Map of the Paurashava

13.2 Plan for Drainage Management and Flood Control

13.2.1 Plan for Drain Network Development

13.2.1.1 Drain Network Plan

Open drainage system is followed in Akhaura Paurashava as it is cheaper than piped drain and easy to maintain. Piped storm water drainage system could not be developed because it is expensive to construct, operate and maintain such system and also beyond the affordable limit of the Paurashava. The situation demands Road side open drainage system after widening the Existing roads mainly in the Built-up part of the Paurashava .

13.2.1.2 Proposal for improvement of the existing drain networks

The existing drainage systems should have to be inter-connected with the proposed new drains on the priority measures of the Drainage Master Plan. The khal network, pucca/kutcha drains and borrow-pits may be up-graded to act as the main framework for improved and integrated as well as viable drainage system for the Akhaura Structure Plan area which will serve the drainage need during the peak monsoon period when the drainage stands critical.

13.2.1.3 Proposals for new drains

To implement the new drains programme, the Paurashava Authority should adopt complementary procedures and policies in maintaining a proper drainage system within its jurisdiction. The following measures are recommended:

- Identify, on the basis of the Drainage Master Plan, all areas where existing main drains are located or will be required in future and enforce existing legislation to prevent unauthorized development or encroachment on the drain alignments;
- Identify, on the basis of the Drainage Master Plan, all low-lying areas which are prone to regular flooding due to drainage congestion and cannot be economically drained by gravity systems;
- Inform residents and enforce building control regulations to prevent development at levels which would be dangerous for future residents;
- Prohibiting dumping of garbage into the drains by enforcing regulations;
- Providing convenient local collection points and more efficient removal services;
- Prohibiting dumping of night soil/wastes into the drains by enforcing regulations and more efficient removal services;

Summary of the proposed new drains have been shown in the Table 13.4

Table 13. 4: Summary of proposed drains

Type of Drain	Length in Km	%
Secondary Drains	24.67	41.32
Tertiary Drain	35.03	58.67
Total	59.70	100

13.2.1.4 List of Infrastructure Measures for Drainage and Flood Control Network

Priority areas should be identified first during preparation of drainage network through observed physical conditions, discussions with the local residents, and detailed discussions with different authorities. The priority for the proposed works should be grouped into different priority levels for phase-wise development.

The following measures are proposed for Drainage and flood control network development.

- Re-excavation in order to deepening and widening of drainage canals comprising the network of canals should be done on priority basis.
- To protect the riverside erosion an embankment-cum road have to be provided which will meet the demand of both transportation and also as the embankment for the town. Embankment also should have to provide for the local canals as to protect from local illegal filling-up or use.
- Specific attention is to be given to the improvement of the drainage systems in the town centre and in the densely populated residential, commercial and industrial areas in the structure plan area.
- About 24.67 kms of Secondary drains and 35.03 kms of tertiary drain have to be provided in the first phase of preparing the drainage network after acquiring Road side lands for widening the Existing roads and also for New roads that have been proposed under Traffic and Transport Master Plan.
- The Paurashava Authority will confirm for the Core and Semi core part in the first phase of Implementation of Drainage networks.
- Non-structural measures prescribed for site development and plinth levels of different structures are to be followed. The existing agricultural lands/lowlands lying in the fringe and semi-core areas of the structure plan area is to serve as good detention basins playing an important role in decreasing magnitude of flood in the core/semi-core areas.
- Further, it may be noted here that though urbanization is in progress, the lands including agricultural lands within the structure plan area will not be urbanized by the year 2020 and that some low and agricultural lands will exist beyond this period, which will serve as storage basins and reduce magnitude of flood significantly during monsoon season.

Details of the proposed new Drainage Networks information have been shown under the **Appendix-B, Table No B-17.**

The existing natural khals will serve as primary drains. Here only alignments of proposed drains have been shown.

Map 13.3 shows the proposed Drainage Network Plan of Akhaura Paurashava.

Primary Drain

Primary drains are called as the main drains. Primary drains cover larger storm drainage area than above discussed tertiary and secondary drains. In ascending order its position is third. Its cross- section is larger than other types; carrying capacity is high and is constructed of brick, cement concrete and sometimes reinforced concrete. Primary drains may be of earthen structure provided sufficient land is available and land value is low. Contributing drainage water comes from tertiary and secondary drains. Primary drains discharge its drainage water to outfall, natural khal, river or large lowland area/ Beels.

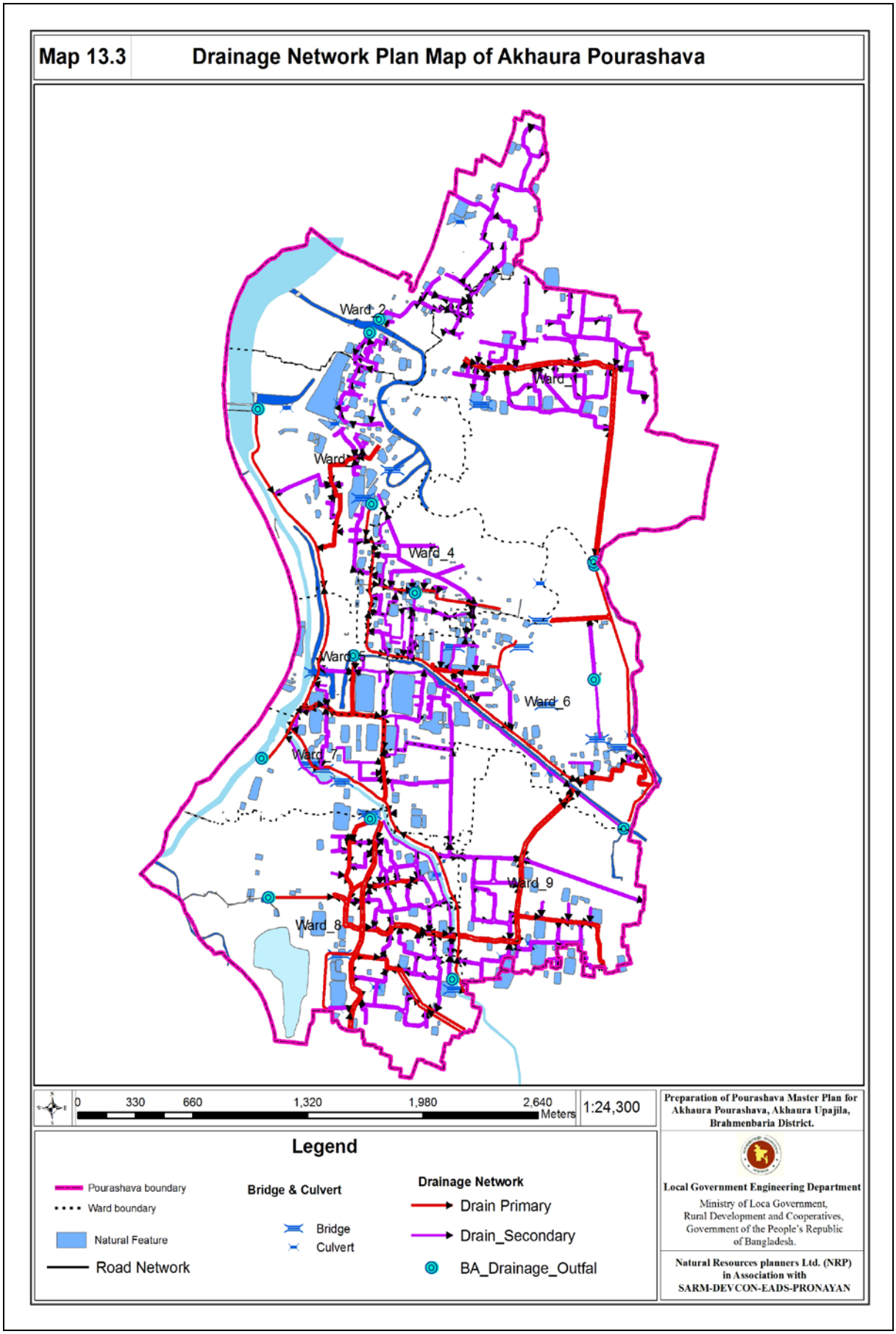
Secondary Drains

Secondary drains collect discharge from tertiary drains. One secondary drain may receive drainage discharges from several tertiary drains in its course. Size and capacity of secondary drain is much bigger than tertiary drains, its catchment area is also bigger than tertiary drains. Like tertiary drains, it may run parallel to bigger roads. Secondary drains may run along and through the middle of its storm water contributing area.

Tertiary Drains

Tertiary drain carry run-off or storm water received from the above mentioned plot drains and block

or Mohallah drains. Their catchment area or storm water contributing area is bigger than Mohallah drains. Tertiary drains generally are the under jurisdiction of municipality and city corporation. These drains or drainage networks are constructed and maintained directly by municipalities and City Corporation. These drains are constructed by brick, cement concrete and sometimes by excavating earth in their alignments. These drains may run parallel to road or across the catchment area. Sometimes borrow pits of the road serves as drains provided borrow pits are uniformly and continuously excavated. Borrow pits that serve as drains may be channeled or lined by brick works. Tertiary drains deliver its discharge usually to secondary drains.



Map 13. 3: Drainage Network Plan Map of Akhaura Paurashava

In planning for drainage network, care should be given for road network in terms of conflict of drainage and waterways with roads. In the following and subsequent sections major element, their principle, purpose and function are discussed and presented in lower to higher order:

Plot Drains

Plot drains are provided around a building on a plot. In most cases, the drain is made of bricks and rectangular in shape that can carry storm water generated in the plot and from the building. Plot drain is connected to the Block or Mohallah drain. The sketch below gives an impression of plot drain usually constructed in a plot and block drains that follow plot drain.

Block Drain

A block drain is provided at the outside of a block that accommodates several buildings of the block. The block drains are made of bricks like plots drains but bigger in size so that it can serve the storm water generated within the block and the buildings and open areas within the block. Sometimes the block drain may serve few neighbouring blocks or Mohallahs. Block drains carry storm water coming from the plot drains. The shape of the block drain is also rectangular, but bigger than plot drains and its bottom is lower than plot drain.

Other Drainage Related Infrastructures

In order to facilitate or mitigate drainage issues some infrastructures are provided or used, these are namely

i. Bridges, culverts, box culverts

ii. Drainage sluices, pipe sluices, siphons

iii. Flood protection embankments and flood walls iv. Sluice gates, Regulators, Navigation lock

v. Flood protection and drainage structures.

13.3 Plan Implementation Strategies

The following Strategies may be made for future Drainage Implementation:

- Encroachment of exiting natural channel/khals to be identified and removed
- Unauthorized cultivation on the bed of the khal or channel to be identified and stopped.
- Construction of roads may provide alongside of the River and canals with natural strips and should ensure that they don't obstruct natural flow of water and movement of fish species.
- Identify and conserve big ponds. These water bodies will work as flood retention pond resource for fish cultivation and vital components to retain ecological balance.
- Identify points of uncontrolled disposal of solid wastes into the exiting drainage channel and take measures to stop these.
- Preserve and enforce right of way over exiting natural channel.
- An embankment-cum-Road should provide to the River edge to protect the Paurashava from River Bank Erosion and also ensure an Important Road for the Paurashava with Recreational Facilities.
- All the Outfalls should have to design and protect first with undertaking activities like Re-excavation regarding, deepening, widening of drainage canals retention ponds, River etc.
- After acquiring all the road side lands and Lands for New Roads for the proposed hierarchy of Roads (vide Chapter 10); Road side Secondary drains will provide on the priority basis firstly

in the Core part of the Paurashava. After that all tertiary drains have to construct with the help of the residence of the Paurashava.

- Any proposed drainage improvement plan should be exchanged with other utility organization to avoid any overlapping and duplication. As such, a high degree of close co-ordination with DPHE, BWDB, LGED, PDB and other utility organizations should be maintained during the project implementation stage so that disruptions to services of this utility organization do not take place.
- Proposed drainage system should be designed to discharge most of the storm run-off by gravity flow; pumping is necessary when gravity flow will not work and when the water level at outfall is higher than the drain water level.

13.3.1 Regulations to implement the Drainage and Flood Plan

There were large number of khals in the Town that have been converted into roads and other commercial purpose uses over the time. Many of these khals were abolished due to rampant disposal of waste and encroachment by khal side land owners. Many khals are facing threat of encroachment and have their width largely reduced. Many khals under threat can still be retained with strict measure taken. The responsibility of protecting these khals can be rest with Paurashava Authority. They can enforce the law on protection of water body/water channel protection in this regard. Besides, action should also be taken to maintain the khals regularly to keep them usable for drainage.

13.3.2 Implementation, monitoring, Evaluation and Coordination of the Plan

The Paurashava authority should improve revenue collection and efficiency in financial management significantly so that they can properly maintain the drainage system.

The drainage improvement plan should be exchanged with other utility organization to avoid any overlapping and duplication. As such, a high degree of close co-ordination with DPHE, BWDB, LGED, PDB and other utility organizations should be maintained during the project implementation stage so that disruptions to services of this utility organization do not take place.

If possible the knowledgeable NGOs could be employed for accurate assessment of individual residents manage and coordinate the Drainage Plan. NGOs/CBOs can be involved in cleaning and maintenance of the drainage activities.

Cost of drainage improvement project and phasing out of project can be ascertained at the time of detail planning stage.

13.4 Environmental Management Plan

13.4.1 Introduction

for better Urban Living environment, it needs good air, pure water, nutritious food, healthy environment and greenery. Without sustainability, environmental deterioration and economic decline will be feeding on each other leading to poverty, pollution, poor health, political upheaval and unrest. It needs to improve our economic growth rate, provide basic minimum life support services to large section of our population and deal with the problems of poverty and unemployment.

13.4.2 Goals and Objectives

The main objectives of environment management Plan is to

- To achieve good living environment;
- To pay attention to conserving natural resources and also improving the status of the.

13.4.3 Methodology and Approach to Planning

The Study team has considered all the aspects affecting the current environment of the Paurashava and the factors having possibility to affect the environment of the Paurashava in future. All collected information were compared, collated and analyzed to portray, overall environmental scenario of Akhaura Paurashava. In followings sections survey findings of environmental survey have been discussed.

13.4.4 Geo-morphology

Geological Condition

The area is not too low and it has predominantly deep silty soils, but it also has a significant proportion of basin clays. The soil of this Paurashava is mainly dark grey floodplain soils. It is subject to rapid rise in flood levels. Organic matter contents in the cultivated layer range from 2-5 percent or more in depression soils.

Meteorological Condition

Rainfall

Rainfall data of Akhaura Paurashava collected from Bangladesh Meteorological Department Dhaka. Rain fall data of Akhaura may be assumed to represent Akhaura Paurashava reasonably. Spatial variations in rainfall pattern are also observed in Akhaura area. Though mean annual rainfall is about 2000 mm over most of the area, but it exceeds 2500 mm in the north-east and exceeds 3000 mm in the extreme south-east

Climate

Akhaura is in the Old Meghna Estuarine Floodplain region. The climatic condition of Akhaura Paurashava falls into mainly three seasons namely winter, summer and monsoon. The minimum temperatures start to fall below 20^0C ranges from 7 November in the southern part to 12 November in the northern part. The mean length of the cool winter period increases from 50 days with minimum temperatures below 15^0C in the south-east to almost 70 days with such temperature in the north-west**.**

13.4.5 Solid Waste and Garbage disposal

13.4.5.1 HH Waste

There is no solid waste management system found in Akhaura Paurashava. The people of this Paurashava are not habituate in through their garbage and kitchen waste in dustbins. Instead they through their waste in road side drains, opens space or road adjacent to their houses. The Paurashava has no solid waste disposal site of its own. It normally dumps the solid waste into low lying areas and canals. The Paura authority could not ensure the prohibition of waste dumping through the entire canals, which has blocked the channel of canals.

Total population of Akhaura Paurashava will be 54095 (projected) during the year 2031 and daily generation of solid waste from is estimated to be 13.5 Metric Tones (considering a generation rate of 0.25 kg/person/day). So several Waste Transfer Stations and one proper Waste Disposal site have to provide for relevant waste management option. Garbase Disposal sites have been shown under the following Map no. 13.4

13.4.5.2 Industrial waste

Discharge of industrial wastes and use of chemical fertilizers and pesticides do not have any significant contribution in land pollution in the Paurashava.

13.4.5.3 Waste Management System

Akhaura Paurashava has a conservancy department to manage the solid waste management system like many other Paurashavas. There is no dustbin system found in this Paurashava. It was reported and proved that, the authority did not maintain formal dumping system. Wastes are dumped where it is generated. The Paurashava authority could not ensure the prohibition of waste dumping station. People are used to manage their household generated solid wastes either with their own efforts or through out here and there**.**

13.4.6 Latrine

Sanitation system, waste disposal system, sewerage system are not well developed which is a major problem.

Most of the people use katcha, hanging and open latrines which are mostly located near low lying areas and water bodies, in open sky and other places. This contaminates water especially during rainy season. Location of Proposed Public Toilets have been shown in the Map No. 13.4

There is no sewerage network in Akhaura Paurashava. Mainly pit latrines and septic tanks based system exists in this Paurashava.

13.4.7 Industry

There are some moderate industries with light industries like saw mills, husking mills, engineering workshops, bakery product, flour mill, Furniture industries etc. which have limited environment effect or low noise. In the structure Plan these types of industries have been proposed to re-settle or remove from the residential areas to other mixed use areas.

13.4.8 Brick Field

No brick fields were found in the Akhaura Paurashava**.**

13.4.9 Fertilizer and other chemical Use

Surface water is being contaminated through improper, domestic solid waste disposal, hospital waste disposal, indiscriminate use of chemicals (fertilizers and insecticides) etc.

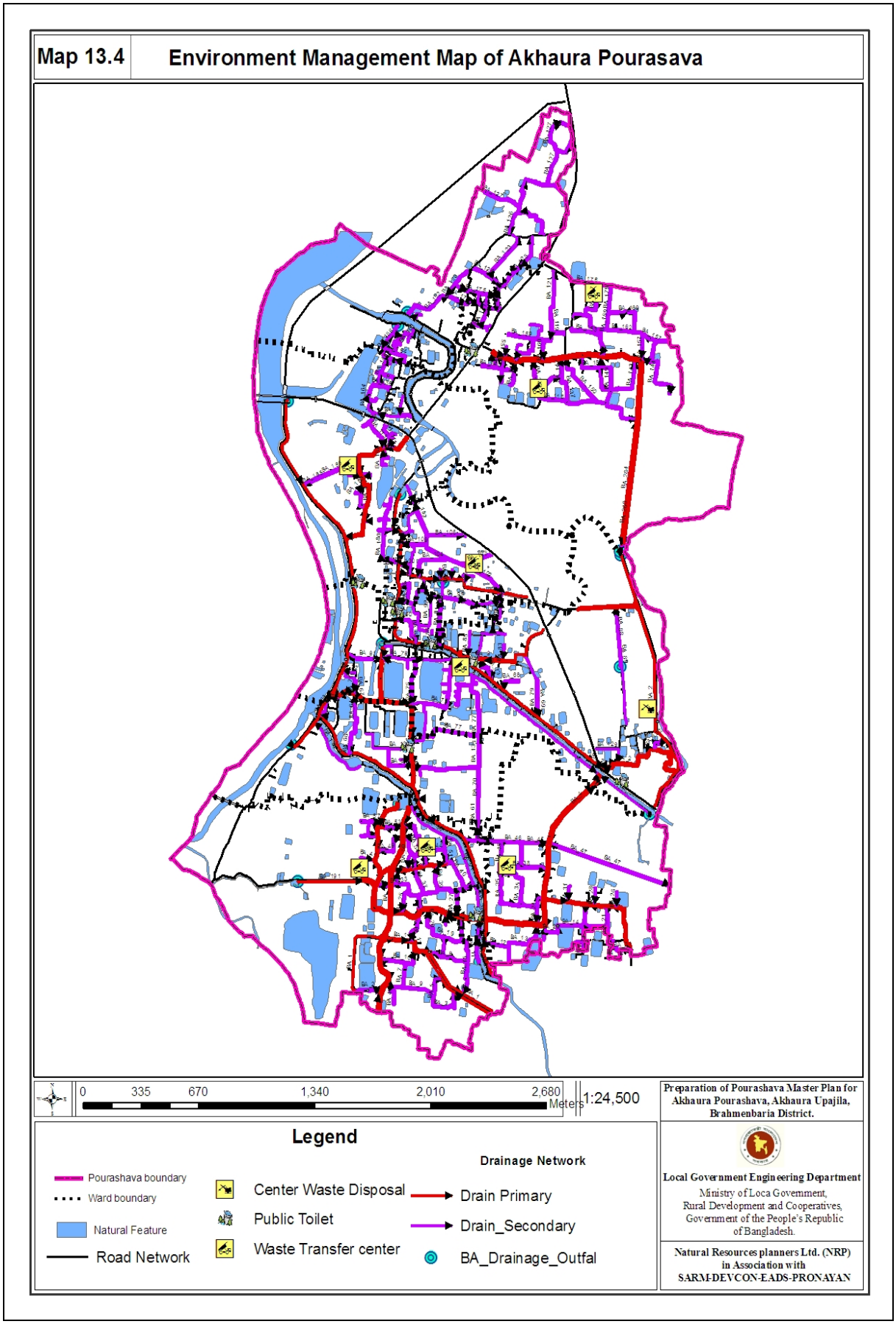
Farmers use fertilizers and pesticides in agricultural land. During rainy season it comes in contact with water and as a result natural water system gets polluted.

that industrial effluent and use of chemical fertilizers/ pesticides have little contribution to the surface water pollution.

People who have land for crop and fish production always use various types of chemicals and fertilizers in their land and water body.

20% of the respondents use chemical fertilizers and pesticides for boosting up their agricultural and fisheries production. The percentage of users of green fertilizers is very insignificant. This situation suggests possibility of land and water contamination in the area.

Use of chemical fertilizers and pesticides also has contributions in land pollution.



Map 13. 4: Environment Management Plan Map of Akhaura Paurashava

13.4.10 Pollutions

13.4.10.1 Water

Water is available from surface and underground. Ponds, ditches, khals and Rivers are the main sources of surface water. But surface water is being contaminated from improper sanitation, solid waste disposal, hospital waste, chemicals (fertilizers and insecticides) etc. On the other hand most of the people use katcha, hanging and open latrines which are mostly located near low lying areas and water bodies, in open sky and other places. This contaminates water especially during rainy season.

13.4.10.2 Air

In Akhaura Paurashava air pollution occurs through emission of harmful gaseous matters from vehicles; open dumping of household, poultry farms, hospital waste, industry etc. Numbers of vehicles are increasing along with increase in population in Akhaura Paurashava. These vehicles including bus, truck, tempo or other motorized vehicles emit smoke which contains un-burnt particles that cause air pollution. Dumping of garbage to open land and ditches make objectionable odor.

13.4.10.3 Sound

Noise pollution signifiant in Akhaura Paurashava. There are some light industries such as saw mills, husking mills, engineering workshops, bakery product, flour mill, dyeing industry etc. These industries produce low noise. Major concern of noise pollution in Akhaura Paurashava is movement of motor vehicles and trains of traffics through the Akhaura by Pass and rail way lines passing through the Paurashava. Especially adjacent areas of the railway junction and checkpost road are affected by vehicular noise.

13.4.10.4 Land Pollution

Land pollution in Akhaura Paurashava is significantly low in terms of environmental aspects at its present situation. About 34.09% of the respondents claimed to have minimal land pollution in the Paurashava. Most of the respondents said that majority of the existing land pollution occurs due to improper management of domestic wastes disposal. Discharge of industrial wastes and use of chemical fertilizers and pesticides do not have any contribution to land pollution.

13.4.10.5 Arsenic

The most Arsenic risk areas are located in the central and southern parts of Bangladesh. Especially in areas located in the south and southeast, extremely high Arsenic concentrations are found exceeding 250 µg/L. High Arsenic concentrations can generally be found in the lower catchments areas of the Ganges, Brahmaputra, and Meghna River system, particularly in areas close to the lower Meghna Estuary, where 80 % of wells exceed the 50 µ/L concentration limit for arsenic. Areas located in the uplifted north-central areas and in the northwest are less affected. However in Akhaura Paurashava no Tube well found affected or marked by DPHE as arsenic affected. The risk of arsenic is also unavoidable although no arsenic patient has been found in the Paurashava.

13.4.10.6 Other Pollution

In Akhaura Paurashava the ratio of people who have private land for crop and fish production and the people who do not have land for crop and fish production is almost 2:1. People who have land for crop and fish production always use various types of chemicals and fertilizers in their land and water body. The percentage of users of green fertilizers is very insignificant. This situation suggests possibility of land and water contamination in the area.

13.4.11 Natural Calamities and Localized Hazards

13.4.11.1 Cyclone

Bangladesh is most vulnerable to several natural disasters and every year natural calamities upset people's lives in some part of the country. of all the natural disasters the problems of flood, Nor'wester, storm and lighting, erosion have become the main concerns of the people in Akhaura Paurashava.

From March to May during pre-monsoon there may be either excessive rainfall or drought condition occur in Akhaura. The Nor'wester known as Kalbaishakhi occurs during pre-monsoon period. The frequency of Nor'wester is maximum in the month of April. This cause uproot of trees, telephone and electricity lines, loss of human life and biodiversity, injury of life, damage and destruction of property, damage of cash crops, disruption of lifestyle, damage to essential services.

13.4.11.2 River Erosion

Though Akhaura Paurashava situated beside large River, no river erosion occurred in recent years.

13.4.11.3 Flood

No provision of Floods in this area. From the field survey it is observed that some area in the core part are affected by normal yearly flooding for lackage of drainage networks.

The project area is moderately agricultural base as from the physical feature survey shows that the provisions of 50% agriculture lands. The land under agriculture purpose use is mostly single cropped area, which are low-lying depressions.

The average elevation of the land of the Paurashava area is 4.96 mPWD. Most of the area of the Paurashava of Brahmenbaria Region lies under above flood level. Poor drainage capacities of the existing khals and water bodies acts to channelizing rain water to near by River Tista.

13.4.11.4 Earth Quake

Akhaura Paurashava falls under the zone II of earthquake zones of Bangladesh, where the shocks of intensity of 8.0 are possible. In Paurashava level, Paurashava office is the responsible for building construction. But, due to lack of capacity and man power Paurashava office has no control over the construction activities of the Paurashava.

13.4.11.5 Water Logging

Due to absence of drainage system and illegal encroachment the natural drainage canals have lost their capacity. As a result water logging has become a regular problem in the city during rainy seasons. Environment of the Paurashava will be degraded if proper management steps are not taken in due time.

The average elevation of the Akhaura Paurashava is 4.96m. Though it is situated beside a river, due to undeveloped drainage network normal and flash flood both occurred in Akhaura Paurashava. Water logging is a common phenomenon in rainy season.

13.4.11.6 Fire Hazard

There is no record of major fire hazards in Akhaura Paurashava.

13.4.11.7 Other Hazards

There is no record of other hazards in Akhaura Paurashava

13.5 Plan for Environmental Management and Pollution Control

13.5.1 Proposals for Environmental Issues

13.5.1.1 Solid waste management Plan

As the number of population grows, the waste generation also increases. This demands the formulation and implementation of an ISWMP. From a rough estimation based on the number of inhabitants, the daily waste generation for the entire Paurashava is 9 tons and it will be 13.5 tons in year 2031. The open dumpsites are with minimal infrastructure and pose some ecological risk to the environment.

The key element of an ISWMP is a general waste hierarchy is-

- Reduce Waste
- Recycle Waste
- Recover waste
- Sanitary Landfill

This means that there should be more effort in reducing waste then in reusing of waste, recycling and recovering of waste, which is appropriate in the Paurashava. Recovering of waste means transforming the waste into other uses through physical, biological or chemical processes (e.g. composting). Less waste should end up in the sanitary landfill.

13.5.1.2 Development of Sanitary Landfills

The Paurashava is still practicing the open dumpsite disposal. The final disposal site should be a sanitary landfill for reducing environmental hazards. The Paurashava should identify a landfill site and develop. The guidelines for the selection of the site and general operation are provided in the plan.

13.5.1.3 Air/Water/Land/Sound

Proper measure will be taken to minimize the adverse environmental impacts on land pollution, water and air quality, biodiversity resources. To control vehicular noise pollution, especially near hospitals and educational institution restriction should be imposed on the use of horns through demarcation of silence zone in these sensitive areas.

13.5.2 Natural calamities and hazard mitigation proposals

Recently a tendency of lining the sides/banks of large ponds and tanks (dighees) has been evident in the study area. This tendency destroys the habitat of various *fossorial* species (creatures that live underground by digging holes in earth) that prefer to live in close proximity to water. Hence the sides/banks of large inland water bodies should be retained as far as possible in their natural state so as to protect the habitats of these species and avoid major damage to the ecosystem.

In Akhaura, the industries have no effluent treatment plant (ETP). By the Plan, industries will be separated from the residential area and ETP will be compulsory for every industry. Waste dumping by the industries in low land and ditches will be prohibited by the master plan. Agro-based and cottage industry will be encouraged.

Chapter Fourteen: Plan for Urban Services

14.1 Introduction

Urban facilities planning and management have become very important for the extra population in the next twenty years for the Akhaura Paurashava. Urban Services particularly water supply, solid waste management, sanitation, Electricity, street lighting and gas, etc are the key aspects for the sustainability and growth of an urban territory.

14.1.1 Content of the Urban Services

The current chapter makes recommendations on urban services for the future Paurashava after brief review of existing conditions. The services will be implemented by Paurashava and other agencies that usually have their own plans for these services. The concerned agencies may consider the following recommendations to draw up or re-structure their own proposals.

- Water supply,
- Solid waste management,
- Sanitation,
- Electricity,
- Street lighting and
- Gas

14.2 Analysis of Existing condition and demand for Services

The demand for basic urban services in Akhaura Paurashava is outstrip the ability of Paurashava authority to deliver and sustain adequate levels of urban services, particularly for the urban poor. The analyses of existing urban conditions have been discussed under the followings with future demand according to the increase of population.

Table 14. 1: Analysis of Existing condition and demand for Urban Services

Type of Basic Urban Services	Existing Service Coverage	Requirements for the Master Plan period
Utility Service Facilities		
Electricity	There are a total of 1154 electric pole (Physical Feature Survey by NRP, 2009-2010) to facilitate electricity throughout the Paura area.	The coverage of electricity has to be extended over the entire Paurashava area to meet the growing demand.
Gas	Gas supply of Akhaura Paurashava mainly exists in the built up area (Middle portion of the Paurashava), which covers a little portion of total house hold (Core and Semi core area) of the Paurashava. From physical feature survey it is found that 15.76km gas network available in Akhaura Paurashava. Ward Nos. 6 and 8 fully covered by gas network. And small portion of other wards covered by Gas supply network	Requires full coverage of Water Supplying
Water supply	Akhaura Paurashava does not have any water supply system.	Full coverage of Water Supplying
Solid Waste Management	The Paurashava authority could not ensure the prohibition of waste dumping station.	Waste transfer stations and dumping station require in near future.
Street Lighting	There is no provisions of Street lighting in the local roads of the Paurashava	It needs to provide street lighting with development road network of the Paurashava
Road Circulation traffic and Transport network	The traffic and transport network are of Very Poor condition in the Paurashava	Provisions of Traffic and Transport network traffic management have to provide according to the master plan proposals

Drainage	There are no authorized Drainage network exist in the Paurashava	Drainage Network have to provide according to the master plan proposals
Fire Station	There is one Fire station exist in the Paurashava	It needs to extend with the provisions of lands to meet the demand with full function in near future
Telecommunication	There is one Telephone exchange office exists and very limited number of subscribers of BTCL telephone connections in Akhaura Paurashava.	The Paurashava will requires two extra telephone exchanges with 1000 lines.
Graveyard/ Cemetary/ Swasan	There is no provisions of publicly authorized place for Graveyard/ Cemetery or Swanson.	It requires to provide selected areas with planned way

Source: Analysis of the Study Team

14.2.1 Electricity

The electricity facility has first introduced to Akhaura during '60 by Wabda. Later from '61 REB is doing this job. It has a total of 1154 electric pole (Physical Feature Survey by NRP, 2009-2010) to facilitate electricity throughout the Paura area. There is no high voltage electric tower in this Paurashava. With the increase of households and also with the increase of commercial activities in future, the coverage of electricity has to be extended over the entire Paurashava area to meet the growing demand. According to the REB (Rural Electrification Board) a single unit household necessitate electricity is about 400 watt. Akhaura Paurashava total requirement of electricity would be 44,47,311 Watt for the year 2031.

14.2.2 Water Supply

Akhaura Paurashava does not have any water supply system. Most of the residents of the use tubewell water for drinking purposes while deep tube-well and shallow tube-wells are used for irrigation.The water requirement for Upazila towns is generally estimated to be about 100 lpcd considering 20% technical loss and 20% demand of Industrial and commercial purpose. Based on this general rule water requirement per day for the Paurashava at present is about 36,26,200 Liters and it will be about 54, 09,500 liters for the projected year 2031.

14.2.3 Solid Waste Management

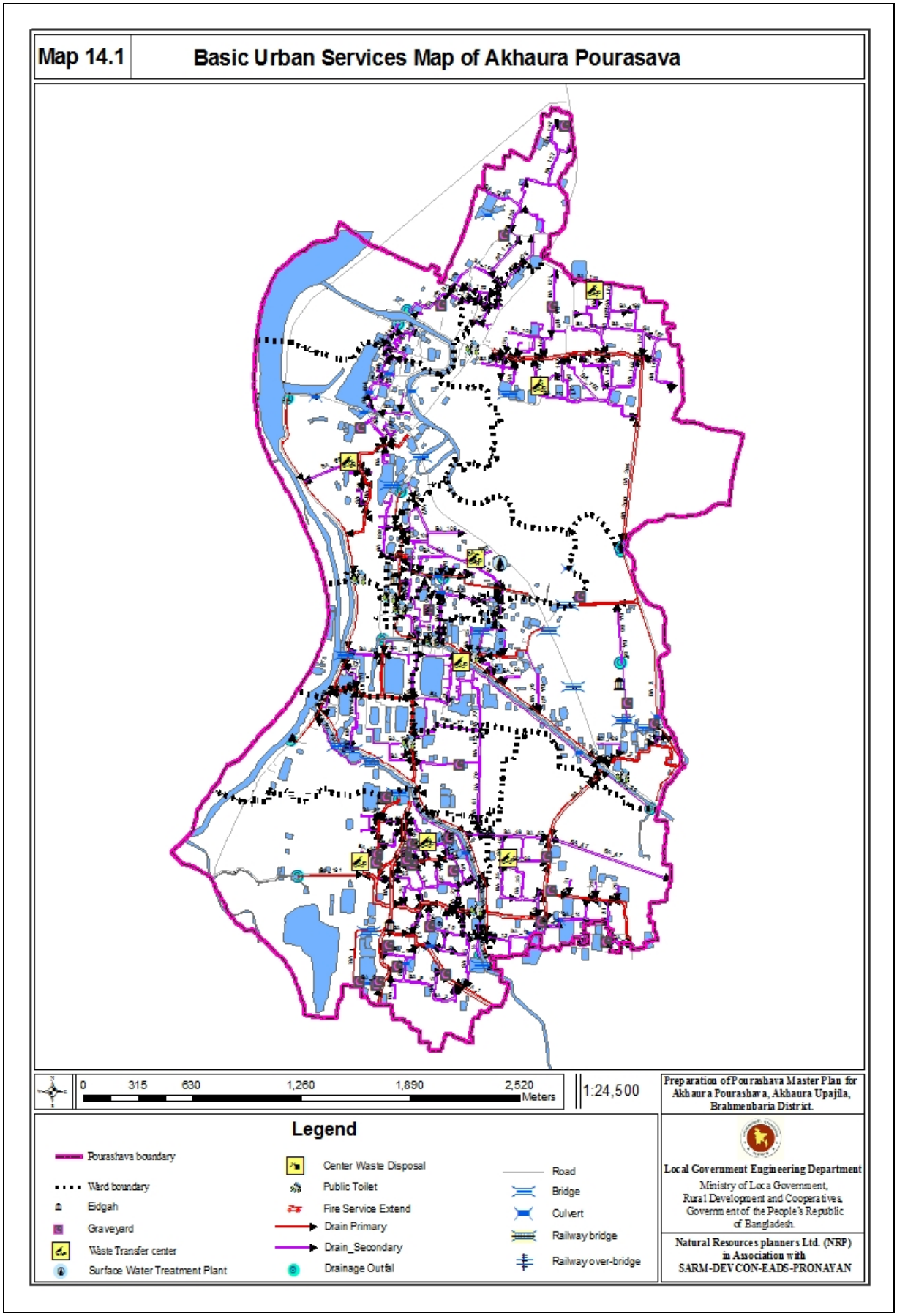
Akhaura Paurashava has a conservancy department to manage the solid waste management system like many other Paurashavas. There is 14 dustbin system found in this Paurashava. It was reported and proved that, the authority did not maintain formal dumping system. Wastes are dumped where it is generated. The Paurashava authority could not ensure the prohibition of waste dumping station. People are used to manage their household generated solid wastes either with their own efforts or through out here and there.Total population of Akhaura Paurashava will be 54095 (projected) during the year 2031. Total daily generation of solid waste from Akhaura Paurashava is estimated to be 13.52 Metric Tones (considering a generation rate of 0.25 kg/person/day). So several Waste Transfer Stations and one proper Waste Disposal site have to provided. Waste transfer stations help achieve a more environmentally sustainable system of waste management as they can reduce transport requirements, particularly long distance haulage, and allow a greater proportion of the waste stream to be recycled, treated and/or recovered.

Basic Urban Services Map has been shown under the following Map **14.1**

14.2.4 Sanitation

Akhaura does not have sewerage network of any kind. The results of household survey conducted by the project present the following pertaining information so far the type of toilet used by the dwellers of Akhaura Paurashava is concerned:

- Sanitary Toilet: 3948
- Other: 1572
- None: 244



Map 14. 1: Basic Urban Service Map of Akhaura Paurashava

14.2.5 Street Lighting

Akhaura Paurashava provides few street lighting facilities but street lighting is not satisfactory in this Paurashava

14.2.6 Gas

Gas supply of Akhaura Paurashava mainly exists in the built up area (Middle portion of the Paurashava), which covers a little portion of total house hold (Core and Semi core area) of the Paurashava. From physical feature survey it is found that 15.76km gas network available in Akhaura Paurashava. Ward Nos. 6 and 8 fully covered by gas network. And small portion of other wards covered by Gas supply network.Bangladesh has 12.5 trillion cubic feet of discovered gas reserves remaining and 32 trillion cubic feet of potential reserves to be confirmed through exploration. Until the 1990s, gas production capacity exceeded demand. Since then, domestic demand for gas has increased exponentially, with higher demand from industry and power generators. International oil companies (IOCs) have significantly helped increase gas production to match rising demand. Their share of gas production grew to reach almost 50% of the total supply in 2008.

14.3 Proposals for Urban Services

14.3.1 Sanitation Improvement Proposals

The following guidelines should be followed for sanitation improvement programme.

- Provide poor families with pit latrines for overall improvement of the environment. Construction and installation of proper number of pit latrines will provide more public sanitation facilities.
- Upgrading of unsanitary latrines or conversion of katcha latrine to a sanitary latrine to be made as a regular programme in order to reduce open defecation around the town.
- Hygiene education programmes for the residents and school children from primary level to be introduced to maximize the benefit of low-cost sanitation. Efforts through NGOs may be made to motivate people for this purpose.
- Public latrines with biogas plant may be planned to distribute the gas to the local area only in small scale for cooking and heating purpose.
- Making provision of public toilets at and around public places such as Bazars, shopping areas, transport terminals, railway station, stadiums, etc. Provision of separate toilets for handicapped people to be made in the proposed public toilets.
- To ensure effective cleaning, operation and maintenance, the public toilets may be leased out to the private parties/NGOs on contract basis.

14.3.2 Water Supply System Development Proposals

The following guidelines should be followed for Water Supply Development Proposals

⇒ Treatment plants can be built for supplying fresh water to meet future water demand of the Paurashava.

⇒ A new water supply network for the future Paurashava area up to 2021 should be planned and analyzed.

⇒ DPHE should be involved for its vast technical expertise in this special field in order to make future Water Supply Project viable and successful for Akhaura Paurashava.

⇒ for water supply system of urbanizing areas, in absence of local urban government, the supply will be largely based on individual hand tube well for some time. In case the density increases fast, a production well based network system can be developed with the help of DPHE.

⇒ Surface water Treatment Plant using surface water from the nearby rivers, ponds may treat the surface water and feed into the Paurashava water supply network.

14.3.3 Electricity Supply System Development Proposals

The following guidelines should be followed for Electricity Supply Development Proposals.

- REB should have to formulate new plans for development of its infrastructure in next few years to serve the Paurashava area to meet with the demand of future possible requirements.
- People should have to introduce with Solar Panel by local NGOs so that they can easily buy it and that is how to reduce dependence on the Electricity.

14.3.4 Proposals for the Improvement of Solid Waste Management

The aim of solid waste management is to:

i) improve collection and disposal efficiencies of household wastes, hazardous and toxic wastes from and industries,

ii) Develop a separate system to collection and disposal efficiencies of toxic wastes from hospitals, clinics

iii) Recovery of resource i.e. separation of biodegradable/non-degradable wastes and metals, re-use/ recycling of solid wastes at transfer stations.

In Akhaura Paurashava solid waste management is totally absent or none exists. Solid waste management system, however, should start with the help of local NGOs and Paurashava authority. It needs improvement through incorporation of garbage truck (open/covered body), handcarts, communal bins, tractor trailer, incinerator and institutional development i.e. re-organization of the solid waste management service for increasing efficiency through training on solid waste management.

The solid waste generated from different households may be collected and disposed off by the following system:

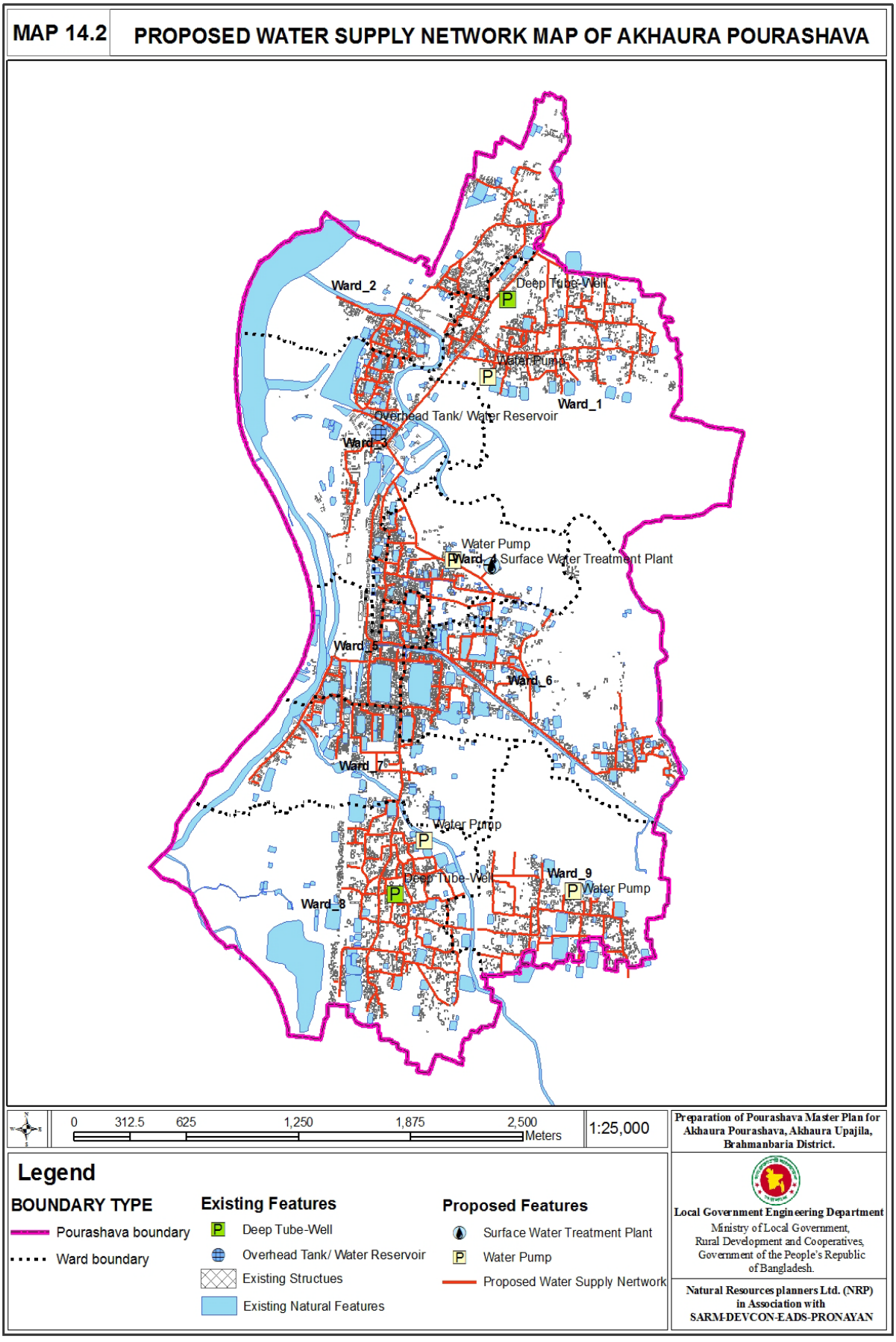
Primary collection : House to house collection and storing of solid waste in the nearby dustbins placed at different locations on the basis of distance and households.

Secondary collection: The solid waste stored inside the dustbins should be transported to a common and convenient place connecting the collection network of the Paurashava; from there the waste will be finally transported to the Solid Waste Dumping place by Garbage trucks.

As for hospitals and Clinics, the waste may be classified into two groups, viz. hazardous and non-hazardous. Hazardous wastes should be treated by the Incinerator where hazardous wastes are burnt and then disposed off. Either hospital or clinic should have its own Incinerator or the Paurashava Authority should have one or more Incinerators at different places which will treat the hazardous wastes from hospitals/clinics on payment of charges by the users. Non-hazardous wastes should be disposed of by the Paurashava Authority.

for future improvement of solid waste management 3 new disposal sites have been proposed considering collection efficiency and disposal time, road distances, traffic congestion, vehicle operation and maintenance costs.

The following methods may be used for disposal of solid wastes: (i) Controlled dumping system (ii) Sanitary Landfill system (iii) Incineration (iv) Composting (v) Resource recovery from wastes.



Map 14. 2: Proposed Water Supply Network Map of Akhaura Paurashava

Part C: Ward Action Plan

Part C of the Report contains Ward wise Action Plan. Different Wards have been briefly described followed by description of Development Proposals.

Ward Action Plan (WAP) is the Third and the last stage of the current planning process. The first two plans address the Structure and Urban Area Plans respectively.

This Part of the report contains Twelve Chapters where Chapter Fifteen describes Detailed Guidelines for Ward Wise Planning.

Chapter Sixteen to **Chapter Twenty Four** describe Ward wise Action Plans is the dominant characteristics of the **Special Planning Zone (SPZ)**. It depicts the kinds of actions to be taken for promoting and regulating development activities within the territory of the zone.

Chapter Twenty Four is consisted for implementation and **Chapter Twenty Five** is for concluding remarks.

Chapter Fifteen: Derivation of Ward Action Plan

15.1 Introduction

The component of Ward Action Plan (WAP) has been brought into the planning stream with the primary aim to render the development plans more pragmatic and realizable. It has some common purposes to serve.

15.2 Purpose of Ward Action Plan

The main purpose of the Ward Action Plan is to understand the every detail of local problems and it enables local people to understand the problems of their own locality and share and support development authority's efforts in resolving the same. The WAP aims improving efficiency of the problem area to serve as a better place of living, working and enjoying. It Promote organized development of new expansion areas and improvement of existing problem areas and also enable to develop housing and shelter for various income groups. It also promotes business, trade and amenities to make the functionally effective and more revisable.

Ward Action Plan must have its own set of objectives which would be realized through a process of plan formulation and their execution. In the process of plan formulation and execution the local community is expected to play active roles.

15.3 Linkage with the Structure and Urban Area Plan

Ward Action Plan is the 3rd component of the Master Plan package. The other two upper level components are Structure Plan and Urban Area Plan. Structure Plan lay down the framework of the future plan including strategy and the sectoral policies. The Urban Area Plan and the Ward Action Plan detail out development proposals under the framework of Structure Plan.

15.4 Detail Guide Lines for Ward wise Plan

The primary aim of Ward Action Plan (WAP) programme is focusing the solvency of local Problems and Promote local development under considering the sub-areas of Urban Area Plan (UAP) according to the Detail Guidelines of Structure Plan which have been considered as commonly identifiable physical character, functional uniformity, uniformity of problems etc. It is most likely that there will be heterogeneity of problems even within the areas of same character. In most cases each WAP will emerge with a unique problem area demanding distinct treatment from planners which reflect in the UAP zones. Problems faced by fringe area are different from the problems prevailing in a built up area. The problems identified in a river front commercial area can not be compared with the problems existing in a central area commercial zone.

However, there must be a minimum standard for common services and facilities to ensure quality and benefits to the local community.

Each Ward wise Plan will be formulated for a particular sub-area facing the need for urgent attention. The selected area should have high priority in dealing with particular problem or should belong to an area experiencing rapid change. It is not needed to prepare detailed Action plans for all the zones under the Master Plan at a time. It would not only be pre-mature to do so, but also the available resources would not allow implementing them. Prioritization of infrastructure/development schemes

To fulfill the requirements of TOR the Planning Team identified several Bankable Projects. These projects were identified from various sectors of development, ranging from physical development of Akhaura Paurashava. It needs to be mentioned here that the implementation of these projects, if found suitable after initial assessment and further studies of feasibility, is not necessarily the sole responsibility of Akhaura Paurashava.

Table 15. 1: Priority of Development Schemes

Sl. No.	Development Schemes	Sectoral Distribution	Period	Fund Procurement
1.	Widening the Existing Roads and Preparation of Walkways and Separate lanes for NMT	Road Network	20011-2016	- Central Govt. - International Financial Assistance (Grant). - Private Sector Involvement.
2.	Preparation of New Roads with Proposed embankment cum roads and Service Roads for Highways	Road Network	2011-2016 & 2016-2021	- Central Government. - Local Government. - International Financial Assistance (Grant). - International Financial Assistance (Loan). - Private Sector Involvement. - Others.
3.	Drainage Construction for Built up area	Drains	2011-2016 & 2016-2021	- DPHE. - International Financial Assistance (Grant).
4.	Construction of Rickshaw/ Auto-rickshaw Stands at Different Points of Akhaura Paurashava	Transport Management	2011-2016	- Local Government. - International Financial Assistance (Grant). - Private Sector Involvement. - Others.
5.	Re-excavation River, River Branch and Existing Canals to improve the Drainage Situations	Transport Management and Drainage	2011-2016 & 2016-2021	-Central Government through BIWTA - Local Government. - International Financial Assistance (Grant).
7.	Piped Water Supply Project in Core Urban Area and other residential area	Water Supply	2011-2016	- Central Government through DPHE - International Financial
8.	Ensuring Planned way settlement instead of Spontaneous Growth	Housing	2011-2016	- Central Government through NHA. - Local Government. - Private Sector Involvement. - Others.
9.	Construction of Passenger Shade and Bus Stoppage	Road / Transportation	2011-2016	- Central Government.
10	Construction of Culvert	Infrastructure (Road)	2011-2016	- Central Government. - Local Government. - International Financial Assistance (Grant). - International Financial Assistance (Loan). - Private Sector Involvement. - Others.
11	Construction of a Children's Park and Riverside Park and Play Ground	Recreation	2011-2016	- Central Government. - Local Government. - International Financial Assistance (Grant). - International Financial Assistance (Loan). - Private Sector Involvement. - Others.
12	Solid Waste Management Disposal, Construction of Sanitary Landfill and Environmental Dev. Projects including Recycling of Solid Waste.	Physical Infrastructure (Solid Waste)	2011-2016	- Central Government. - International Financial Assistance (Grant). - Others (NGOs).
13	Solid Waste Disposal Site Development	Solid Waste Management	2011-2016	- Central Government - International Financial

Sl. No.	Development Schemes	Sectoral Distribution	Period	Fund Procurement
14	Improvement of Existing Drains and Construction of New Drains with Storm Sewerage System	Physical Infrastructure (Drainage)	2011-2016	- Central Government. - Local Government. - International Financial Assistance (Grant).
15	Development of Sewerage Network for	Sanitation	Entire Plan Implementation Period	- Central Government - International Financial
17	Improvement of Akhaura Bazaar	Commerce and Trade	2011-2016	- Central Government. - Private Sector Involvement.
19	Development of Kitchen Markets	Commerce and Trade	2011-2016 & 2016-2021	- Central Government. - International Financial Assistance. - Private Sector Involvement.
20	Development of Agro base Industries	Industry	2011-2016	- Central Government. - International Financial Assistance. - Private Sector Involvement.
21	Conservation of Natural Canal, Ponds and Open Space	Social	Entire Plan Preparation period	- Central Government. - foreign Assistance

Source: The Study Team of Master Plan

15.5 Ward wise Action Plan for next five years

Ward wise action plan have been discussed under the following Chapters

Chapter Sixteen:
Action Plan for Ward 01

16.1 Introduction

Analyzing the over all demand and planning activities to do in details requirements have been discussed in the structure plan and Urban area plan. Now the overall planning consideration and development have been identified Ward No. 01 of Akhaura Paurashava.

Ward 01 of Akhaura jurisdiction area is basically the rural base area which has been considered as the peripheral area of the Structure Plan. Ward 01 Occupies 430.31 acres of land (Vide Table 16.1) which contributes 17.85% of total lands of the Paurashava. About 58.69 % lands of Ward no 1 is using as agricultural purposes.

Table 16. 1: Population Statistics of Ward No. 01

Item	Year	
Year	2011	2031
Area (acre)	430.28	430.28
Population	5137.00	7663.30
Density of Population (acre)	11.94	17.81

The main problem at the Ward No. 01 is its segregate from the core area, absence of Urban services, Absence of Road network, absence of Drainage facilities etc. Map 16.1 shows the existing land use condition of Ward No. 01.

The approach to preparation of the Ward Action Plan is based on the idea of promotion of infrastructure with minimum interference with the existing structures. The inherent concept behind the planning is to apply the idea of enabling strategy, where the role of the public authority is to facilitate private development through the creation of infrastructure. Such an approach has the following advantages:

Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 01 are-

- Lands have to acquire for widening the existing roads and for the propose new roads within first two years (2011 to 2014)
- Construct new roads to connect ward no. 1 with other areas and built up areas of the Paurashava (2011 to 2016).
- Construct embankment-Cum-Road for the Branch of the river Titash to protect it from local encroachments (2011 to 2016).
- Construction of drains for the Catchments area of Ward no. 1 (2012 to 2016).
- Provision of Urban services with utility facilities and community service facilities.

Development Opportunities

Due to low density of population and having opportunity of Akhaura River creates development opportunity of this ward. The development opportunities are as follows,

- From environmental point of view, low density population can create a very livable environment for the area with respect to ventilation, use of road and other basic services.
- Widening the existing roads and providing new roads will help creating linkages with the core part of the Paurashava.

- Cheap labor, availability of raw materials and agricultural land can help grow small scale manufacturing in this town and agro based industry. This, however, would require local initiative. Local entrepreneurs may be provided with small capital as incentive toward initiating business ventures based on local potentiality.

16.2 Priority Tasks

Land acquisition for proposed development is the main tasks for development of Ward 01 in the first phase of the Master Plan. First by seeking voluntary contribution of land and / or purchase of land through negotiation. In case negotiation fails, the compulsory land acquisition power will be applied to procure land. Attempt will be made to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Again provisions of Electricity, Gas with construction of Road network and Drains are the prime tasks for development of the area.

16.3 Ward Action Plan Proposals

Ward No. 01 is mainly rural in character. Table 16.1 and Table 16.2 shows the existing land use pattern of Ward no. 01 of Akhaura Paurashava. Map 16.2 shows the proposed land uses of Ward No. 01.

16.3.1 Proposed Land Use Zoning

The category wise proposals are presented here. Table 16.2 shows the amount of land existing and proposed uses in Ward no. 1.

Urban Residential Zone

In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, more 146.33 acres of land has been earmarked for urban residential use which will occupy 34.00% of the total land. Map 14.2 and Table 16.2 shows the detail.

Education and Research

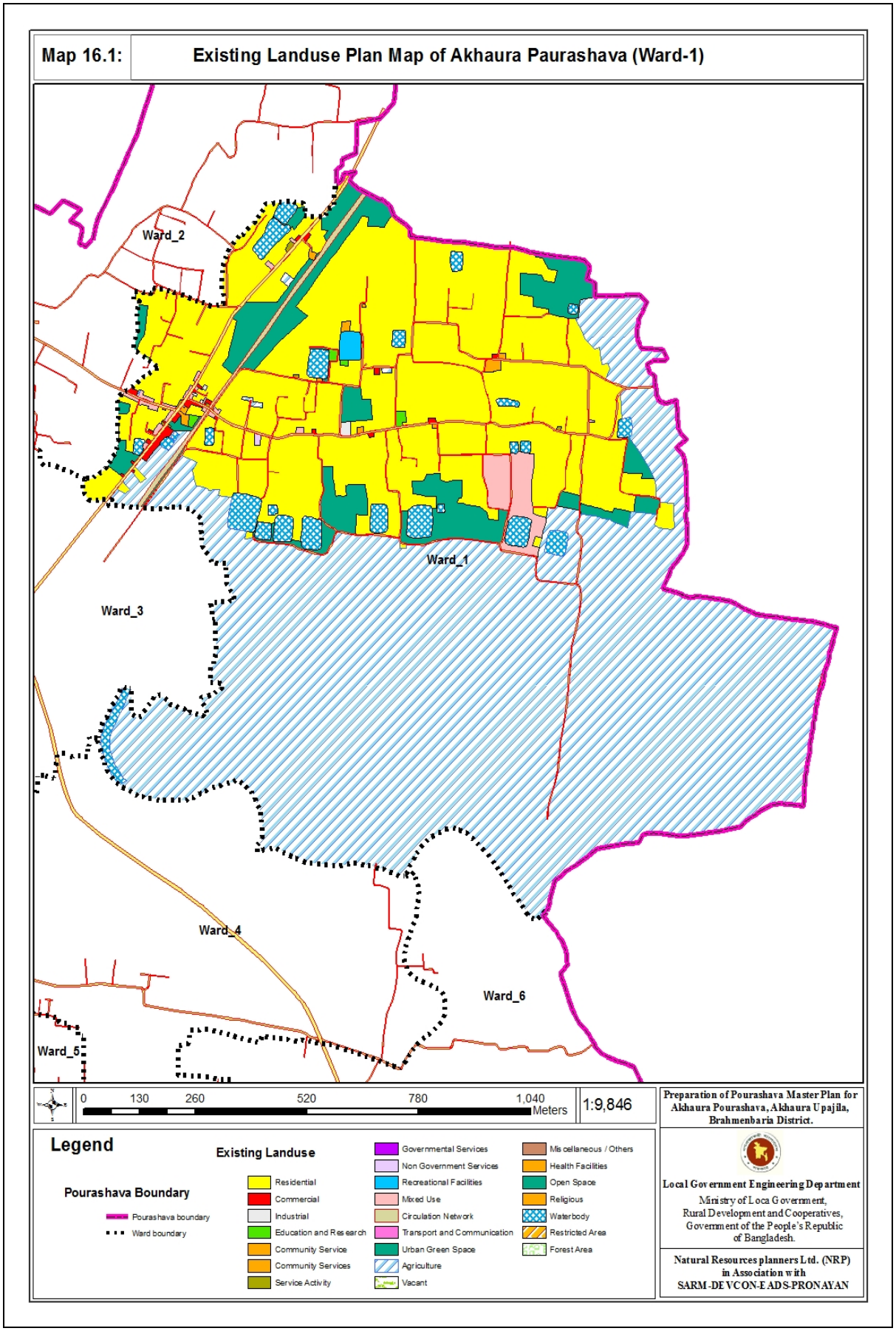
In ward no. 1 there are existing 2 primary schools, one madrasa, and one moktob. In Ward Action Plan, one Primary school is proposed with provision of extension of the existing one. Again one new Primary school is proposed. Total Land area for education and research is 0.48 acres (0.11%) of total land in Ward no. 01 of this Paurashava.

Health Services:

There are no provisions of Health facilities in this Ward. To provide Health facilities 0.46 (.11%) acres of land is proposed by the team of consultants

Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 0.72 acres of land has been proposed for this purpose which will occupy only 0.17 % of total land of the ward.



Map 16. 1: Existing Land Use of Ward No. 01

Table 16. 2: Landuse proposals for Ward No. 01

Sl.No.	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
1	Residential	122.95	28.57	1	Urban Settlement	146.76	34.00
					Rural Settlement	0.00	0.00
2	Commercial	0.98	0.23	2	Commercial	0.72	0.29
3	Industrial/ Manufacturing/ Processing	0.26	0.06	3	Industrial/ Manufacturing/ Processing	0.15	0.03
4	Education & Research	0.48	0.11	4	Education & Research	7.84	1.82
5	Community Services	0.77	0.18	5	Community Services	0.65	0.15
6	Utility Service	0.19	0.04	6	Utility Service	0.49	0.12
7	Governmental Services	0.00	0.00	7	Governmental Services	0.23	0.05
8	Non Government Services	0.08	0.02	8	Non Government Services	0.00	0.00
9	Recreational Facilities	0.79	0.18	9	Recreational Facilities	0.00	0.00
10	Mixed Use	5.22	1.21	10	Mixed Use	4.11	0.96
11	Circulation Network	9.42	2.19	11	Circulation Network	34.95	8.12
12	Transport and Communication	0.00	0.00	12	Transport and Communication	0.00	0.00
13	Open Space	25.01	5.81	13	Open Space	2.00	0.47
14	Agricultural	252.54	58.69	14	Agricultural	214.88	49.90
15	Health Services	0.00	0.00	15	Health Services	0.46	0.11
16	Miscellaneous / Others	0.00	0.00	16	Miscellaneous / Others	0.00	0.00
17	Water body	11.60	2.70	17	Water body	17.04	3.96
18	Restricted Area	0.00	0.00	18	Restricted Area	0.00	0.00
19	forest Area	0.00	0.00	19	forest Area	0.00	0.00
20	Recreational Facilities*	0.00	0.00	20	Recreational Facilities*	0.00	0.00
21	Historical and Heritage Site	0.00	0.00	21	Historical and Heritage Site	0.00	0.00
22	Urban Deferred	0.00	0.00	22	Urban Deferred	0.00	0.00
23	Overlay Zone	0.00	0.00	23	Overlay Zone	0.00	0.00
24	Beach	0.00	0.00	24	Beach	0.00	0.00
25	Miscellaneous	0.00	0.00	25	Miscellaneous	0.06	0.01
Total		430.28	100.00	Total		430.33	100.00

Circulation network

for any type of development, circulation net-work is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 34.95 acres of land and about 8.12% of the total area.

Community Facilities

New land for community facilities has been proposed 0.65 acres.

Agricultural Area

The Paurashava including Ward No. 01 has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. The highest amount of land of the Ward will remain for agricultural use up to the year 2031. About 58.69% lands of Ward No. 01 is using as the agriculture purposes but the planning team considered 49.94% of lands as the agriculture purposes uses considering the development plan.

Open Space

Due to presence of huge amount of agricultural land and increasing demand for other facilities open space has been proposed 2 acres which is 0.47% of total area.

Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with the existing branch of the Titash River with an area equal to or more than 17.04 acres will be preserved as the water retention ponds.

Utility Services Zone

A total of 0.49 acres of land covering 0.11% of total land is earmarked as Utility Services zone at Ward no. 01. Proposals are made for the establishment of two waste transfer stations in this zone.

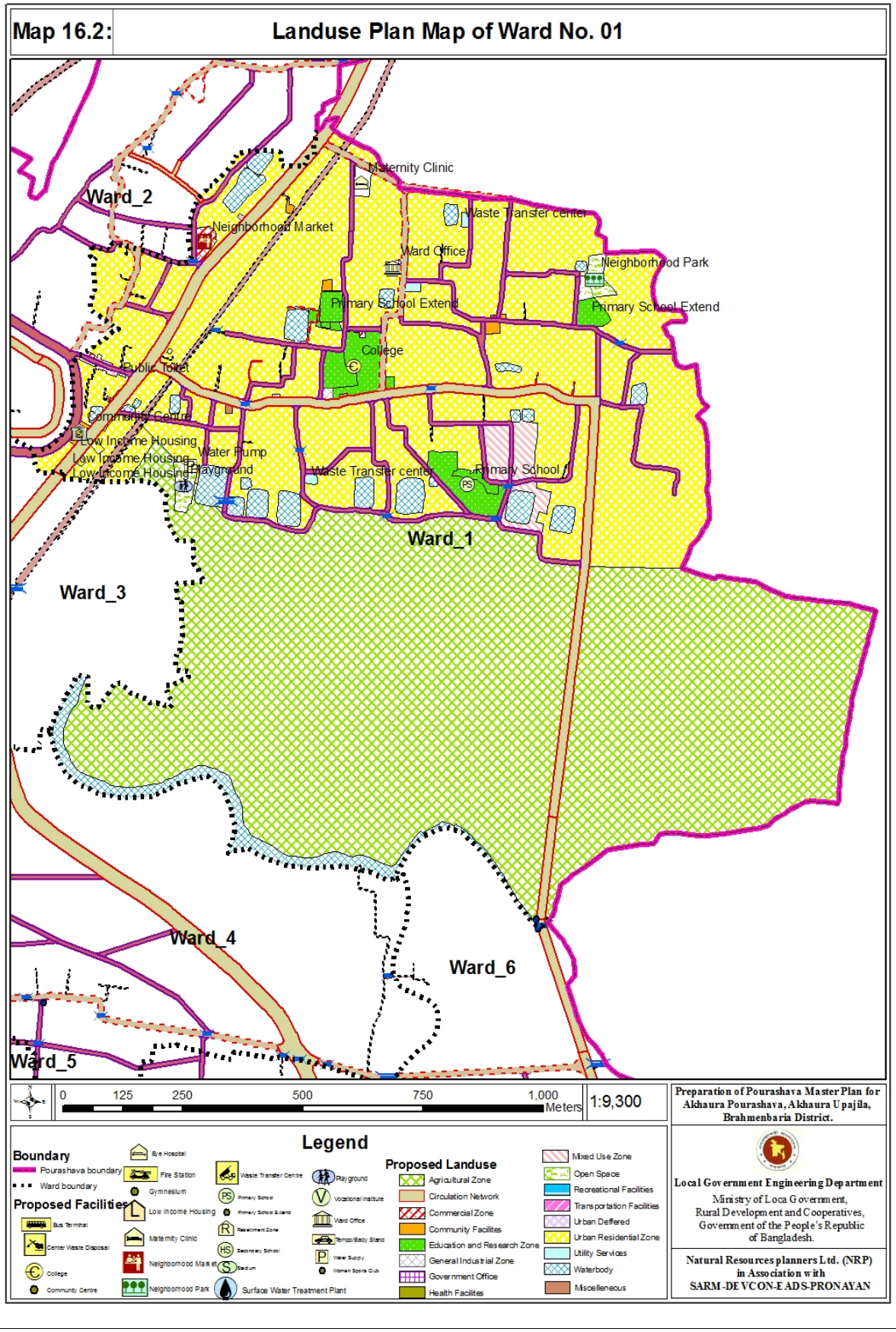
Proposed Road Infrastructure Development

A total of 12.28km of road development has been proposed in first ward action plan for Ward no. 01 of Akhaura Paurashava. Length of the local road will be 7.5 km and width of these roads will be 25 ft for road network development proposal. Total length of secondary road will be 1.13 km and width of these roads will be 40 ft for this ward. The rest 1.43 km Local road will be developed as new road and its width will be 25 ft,40 ft and 60 ft. The detailed scenario of road network development proposal is given in Table 16.3.

Table 16. 3: Summary of Road Network Proposal at Ward no. 01 of Akhaura Paurashava

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25	Local Road	7539.62	61.38	1045.97	72.48	6493.65	65.00
40	Secondary Road	982.60	8.00	174.07	12.06	808.53	8.09
60	Primary Road	2036.23	16.58	223.10	15.46	1813.13	18.15
80		874.18	7.12	0	0	874.18	8.75
Existing Road		851.78	6.93	0	0	0	0.00
Total		12284.41	100.00	1443.14	100.00	9989.49	100.00

Again a total of 1.44 km of new road have been proposed in Ward no. 01. Table 16.3 and Table 16.4 show the details.



Map 16. 2: Land Use Proposals for Ward No. 01

Table 16. 4: New Road Proposal for Ward no. 01

Proposed ID	Type of Road	Proposed Width(In Feet)	Length in Meter
PR_N_69	Primary	60	12.67
PR_N_70	Primary	60	210.47
SR_N_56	Secondary	40	174.07
LR_N_35	Local	25	103.95
LR_N_55	Local	25	61.12
LR_N_55	Local	25	59.82
LR_N_34	Local	25	204.62
LR_N_31	Local	25	83.02
LR_N_33	Local	25	234.18
LR_N_32	Local	25	156.75
LR_N_57	Local	25	142.52
Total			**1443.14**

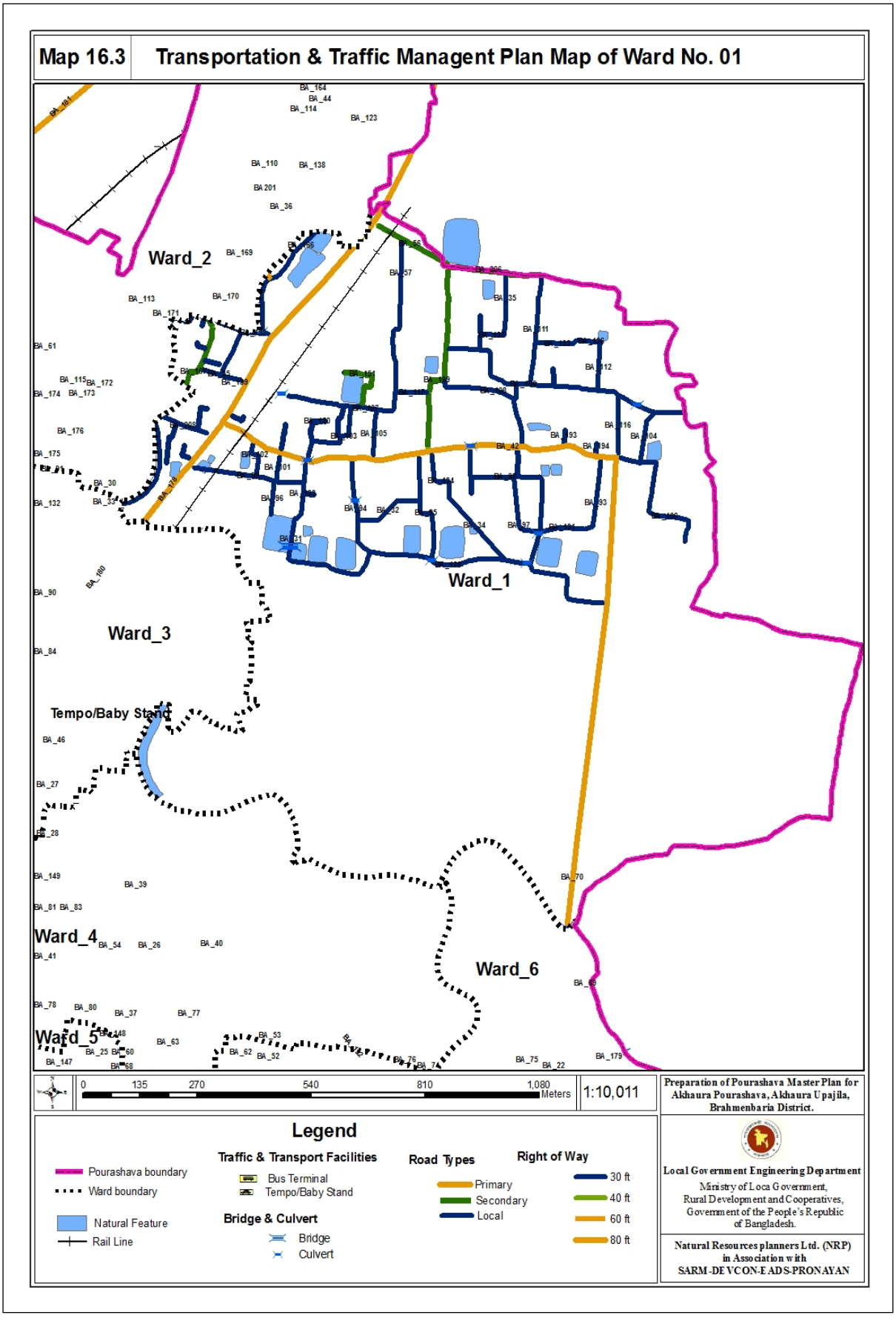
A total of 10.13 km of road widening has been proposed for this ward. Table16.5 shows the details.

Table 16. 5: Road Widening Proposal for Ward no. 01

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length in Meter
PR_W_178	BA_228	Primary	80	5.02	182.26
PR_W_178	BA_228	Primary	80	5.02	345.20
PR_W_178	BA_228	Primary	80	5.02	73.44
PR_W_178	BA_228	Primary	80	5.02	35.70
PR_W_178	BA_228	Primary	80	5.02	22.87
PR_W_178	BA_228	Primary	80	5.02	85.99
PR_W_178	BA_228	Primary	80	5.02	128.73
PR_W_42	BA_350	Primary	60	10.23	131.20
PR_W_169	BA_350	Primary	60	9.91	8.28
PR_W_42	BA_350	Primary	60	10.23	332.16
PR_W_42	BA_350	Primary	60	10.23	523.16
PR_W_42	BA_350	Primary	60	10.23	67.94
PR_W_42	BA_350	Primary	60	10.23	74.43
PR_W_42	BA_350	Primary	60	10.23	65.38
PR_W_42	BA_350	Primary	60	10.23	108.35
PR_W_42	BA_350	Primary	60	10.23	49.64
PR_W_42	BA_350	Primary	60	10.23	109.48
PR_W_42	BA_350	Primary	60	10.23	22.40
PR_W_42	BA_350	Primary	60	10.23	80.22
PR_W_42	BA_350	Primary	60	10.23	112.44
PR_W_42	BA_350	Primary	60	10.23	81.09
PR_W_42	BA_350	Primary	60	10.23	46.98
SR_W_109	BA_173	Secondary	40	10.63	179.54
SR_W_109	BA_173	Secondary	40	10.63	128.22
SR_W_109	BA_173	Secondary	40	10.63	124.77
SR_W_206	BA_337	Secondary	40	6.63	1.92
SR_W_167	BA_208	Secondary	40	6.79	157.96
SR_W_206	BA_337	Secondary	40	6.63	194.74
SR_W_167	BA_208	Secondary	40	6.79	21.38
LR_W_208	BA_10	Local	25	13.22	52.56
LR_W_208	BA_10	Local	25	13.22	23.88
LR_W_106	BA_162	Local	25	6.69	67.51
LR_W_133	BA_421	Local	25	5.08	25.12
LR_W_133	BA_421	Local	25	5.08	42.70
LR_W_103	BA_158	Local	25	6.76	35.04

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length in Meter
LR_W_97	BA_115	Local	25	7.31	156.75
LR_W_98	BA_118	Local	25	5.18	9.41
LR_W_98	BA_118	Local	25	5.18	186.39
LR_W_98	BA_118	Local	25	5.18	76.95
LR_W_98	BA_118	Local	25	5.18	163.73
LR_W_104	BA_160	Local	25	5.05	115.26
LR_W_170	BA_221	Local	25	6.63	3.51
LR_W_208	BA_10	Local	25	13.22	36.77
LR_W_100	BA_142	Local	25	3.41	8.36
LR_W_106	BA_162	Local	25	6.69	72.23
LR_W_108	BA_170	Local	25	6.89	176.93
LR_W_106	BA_162	Local	25	6.69	56.14
LR_W_166	BA_66	Local	25	5.02	68.64
LR_W_103	BA_158	Local	25	6.76	79.58
LR_W_128	BA_403	Local	25	7.08	235.84
LR_W_96	BA_87	Local	25	6.66	73.04
LR_W_134	BA_424	Local	25	10.23	110.79
LR_W_116	BA_250	Local	25	6.82	128.35
LR_W_108	BA_170	Local	25	6.89	35.78
LR_W_117	BA_257	Local	25	5.28	70.22
LR_W_171	BA_163	Local	25	9.97	29.18
LR_W_105	BA_161	Local	25	5.08	100.20
LR_W_107	BA_169	Local	25	7.08	130.89
LR_W_111	BA_176	Local	25	4.99	74.34
LR_W_99	BA_131	Local	25	3.51	197.17
LR_W_95	BA_83	Local	25	9.94	250.68
LR_W_128	BA_403	Local	25	7.08	476.38
LR_W_94	BA_83	Local	25	9.94	221.06
LR_W_102	BA_151	Local	25	13.74	82.84
LR_W_107	BA_169	Local	25	7.08	132.02
LR_W_166	BA_66	Local	25	5.02	152.48
LR_W_131	BA_411	Local	25	3.38	100.29
LR_W_137	BA_431	Local	25	8.30	31.74
LR_W_137	BA_431	Local	25	8.30	89.07
LR_W_198	BA_132	Local	25	7.08	50.34
LR_W_139	BA_441	Local	25	5.08	38.83
LR_W_136	BA_429	Local	25	5.02	52.04
LR_W_135	BA_424	Local	25	10.23	105.63
LR_W_112	BA_177	Local	25	6.69	99.18
LR_W_99	BA_131	Local	25	3.51	61.80
LR_W_101	BA_143	Local	25	7.28	52.72
LR_W_198	BA_132	Local	25	7.08	46.15
LR_W_128	BA_403	Local	25	7.08	143.88
LR_W_103	BA_158	Local	25	6.76	82.27
LR_W_107	BA_169	Local	25	7.08	16.64
LR_W_107	BA_169	Local	25	7.08	26.24
LR_W_107	BA_169	Local	25	7.08	36.26
LR_W_107	BA_169	Local	25	7.08	79.85
LR_W_107	BA_169	Local	25	7.08	78.40
LR_W_166	BA_66	Local	25	5.02	60.37
LR_W_106	BA_162	Local	25	6.69	31.39
LR_W_106	BA_162	Local	25	6.69	56.76
LR_W_106	BA_162	Local	25	6.69	101.94
LR_W_106	BA_162	Local	25	6.69	53.93
LR_W_106	BA_162	Local	25	6.69	97.22

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length in Meter
LR_W_108	BA_170	Local	25	6.89	108.42
LR_W_111	BA_176	Local	25	4.99	152.80
LR_W_111	BA_176	Local	25	4.99	17.40
LR_W_106	BA_162	Local	25	6.69	89.10
LR_W_100	BA_142	Local	25	3.41	299.28
LR_W_100	BA_142	Local	25	3.41	39.85
LR_W_133	BA_421	Local	25	5.08	66.11
	Total				**9989.49**



Map 16. 3: Traffic and Transportation Plan Proposal for Ward No. 01

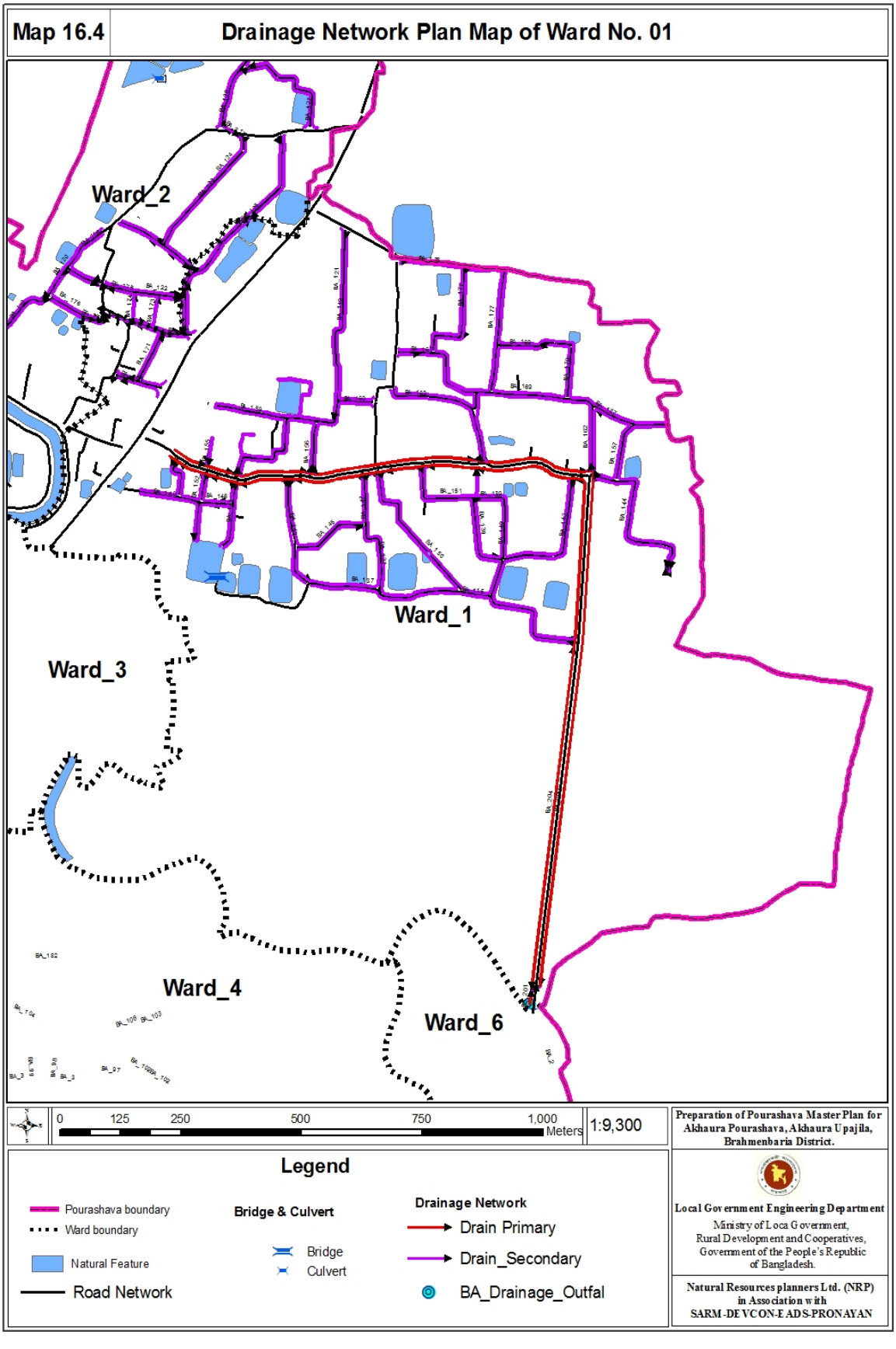
Drainage Development Plan

There is no man-made drainage system at Ward no. 01. The existing drainage of the ward mainly depends on the natural drainage facilities. Besides, it will be necessary to re-excavate the khals that serve as primary drains. There is no proposal for man made drainage facilities in first phase of the master Plan.

Table 16. 6: Drainage Network Proposals of Ward No. 01

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area_acre
SD_N_200	Drain Secondary	1.50	1441.00	0.71
SD_N_201	Drain Secondary	1.50	20.00	0.01
SD_N_204	Drain Secondary	1.50	1426.00	0.71
SD_N_200	Drain Secondary	1.50	1.00	0.00
SD_N_201	Drain Secondary	1.50	1.00	0.00
SD_N_204	Drain Secondary	1.50	2.00	0.00
TD_N_115	Drain_Tertiary	1.00	307.00	0.15
TD_N_117	Drain_Tertiary	1.00	9.00	0.01
TD_N_119	Drain_Tertiary	1.00	208.00	0.10
TD_N_121	Drain_Tertiary	1.00	471.00	0.23
TD_N_122	Drain_Tertiary	1.00	28.00	0.01
TD_N_123	Drain_Tertiary	1.00	75.00	0.04
TD_N_125	Drain_Tertiary	1.00	149.00	0.07
TD_N_137	Drain_Tertiary	1.00	254.00	0.13
TD_N_139	Drain_Tertiary	1.00	157.00	0.08
TD_N_140	Drain_Tertiary	1.00	207.00	0.10
TD_N_141	Drain_Tertiary	1.00	69.00	0.03
TD_N_142	Drain_Tertiary	1.00	111.00	0.06
TD_N_143	Drain_Tertiary	1.00	289.00	0.14
TD_N_144	Drain_Tertiary	1.00	167.00	0.08
TD_N_145	Drain_Tertiary	1.00	191.00	0.10
TD_N_146	Drain_Tertiary	1.00	75.00	0.04
TD_N_147	Drain_Tertiary	1.00	366.00	0.18
TD_N_149	Drain_Tertiary	1.00	248.00	0.12
TD_N_150	Drain_Tertiary	1.00	383.00	0.19
TD_N_151	Drain_Tertiary	1.00	109.00	0.05
TD_N_152	Drain_Tertiary	1.00	86.00	0.04
TD_N_153	Drain_Tertiary	1.00	80.00	0.04
TD_N_155	Drain_Tertiary	1.00	57.00	0.03
TD_N_156	Drain_Tertiary	1.00	173.00	0.09
TD_N_157	Drain_Tertiary	1.00	179.00	0.09
TD_N_159	Drain_Tertiary	1.00	235.00	0.12
TD_N_160	Drain_Tertiary	1.00	125.00	0.06
TD_N_162	Drain_Tertiary	1.00	252.00	0.13
TD_N_163	Drain_Tertiary	1.00	143.00	0.07
TD_N_166	Drain_Tertiary	1.00	53.00	0.03
TD_N_167	Drain_Tertiary	1.00	207.00	0.10
TD_N_169	Drain_Tertiary	1.00	238.00	0.12
TD_N_170	Drain_Tertiary	1.00	105.00	0.05
TD_N_171	Drain_Tertiary	1.00	97.00	0.05
TD_N_172	Drain_Tertiary	1.00	30.00	0.02
TD_N_173	Drain_Tertiary	1.00	33.00	0.02
TD_N_176	Drain_Tertiary	1.00	5.00	0.00
TD_N_177	Drain_Tertiary	1.00	348.00	0.17
TD_N_178	Drain_Tertiary	1.00	209.00	0.10
TD_N_179	Drain_Tertiary	1.00	551.00	0.27
TD_N_197	Drain_Tertiary	1.00	5.00	0.00
TD_N_199	Drain_Tertiary	1.00	11.00	0.01
TD_N_202	Drain_Tertiary	1.00	12.00	0.01
TD_N_208	Drain_Tertiary	1.00	3.00	0.00

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area_acre
TD_N_209	Drain_Tertiary	1.00	4.00	0.00
TD_N_210	Drain_Tertiary	1.00	19.00	0.01
TD_N_122	Drain_Tertiary	1.00	0.00	0.00
TD_N_123	Drain_Tertiary	1.00	1.00	0.00
TD_N_125	Drain_Tertiary	1.00	1.00	0.00
TD_N_173	Drain_Tertiary	1.00	2.00	0.00
TD_N_176	Drain_Tertiary	1.00	1.00	0.00
TD_N_208	Drain_Tertiary	1.00	1.00	0.00
TD_N_125	Drain_Tertiary	1.00	1.00	0.00
TD_N_197	Drain_Tertiary	1.00	1.00	0.00
TD_N_146	Drain_Tertiary	1.00	1.00	0.00
TD_N_199	Drain_Tertiary	1.00	1.00	0.00
TD_N_171	Drain_Tertiary	1.00	1.00	0.00
TD_N_209	Drain_Tertiary	1.00	1.00	0.00
TD_N_171	Drain_Tertiary	1.00	1.00	0.00
TD_N_210	Drain_Tertiary	1.00	1.00	0.00
TD_N_202	Drain_Tertiary	1.00	1.00	0.00
TD_N_202	Drain_Tertiary	1.00	1.00	0.00
TD_N_202	Drain_Tertiary	1.00	1.00	0.00
Grand Total			10041.00	4.98



Map 16. 4: Proposed Drainage network of Ward No No. 01

16.3.2 Urban Services

Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is also another major factor influencing the volume of solid waste. The consultant proposes one solid waste transfer stations and the dumping station has been proposed in this area.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Titash River. A water treatment plant may establish here with a detail feasibility study on the bank of the Titash River.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. The consultant proposes one public toilet in this area which covered 0.2 acre.

Education Facility

There is two primary school,one madrasa and one moktob in this ward. Additionally, one Primary school is proposed and another is widen in this Ward.

Recreation and Open Space

one local playground with 0.91 acre land have been proposed to fulfill the requirement of adjoining area. Detail was given in Table 10.17 in Chapter 10, Part-B of this report.

Ward Center

In every ward one ward center has been proposed. 0.23 acre land proposed in this ward for ward centre.

Table 16. 7: Development Proposals of Ward No. 01

Proposed Activities	Area in acre	Mouza Name	Plot No.
Low Cost Housing	3.152	Durgapur	99999
Neighborhood Market	0.56	Durgapur	72, 76, 99999,
College	3.17	Durgapur	53, 54, 55, 56, 57, 58, 59, 60, 61, 175
Primary School	2.68	Durgapur	198, 199, 200, 201, 202, 203, 204, 205, 206, 284, 387, 567,
Maternity Clinic	0.46	Durgapur	94, 96
Ward Center	0.23	Durgapur	109
Neighborhood Park	1.09	Durgapur	137, 151, 989
Play Ground	0.91	Durgapur	699, 700, 701, 702
Public Toilet	0.02	Durgapur	673
Waste Transfer center	0.24	Durgapur,	127, 636, 637
Water Pump	0.08	Durgapur	700
Community Centre	0.22	Durgapur	688

Chapter Seventeen: Action Plan for Ward 02

17.1 Proposals and Plans for Ward 02

Ward No. 02 of Akhaura jurisdiction area is basically the rural base area which is just besides of the River Titash. Ward No. 02 is consists of Peripheral area and New Urban Area and large portion of Agricultural Area. Ward no. 02 occupies 10.69% of total lands of the Paurashava where 39.59% of total lands of Ward no 2 is using as agricultural purposes. Demographic profile of the Paurashava has been shown under the Table 17.1

Table 17. 1: Population Statistics of Ward No. 02

Item	Year	
	2011	2031
Area (acre)	258.07	258.07
Population	3181.00	4745.37
Density of Population (acre)	12.33	18.39

Analyzing the over all demand and planning activities to do in details requirements have been discussed in the structure plan and Urban area plan. Ward No 02 consist of NUA , PUA and AgA according to the Urban area Plan. Map 16.1 shows the existing land use condition of Ward No. 01.

Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 02 are-

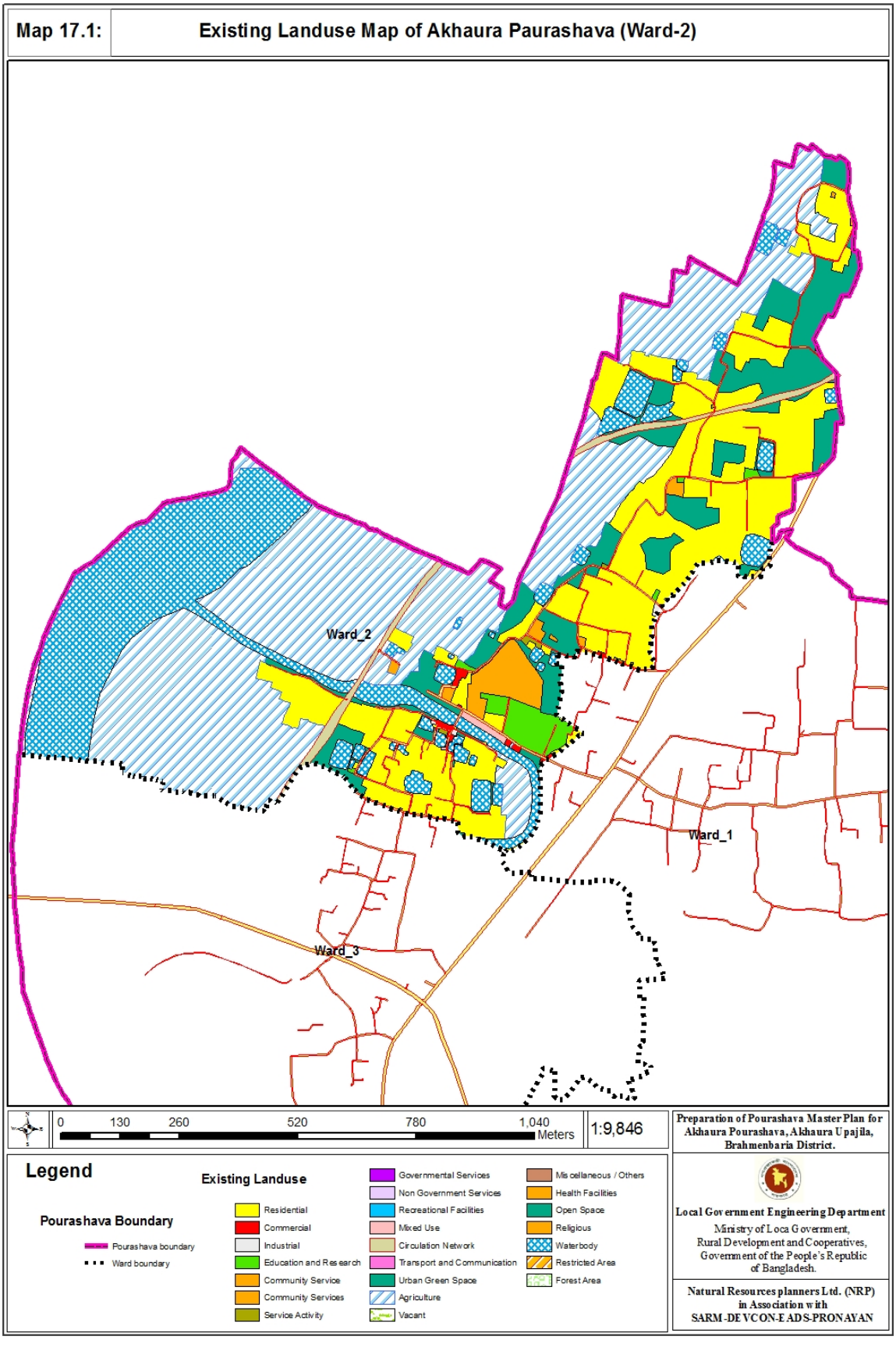
- Resettlement program to stop the existing spontaneous growth of residential areas
- Lands have to acquire for widening the existing roads and for the propose new roads within first two years (2011 to 2014)
- Construction of drains for the Catchments area in of Ward no. 2 (2011 to 2016).
- Providing all the Municipal Facilities as to provide as the area to grow up as Pure residential area.

17.2 Priority Tasks

The first priority tasks to develop the residential area of this ward are to take Resettlement program to stop the existing spontaneous growth.

Land acquisition for proposed development is the main tasks for development of Ward No. 02 as few portion of this ward has been proposed for the residential area.

Attempt should make to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads, the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement, the development authority may use its power of compulsory land acquisition to procure necessary land.



Map 17. 1: Existing Landuse Map of Ward no 02

17.3 Ward Action Plan Proposals

Ward no. 02 is mainly rural in character. Table 17.1 and Table 17.2 shows the existing land use pattern of Ward no. 02 of Akhaura Paurashava.

17.3.1 Proposed Land Use Zoning

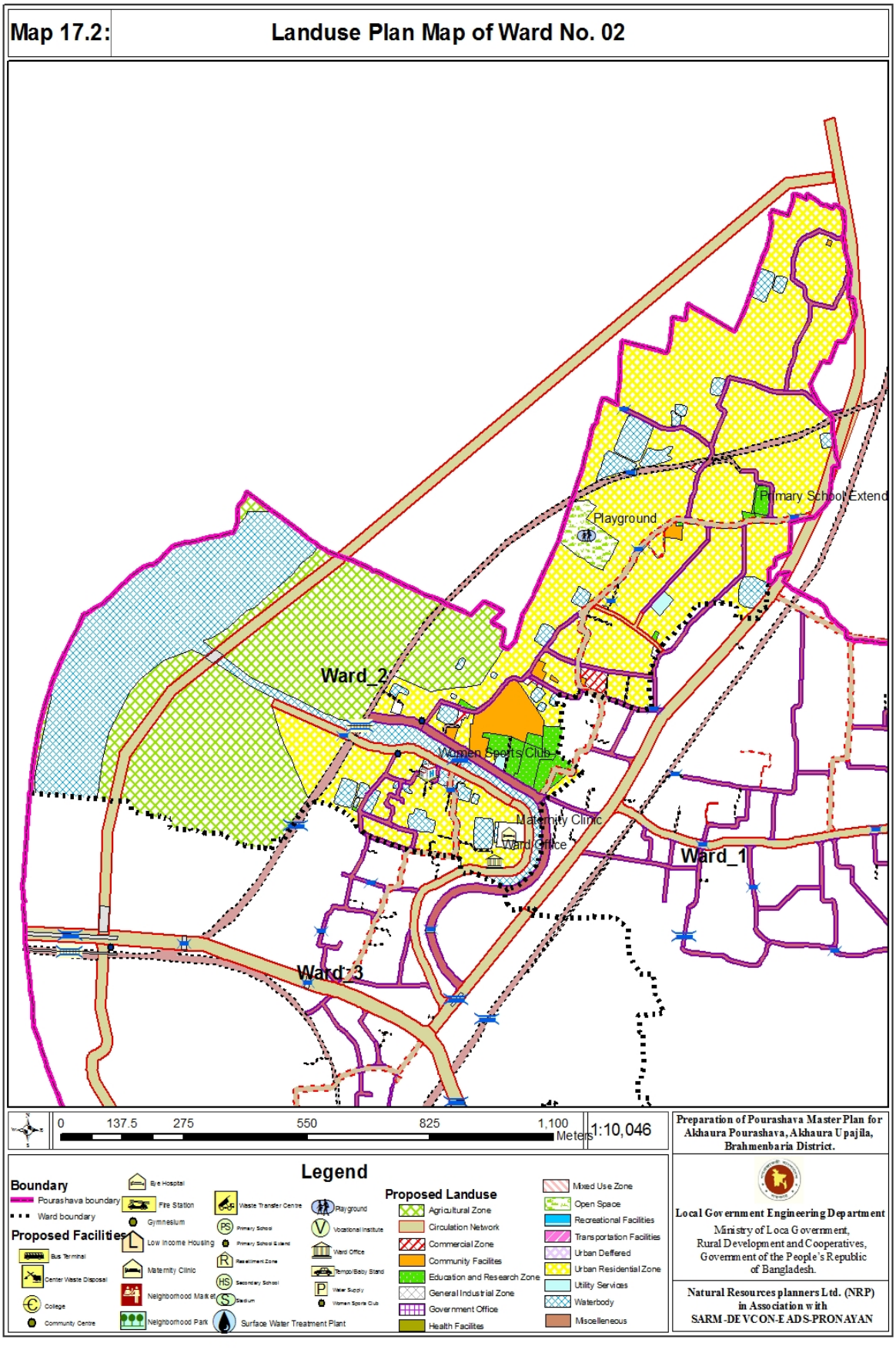
The category wise proposals are presented here. Table 17.2 shows the amount of land existing and proposed uses in Ward no. 2. Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 17.1**).

Table 17. 2: Landuse proposals for Ward No. 02

Sr. no	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
1	Residential	59.61	23.14	1	Urban Settlement	103.73	40.24
					Rural Settlement	0.00	0.00
2	Commercial	0.52	0.20	2	Commercial	0.94	0.37
3	Industrial/ Manufacturing/ Processing	0.12	0.05	3	Industrial/ Manufacturing/ Processing	0.07	0.03
4	Education & Research	3.70	1.44	4	Education & Research	4.61	1.79
5	Community Services	4.71	1.83	5	Community Services	4.30	1.67
6	Utility Service	0.27	0.11	6	Utility Service	0.49	0.19
7	Governmental Services	0.00	0.00	7	Governmental Services	0.12	0.05
8	Non Government Services	0.00	0.00	8	Non Government Services	0.00	0.00
9	Recreational Facilities	0.00	0.00	9	Recreational Facilities	0.15	0.06
10	Mixed Use	0.00	0.00	10	Mixed Use	0.00	0.00
11	Circulation Network	7.01	2.72	11	Circulation Network	26.80	10.40
12	Transport and Communication	0.00	0.00	12	Transport and Communication	0.00	0.00
13	Open Space	28.41	11.03	13	Open Space	2.66	1.03
14	Agricultural	102.02	39.59	14	Agricultural	63.17	24.51
15	Health Services	0.00	0.00	15	Health Services	0.87	0.34
16	Miscellaneous / Others	0.00	0.00	16	Miscellaneous / Others	0.00	0.00
17	Water body	51.31	19.91	17	Water body	50.15	19.46
18	Restricted Area	0.00	0.00	18	Restricted Area	0.00	0.00
19	forest Area	0.00	0.00	19	forest Area	0.00	0.00
20	Recreational Facilities*	0.00	0.00	20	Recreational Facilities*	0.15	0.06
21	Historical and Heritage Site	0.00	0.00	21	Historical and Heritage Site	0.00	0.00
22	Urban Deferred	0.00	0.00	22	Urban Deferred	0.00	0.00
23	Overlay Zone	0.00	0.00	23	Overlay Zone	0.00	0.00
24	Beach	0.00	0.00	24	Beach	0.00	0.00
25	Miscellaneous	0.00	0.00	25	Miscellaneous	0.00	0.00
Total		257.67	100.00	Total		257.75	100.00

Urban Residential Zone

In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, 103.73 acre of land has been earmarked for urban residential use which will occupy around 38.68% of the total land. Map 17.2 and Table 17.2 shows the detail.



Map 17. 2: Proposed Circulation network of Ward No.02

Education and Research

In this ward there are two primary school , one high school and one madrasa . At present total area for education and research is 3.70 which is extended to 4.61.

Commercial Activity

At present, commercial activity and density of population are very low in this ward. Only 0.94 acres of land has been proposed for this purpose which occupy only 0.37 % of total land.

General Industry

Only 0.07 acres of land has been proposed for this purpose which occupy only 0.03 % of total land.

Circulation network

for any type of development, circulation net-work is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 26.80 acres of land and more than 10.40% of the total area.

Community Facilities

Land for community facilities will be 4.30 which is 1.67% of total land of the ward.

Agricultural Area

The Paurashava including Ward No. 02 has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. The total area under this use has been estimated as about 63.17 acres of land covering 24.51% of the total land. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

Open Space

Land for Open space will be 2.66 acre which includes open recreational facilities playground, Local Park and green belt.

Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The proposed retention area covers 50.15 acres of land which covers almost 19.46% of the total ward area.

Proposed Road Infrastructure Development

A total of 7.82 km of road development has been proposed in the ward action plan for Ward no. 02 of Akhaura Paurashava. Length of the local road will be 4.14 km and width of these roads will be varied from 25 ft. Total length of secondary road will be 1.24 km and width of these roads will be 40 ft for this ward. Total length of primary road will be 1.9 km and width of these roads will be varied from 60 ft to 80 ft for this ward. Summary of Road Network Proposal have benn shown under the Following Table 17.3.

Table 17. 3: Summary of Road Network Proposal at Ward no. 02

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25	Local Road	4141.92	52.91	422.38	28.74	3719.54	63.84
40	Secondary	1241.76	15.86	0.00	0.00	1241.76	21.31
60	Primary Road	1088.64	13.91	297.29	20.23	791.35	13.58
80		823.37	10.52	749.75	51.02	73.62	1.26
Existing Road		531.88	6.79		0.00		0.00
Total		7827.57	100.00	1469.42	100.00	5826.27	100.00

Again a total of 1.47 km of new road have been proposed in Ward no. 02. Table 17.3 and Table 17.4 show the details.

Table 17. 4: New Road Proposal for Ward no. 02

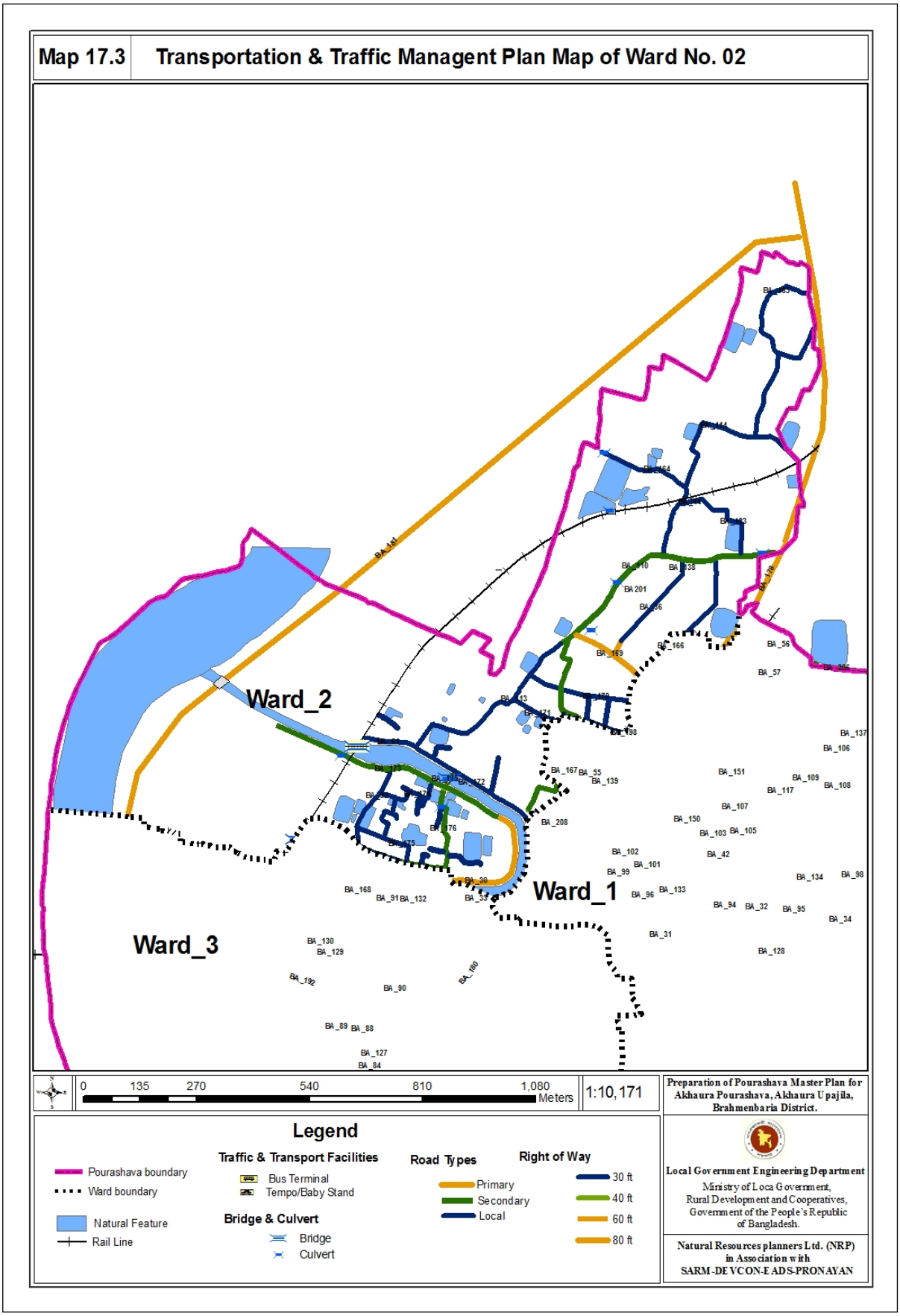
Proposed ID	Type of Road	Proposed Width(In Feet)	Length in Meter
PR_N_198	Primary	80	749.75
PR_N_30	Primary	60	297.29
LR_N_33	Local	25	7.15
LR_N_71	Local	25	77.24
LR_N_36	Local	25	214.58
LR_N_61	Local	25	123.42
Total			1,469.42

A total of 5.82 km meters of road widening has been proposed for this ward. Table17.5 shows the details.

Table 17. 5: Road Widening Proposal in first Ward Action Plan for Ward no. 02

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length
PR_W_178	BA_228	Primary	80	5.02	73.62
PR_W_173	BA_165	Primary	60	9.94	104.81
PR_W_173	BA_165	Primary	60	9.94	33.85
PR_W_173	BA_165	Primary	60	9.94	16.81
PR_W_173	BA_165	Primary	60	9.94	59.24
PR_W_173	BA_165	Primary	60	9.94	69.30
PR_W_173	BA_165	Primary	60	9.94	104.51
PR_W_173	BA_165	Primary	60	9.94	193.08
PR_W_114	BA_218	Primary	60	9.91	36.84
PR_W_138	BA_439	Primary	60	9.91	101.63
PR_W_173	BA_75	Primary	60	9.91	71.30
SR_W_110	BA_174	Secondary	40	13.81	103.22
SR_W_110	BA_174	Secondary	40	13.81	81.99
SR_W_167	BA_208	Secondary	40	6.79	115.74
SR_W_169	BA_208	Secondary	40	6.79	4.16
SR_W_167	BA_174	Secondary	40	13.81	68.15
SR_W_167	BA_174	Secondary	40	13.81	78.91
SR_W_110	BA_174	Secondary	40	13.81	22.13
SR_W_168	BA_174	Secondary	40	13.81	79.87
SR_W_198	BA_350	Secondary	40	5.12	125.06
SR_W_198	BA_350	Secondary	40	5.12	37.31
SR_W_176	BA_219	Secondary	40	14.04	25.51
SR_W_115	BA_71	Secondary	40	7.02	25.64
SR_W_172	BA_71	Secondary	40	7.02	10.29
SR_W_174	BA_71	Secondary	40	7.02	0.02
SR_W_173	BA_174	Secondary	40	13.81	60.93
SR_W_174	BA_174	Secondary	40	13.81	9.90
SR_W_172	BA_208	Secondary	40	6.79	22.91
SR_W_172	BA_71	Secondary	40	7.02	34.20
SR_W_170	BA_174	Secondary	40	13.81	23.82
SR_W_208	BA_71	Secondary	40	7.02	4.26
SR_W_172	BA_350	Secondary	40	5.12	31.22
SR_W_91	BA_174	Secondary	40	13.81	144.22
SR_W_114	BA_174	Secondary	40	13.81	132.32
LR_W_92	BA_74	Local	25	8.40	167.15

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length
LR_W_172	BA_190	Local	25	13.19	99.91
LR_W_172	BA_190	Local	25	13.19	103.48
LR_W_114	BA_217	Local	25	6.69	148.76
LR_W_166	BA_66	Local	25	5.02	97.67
LR_W_172	BA_132	Local	25	7.08	0.95
LR_W_198	BA_217	Local	25	6.69	320.04
LR_W_114	BA_217	Local	25	6.69	14.57
LR_W_169	BA_438	Local	25	5.08	25.91
LR_W_110	BA_74	Local	25	8.40	38.35
LR_W_110	BA_57	Local	25	9.91	6.41
LR_W_92	BA_66	Local	25	5.02	100.89
LR_W_166	BA_132	Local	25	7.08	39.94
LR_W_110	BA_132	Local	25	7.08	20.91
LR_W_198	BA_132	Local	25	7.08	16.55
LR_W_173	BA_180	Local	25	6.79	68.20
LR_W_176	BA_180	Local	25	6.79	288.24
LR_W_173	BA_74	Local	25	8.40	10.37
LR_W_113	BA_352	Local	25	6.72	87.48
LR_W_113	BA_4	Local	25	14.86	28.22
LR_W_172	BA_4	Local	25	14.86	12.29
LR_W_91	BA_4	Local	25	14.86	38.61
LR_W_91	BA_190	Local	25	13.19	48.94
LR_W_92	BA_221	Local	25	6.63	47.96
LR_W_175	BA_221	Local	25	6.63	62.44
LR_W_174	BA_180	Local	25	6.79	74.94
LR_W_170	BA_74	Local	25	8.40	17.03
LR_W_170	BA_221	Local	25	6.63	48.34
LR_W_113	BA_10	Local	25	13.22	7.71
LR_W_91	BA_190	Local	25	13.19	58.80
LR_W_110	BA_74	Local	25	8.40	50.08
LR_W_110	BA_4	Local	25	14.86	35.31
LR_W_167	BA_74	Local	25	8.40	51.41
LR_W_92	BA_217	Local	25	6.69	96.47
LR_W_172	BA_180	Local	25	6.79	104.62
LR_W_92	BA_57	Local	25	9.91	0.03
LR_W_174	BA_57	Local	25	9.91	56.02
LR_W_92	BA_74	Local	25	8.40	21.22
LR_W_110	BA_217	Local	25	6.69	22.27
LR_W_113	BA_66	Local	25	5.02	217.65
LR_W_91	BA_166	Local	25	6.63	219.48
LR_W_176	BA_166	Local	25	6.63	177.38
LR_W_168	BA_166	Local	25	6.63	167.84
LR_W_168	BA_166	Local	25	6.63	22.56
LR_W_92	BA_163	Local	25	9.97	106.11
LR_W_169	BA_343	Local	25	6.63	159.56
LR_W_110	BA_74	Local	25	8.40	37.13
LR_W_110	BA_74	Local	25	8.40	73.34
Total					5826.28



Map 17. 3: Shows the Proposed Circulation network of Ward No.02

Drainage Development Plan

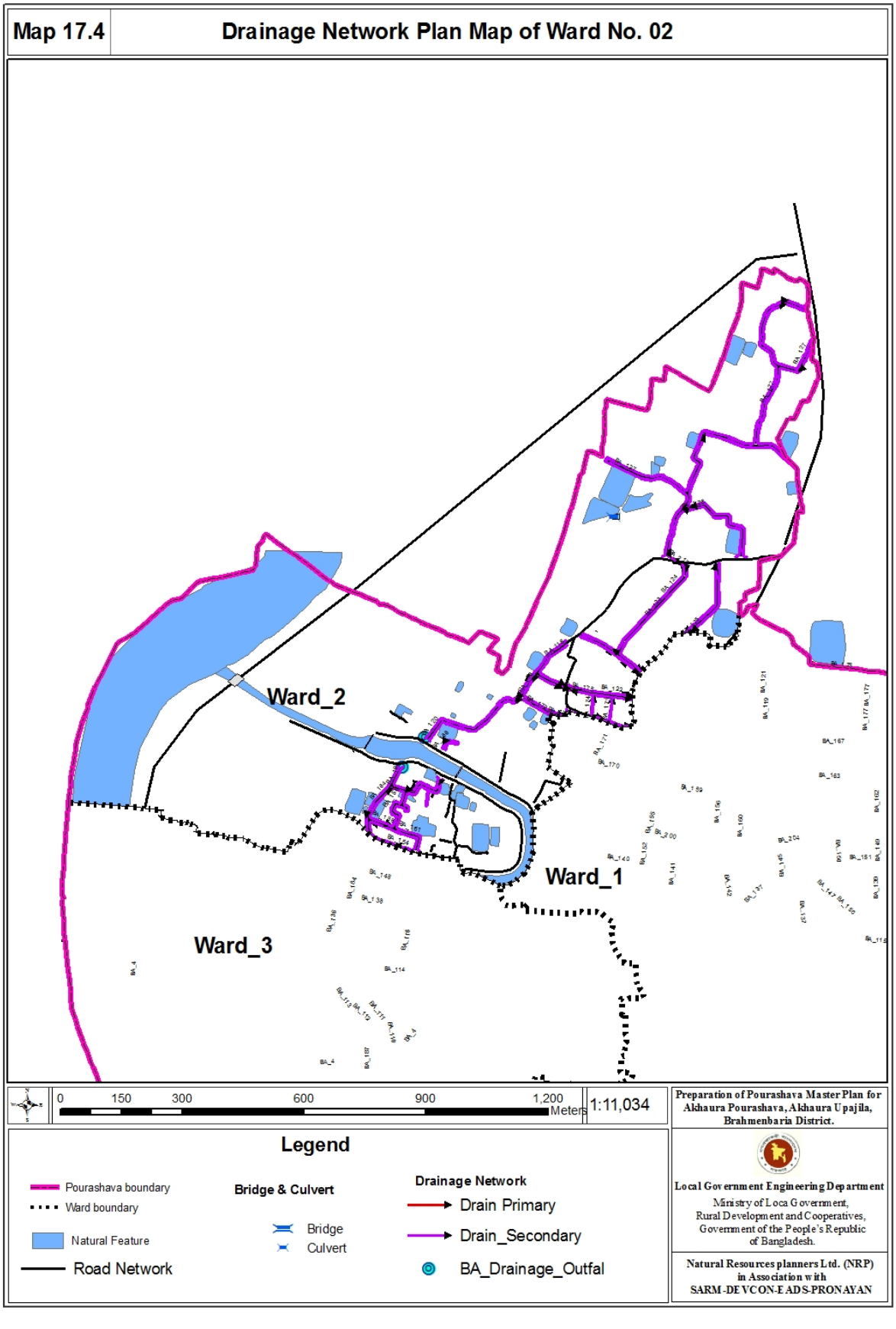
There is no man-made drainage system at Ward no. 02. The existing drainage of the ward mainly depends on the natural drainage facilities.The proposed drainage facilities will bedeveloped based on these natural channels. These two will serve as primary drains and will be connected by 4 km drain from Ward Action Plan. Table 17.6 show the details of the proposed drain.

Table 17. 6: Drainage Proposal for Ward no. 02

WARD_NO	DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area_acre
Ward No. 2	TD_W_118	Drain_Tertiary	1.00	80.00	0.04
Ward No. 2	TD_W_120	Drain_Tertiary	1.00	233.00	0.12
Ward No. 2	TD_W_122	Drain_Tertiary	1.00	167.00	0.08
Ward No. 2	TD_W_123	Drain_Tertiary	1.00	272.00	0.13
Ward No. 2	TD_W_124	Drain_Tertiary	1.00	184.00	0.09
Ward No. 2	TD_W_125	Drain_Tertiary	1.00	98.00	0.05
Ward No. 2	TD_W_126	Drain_Tertiary	1.00	182.00	0.09
Ward No. 2	TD_W_127	Drain_Tertiary	1.00	1419.00	0.70
Ward No. 2	TD_W_154	Drain_Tertiary	1.00	143.00	0.07
Ward No. 2	TD_W_158	Drain_Tertiary	1.00	145.00	0.07
Ward No. 2	TD_W_161	Drain_Tertiary	1.00	226.00	0.11
Ward No. 2	TD_W_164	Drain_Tertiary	1.00	90.00	0.05
Ward No. 2	TD_W_165	Drain_Tertiary	1.00	99.00	0.05
Ward No. 2	TD_W_168	Drain_Tertiary	1.00	49.00	0.02
Ward No. 2	TD_W_172	Drain_Tertiary	1.00	184.00	0.09
Ward No. 2	TD_W_173	Drain_Tertiary	1.00	79.00	0.04
Ward No. 2	TD_W_174	Drain_Tertiary	1.00	97.00	0.05
Ward No. 2	TD_W_175	Drain_Tertiary	1.00	52.00	0.03
Ward No. 2	TD_W_176	Drain_Tertiary	1.00	121.00	0.06
Ward No. 2	TD_W_194	Drain_Tertiary	1.00	5.00	0.00
Ward No. 2	TD_W_195	Drain_Tertiary	1.00	6.00	0.00
Ward No. 2	TD_W_196	Drain_Tertiary	1.00	6.00	0.00
Ward No. 2	TD_W_198	Drain_Tertiary	1.00	2.00	0.00
Ward No. 2	TD_W_205	Drain_Tertiary	1.00	11.00	0.01
Ward No. 2	TD_W_206	Drain_Tertiary	1.00	4.00	0.00
Ward No. 2	TD_W_207	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_208	Drain_Tertiary	1.00	0.00	0.00
Ward No. 2	TD_W_210	Drain_Tertiary	1.00	0.00	0.00
Ward No. 2	TD_W_211	Drain_Tertiary	1.00	5.00	0.00
Ward No. 2	TD_W_212	Drain_Tertiary	1.00	5.00	0.00
Ward No. 2	TD_W_213	Drain_Tertiary	1.00	15.00	0.01
Ward No. 2	TD_W_122	Drain_Tertiary	1.00	0.00	0.00
Ward No. 2	TD_W_123	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_125	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_173	Drain_Tertiary	1.00	2.00	0.00
Ward No. 2	TD_W_176	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_208	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_118	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_205	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_124	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_211	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_124	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_213	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_126	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_213	Drain_Tertiary	1.00	1.00	0.00

WARD_NO	DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area_acre
Ward No. 2	TD_W_127	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_212	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_154	Drain_Tertiary	1.00	0.00	0.00
Ward No. 2	TD_W_194	Drain_Tertiary	1.00	0.00	0.00
Ward No. 2	TD_W_172	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_210	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_175	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_205	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_176	Drain_Tertiary	1.00	1.00	0.00
Ward No. 2	TD_W_205	Drain_Tertiary	1.00	1.00	0.00
Grand Total				4002.00	1.98

Besides, it will be necessary to re-excavate the khals that serve as primary drains



Map 17. 4: Proposed Drainage network of Ward No.02

17.3.2 Urban Services

Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town is yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water .A water treatment plant will be established and water supply lines in this ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant. Water supply network supply will be established at 2nd phase of water supply installation at Paurashava.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure.

Education Facility

There is one primary school facility in this ward. Additionally, one secondary school is proposed with. Map 17.2 shows the location of proposed educational facilities in ward no. 2 of Akhaura Paurashava.

Recreation and Open Space

A total of 2.66 acres of land have been proposed for recreation and open space purpose to fulfill the requirement of adjoining area.

Ward Center

In every ward one ward center has been proposed. 0.12 acre land proposed in this ward for ward centre.

Table 17. 7: Development Proposal for Ward no. 02

Propose Activities	Area in acre	Mouza Name	Plot No.
Maternity Clinic	0.75	Kharampur	321
Ward Center	0.12	Kharampur	324
Play Ground	2.66	Tanpara	149, 150

Chapter Eighteen: Action Plan for Ward 03

18.1 Proposals and Plans for Ward 03

Ward No. 03 of Akhaura jurisdiction area is a part of the Core Urban area and lies besides of the River Titash. According to the Urban Area Plan, Ward No. 03 consists of New Urban Area and Core Urban Area. Ward no. 03 occupies 12.23% of total lands of the Paurashava where 44.27% of total lands of Ward No. 03 is using as agricultural purposes. Table 18.1 shows the demographic profile of the Ward No. 03.

Table 18. 1: Population Statistics of Ward No. 03

Items	Year	
	2011	2031
Area (acre)	295.04	295.04
Population	3344	4973
Density of Population (acre)	11.30	16.80

Analyzing the over all demand and planning activities to do in details requirements have been discussed in the structure plan and Urban area plan. In the Urban area Plan this part of the Paurashava is quite important as this part have been considered as for Core Urban area and some part have been proposed as the urban area and the rest of the part have been proposed for Agricultural area. Map 18.1 shows the existing Landuses of Ward No. 03.

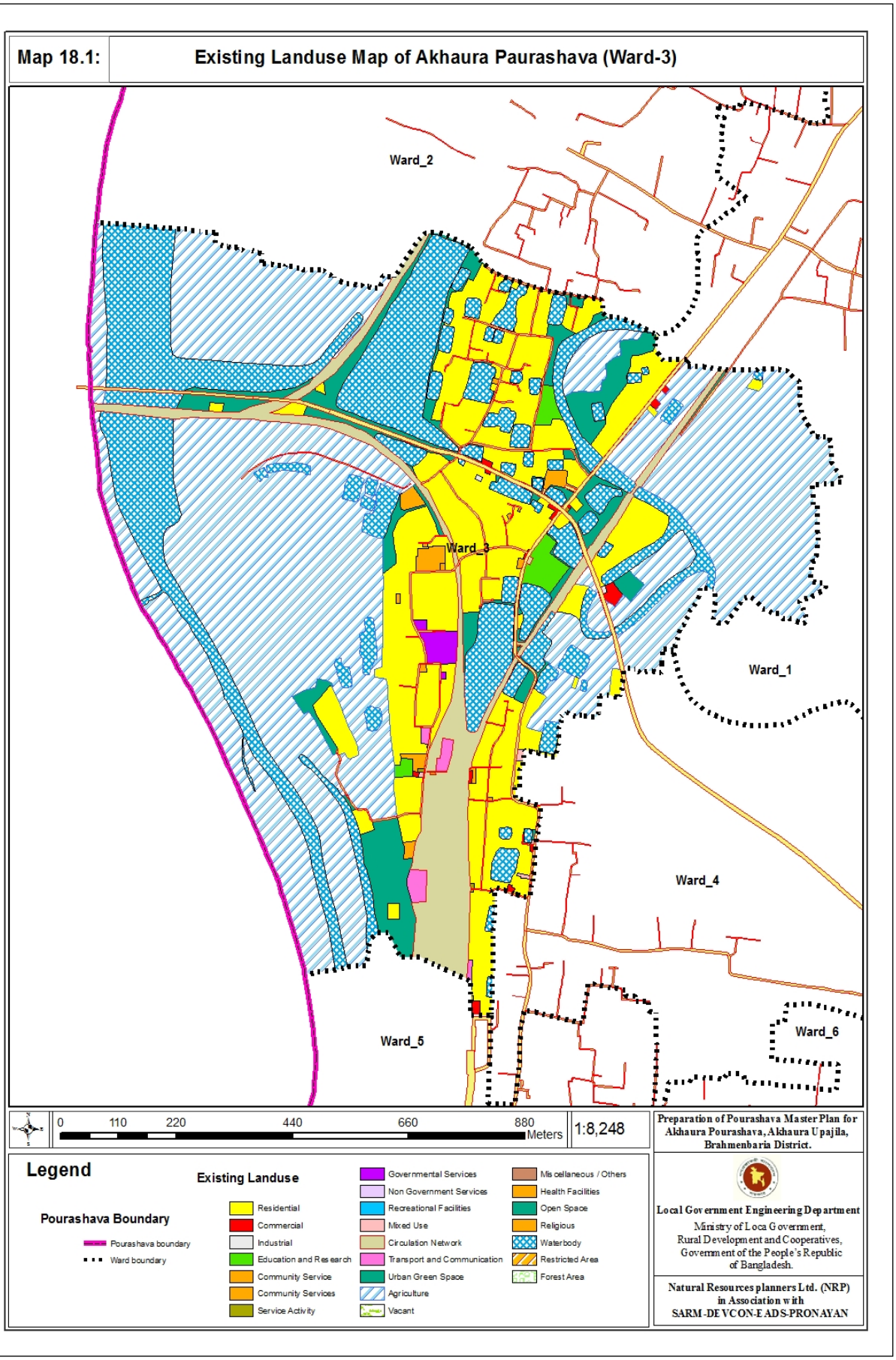
Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 03 are-

- Lands have to acquire for widening the existing roads and for the proposed new roads within first two years (2011 to 2014)
- Widening Bypass Road and protect it from local activities (2011 to 2016).
- Drains have to Construct for this ward (vide Map 11.6) (2011 to 2016).
- Providing all the Municipal Facilities as to provide as the area to grow up as Core area and Pure residential area.

18.2 Priority Tasks

Land acquisition for proposed development is the main tasks for development of Ward No. 03 as few portion of this ward have been proposed for the residential area.

Attempt should make to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land.



Map 18. 1: Exisitng Land Use Map

Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 18.1**).

18.3 Ward Action Plan Proposals

Ward no. 03 is mainly urban in character. Table 18.1 and Table 18.2 shows the existing land use pattern of Ward no. 03 of Akhaura Paurashava.

18.3.1 Proposed Land Use Zoning

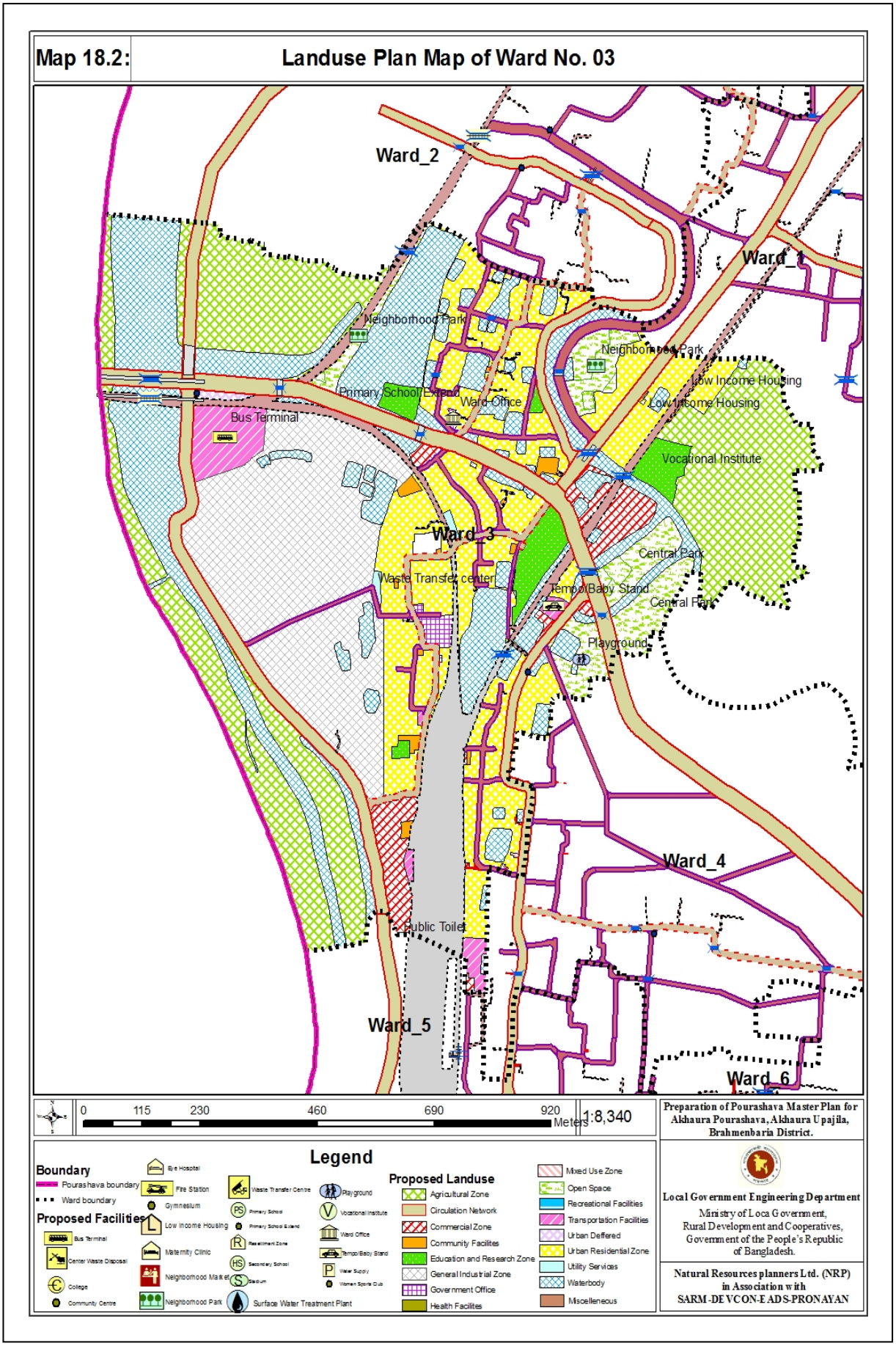
The category wise proposals are presented here. Table 18.2 shows the amount of land existing and proposed uses in Ward no. 3. Map 18.2 and Table 18.2 shows the detail.

Table 18. 2: Landuse proposals for Ward No. 03

Sr. no	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
1	Residential	52.16	17.68	1	Urban Settlement	46.38	15.70
					Rural Settlement	0.00	0.00
2	Commercial	0.69	0.23	2	Commercial	7.30	2.47
3	Industrial/ Manufacturing/	0.05	0.02	3	Industrial/ Manufacturing/	40.94	13.86
4	Education & Research	2.07	0.70	4	Education & Research	6.12	2.07
5	Community Services	1.90	0.64	5	Community Services	1.14	0.39
6	Utility Service	0.08	0.03	6	Utility Service	0.42	0.14
7	Governmental Services	1.03	0.35	7	Governmental Services	1.01	0.34
8	Non Government Services	0.00	0.00	8	Non Government	0.00	0.00
9	Recreational Facilities	0.00	0.00	9	Recreational Facilities	0.33	0.11
10	Mixed Use	0.15	0.05	10	Mixed Use	0.05	0.02
11	Circulation Network	23.87	8.09	11	Circulation Network	53.16	18.00
12	Transport and	1.03	0.35	12	Transport and	5.66	1.92
13	Open Space	17.09	5.79	13	Open Space	13.03	4.41
14	Agricultural	130.61	44.27	14	Agricultural	60.10	20.35
15	Health Service	0.00	0.00	15	Health Services	0.50	0.17
16	Miscellaneous / Others	0.00	0.00	16	Miscellaneous / Others	0.00	0.00
17	Water body	64.30	21.79	17	Water body	58.84	19.92
18	Restricted Area	0.00	0.00	18	Restricted Area	0.00	0.00
19	forest Area	0.00	0.00	19	forest Area	0.00	0.00
20	Recreational Facilities*	0.00	0.00	20	Recreational Facilities*	0.00	0.00
21	Historical and Heritage Site	0.00	0.00	21	Historical and Heritage	0.00	0.00
22	Urban Deferred	0.00	0.00	22	Urban Deferred	0.38	0.13
23	Overlay Zone	0.00	0.00	23	Overlay Zone	0.00	0.00
24	Beach	0.00	0.00	24	Beach	0.00	0.00
25	Miscellaneous	0.00	0.00	25	Miscellaneous	0.00	0.00
Total		295.04	100.00	Total		295.37	100.00

Urban Residential Zone

In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, more than 46.38 acre of land has been earmarked for urban residential use which will occupy almost 15.70% of the total land.



Map 18. 2: Land Use Proposals for Ward No. 03

Low Income Housing

4.54 acre land has been proposed for low income housing which is need future development for poor people

Education and Research

In Ward Action Plan, one Primary school is proposed for extended. At present in Ward No 3, one secondary school and one vocational college is existed.

Commercial Activity

At present, an Only 7.01 acre of land has been proposed for this purpose which will occupy only 2.37% of total land. Additionally, other commercial functions are provided at mixed use zone, along with administrative and community facilities for this ward.

General Industry

This ward is very much potential for industrial area so that 40.94 acre land has been propose for general industries.

Mixed Use Zone

A total of 0.05 acres of land will be used as mixed use.

Circulation network

for any type of development, circulation net-work is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 53.16 acres of land and more than 18.00 % of the total area.

Transport and Communication

One Bus Terminal is proposed for this ward. It will be located just beside Bypass road and occupies 4.09 acres land which is 1.92% total land of the ward.

Community Facilities

Land for community facilities will be 1.14 acre whereas present land for this purpose in this ward is 1.90 acres.

Agricultural Area

The Paurashava including Ward No.03 has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. The total area under this use has been estimated as about 60.10 acres of land covering 20.35% of the total land.

Open Space

Land for Open space will be 13.03 acre which includes open recreational facilities playground, Local Park.

Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 58.84 acres of land which covers almost 19.92% of the total ward area.

Urban Deferred

for the purpose, 0.38 acres of land is proposed for the development of the town in future. It covers almost 0.13% of the whole ward.

Proposed Road Infrastructure Development

A total of 8.78 km of road development has been proposed in first ward action plan for Ward no. 03 of Akhaura Paurashava. Length of the local road will be 3.13 km and width of these roads will covers 35.64% of total road network development proposal. Total length of secondary road will be 1.29 km and width of these roads will be 40 ft for this ward. Total length of 60 ft and 80 ft primary road will be 0.97 and 3.04 km respectably. The detailed scenario of road network development proposal is given in Table 18.3.

Table 18. 3: Summary of Road Network Proposal at Ward no. 03 of Akhaura Paurashava

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25	Local Road	3131.80	35.64	854.19	56.75	2277.61	32.86
40	Secondary Road	1292.08	14.70	0.00	0.00	1292.08	18.64
60	Primary Road	973.13	11.07	360.13	23.93	613.00	8.84
80		3040.25	34.60	290.86	19.32	2749.39	39.66
Existing Road		350.23	3.99	0	0.00	0	0.00
Total		8787.49	100.00	1505.18	100.00	6932.08	100.00

Again a total of 1.50 km of new road has been proposed in Ward no. 03. Table 18.4 and Table 18.5 show the details.

Table 18. 4: New Road Proposal for Ward no. 03

Proposed ID	Type of Road	Proposed Width(In Feet)	Length in Meter
PR_N_198	Primary	80	290.86
PR_N_30	Primary	60	327.51
PR_N_30	Primary	60	32.62
LR_N_27	Local	25	104.65
LR_N_33	Local	25	359.82
LR_N_29	Local	25	389.72
Grand Total			1,505.18

A total of 6.93 km meters of road widening have been proposed for this ward. Table 18.5 shows the details.

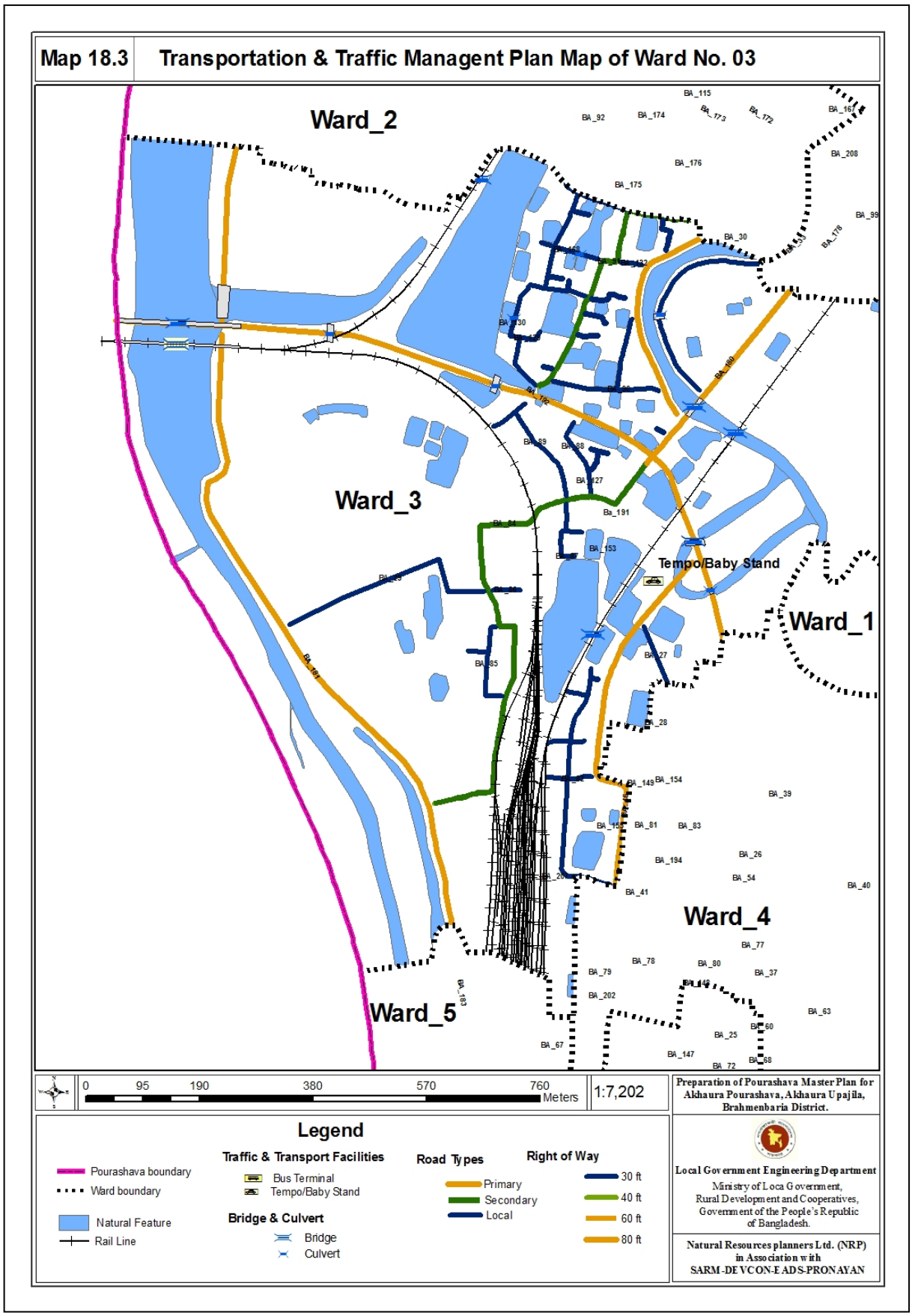
Table 18. 5: Road Widening Proposal in first Ward Action Plan for Ward no. 03

Proposed ID	Existing ID	Type of Road	Proposed Width (In Feet)	Existing Width (In Feet)	Length in Meter
PR_W_178	BA_228	Primary	80	5.02	3.52
PR_W_180	BA_348	Primary	80	6.63	279.59
PR_W_192	BA_423	Primary	80	3.31	180.43
PR_W_192	BA_423	Primary	80	3.31	174.50
PR_W_181	BA_224	Primary	80	6.63	916.39
PR_W_192	BA_423	Primary	80	3.31	147.74
PR_W_192	BA_423	Primary	80	3.31	176.09
PR_W_180	BA_348	Primary	80	6.63	31.09
PR_W_192	BA_423	Primary	80	3.31	143.24
PR_W_192	BA_423	Primary	80	3.31	46.83
PR_W_192	BA_423	Primary	80	3.31	256.95
PR_W_181	BA_224	Primary	80	6.63	200.91
PR_W_192	BA_423	Primary	80	3.31	15.54
PR_W_180	BA_348	Primary	80	6.63	22.30
PR_W_192	BA_423	Primary	80	3.31	21.68
PR_W_192	BA_423	Primary	80	3.31	132.59

Proposed ID	Existing ID	Type of Road	Proposed Width (In Feet)	Existing Width (In Feet)	Length in Meter
PR_W_46	BA_368	Primary	60	10.23	181.13
PR_W_46	BA_368	Primary	60	10.23	1.71
PR_W_46	BA_368	Primary	60	10.23	102.08
PR_W_46	BA_368	Primary	60	10.23	64.45
PR_W_46	BA_368	Primary	60	10.23	43.02
PR_W_46	BA_368	Primary	60	10.23	220.63
SR_W_84	BA_48	Secondary	40	5.18	265.79
SR_W_84	BA_48	Secondary	40	5.18	162.82
SR_W_84	BA_48	Secondary	40	5.18	140.69
SR_W_91	BA_71	Secondary	40	7.02	8.89
SR_W_91	BA_71	Secondary	40	7.02	12.00
SR_W_91	BA_71	Secondary	40	7.02	1.30
SR_W_84	BA_48	Secondary	40	5.18	12.03
SR_W_84	BA_48	Secondary	40	5.18	41.35
SR_W_84	BA_48	Secondary	40	5.18	127.85
SR_W_91	BA_71	Secondary	40	7.02	20.00
SR_W_91	BA_71	Secondary	40	7.02	67.02
SR_W_91	BA_71	Secondary	40	7.02	35.75
SR_W_91	BA_71	Secondary	40	7.02	29.58
SR_W_91	BA_71	Secondary	40	7.02	64.75
SR_W_91	BA_71	Secondary	40	7.02	24.80
SR_W_91	BA_71	Secondary	40	7.02	86.11
SR_W_91	BA_71	Secondary	40	7.02	5.95
SR_W_91	BA_71	Secondary	40	7.02	13.04
SR_W_91	BA_71	Secondary	40	7.02	21.61
SR_W_84	BA_48	Secondary	40	5.18	50.39
SR_W_84	BA_48	Secondary	40	5.18	100.36
LR_W_130	BA_410	Local	25	3.38	70.54
LR_W_168	BA_57	Local	25	9.91	65.98
LR_W_89	BA_68	Local	25	5.02	21.18
LR_W_88	BA_65	Local	25	6.72	79.95
LR_W_92	BA_74	Local	25	8.40	14.15
LR_W_168	BA_57	Local	25	9.91	4.46
LR_W_89	BA_68	Local	25	5.02	44.40
LR_W_82	BA_43	Local	25	3.48	16.20
LR_W_82	BA_43	Local	25	3.48	28.72
LR_W_82	BA_43	Local	25	3.48	82.74
LR_W_82	BA_43	Local	25	3.48	60.61
LR_W_82	BA_43	Local	25	3.48	187.91
LR_W_82	BA_43	Local	25	3.48	38.59
LR_W_82	BA_43	Local	25	3.48	41.63
LR_W_87	BA_63	Local	25	5.02	74.51
LR_W_127	BA_395	Local	25	5.05	37.93
LR_W_85	BA_52	Local	25	4.82	98.28
LR_W_129	BA_408	Local	25	6.72	92.79
LR_W_90	BA_70	Local	25	5.05	70.18
LR_W_168	BA_57	Local	25	9.91	36.75
LR_W_168	BA_57	Local	25	9.91	31.49
LR_W_168	BA_57	Local	25	9.91	50.14
LR_W_168	BA_57	Local	25	9.91	22.45

Proposed ID	Existing ID	Type of Road	Proposed Width (In Feet)	Existing Width (In Feet)	Length in Meter
LR_W_89	BA_68	Local	25	5.02	167.31
LR_W_86	BA_56	Local	25	6.95	46.54
LR_W_168	BA_57	Local	25	9.91	77.96
LR_W_168	BA_57	Local	25	9.91	20.12
LR_W_168	BA_57	Local	25	9.91	63.32
LR_W_90	BA_70	Local	25	5.05	109.87
LR_W_85	BA_52	Local	25	4.82	51.13
LR_W_168	BA_57	Local	25	9.91	30.34
LR_W_168	BA_57	Local	25	9.91	29.56
LR_W_87	BA_63	Local	25	5.02	45.69
LR_W_127	BA_395	Local	25	5.05	14.99
LR_W_82	BA_43	Local	25	3.48	35.30
LR_W_82	BA_43	Local	25	3.48	23.97
LR_W_85	BA_52	Local	25	4.82	33.50
LR_W_132	BA_418	Local	25	4.00	37.84
LR_W_129	BA_408	Local	25	6.72	41.93
LR_W_90	BA_70	Local	25	5.05	118.84
LR_W_87	BA_63	Local	25	5.02	21.93
LR_W_82	BA_43	Local	25	3.48	35.91
Total					6932.08

Circulation Network Proposal Have been shown under the Map 18.3



Map 18. 3: Circulation Networn Proposal for Ward No. 03

Drainage Development Plan

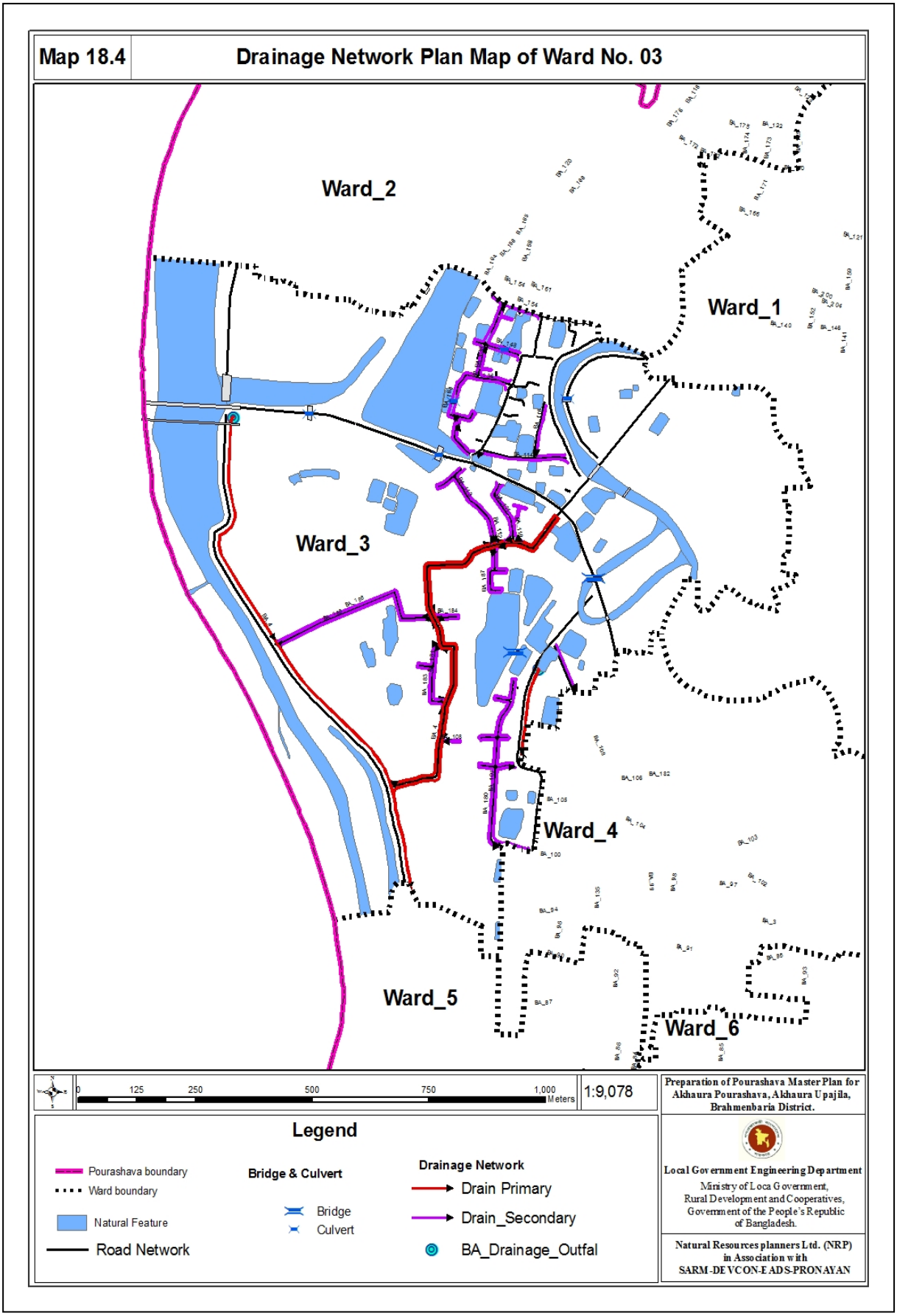
There is no man-made drainage system at Ward no. 03. The existing drainage of the ward mainly depends on the natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. These two will serve as primary drains and will be connected tertiary drain from second Ward Action Plan. Table 18.6 shows the details.

Table 18. 6: Summary of Drainage Network Proposal at Ward no. 03 of Akhaura Paurashava

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area_acre
SD_N_3	Drain Secondary	1.50	137.00	0.07
SD_N_4	Drain Secondary	1.50	2211.00	1.09
TD_N_107	Drain_Tetiary	1.00	129.00	0.06
TD_N_108	Drain_Tetiary	1.00	37.00	0.02
TD_N_110	Drain_Tetiary	1.00	130.00	0.06
TD_N_111	Drain_Tetiary	1.00	70.00	0.04
TD_N_112	Drain_Tetiary	1.00	93.00	0.05
TD_N_113	Drain_Tetiary	1.00	136.00	0.07
TD_N_114	Drain_Tetiary	1.00	94.00	0.05
TD_N_116	Drain_Tetiary	1.00	83.00	0.04
TD_N_136	Drain_Tetiary	1.00	180.00	0.09
TD_N_138	Drain_Tetiary	1.00	121.00	0.06
TD_N_148	Drain_Tetiary	1.00	142.00	0.07
TD_N_164	Drain_Tetiary	1.00	223.00	0.11
TD_N_180	Drain_Tetiary	1.00	410.00	0.20
TD_N_181	Drain_Tetiary	1.00	68.00	0.03
TD_N_182	Drain_Tetiary	1.00	53.00	0.03
TD_N_183	Drain_Tetiary	1.00	108.00	0.05
TD_N_184	Drain_Tetiary	1.00	53.00	0.03
TD_N_185	Drain_Tetiary	1.00	196.00	0.10
TD_N_186	Drain_Tetiary	1.00	196.00	0.10
TD_N_187	Drain_Tetiary	1.00	142.00	0.07
TD_N_192	Drain_Tetiary	1.00	4.00	0.00
TD_N_193	Drain_Tetiary	1.00	7.00	0.00
TD_N_194	Drain_Tetiary	1.00	5.00	0.00
TD_N_136	Drain_Tetiary	1.00	1.00	0.00
TD_N_193	Drain_Tetiary	1.00	1.00	0.00
TD_N_164	Drain_Tetiary	1.00	1.00	0.00
TD_N_193	Drain_Tetiary	1.00	1.00	0.00
Total			5032.00	2.50

Besides, it will be necessary to re-excavate the khals that serve as primary drains.

Drainage Network Proposal for Ward No. 03 have been shown under the Following Map 18.4



Map 18. 4: Drainage network Proposal for Ward No. 03

18.3.2 Urban Services

Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town is yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water. A water treatment plant will be established and water supply lines in this ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant. Water supply network supply will be established at 2nd phase of water supply installation at the Paurashava.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. The consultant proposes one public toilet in this area which covered 0.2 acre.

Transportation Facilities

One bus terminal and one tempo station proposed in this ward which covered 4.48 acre.

Ward Center

In every ward one ward center has been proposed. 0.15 acre land proposed in this ward for ward centre.

Open space and recreation

One neighborhood park and one playground has been proposed in this ward which covered 4.58 acre.

Table 18. 7: Development Proposal at Ward no. 03 of Akhaura Paurashava

Propose Activities	Area in acre	Mouza Name	Plot No.
Low Cost Housing	0.124	Kasba	61
	4.329	Kharampur	548, 549, 554, 555, 556, 562, 564, 569, 574, 712,
Vocational Institute	0.26	Kasba,	82, 719
	1.72	Kharampur,	601, 609, 610, 611, 615, 712
Ward Center	0.15	Kharampur	491
Central Park	3.42	Kasba	11, 34, 49, 91, 109, 117, 128, 501, 502, 505, 697, 801
	2.68	Kharampur	617, 619, 620, 621, 622, 623, 625, 626, 627, 628, 629, 630, 633, 634, 637, 638
Neighborhood Park	0.17	Kasba	4, 7
	4.42	Kharampur	222, 223, 227, 228, 231, 236, 244, 279, 280, 281, 287, 528, 529, 530, 533, 534, 537, 538, 539, 540, 543, 544, 545, 559, 560, 561

Propose Activities	Area in acre	Mouza Name	Plot No.
Play Ground	2.34	Kasba	8, 10, 38, 40, 41, 92, 109, 118, 122, 123, 124, 125, 129, 130, 131, 132, 134, 135, 146, 494, 496, 497, 498, 507, 511, 513
Public Toilet	0.03	Kasba	99, 756
Waste Transfer center	0.20	Kasba	503
Bus & Truck Stand	4.09	Kasba	6
Tempo Stand	0.39	Kasba	92, 116

Chapter Nineteen:
Action Plan for Ward 04

19.1 Proposals and Plans for Ward 04

Ward No. 04 of Akhaura jurisdiction area is a part of the Core Urban area and Residential area. According to the Urban Area Plan, Ward No. 04 consists of Core Urban Area, New Urban Area and Agricultural area. Ward no. 04 occupies 5.81% of total lands only of the Paurashava where 28.86% of total lands of Ward No. 04 is using as Residential purposes. Table 19.1 shows the demographic profile of the Ward No. 04

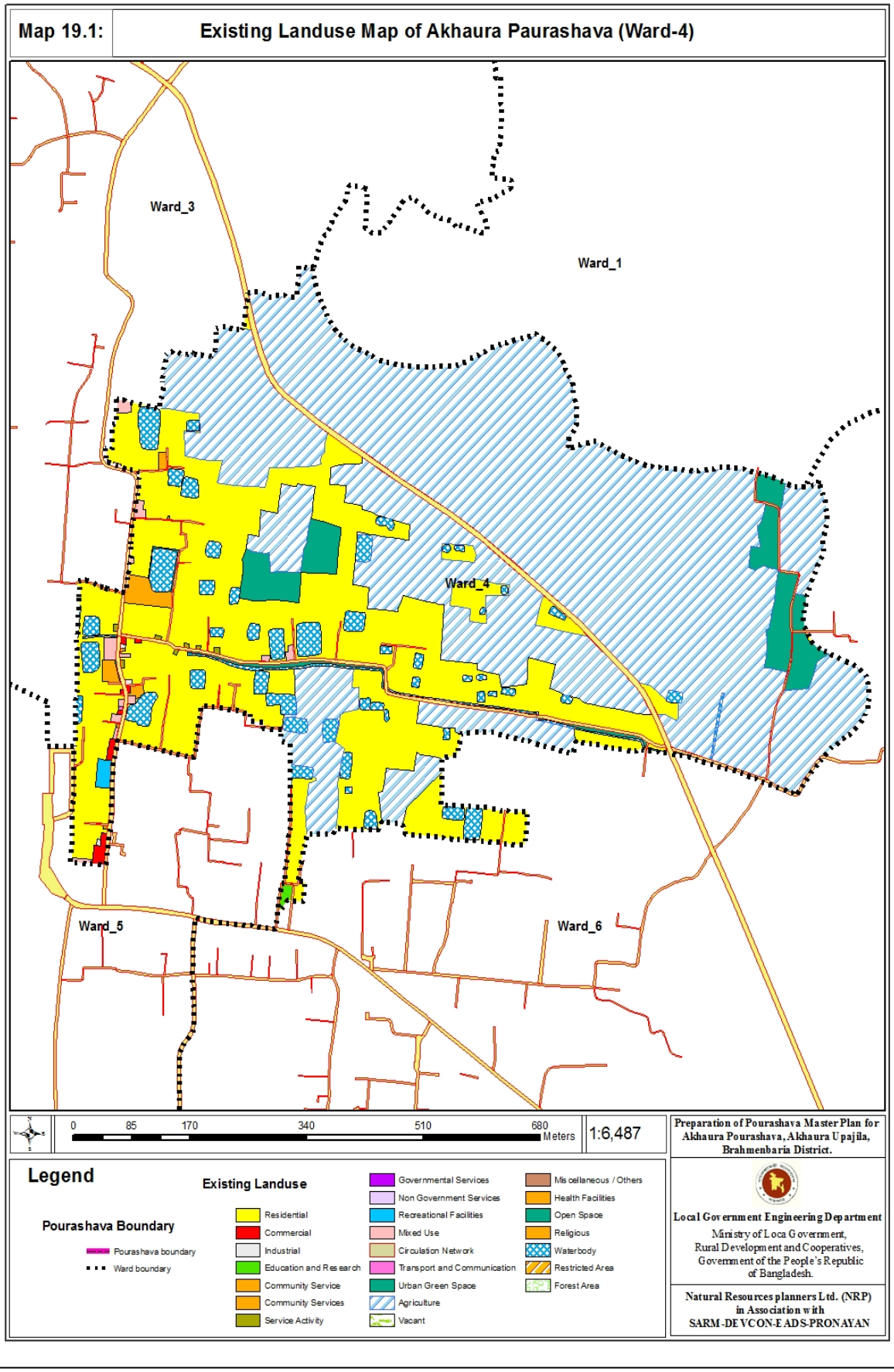
Table 19. 1: Population Statistics of Ward No. 04

Item	Year	
	2011	2031
Area (acre)	140.10	140.10
Population	3830	5713
Density of Population (acre)	27.34	40.78

Analyzing the over all demand and planning activities details requirements have been discussed under the structure plan and Urban area plan. In the Urban area Plan this part of the Paurashava is quite important as this part have been considered as for Administrative and Mixed commercial area, some part have been proposed as natural conserved area with mixed area and the rest of the part have been proposed for highly commercial facilities to serve the Transit oriented Development of Akhaura. Exisiting Land Uses have been shown in the Map 19.1.

Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 04 are-

- Resettlement program to stop the existing spontaneous growth of residential and commercial areas.
- Lands have to acquire for widening the existing roads and for the proposed new roads within first two years (2011 to 2014).
- Construct Bypass Road and protect it from local activities (2011 to 2016).
- Construction of drains (vide **Map 19.4**) (2011 to 2016).
- Providing all the Municipal Facilities as to provide as the area to grow up as Mix commercial with the administrative area



Map 19. 1: Exisiting Land Uses of Ward No. 04

19.2 Priority Tasks

The first priority tasks to develop the residential and commercial areas of this ward are to take under Resettlement program to stop the existing spontaneous growth.

Land acquisition for proposed development is the main tasks for development of Ward No. 04 as few portion of this ward have been proposed for the mixed residential and is administrative area.

Attempt should make to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land.

19.3 Ward Action Plan Proposals

Ward no. 04 is mainly urban and rural in character. Table 19.1 and Table 19.2 shows the existing land use pattern of Ward no. 04 of Akhaura Paurashava.

19.3.1 Proposed Land Use Zoning

The category wise proposals are presented here. Table 19.2 shows the amount of land existing and proposed uses in Ward no. 4.

Table 19. 2: Landuse proposals for Ward No. 04

Sl. no.	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
1	Residential	40.43	28.86	1	Urban Settlement	50.85	36.26
					Rural Settlement	0.00	0.00
2	Commercial	0.27	0.19	2	Commercial	1.04	0.74
3	Industrial/ Manufacturing/	0.04	0.03	3	Industrial/ Manufacturing/	0.02	0.01
4	Education & Research	0.11	0.08	4	Education & Research	5.04	3.59
5	Community Services	0.86	0.61	5	Community Services	0.92	0.66
6	Utility Service	0.11	0.08	6	Utility Service	1.66	1.18
7	Governmental Services	0.00	0.00	7	Governmental Services	0.20	0.14
8	Non Government Services	0.00	0.00	8	Non Government	0.00	0.00
9	Recreational Facilities	0.19	0.14	9	Recreational Facilities	0.13	0.10
10	Mixed Use	0.58	0.41	10	Mixed Use	0.29	0.21
11	Circulation Network	3.90	2.78	11	Circulation Network	17.73	12.64
12	Transport and	0.01	0.01	12	Transport and	0.00	0.00
13	Open Space	5.45	3.89	13	Open Space	5.91	4.21
14	Agricultural	81.51	58.18	14	Agricultural	48.16	34.34
15	Health Service	0.00	0.00	15	Health Service	0.67	0.48
16	Miscellaneous / Others	0.00	0.00	16	Miscellaneous / Others	0.00	0.00
17	Water body	6.64	4.74	17	Water body	7.48	5.33
18	Restricted Area	0.00	0.00	18	Restricted Area	0.00	0.00
19	forest Area	0.00	0.00	19	forest Area	0.00	0.00
20	Recreational Facilities*	0.00	0.00	20	Recreational Facilities*	0.13	0.10
21	Historical and Heritage	0.00	0.00	21	Historical and Heritage	0.00	0.00
22	Urban Deferred	0.00	0.00	22	Urban Deferred	0.00	0.00
23	Overlay Zone	0.00	0.00	23	Overlay Zone	0.00	0.00
24	Beach	0.00	0.00	24	Beach	0.00	0.00
25	Miscellaneous	0.00	0.00	25	Miscellaneous	0.00	0.00
Total		140.10	100.0	Tota		140.2	100.0

Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide Map 19.2).

Urban Residential Zone

In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, more than 50.85 acre of land has been earmarked for urban residential use which will occupy 36.26% of the total land. Map 19.2 and Table 19.2 shows the detail.

Re-settlement Zone

In this ward total 5.92 acre land proposed for re-settlement zone.

Education and Research

In Ward Action Plan, One secondary school is proposed with an area. At present there are one primary school and one secondary scholl exited in the ward. A total of 5.04 acre land has been proposed for this purpose.

Commercial Activity

At present, commercial activity and density of population are very low in this ward. 1.04 acres of land has been proposed for this purpose which will occupy only 0.74 % of total land. Additionally, other commercial functions are provided at mixed use zone, along with administrative and community facilities for this ward.

Mixed Use Zone

A total of 0.29 acres of land will be used as mixed use.

Circulation network

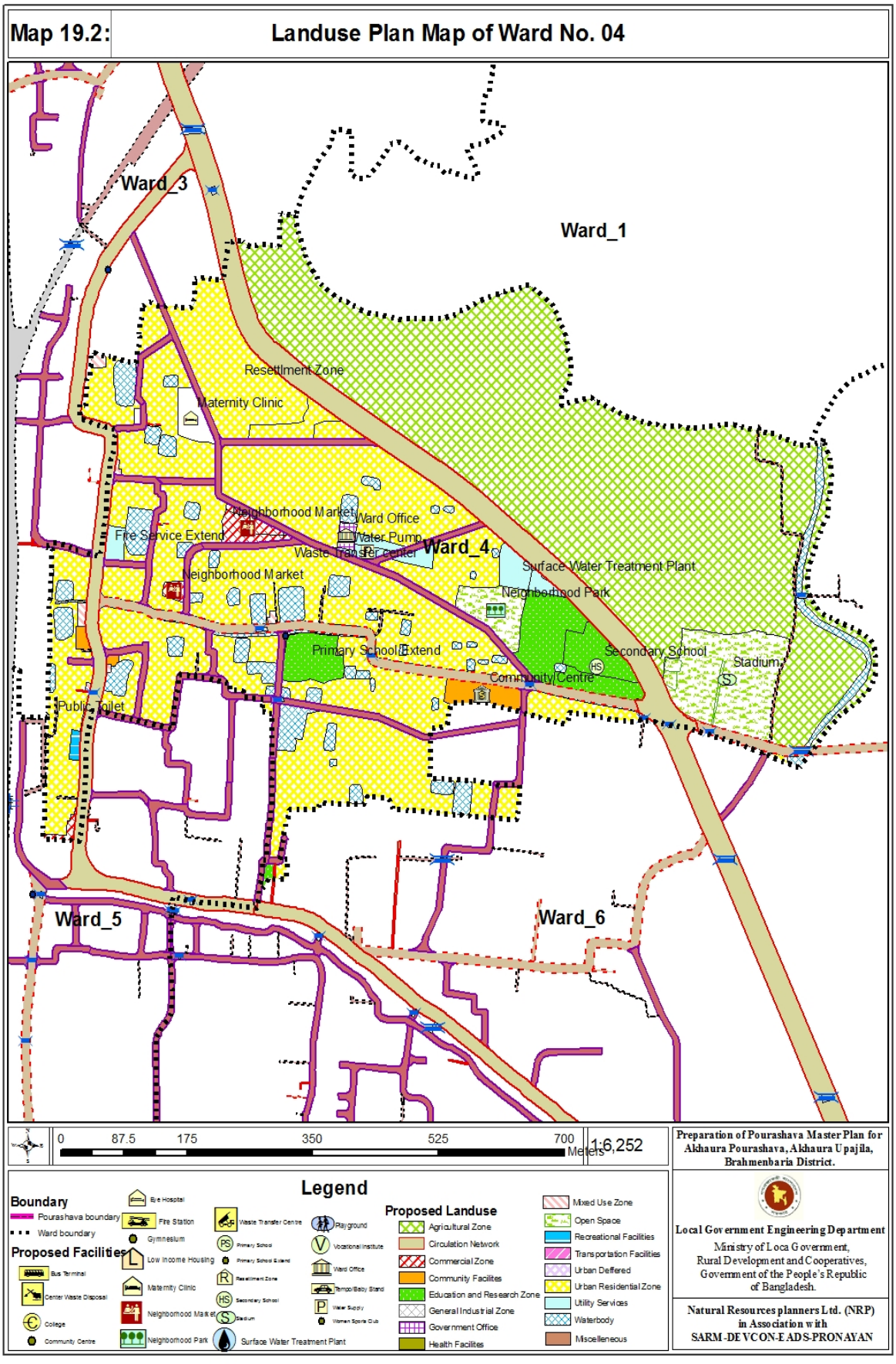
for any type of development, circulation net-work is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 17.71acres of land and more than 40.68% of the total area.

Transport and Communication

As this Ward of the Paurashava no Transport and Communication has been proposed here.

Community Facilities

Land for community facilities will be 0.92 acre whereas present land for this purpose in this ward is 0.86 acres.



Map 19. 2: Land Use Proposals for Ward No. 04

Agricultural Area

The Paurashava including Ward No.04 has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. The total area under this use has been estimated as about 48.16 acres of land covering 34.34% of the total land.

Open Space

Land for Open space will be 5.91 acre which includes open recreational facilities playground, Local Park.

General Indusry

In this ward no industrial zone has been proposed only existing low category industries exist which is covered 0.02 acre.

Water bodies

The plan suggests for preserving most of the water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.25 acres will be preserved as the water retention ponds. The proposed retention area covers 7.48acres of land which covers almost 5.33 % of the total ward area.

Urban Deferred

As this Ward of the Paurashava no Urban Deferred has been proposed here.

Utility Services Zone

A total of 1.66 acre of land covering 1.18% of total land is earmarked as Utility Services zone at Ward no. 04. A water pump is proposed to be located in this ward.

Proposed Road Infrastructure Development

A total of 5.46 km of road development has been proposed in first ward action plan for Ward no. 04 of Akhaura Paurashava. Length of the local road will be 2.93 km and width of these roads 25ft which covers almost 50% of total road network development proposal. Total length of secondary road will be 0.95 km and width is 40ft. 1.24 km primary road will be developed and its width will be will be varied from 60 ft to 80ft for this ward.Summary of road network proposal is given in Table 19.3.

Table 19. 3: Summary of Road Network Proposal at Ward no. 04 of Akhaura Paurashava

Width in ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25	Local Road	2903.02	53.30	1993.18	100.00	909.84	29.31
40	Secondary Road	953.83	17.51	0.00	0.00	953.83	30.73
60	Primary Road	334.98	6.15	0.00	0.00	334.98	10.79
80		905.56	16.63	0.00	0.00	905.56	29.17
Existing Road		348.83	6.41		0.00		0.00
Total		5446.22	100.00	1993.18	100.00	3104.21	100.00

Again a total of 1.99 km of new road have been proposed in Ward no. 04. Table 19.4 and Table 19.5 show the details.

Table 19. 4: New Road Proposal for Ward no. 04

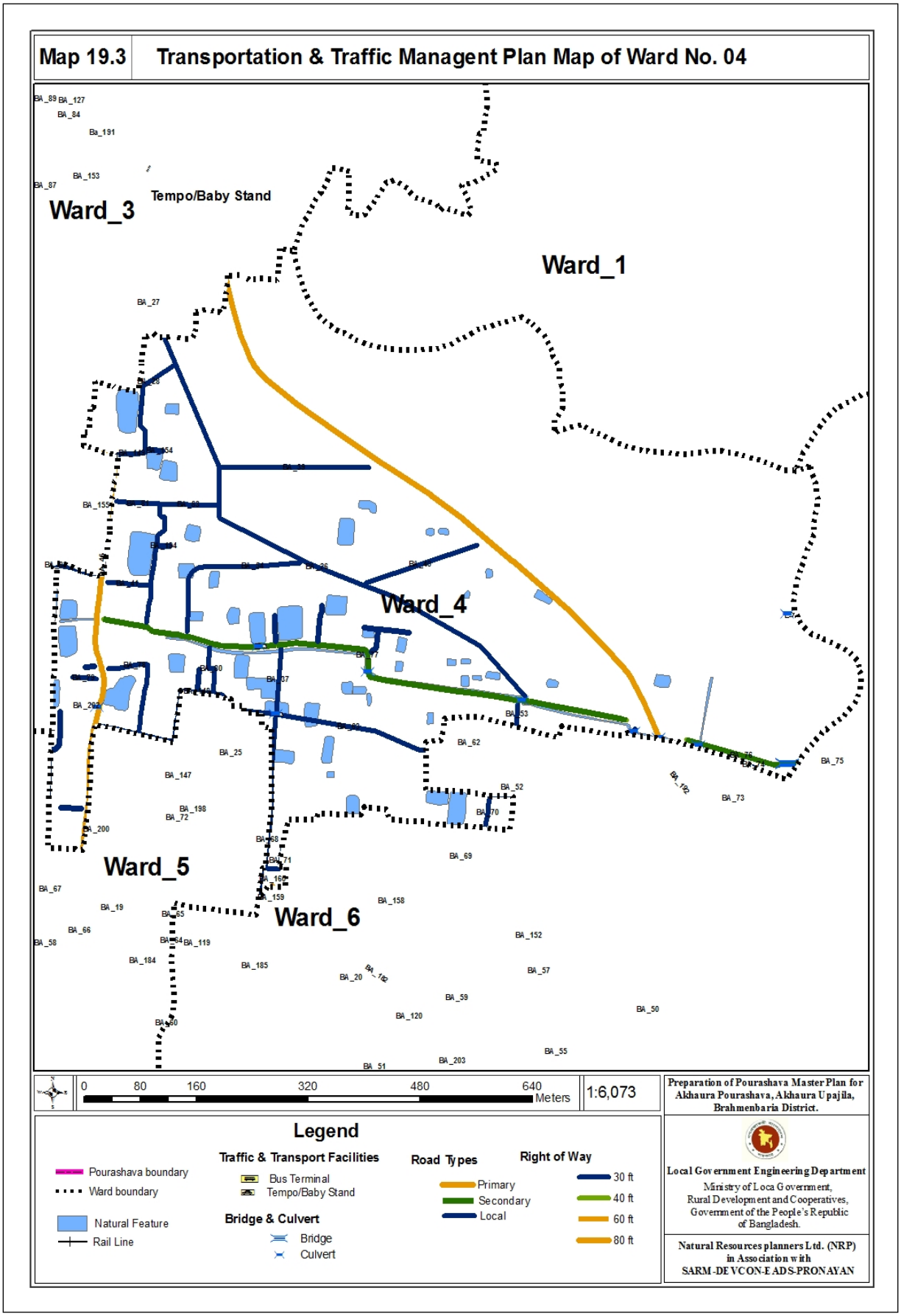
Proposed ID	Type of Road	Proposed Width(In Feet)	Length in Meter
LR_N_54	Local	25	138.12
LR_N_41	Local	25	59.29
LR_N_40	Local	25	167.15
LR_N_53	Local	25	30.02
LR_N_28	Local	25	116.09
LR_N_26	Local	25	524.92
LR_N_26	Local	25	195.72
LR_N_63	Local	25	220.92
LR_N_37	Local	25	86.78
LR_N_60	Local	25	72.57
LR_N_26	Local	25	58.77
LR_N_39	Local	25	212.31
LR_N_63	Local	25	8.45
LR_N_28	Local	25	102.10
Grand Total			1,993.18

A total of 3.34 km of road widening has been proposed for this ward. Among these Table19.5 shows the details.

Table 19. 5: Road Widening Proposal in first Ward Action Plan for Ward no. 04

Proposed ID	Existing ID	Type of Road	Proposed Width (In Feet)	Existing Width (In Feet)	Length in Meter
PR_W_192	BA_423	Primary	80	3.31	9.91
PR_W_192	BA_423	Primary	80	3.31	537.57
PR_W_192	BA_423	Primary	80	3.31	358.08
PR_W_46	BA_368	Primary	60	10.23	69.95
PR_W_46	BA_368	Primary	60	10.23	32.52
PR_W_46	BA_368	Primary	60	10.23	23.77
PR_W_46	BA_368	Primary	60	10.23	40.12
PR_W_46	BA_368	Primary	60	10.23	13.62
PR_W_46	BA_368	Primary	60	10.23	71.92
PR_W_46	BA_368	Primary	60	10.23	58.74
PR_W_46	BA_368	Primary	60	10.23	0.11
PR_W_46	BA_368	Primary	60	10.23	0.52
PR_W_46	BA_368	Primary	60	10.23	23.73
SR_W_76	BA_11	Secondary	40	9.91	164.00
SR_W_77	BA_12	Secondary	40	6.63	379.90
SR_W_77	BA_12	Secondary	40	6.63	158.34
SR_W_77	BA_12	Secondary	40	6.63	34.50
SR_W_77	BA_12	Secondary	40	6.63	94.79
SR_W_77	BA_12	Secondary	40	6.63	61.44
SR_W_77	BA_12	Secondary	40	6.63	60.86
LR_W_83	LR_W_45	Local	25	5.15	81.09
LR_W_148	LR_W_46	Local	25	6.63	56.38
LR_W_80	LR_W_34	Local	25	4.99	37.56
LR_W_70	LR_W_35	Local	25	6.63	44.24
LR_W_82	LR_W_43	Local	25	3.48	47.74
LR_W_78	LR_W_17	Local	25	11.55	48.69
LR_W_81	LR_W_39	Local	25	6.89	54.66
LR_W_81	LR_W_39	Local	25	6.89	61.60
LR_W_149	LR_W_40	Local	25	6.63	0.94

Proposed ID	Existing ID	Type of Road	Proposed Width (In Feet)	Existing Width (In Feet)	Length in Meter
LR_W_149	LR_W_41	Local	25	6.63	44.81
LR_W_80	LR_W_34	Local	25	4.99	31.35
LR_W_148	LR_W_32	Local	25	6.63	9.90
LR_W_148	LR_W_33	Local	25	6.63	4.06
LR_W_71	LR_W_35	Local	25	6.63	9.62
LR_W_68	LR_W_288	Local	25	10.23	1.51
LR_W_71	LR_W_36	Local	25	6.63	9.06
LR_W_149	LR_W_37	Local	25	6.63	12.43
LR_W_81	LR_W_39	Local	25	6.89	49.27
LR_W_78	LR_W_17	Local	25	11.55	14.70
LR_W_81	LR_W_39	Local	25	6.89	13.35
LR_W_149	LR_W_40	Local	25	6.63	12.37
LR_W_81	LR_W_39	Local	25	6.89	57.66
LR_W_79	LR_W_31	Local	25	6.89	35.17
LR_W_78	LR_W_17	Local	25	11.55	38.37
LR_W_68	LR_W_288	Local	25	10.23	85.01
LR_W_78	LR_W_17	Local	25	11.55	42.57
LR_W_78	LR_W_17	Local	25	11.55	5.77
					3104.21



Map 19. 3: Circulation Network Map of Ward No. 04

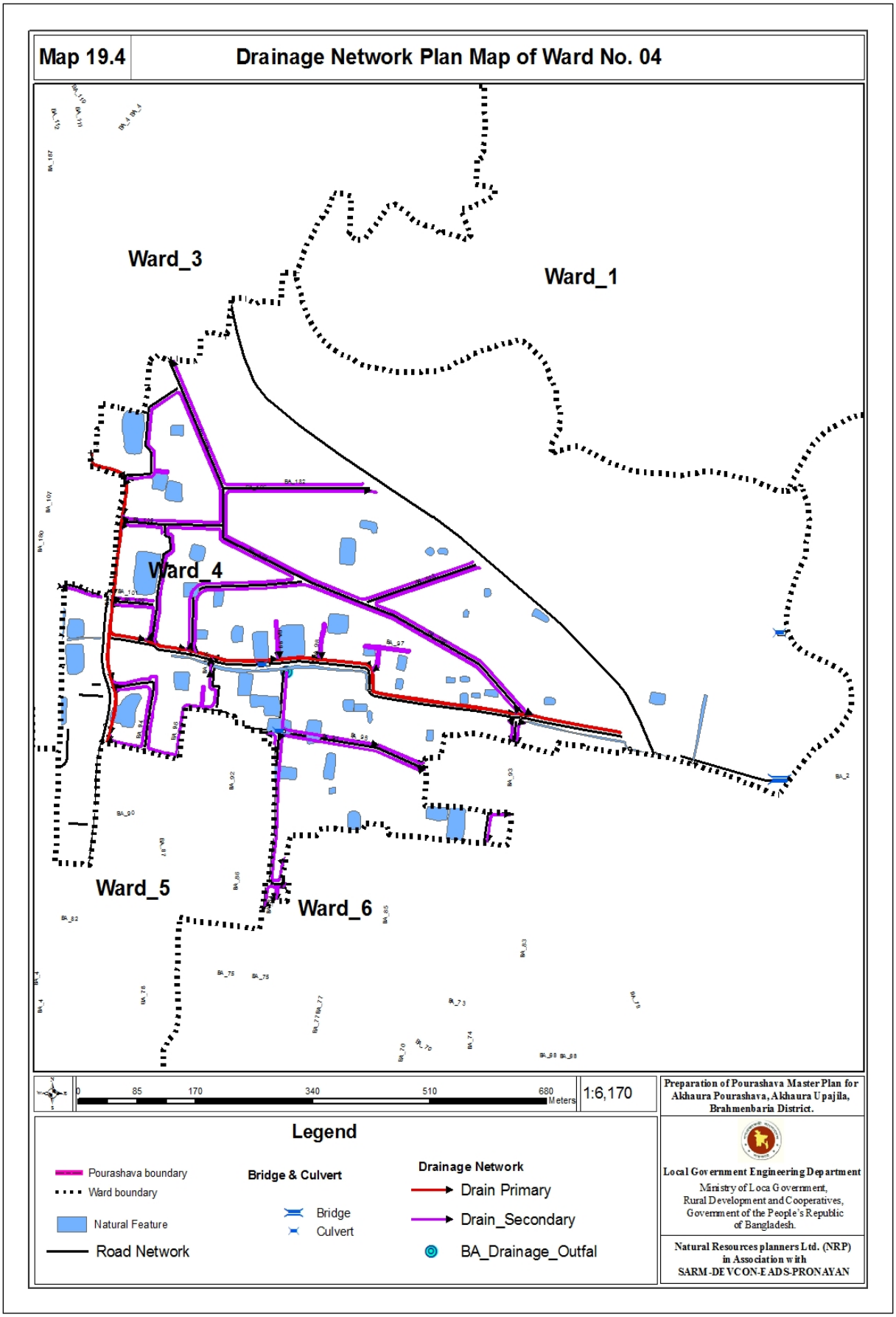
Drainage Development Plan

There is no man-made drainage system at Ward no. 04. The existing drainage of the ward mainly depends on the natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. These two will serve as primary drains and will be connected tertiary drain from second Ward Action Plan. Table 19.6 shows the details.

Table 19. 6: Drainage Proposal in first Ward Action Plan for Ward no. 04

WARD_NO	DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area_acre
Ward No. 4	SD_N_3	Drain Secondary	1.50	920.000	0.456
Ward No. 4	SD_N_3	Drain_Secondary	1.50	1.000	0.000
Ward No. 4	TD_N_84	Drain_Tertiary	1.00	30.000	0.015
Ward No. 4	TD_N_91	Drain_Tertiary	1.00	246.000	0.402
Ward No. 4	TD_N_92	Drain_Tertiary	1.00	16.000	0.008
Ward No. 4	TD_N_93	Drain_Tertiary	1.00	51.000	0.026
Ward No. 4	TD_N_94	Drain_Tertiary	1.00	93.000	0.046
Ward No. 4	TD_N_95	Drain_Tertiary	1.00	162.000	0.081
Ward No. 4	TD_N_96	Drain_Tertiary	1.00	216.000	0.107
Ward No. 4	TD_N_97	Drain_Tertiary	1.00	98.000	0.049
Ward No. 4	TD_N_98	Drain_Tertiary	1.00	50.000	0.025
Ward No. 4	TD_N_99	Drain_Tertiary	1.00	53.000	0.027
Ward No. 4	TD_N_100	Drain_Tertiary	1.00	53.000	0.027
Ward No. 4	TD_N_101	Drain_Tertiary	1.00	29.000	0.015
Ward No. 4	TD_N_102	Drain_Tertiary	1.00	301.000	0.149
Ward No. 4	TD_N_103	Drain_Tertiary	1.00	218.000	0.108
Ward No. 4	TD_N_104	Drain_Tertiary	1.00	308.000	0.153
Ward No. 4	TD_N_105	Drain_Tertiary	1.00	34.000	0.017
Ward No. 4	TD_N_106	Drain_Tertiary	1.00	332.000	0.165
Ward No. 4	TD_N_109	Drain_Tertiary	1.00	279.000	0.138
Ward No. 4	TD_N_135	Drain_Tertiary	1.00	8.000	0.004
Ward No. 4	TD_N_180	Drain_Tertiary	1.00	30.000	0.015
Ward No. 4	TD_N_182	Drain_Tertiary	1.00	195.000	0.097
Ward No. 4	TD_N_135	Drain_Tertiary	1.00	1.000	0.000
Ward No. 4	TD_N_96	Drain_Tertiary	1.00	1.000	0.000
Ward No. 4	TD_N_135	Drain_Tertiary	1.00	1.000	0.000
Grand Total				3726.000	1.851

Besides, it will be necessary to re-excavate the khals that serve as primary drains.



Map 19. 4: Drainage Network Map of Ward No. 04

19.3.2 Urban Services

Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town is yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water. A water treatment plant will be established and water supply lines in this ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant. Water supply network supply will be established at 2nd phase of water supply installation at the Paurashava.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. The consultant proposes one public toilet in this ward which covered 0.2 acre.

Recreation and Open Space

One stadium is proposed in this ward which area is 4.62 acre and One neighborhood park proposed which covered 1.28 acre. Total area of 5.91 acre land proposed for open space and recreation purpose to fulfill the requirement of adjoining area.

Ward Center

In every ward one ward center has been proposed. 0.2 acre land proposed in this ward for ward centre.

Neighborhood Market

One neighborhood market has been proposed which covered 0.82 acre

Table 19. 7: Development Proposal for Ward no. 04

Propose Activities	Area in acre	Mouza Name	Plot No.
Resettlement Zone	5.93	Kasba	22, 25, 139, 162, 175, 456, 462, 463, 469, 477, 491, 521, 522, 529, 530, 532, 535, 545, 549, 566, 568, 571, 572, 574, 584, 585, 728, 806
Neighborhood Market	0.89	Kasba	181, 382, 407, 410, 427, 430, 692, 706,
Secondary School	1.87	Kasba	190, 202, 209, 310, 345, 608, 666, 781,
Maternity Clinic	0.56	Kasba	25, 161, 456,
Ward Center	0.20	Kasba	178
Neighborhood Park	1.29	Kasba	187, 384, 607, 683
Stadium	4.62	Kasba	191, 208, 209, 319, 338, 344, 616, 619, 624, 650, 659, 660, 665, 786, 790
Public Toilet	0.01	Kasba	653

Surface Water treatment Plant	0.03	Kasba	433, 434, 605, 687,
Waste Transfer center	0.25	Kasba	394, 746
Water Pump	0.17	Durgapur	435
Community Centre	0.74	Kasba,	627

Chapter Twenty:
Action Plan for Ward 05

20.1 Proposals and Plans for Ward 05

Ward No. 05 of Akhaura jurisdiction area is the main core part of the Urban area where Akhaura Railway area exists and lies besides of the River Titash. According to the Urban Area Plan, Ward No. 05 consists of Core Urban Area. Ward no. 05 occupies 3.72% of total lands only of the Paurashava where 27.78% of total lands of the Ward is using as Residential purposes. Table 20.1 shows demographic profile of Ward No. 05. Existing Land uses of Ward No. 5 have been shown in the Map 20.1.

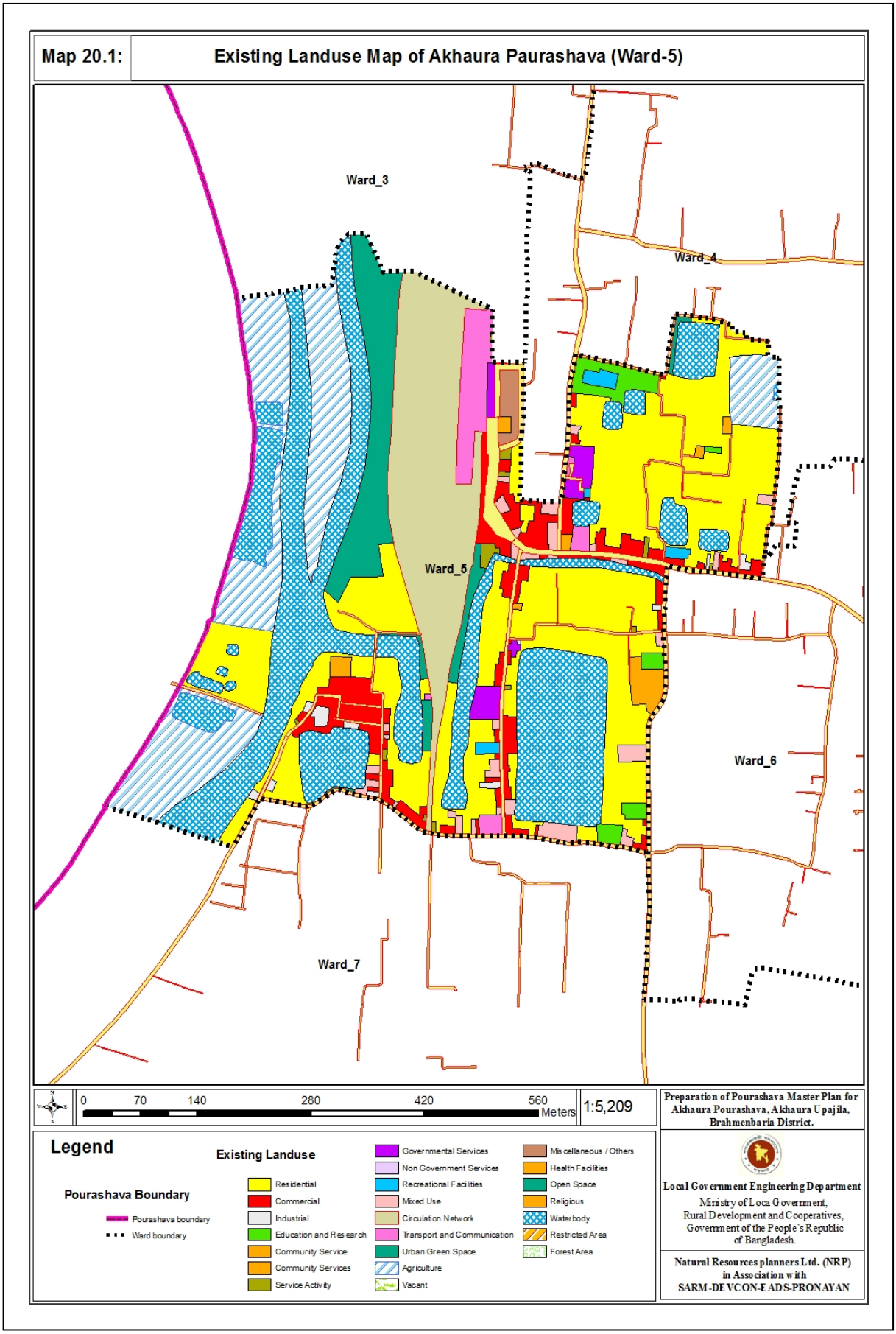
Table 20. 1: Population Statistics of Ward No. 05

Item	Year	
	2011	2031
Area (acre)	89.67	89.67
Population	2958	4440
Density of Population (acre)	32.99	49.21

Analyzing the over all demand and planning activities, detail requirements have been discussed under the structure plan and Urban area plan. In the Urban area Plan this part of the Paurashava is quite important as this part have been considered as for Circulation and commercial area.some part have been proposed as High residential area.

Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 05 are-

- Lands have to acquire for widening the existing roads and for the proposed new roads within first two years (2040 to 2014).
- Construct good circulation nerwork beside the railway station.
- Construct embankment cum road for the River Titash (2040 to 2016).
- Drains Construction (vide **Map 20.4**) (2040 to 2016).
- Providing all the Municipal Facilities as to provide as the area to grow up as commercial area.
- Providing all the Municipal Facilities as to provide as the High residential area besides of the river Titash.



Map 20. 1: Existing Land Use Map of Ward No. 05

20.2 Priority Tasks

Land acquisition for proposed development is the main tasks for development of Ward No. 05 as few portion of this ward have been proposed for the mixed residential and ix administrative area.Attempt should make to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land. Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 20.2**).

20.3 Ward Action Plan Proposals

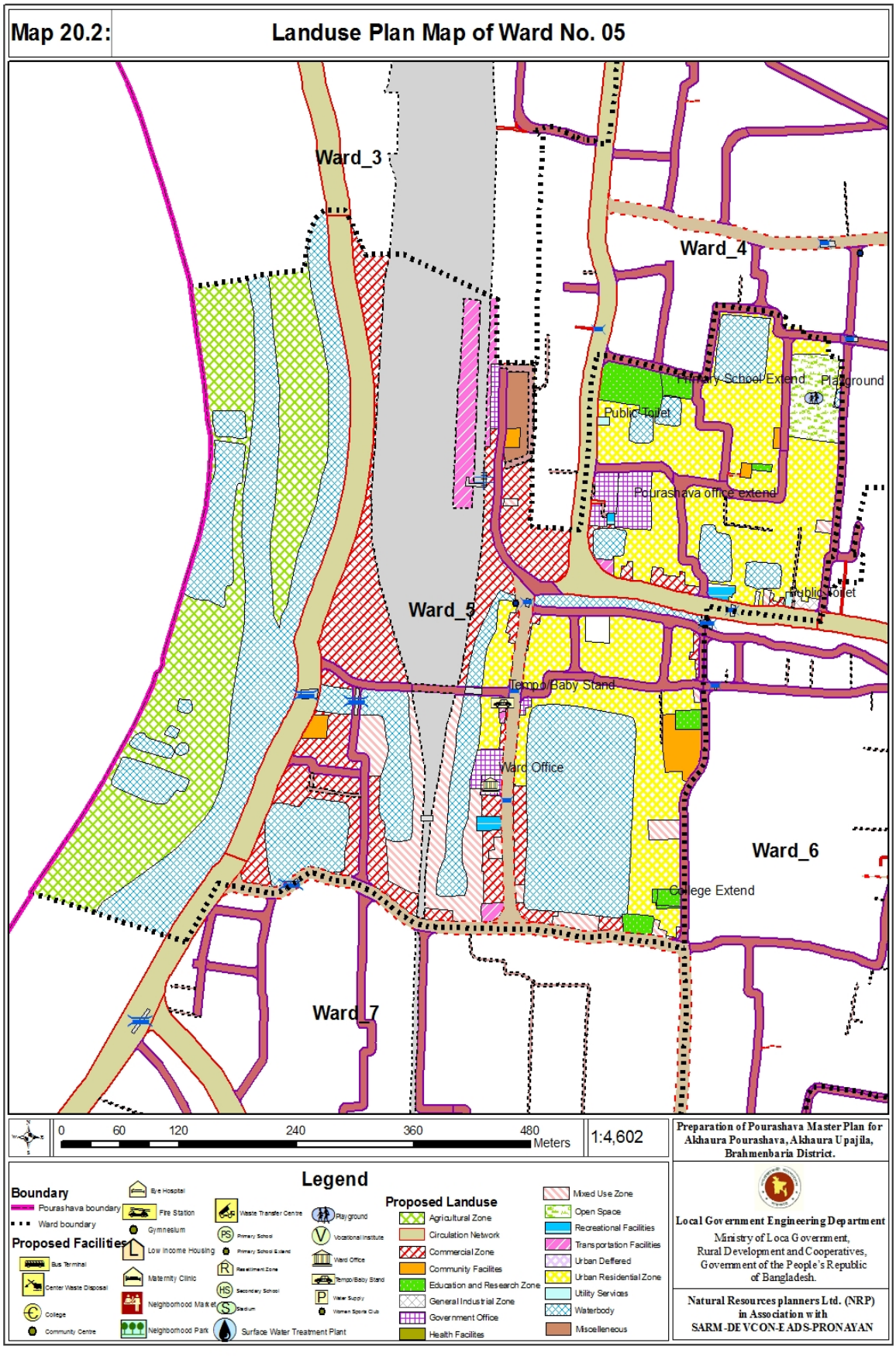
Ward no. 05 is mainly the core part and urban character. Table 20.1 and Table 20.2 shows the existing land use pattern of Ward no. 05 of Akhaura Paurashava.

20.3.1 Proposed Land Use Zoning

The category wise proposals are presented here. Table 16.2 shows the amount of land existing and proposed uses in Ward no. 5.

Table 20. 2: Landuse proposals for Ward No. 05

Sr. no	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
1	Residential	24.91	27.78	1	Urban Settlement	13.82	15.42
					Rural Settlement	0.00	0.00
2	Commercial	4.38	4.88	2	Commercial	8.56	9.54
3	Industrial/ Manufacturing/ Processing	0.37	0.41	3	Industrial/ Manufacturing/ Processing	0.09	0.10
4	Education & Research	1.18	1.32	4	Education & Research	1.21	1.35
5	Community Services	0.87	0.97	5	Community Services	0.72	0.80
6	Utility Service	0.28	0.32	6	Utility Service	0.05	0.05
7	Governmental Services	0.91	1.01	7	Governmental Services	1.25	1.40
8	Non Government Services	0.40	0.44	8	Non Government Services	0.00	0.00
9	Recreational Facilities	0	0.00	9	Recreational Facilities	0.20	0.23
10	Mixed Use	1.38	1.54	10	Mixed Use	3.09	3.44
11	Circulation Network	13.15	14.66	11	Circulation Network	22.79	25.41
12	Transport and Communication	1.92	2.14	12	Transport and Communication	1.44	1.60
13	Open Space	4.85	5.40	13	Open Space	1.01	1.13
14	Agricultural	11.51	12.83	14	Agricultural	12.12	13.52
15	Health Service	0	0.00	15	Health Service	0.15	0.17
16	Miscellaneous / Others	0.42	0.47	16	Miscellaneous / Others	0.41	0.45
17	Water body	23.16	25.83	17	Water body	22.77	25.39
18	Restricted Area	0.00	0.00	18	Restricted Area	0.00	0.00
19	forest Area	0.00	0.00	19	forest Area	0.00	0.00
20	Recreational Facilities*	0.00	0.00	20	Recreational Facilities*	0.00	0.00
21	Historical and Heritage Site	0.00	0.00	21	Historical and Heritage Site	0.00	0.00
22	Urban Deferred	0.00	0.00	22	Urban Deferred	0.00	0.00
23	Overlay Zone	0.00	0.00	23	Overlay Zone	0.00	0.00
24	Beach	0.00	0.00	24	Beach	0.00	0.00
25	Miscellaneous	0.00	0.00	25	Miscellaneous	0.00	0.00
Total		89.67	100.00	Total		89.67	100.00



Map 20. 2: Proposed Land Use Map of Ward no. 05

Urban Residential Zone

In existing land uses, urban residential has been considered as residential use as a whole. In Ward Action Plan, more than 13.87 acres of land has been earmarked for urban residential use which will occupy 15.47% of the total land. Map 20.1 shows the detail.

Education and Research

In Ward Action Plan, one 1 Primary and college is proposed for extension with an area covered educational purpose of 1.21 acres.

Commercial Activity

At present, commercial activity and density of population are high in this ward. This area has about 4.88% of commercial purposes whereas the planning team proposed 9.54% as commercial purpose uses.

General Industrial

No industrial area has been proposed in this ward.

Mixed Use Zone

A total of 3.09 acres of land will be used as mixed use.

Circulation network

To improve the efficiency of transport network of the ward, widening the existing roads are proposed which will consume almost 22.79 acres of land and more than 25.41% of the total area.

Open Space

Land for Open space will be 1.01 acres which includes open recreational facilities playground, Local Park.

Utility Services Zone

As this Ward of the Paurashava no Utility Services Zone has been proposed here.

Proposed Road Infrastructure Development

A total of 4.55 km of road development has been proposed in first ward action plan for Ward no. 05 of Akhaura Paurashava. Length of the local road will be 2.39 km and width of these roads 25ft which covers almost 51% of total road network development proposal. Total length of secondary road will be 0.64 km and width is 40ft. 1.23 km primary road will be developed and its width will be will be varied from 60 ft to 80ft for this ward.The detailed scenario of road network development proposal is given in Table 20.3.

Table 20. 3: Summary of Road Network Proposal at Ward no. 05 of Akhaura Paurashava

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25	Local Road	2390.40	52.49	481.19	100.00	1909.20	53.02
40	Secondary Road	645.13	14.17	0.00	0.00	645.13	17.91
60	Primary Road	286.41	6.29	0.00	0.00	286.41	7.95
80		760.35	16.70	0.00	0.00	760.35	21.11

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
Existing Road		471.42	10.35		0.00		0.00
Total		4553.71	100.00	481.19	100.00	3601.10	100.00

Again a total of 0.48 km of new road have been proposed in Ward no. 05. Table 20.4 show the details.

Table 20. 4: New Road Proposal for Ward no. 05

Proposed ID	Type of Road	Proposed Width(In Feet)	Length in Meter
LR_N_58	Local	25	100.02
LR_N_19	Local	25	97.77
LR_N_19	Local	25	38.25
LR_N_19	Local	25	42.66
LR_N_51	Local	25	84.04
LR_N_25	Local	25	110.31
LR_N_19	Local	25	8.16
Grand Total			481.19

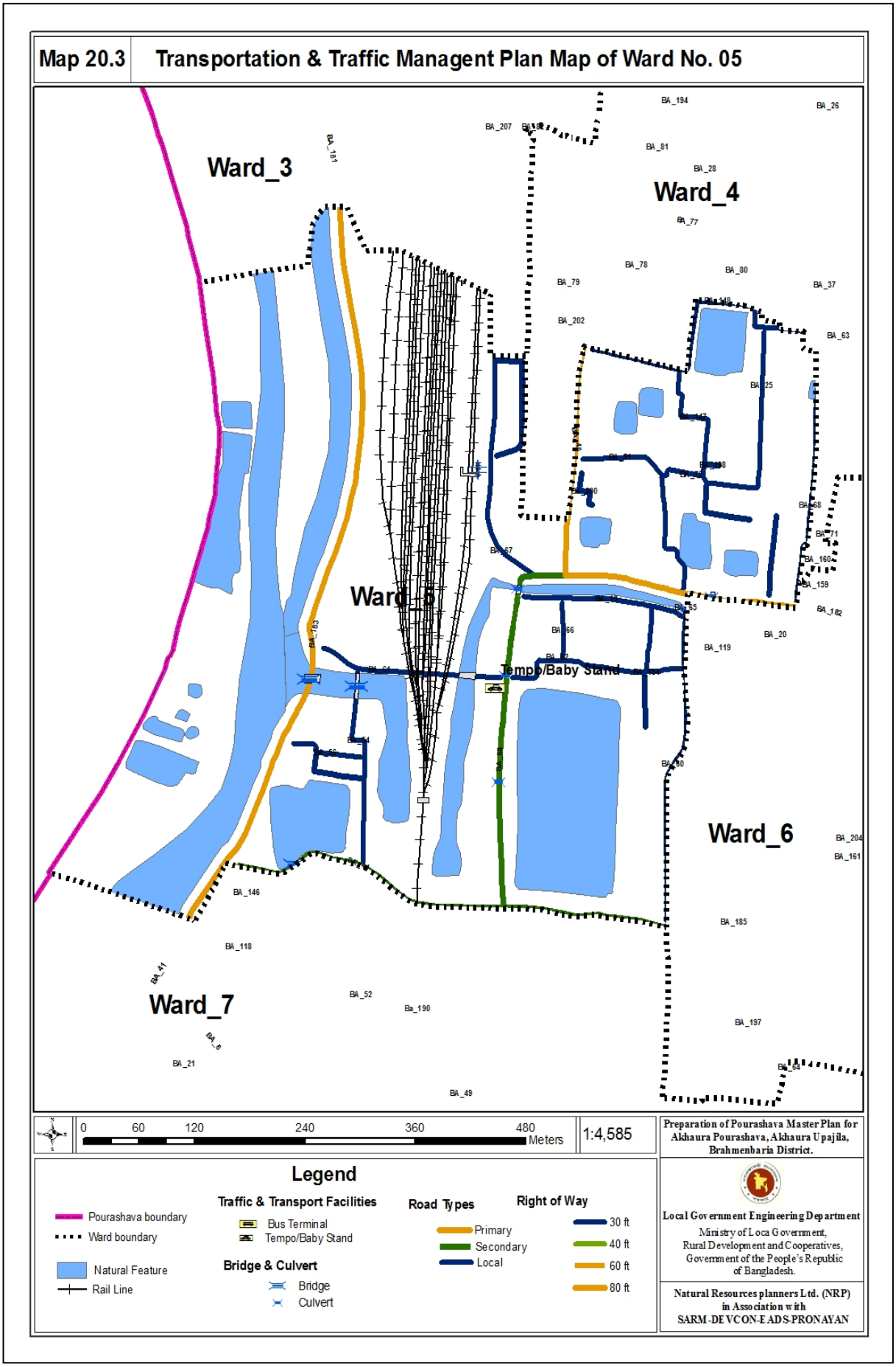
A total of 3.60 km of road widening has been proposed for this ward. Table 20.5 shows the details.

Table 20. 5: Road Widening Proposal in first Ward Action Plan for Ward no. 05

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length
PR_W_41	BA_316	Primary	80	10.23	67.72
PR_W_41	BA_316	Primary	80	10.23	32.24
PR_W_183	BA_224	Primary	80	6.63	211.10
PR_W_181	BA_224	Primary	80	6.63	4.88
PR_W_183	BA_224	Primary	80	6.63	444.41
PR_W_46	BA_368	Primary	60	10.23	47.38
PR_W_46	BA_368	Primary	60	10.23	28.61
PR_W_46	BA_368	Primary	60	10.23	20.15
PR_W_46	BA_368	Primary	60	10.23	12.45
PR_W_46	BA_368	Primary	60	10.23	4.68
PR_W_46	BA_368	Primary	60	10.23	106.89
PR_W_46	BA_368	Primary	60	10.23	9.76
PR_W_46	BA_368	Primary	60	10.23	56.49
SR_W_44	BA_363	Secondary	40	10.23	43.82
SR_W_44	BA_363	Secondary	40	10.23	128.88
SR_W_44	BA_363	Secondary	40	10.23	8.75
SR_W_58	BA_443	Secondary	40	10.23	224.77
SR_W_58	BA_443	Secondary	40	10.23	83.60
SR_W_58	BA_443	Secondary	40	10.23	17.61
SR_W_58	BA_443	Secondary	40	10.23	14.95
SR_W_58	BA_443	Secondary	40	10.23	20.43
SR_W_58	BA_443	Secondary	40	10.23	12.56
SR_W_44	BA_363	Secondary	40	10.23	61.99
SR_W_44	BA_363	Secondary	40	10.23	1.85
SR_W_44	BA_363	Secondary	40	10.23	25.70
SR_W_44	BA_363	Secondary	40	10.23	0.21
LR_W_67	BA_358	Local	25	6.63	97.32
LR_W_72	BA_358	Local	25	6.63	9.11
LR_W_72	BA_358	Local	25	6.63	171.09

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length
LR_W_148	BA_358	Local	25	6.63	44.33
LR_W_66	BA_358	Local	25	6.63	54.83
LR_W_72	BA_358	Local	25	6.63	10.80
LR_W_72	BA_358	Local	25	6.63	109.70
LR_W_67	BA_358	Local	25	6.63	141.27
LR_W_54	BA_420	Local	25	10.23	21.19
LR_W_54	BA_420	Local	25	10.23	97.80
LR_W_61	BA_358	Local	25	6.63	55.46
LR_W_62	BA_358	Local	25	6.63	39.84
LR_W_62	BA_358	Local	25	6.63	19.38
LR_W_184	BA_358	Local	25	8.33	41.64
LR_W_63	BA_358	Local	25	6.63	43.22
LR_W_60	BA_18	Local	25	10.23	140.97
LR_W_184	BA_358	Local	25	8.33	28.85
LR_W_54	BA_420	Local	25	10.23	23.79
LR_W_148	BA_358	Local	25	6.63	12.00
LR_W_148	BA_358	Local	25	6.63	139.76
LR_W_148	BA_358	Local	25	6.63	53.29
LR_W_56	BA_434	Local	25	10.23	30.72
LR_W_68	BA_288	Local	25	10.23	56.91
LR_W_184	BA_358	Local	25	8.33	28.79
LR_W_56	BA_434	Local	25	10.23	49.38
LR_W_184	BA_358	Local	25	8.33	71.93
LR_W_62	BA_358	Local	25	6.63	29.90
LR_W_61	BA_358	Local	25	6.63	43.13
LR_W_54	BA_420	Local	25	10.23	16.95
LR_W_147	BA_358	Local	25	6.63	133.56
LR_W_54	BA_420	Local	25	10.23	41.56
LR_W_68	BA_288	Local	25	10.23	50.75
Total					3601.10

Proposed Circulation Network for this Ward have been shown in the Map 20.3



Map 20. 3: Proposed Circulation Network Map of Ward No. 05

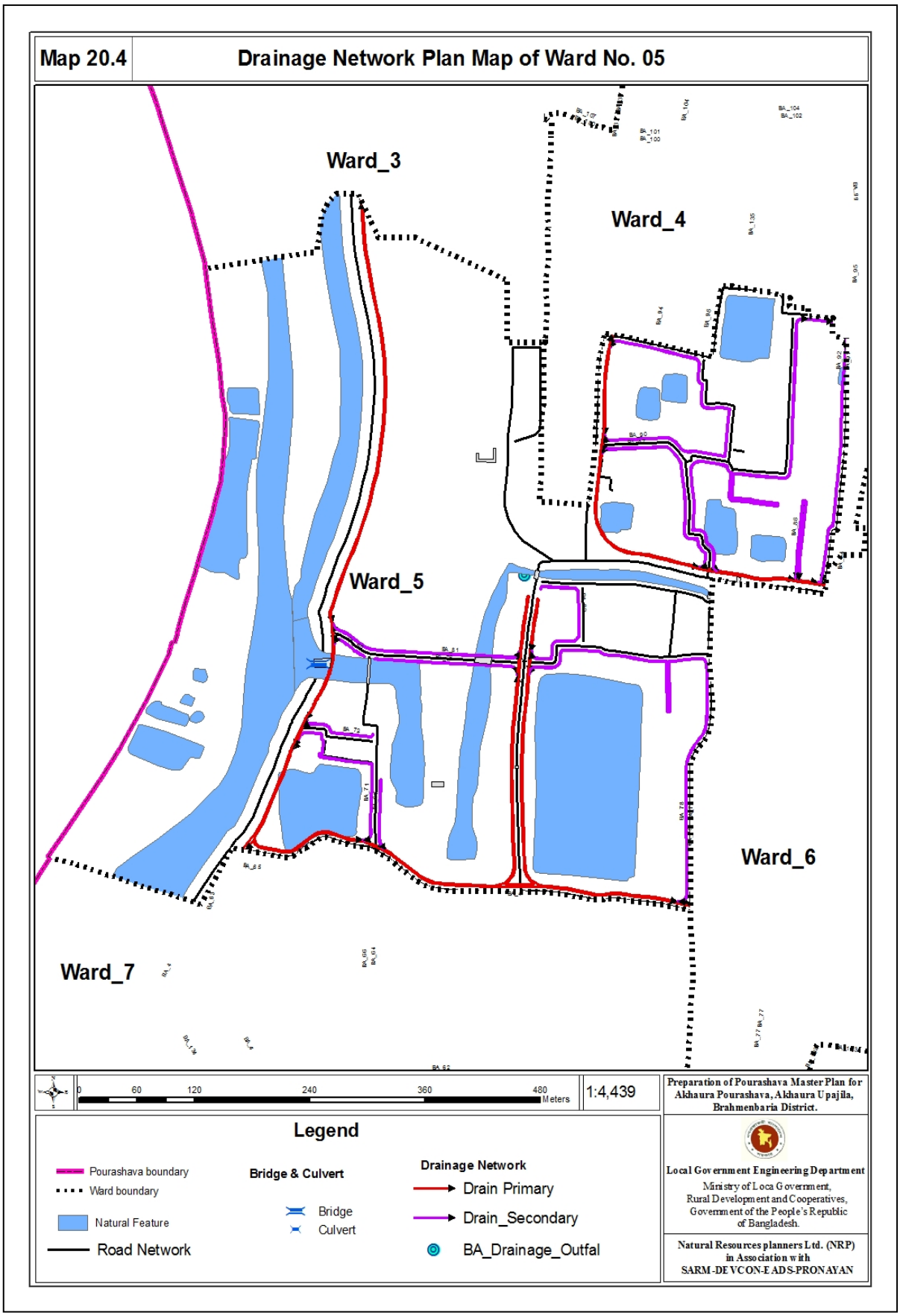
Drainage Development Plan

There few man-made drainage system exist at Ward no. 05. The existing drainage of the ward mainly depends on the natural drainage facilities. The proposed drainage facilities will be developed based on the natural channels. Table 20.6 and Map 20.4 show the details.

Table 20. 6: Proposed Drainage Development Plan Proposals

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area_acre
SD_N_3	Drain Secondary	1.50	333.000	0.165
SD_N_4	Drain Secondary	1.50	1355.000	0.671
TD_N_67	Drain_Tertiary	1.00	35.000	0.018
TD_N_71	Drain_Tertiary	1.00	100.000	0.050
TD_N_72	Drain_Tertiary	1.00	38.000	0.019
TD_N_76	Drain_Tertiary	1.00	76.000	0.038
TD_N_78	Drain_Tertiary	1.00	277.000	0.138
TD_N_80	Drain_Tertiary	1.00	18.000	0.010
TD_N_81	Drain_Tertiary	1.00	102.000	0.051
TD_N_82	Drain_Tertiary	1.00	78.000	0.039
TD_N_86	Drain_Tertiary	1.00	80.000	0.040
TD_N_87	Drain_Tertiary	1.00	106.000	0.053
TD_N_90	Drain_Tertiary	1.00	177.000	0.088
TD_N_92	Drain_Tertiary	1.00	409.000	0.202
Grand Total			3184.000	1.581

Besides, it will be necessary to re-excavate the khals that serve as primary drains.



Map 20. 4:Proposed Drainage Network Plan for Ward No. 05

20.3.2 Urban Services

Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is also another major factor influencing the volume of solid waste. Population and the volume of waste in the town is yet to be large enough to become a problem for it. But the present management system is not satisfactory and it might be led to problem in future. The consultant recommended that home collection system is introduced in the ward by creation of local CBOs. This will cause organized collection of waste and prevent indiscriminate littering.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water. A water treatment plant will be established and water supply lines in this ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant. Water supply network supply will be established at 2nd phase of water supply installation at the Paurashava.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. The consultant proposes one public toilet in this ward which covered 0.04 acre.

Recreation and Open Space

One playground is proposed in this ward which area is 1.09 acre. Total area of 1.09 acre land proposed for open space and recreation purpose to fulfill the requirement of adjoining area.

Ward Center

In every ward one ward center has been proposed. 0.1 acre land proposed in this ward for ward centre.

Neighborhood Market

One tempo stand has been prposed in this ward which coverd 0.03 acre.

Table 20. 7: Development Proposals for ward no 5

Proposed Activities	Area in acre	Mouza Name	Plot No.
Ward Center	0.10	Mishrail	186
Play Ground	1.01	Kasba	216, 331
Public Toilet	0.02	Kasba	630
Rickshaw & Tempo Stand,	0.03	Mishrail	177, 179

Chapter Twenty One: Action Plan for Ward 06

21.1 Proposals and Plans for Ward 06

Ward No. 06 of Akhaura jurisdiction area is the mainly the eastern part of the urban area . According to the Urban Area Plan, Ward No. 06 consists of Core Urban Area (CUA) and New Urban Area (NUA) and agricultural land. Ward no. 06 occupies 13.75% of total lands only of the Paurashava where 25.04% of total lands of the Ward is using as Agricultural purposes. Table 21.1 shows demographic profile of Ward No. 06. Existing Land uses of Ward No. 06 have been shown in the Map 20.2.

Table 21. 1: Population Statistics of Ward No. 06

Item	Year	
	2011	2031
Area (acre)	331.36	331.36
Population	5800.00	8652.36
Density of Population (acre)	17.50	26.11

Analyzing the over all demand and planning activities, detail requirements have been discussed under the structure plan and Urban area plan. In the Urban area Plan this part of the Paurashava is quite important as this part have been considered as for core urban area (CUA), Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 21.2**).

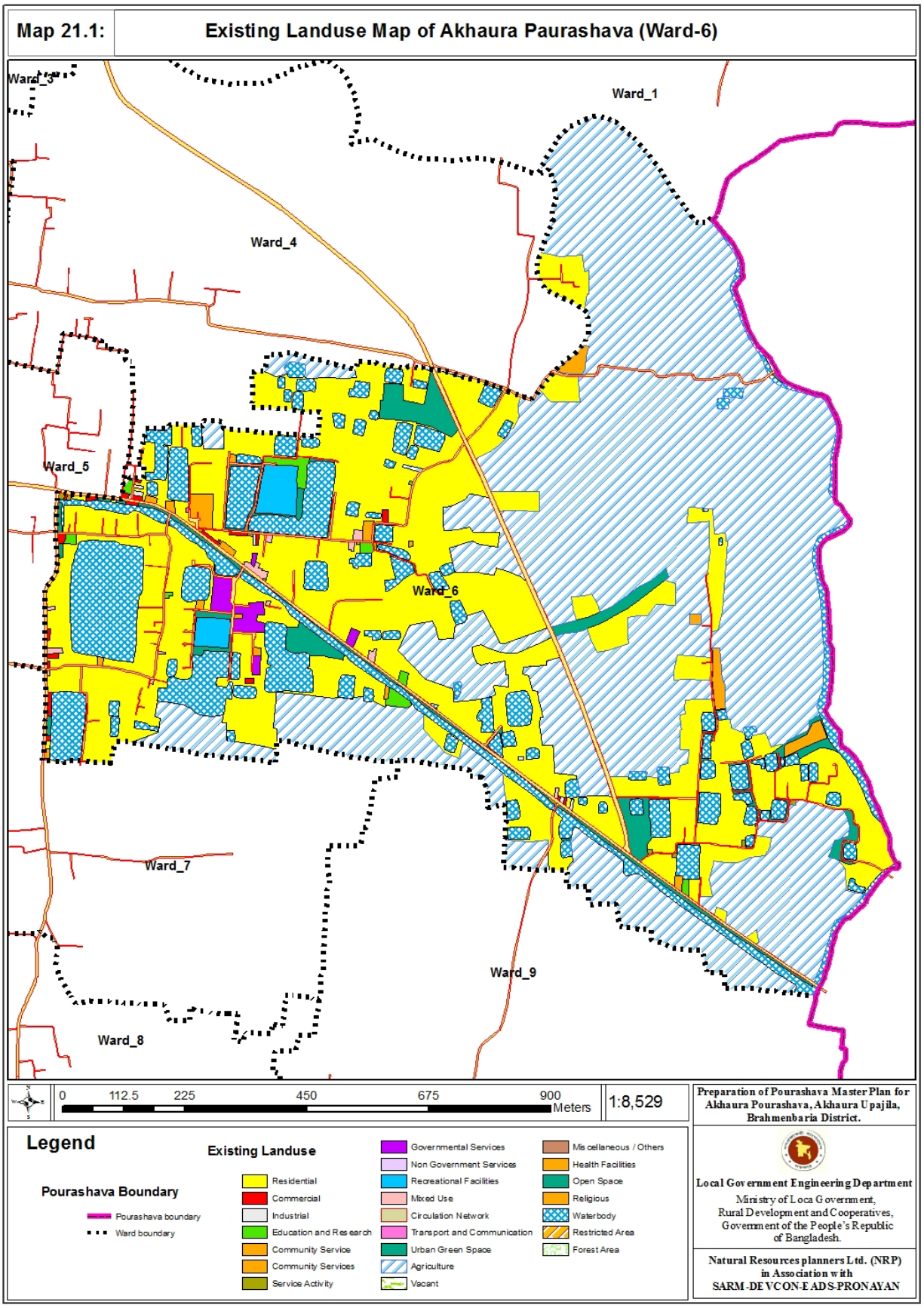
Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 06 are-

- Lands have to acquire for widening the existing roads and for the proposed new roads within first two years (2011 to 2014).
- Construct drains for the Catchments area (vide **Map 21.4**) (2011 to 2016).
- Providing all the Municipal Facilities as to provide as the area to grow up as New Urban area (NUA).
- Prioritze the development activities like Road side Markets, hotel etc. to serve the Agartala (of India) and Akhaura Connecting Roads.

21.2 Priority Tasks

Land acquisition for proposed development is the main tasks for development of Ward No. 06 as few portion of this ward have been proposed for the urban residential and agricultural zone.

Attempt should make to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land.



Map 21. 1: Existing Land Use Map of Ward No. 06

21.3 Ward Action Plan Proposals

Ward no. 06 covers mainly new residential area. Table 21.1 and Table 21.2 shows the existing land use pattern of Ward no. 06 of Akhaura Paurashava.

21.3.1 Proposed Land Use Zoning

The category wise proposals are presented here. Table 21.2 shows the amount of land existing and proposed uses in Ward no. 6.

Table 21. 2: Landuse proposals for Ward No. 06

Sr. no	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
1	Residential	95.70	28.88	1	Urban Settlement	122.71	37.03
		0.00	0.00		Rural Settlement	0.00	0.00
2	Commercial	0.73	0.22	2	Commercial	1.60	0.48
3	Industrial/ Manufacturing/ Processing	0.17	0.05	3	Industrial/ Manufacturing/ Processing	0.14	0.04
4	Education & Research	1.25	0.38	4	Education & Research	9.70	2.93
5	Community Services	2.95	0.89	5	Community Services	2.11	0.64
6	Utility Service	0.00	0.00	6	Utility Service	4.83	1.46
7	Governmental Services	0.00	0.00	7	Governmental Services	4.26	1.29
8	Non Government Services	0.00	0.00	8	Non Government Services	0.00	0.00
9	Recreational Facilities	2.43	0.73	9	Recreational Facilities	0.00	0.00
10	Mixed Use	0.00	0.00	10	Mixed Use	0.30	0.09
11	Circulation Network	8.22	2.48	11	Circulation Network	41.72	12.59
12	Transport and Communication	0.01	0.00	12	Transport and Communication	0.51	0.15
13	Open Space	9.69	2.92	13	Open Space	3.06	0.92
14	Agricultural	161.94	48.87	14	Agricultural	82.97	25.04
15	Health Service	0.00	0.00	15	Health Service	0.74	0.22
16	Miscellaneous / Others	0.58	0.18	16	Miscellaneous / Others	0.00	0.00
17	Water body	45.97	13.87	17	Water body	48.46	14.63
18	Restricted Area	0.21	0.06	18	Restricted Area	0.00	0.00
19	forest Area	1.52	0.46	19	forest Area	0.00	0.00
20	Recreational Facilities*	0.00	0.00	20	Recreational Facilities*	0.00	0.00
21	Historical and Heritage Site	0.00	0.00	21	Historical and Heritage Site	0.00	0.00
22	Urban Deferred	0.00	0.00	22	Urban Deferred	8.23	2.48
23	Overlay Zone	0.00	0.00	23	Overlay Zone	0.00	0.00
24	Beach	0.00	0.00	24	Beach	0.00	0.00
25	Miscellaneous	0.00	0.00	25	Miscellaneous	0.00	0.00
Total		331.36	100.00	Total		331.35	100.00

Urban Residential Zone

In Ward Action Plan, more than 122.71 acres of land has been earmarked for urban residential use which will occupy 37.03% of the total land. Map 21.1 and Table 21.2 shows the detail.

Commercial Activity

At present 0nly 0.48 % of land of the ward area has been proposed for this purpose.

Mixed Use Zone

A total of 0.09 acres of land will be used as mixed use.

Circulation network

for any type of development, circulation net-work is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 41.72 acres of land and more than 12.59 % of the total area.

Open Space

Land for Open space will be 3.06 acres which includes open recreational facilities playground and Local Park.

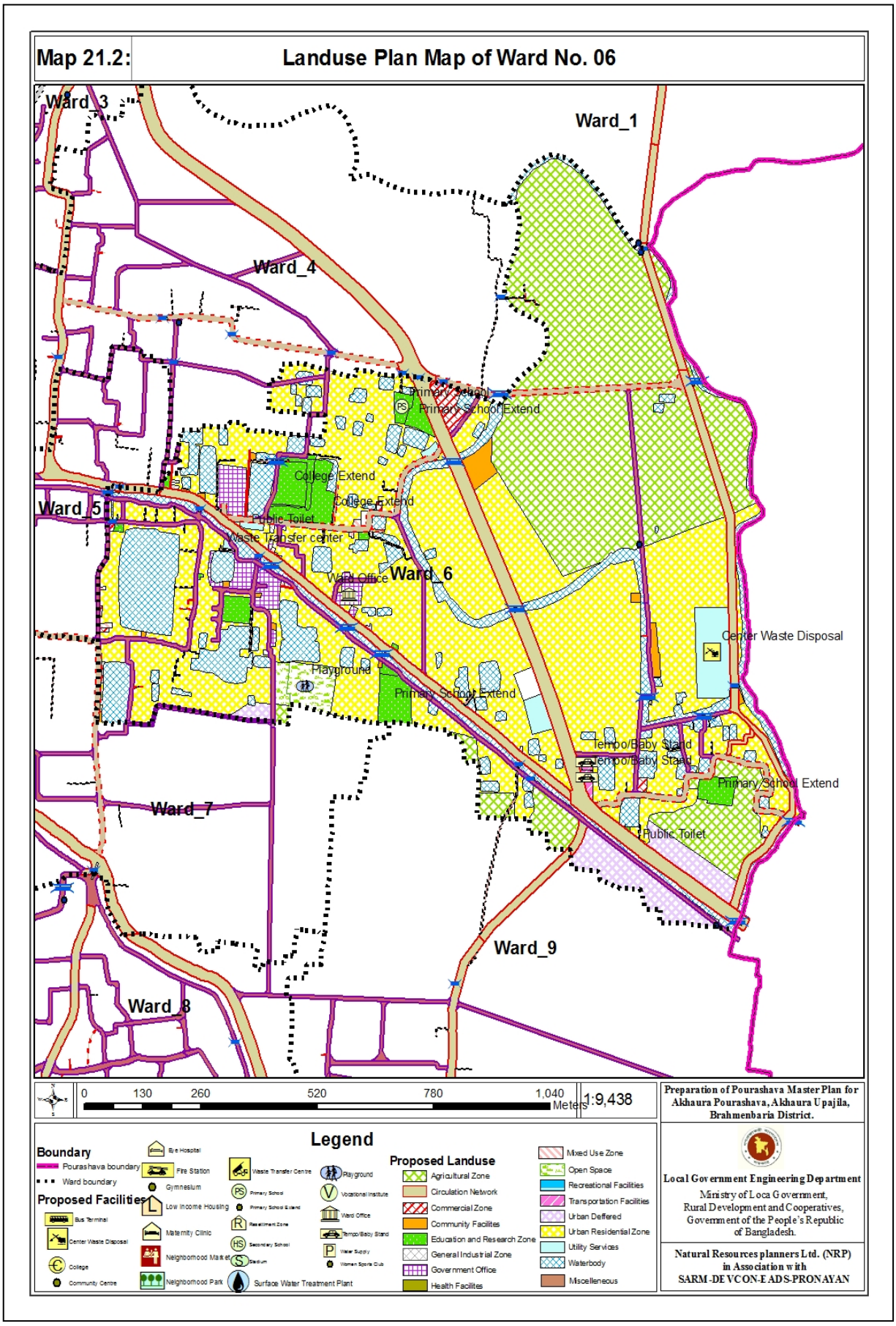
Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 21.2**).

Proposed Road Infrastructure Development

A total of 13.87 km of road development has been proposed in first ward action plan for Ward no. 06 of Akhaura Paurashava. Length of the local road will be 6.7 km and width of these roads will be 25 ft. Total length of secondary road will be 1.8 km and width of these roads will be 40ft for this ward. Total length of primary road will be 4.1 and that will vary from 60 ft to 80 ft.The detailed scenario of road network development proposal is given in Table 21.3.

Table 21. 3: Summary of Road Network Proposal at Ward no. 06 of Akhaura Paurashava

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25.00	Local Road	6762.00	48.75	3156.00	92.06	3606.00	38.36
40.00	Secondary Road	1807.13	13.03		0.00	1807.13	19.22
60.00	Primary Road	2877.91	20.75	272.17	7.94	2605.74	27.72
80.00		1381.47	9.96		0.00	1381.47	14.70
Existing Road		1042.00	7.51		0.00		0.00
Total		13870.51	100.00	3428.17	100.00	9400.33	100.00



Map 21. 2: Proposed Land Use Map of Ward no. 06

Again a total of 3.4 km of new road have been proposed in Ward no. 06. Table 21.4 shows the details.

Table 21. 4: New Road Proposal for Ward no. 06

WARD_NO	Proposed ID	Type of Road	Proposed Width(In Feet)	Length in Meter
Ward_6	SR_N_69	Secondary	60	272.17
Ward_6	LR_N_20	Local	25	1697.71
Ward_6	LR_N_22	Local	25	454.94
Ward_6	LR_N_23	Local	25	202.98
Ward_6	LR_N_50	Local	25	371.93
Ward_6	LR_N_52	Local	25	128.00
Ward_6	LR_N_62	Local	25	125.86
Ward_6	LR_N_67	Local	25	174.68
Grand Total				3428.27

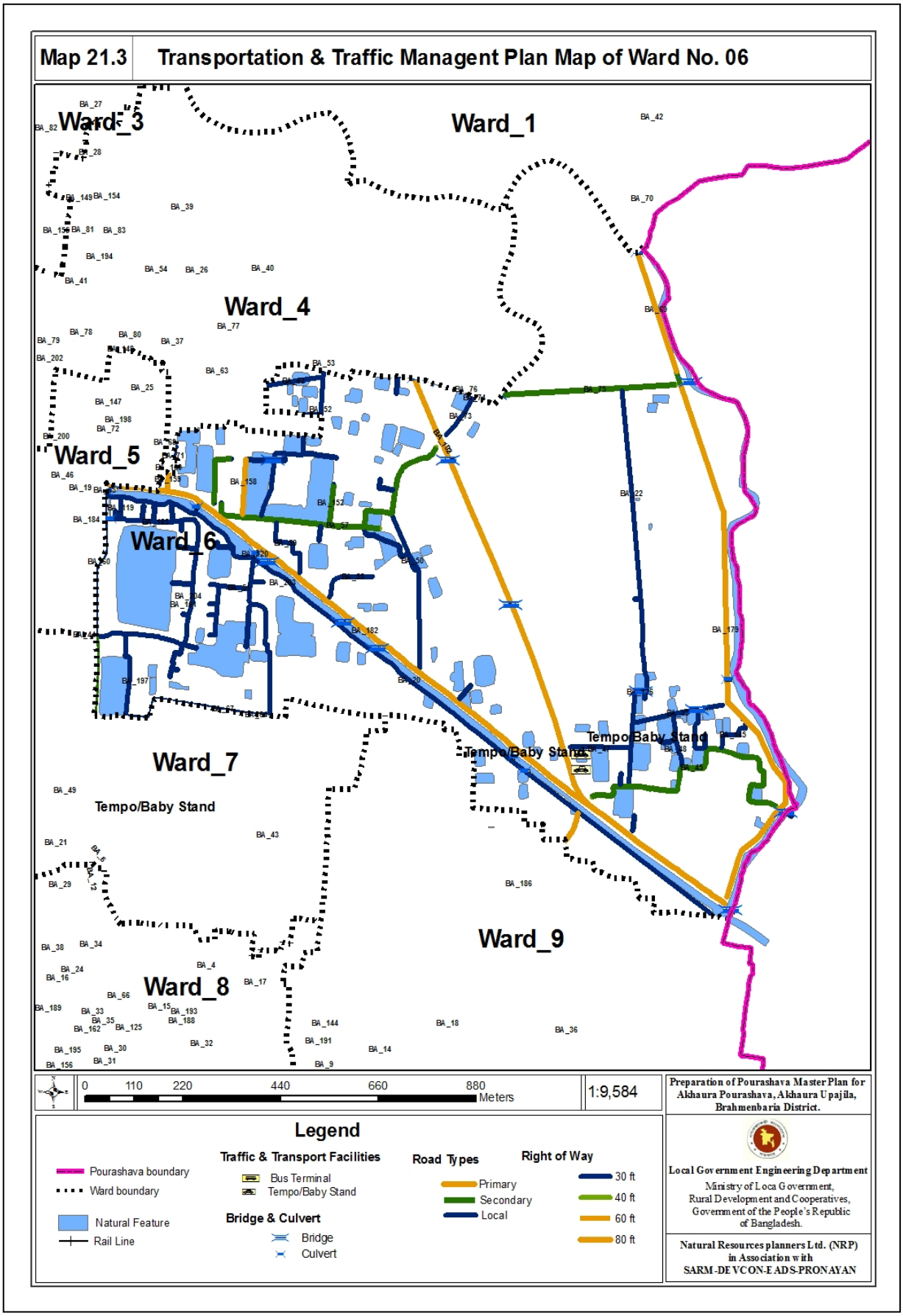
A total of 9.4 km of road widening has been proposed for this ward. Table21.5 shows the details.

Table 21. 5: Road Widening Proposal in first Ward Action Plan for Ward no. 06

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length in Meter
PR_W_192	BA_405	Primary	80	3.31	1381.47
PR_W_179	BA_377	Primary	60	10.23	1253.62
PR_W_182	BA_18	Primary	60	6.59	1215.49
PR_W_19	BA_405	Primary	60	10.23	66.89
PR_W_46	BA_405	Primary	60	10.23	69.75
SR_W_192	BA_359	Secondary	40	6.63	31.50
SR_W_44	BA_396	Secondary	40	8.30	119.69
SR_W_45	BA_377	Secondary	40	10.23	656.06
SR_W_57	BA_377	Secondary	40	6.63	607.50
SR_W_75	BA_377	Secondary	40	6.63	392.38
LR_W_119	BA_377	Local	25	6.66	39.89
LR_W_120	BA_405	Local	25	10.23	13.75
LR_W_126	BA_399	Local	25	8.27	426.63
LR_W_152	BA_399	Local	25	6.76	83.60
LR_W_158	BA_279	Local	25	8.27	120.17
LR_W_159	BA_279	Local	25	8.27	32.65
LR_W_185	BA_405	Local	25	5.05	853.96
LR_W_47	BA_405	Local	25	20.47	133.15
LR_W_48	BA_405	Local	25	20.47	108.63
LR_W_50	BA_359	Local	25	10.23	205.94
LR_W_51	BA_359	Local	25	6.63	624.19
LR_W_53	BA_359	Local	25	10.23	25.07
LR_W_55	BA_359	Local	25	20.47	127.29
LR_W_57	BA_359	Local	25	10.23	158.93
LR_W_59	BA_359	Local	25	10.23	157.49
LR_W_60	BA_359	Local	25	10.23	111.23
LR_W_69	BA_359	Local	25	10.23	245.85

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length in Meter
LR_W_71	BA_359	Local	25	10.23	31.40
LR_W_73	BA_359	Local	25	10.23	106.20
Grand Total					9400.34

Proposed Circulation Network for this Ward have been shown in the Map 21.3



Map 21. 3: Proposed Circulation Network Map of Ward No. 05

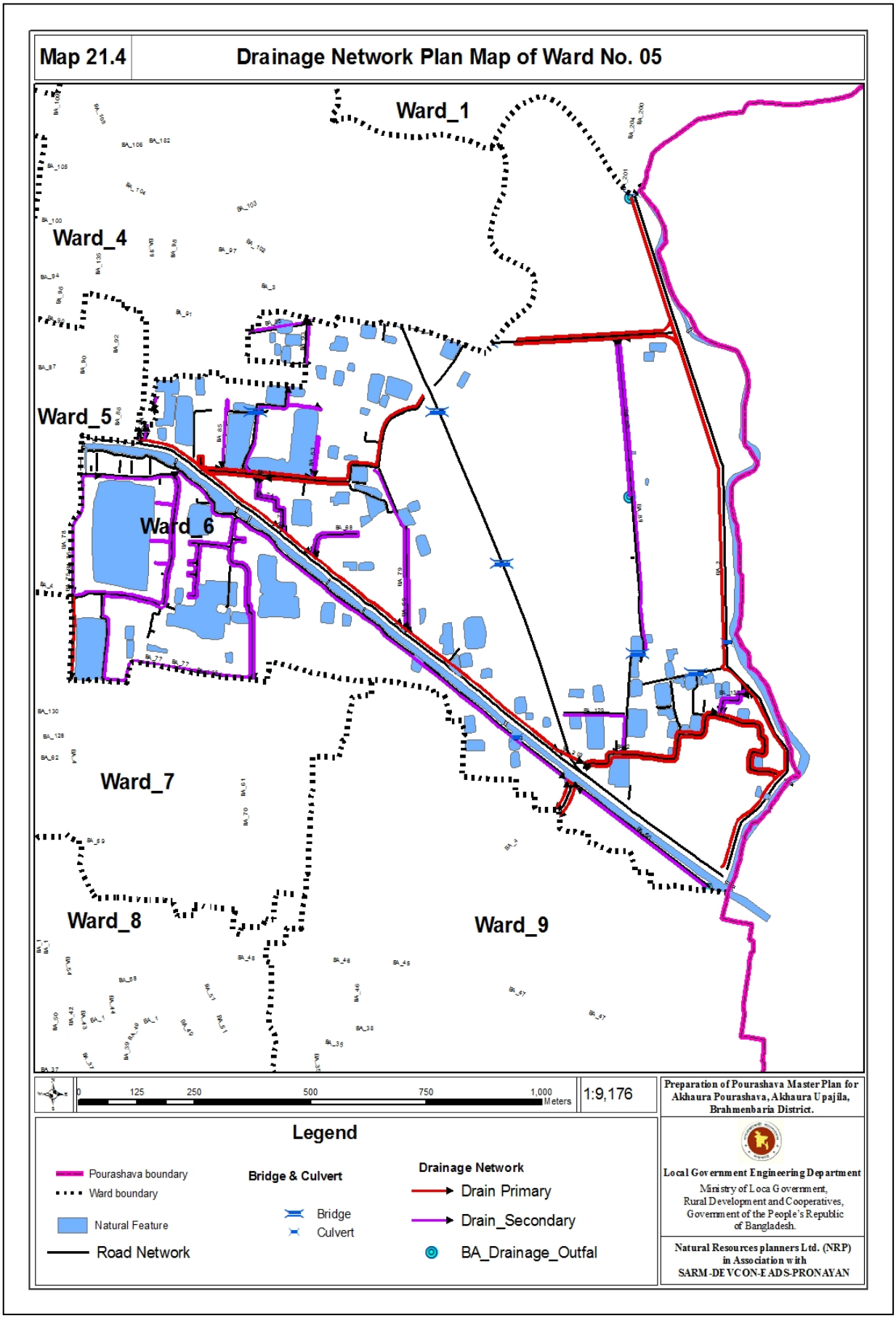
Drainage Development Plan

There is no man-made drainage system at Ward no. 6. The existing drainage of the ward mainly depends on the natural drainage facilities. The proposals for drainage facilities in this Ward have been shown under the Table 21.6

Table 21. 6: Proposed Drainage Development Plan Proposals

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area (acre)
SD_N_2	Drain Secondary	1.50	2704.00	1.34
SD_N_3	Drain Secondary	1.50	1577.00	0.78
SD_N_4	Drain Secondary	1.50	261.00	0.13
SD_N_203	Drain Secondary	1.50	44.00	0.02
SD_N_2	Drain Secondary	1.50	1.00	0.00
SD_N_203	Drain Secondary	1.50	1.00	0.00
SD_N_3	Drain Secondary	1.50	1.00	0.00
SD_N_203	Drain Secondary	1.50	1.00	0.00
TD_N_60	Drain_Tertiary	1.00	172.00	0.09
TD_N_68	Drain_Tertiary	1.00	132.00	0.07
TD_N_69	Drain_Tertiary	1.00	108.00	0.05
TD_N_70	Drain_Tertiary	1.00	650.00	0.32
TD_N_73	Drain_Tertiary	1.00	82.00	0.04
TD_N_74	Drain_Tertiary	1.00	78.00	0.04
TD_N_75	Drain_Tertiary	1.00	558.00	0.28
TD_N_77	Drain_Tertiary	1.00	955.00	0.47
TD_N_79	Drain_Tertiary	1.00	173.00	0.09
TD_N_83	Drain_Tertiary	1.00	86.00	0.04
TD_N_84	Drain_Tertiary	1.00	26.00	0.01
TD_N_85	Drain_Tertiary	1.00	82.00	0.04
TD_N_88	Drain_Tertiary	1.00	165.00	0.08
TD_N_89	Drain_Tertiary	1.00	324.00	0.16
TD_N_91	Drain_Tertiary	1.00	35.00	0.02
TD_N_93	Drain_Tertiary	1.00	247.00	0.12
TD_N_95	Drain_Tertiary	1.00	66.00	0.03
TD_N_129	Drain_Tertiary	1.00	102.00	0.05
TD_N_131	Drain_Tertiary	1.00	47.00	0.02
TD_N_132	Drain_Tertiary	1.00	54.00	0.03
Grand Total			8732.00	4.33

Drainage network Proposal for Ward no. 06 have been shown under the Map 21.4



Map 21. 4: Proposed Drainage Network Plan for Ward No. 06

21.3.2 Urban ServicesSolid Waste Management

Solid waste management is an important urban service. The consultant proposes one solid waste transfer stations in this ward. It is recommended that home collection system is introduced in the ward by creation of local CBOs.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Titash River. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement from this water treatment plant.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. The consultant proposes one public toilet in this area which covered 0.165 acre.

Education Facility

There is two primary school,one madrasa and one moktob in this ward. Additionally, one Primary school is proposed and two are widen in this Ward.

Recreation and Open Space

Total 3.06 acre land have been proposed to fulfill the requirement of adjoining area. Detail was given in Table 10.17 in Chapter 10, Part-B of this report.

Ward Center

In every ward one ward center has been proposed in ward 0.6 acre land proposed for ward centre.

Table 21. 7: Development Proposals for ward 6

Proposed Activities	Area in acre	Mouza Name	Plot No.
Primary School	0.54	Mishrail	53, 116
Ward Center	0.60	Mishrail	288
Play Ground	3.06	Mishrail	311, 323, 324
Central Waste Disposal	3.58	Naryanpur	109, 110, 111, 112, 113, 114, 115, 116, 117, 121, 122, 123, 125, 126, 127, 128, 130,
Public Toilet	0.03	Mishrail	265
Waste Transfer center	0.07	Mishrail,	265
Tempo Stand	0.50	Naryanpur	197, 198, 199, 204

Chapter Twenty Two: Action Plan for Ward 07

22.1 Proposals and Plans for Ward 07

Ward No. 07 of Akhaura jurisdiction area is the mainly the western part of the porashava . According to the Urban Area Plan, Ward No. 07 consists of Core Urban Area (CUA) and New Urban Area (NUA) , Peripheral Urban Area (PUA) and agricultural land. Ward no. 07 occupies 8.01% of total lands only of the Paurashava where 23.55% of total lands of the Ward is using as Agricultural purposes. Table 21.1 shows demographic profile of Ward No. 07. Existing Land uses of Ward No. 7 have been shown in the Map 22.1.

Table 22. 1: Population Statistics of Ward No. 07

Item	Year	
	2011	2031
Area (acre)	193.17	193.17
Population	3767.00	5619.56
Density of Population (acre)	19.50	29.09

Analyzing the over all demand and planning activities, detail requirements have been discussed under the structure plan and Urban area plan. In the Urban area Plan this part of the Paurashava is quite important as this part have been considered as for High Residential Area (part of CUA), some part have been proposed as mixed residential, some of the part have been proposed for peripheral Urban Area (PUA) and rest of the part is proposed to remain as the Agricultural land. Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 22.1**).

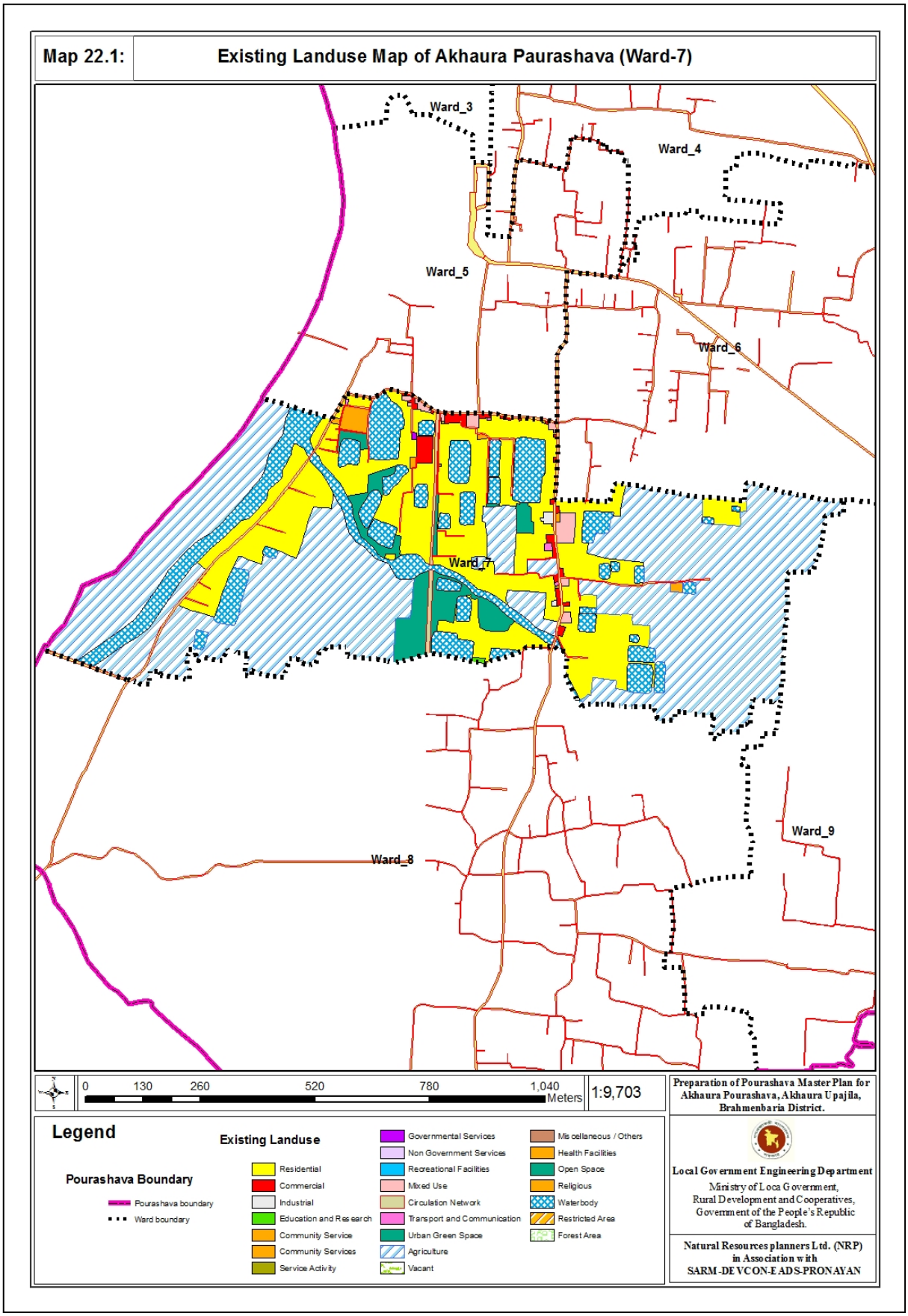
Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 07 are-

- Lands have to acquire for widening the existing roads and for the proposed new roads within first two years (2040 to 2014).
- Construct drains for the Catchments area (vide **Map 13.6**) (2040 to 2016).
- Providing all the Municipal Facilities as to provide as the area to grow up as mixed use area.

22.2 Priority Tasks

Land acquisition for proposed development is the main tasks for development of Ward No. 07 as few portion of this ward have been proposed for the Core urban area, peripheral urban area and new urban area.

Attempt should make to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land.



Map 22. 1: Existing Land Use Map of Ward No. 07

22.3 Ward Action Plan Proposals

Ward no. 07 is mainly urban in character. Table 22.1 and Table 22.2 shows the existing land use pattern of Ward no. 01 of Akhaura Paurashava.

22.3.1 Proposed Land Use Zoning

The category wise proposals are presented here. Table 22.2 shows the amount of land existing and proposed uses in Ward no. 7.

Table 22. 2: Landuse proposals for Ward No. 07

Sr. no	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
1	Residential	47.48	24.58	1	Urban Settlement	59.85	30.98
					Rural Settlement	0.00	0.00
2	Commercial	1.48	0.77	2	Commercial	2.75	1.43
3	Industrial/ Manufacturing/ Processing	0.19	0.10	3	Industrial/ Manufacturing/ Processing	0.13	0.07
4	Education & Research	0.08	0.04	4	Education & Research	4.36	2.26
5	Community Services	1.24	0.64	5	Community Services	0.16	0.08
6	Utility Service	0.05	0.03	6	Utility Service	0.62	0.32
7	Governmental Services	0.04	0.02	7	Governmental Services	0.30	0.15
8	Non Government Services	0.00	0.00	8	Non Government Services	0.00	0.00
9	Recreational Facilities	0.00	0.00	9	Recreational Facilities	1.71	0.89
10	Mixed Use	1.36	0.70	10	Mixed Use	0.75	0.39
11	Circulation Network	3.70	1.92	11	Circulation Network	19.98	10.34
12	Transport and Communication	0.12	0.06	12	Transport and Communication	0.46	0.24
13	Open Space	7.64	3.96	13	Open Space	6.34	3.28
14	Agricultural	100.00	51.77	14	Agricultural	45.50	23.55
15	Health Service	0.00	0.00	15	Health Service	1.14	0.59
16	Miscellaneous / Others	0.00	0.00	16	Miscellaneous / Others	0.00	0.00
17	Water body	29.78	15.42	17	Water body	29.52	15.28
18	Restricted Area	0.00	0.00	18	Restricted Area	0.00	0.00
19	forest Area	0.00	0.00	19	forest Area	0.00	0.00
20	Recreational Facilities*	0.00	0.00	20	Recreational Facilities*	0.00	0.00
21	Historical and Heritage Site	0.00	0.00	21	Historical and Heritage Site	0.00	0.00
22	Urban Deferred	0.00	0.00	22	Urban Deferred	19.61	10.15
23	Overlay Zone	0.00	0.00	23	Overlay Zone	0.00	0.00
24	Beach	0.00	0.00	24	Beach	0.00	0.00
25	Miscellaneous	0.00	0.00	25	Miscellaneous		0.00
Total		193.17	100.00	Total		193.17	100.00

Urban Residential Zone

In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, more than 59.87 acres of land has been earmarked for urban residential use which will occupy 31% of the total land. Map 22.1 and Table 22.2 shows the detail.

Education and Research

In Ward Action Plan, one Primary School is proposed and one primary school is extended with an area of 4.36 acres, which is 2.26% of total land in Ward no. 07 of this Paurashava.

Commercial Activity

At present, commercial activity and density of population are very low in this ward. The Planning team considered 2.75 acres of land for the commercial purposes in this Ward.

Circulation network

for any type of development, circulation net-work is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 19.98 acres of land and more than 10.34% of the total area.

Community Facilities

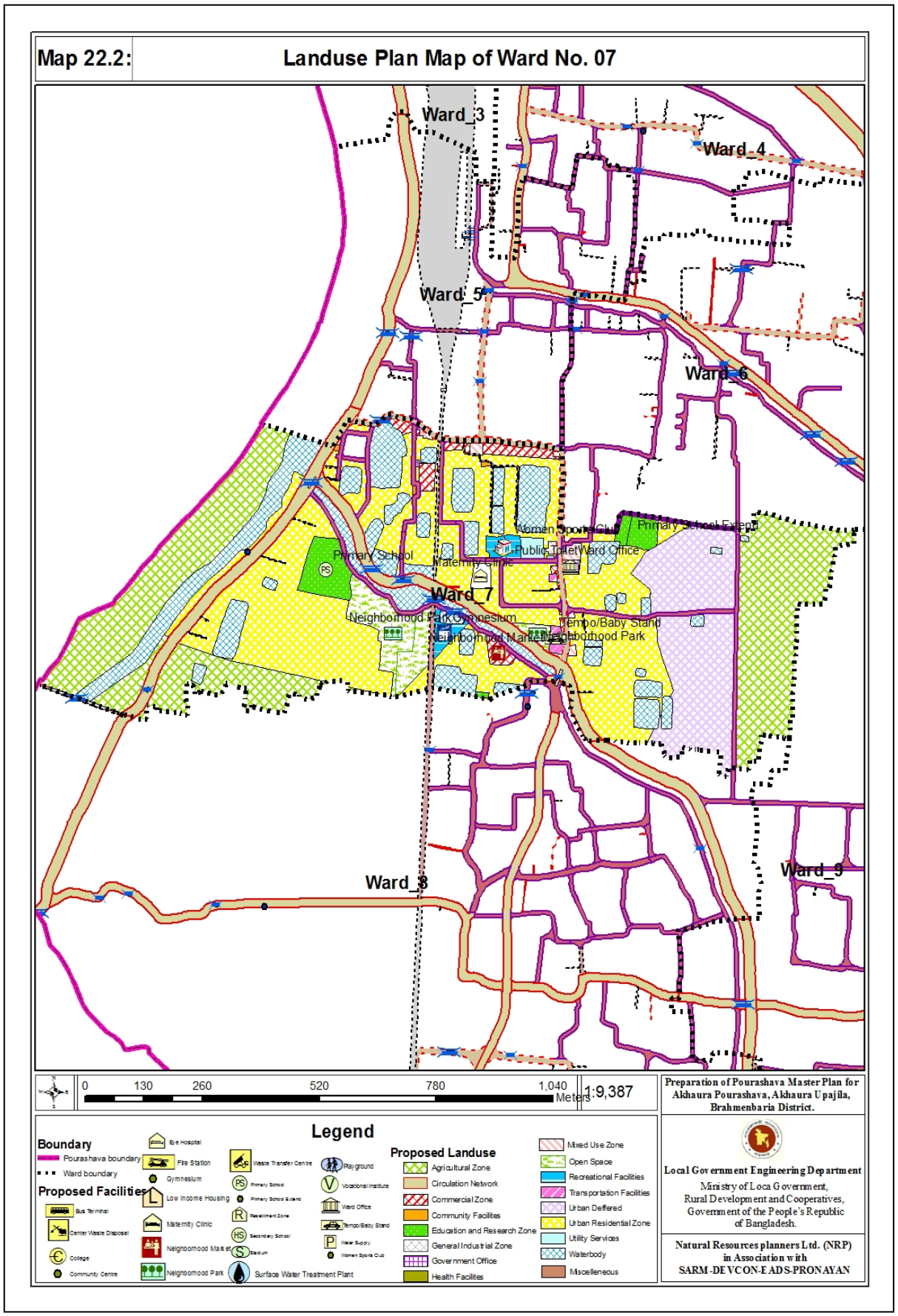
Land for community facilities will be 0.61 acres in this ward.

Agricultural Area

The Paurashava has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. The highest amount of land of the Ward will remain for agricultural use up to the year 2031. The total area under this use has been estimated as about 23.55% of the total land. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

Utility Services Zone

A total of .62 acres of land covering .32% of total land is earmarked as Utility Services zone at Ward no. 07. Proposals are made for the establishment of two waste transfer stations in this zone.



Map 22. 2: Land Use Map of Ward no. 07

Proposed Road Infrastructure Development

A total of 6.6 km of road development has been proposed in first ward action plan for Ward no. 07 of Akhaura Paurashava. Length of the local road will be 3.4 km and width of these roads will be 25 ft of road network development proposal. Total length of secondary road will be 0.56 km and width of these roads will be 40 ft for this ward (Vide Table 22.3).

Table 22. 3: Summary of Road Network Proposal at Ward no. 01 of Akhaura Paurashava

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25.00	Local Road	3400.03	51.46	2031.04	69.29	1369.46	51.18
40.00	Secondary Road	565.61	8.56	0.00	0.00	565.61	21.14
60.00	Primary Road	0.00	0.00	0.00	0.00	0.00	0.00
80.00		1640.90	24.84	900.269435	30.71	740.6353802	27.68
Existing Road		1000.16	15.14		0.00		0.00
Total		6606.70	100.00	2931.31	100.00	2675.71	100.00

Again a total 3.08km of new road have been proposed in Ward no. 01. Table 22.3 and Table 22.4 show the details. The overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 22.2**).

Table 22. 4: New Road Proposal for Ward no. 07

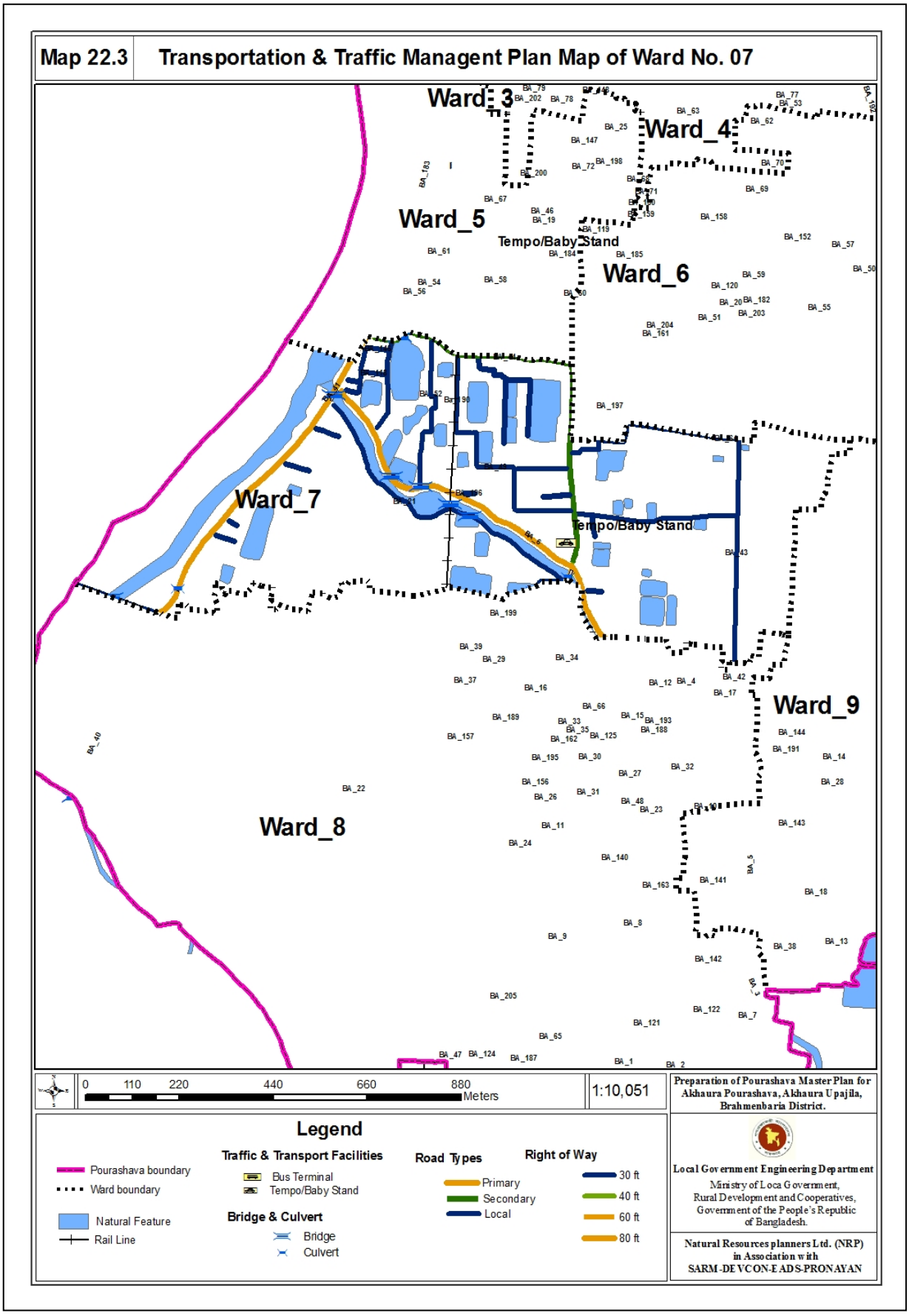
Proposed ID	Type of Road	Proposed Width(in Feet)	Length in Meter
PR_N_6	Primary	80	900.27
LR_N_21	Local	25	729.70
LR_N_43	Local	25	510.00
LR_N_49	Local	25	403.04
LR_N_59	Local	25	116.94
LR_N_64	Local	25	270.90
Grand Total			2930.84

A total of 2.67 km of road widening has been proposed for this ward Table 22.5 shows the details.

Table 22. 5: Road Widening Proposal in first Ward Action Plan for Ward no. 07

Proposed ID	Existing ID	Type of Road	Proposed	Existing	Length
PR_W_41	BA_316	Primary	80	10.23	740.64
SR_W_44	BA_363	Secondary	40	10.23	565.61
LR_W_118	BA_121	Local	25	6.63	53.97
LR_W_146	BA_121	Local	25	6.63	363.40
LR_W_190	BA_203	Local	25	10.23	208.18
LR_W_29	BA_277	Local	25	17.15	11.79
LR_W_43	BA_354	Local	25	10.23	374.95
LR_W_49	BA_398	Local	25	10.23	93.01
LR_W_52	BA_412	Local	25	10.23	264.16
Grand Total					2675.71

Proposed Circulation Network for this Ward have been shown in the Map 20.3



Map 22. 3: Proposed Circulation Network Map of Ward No. 07

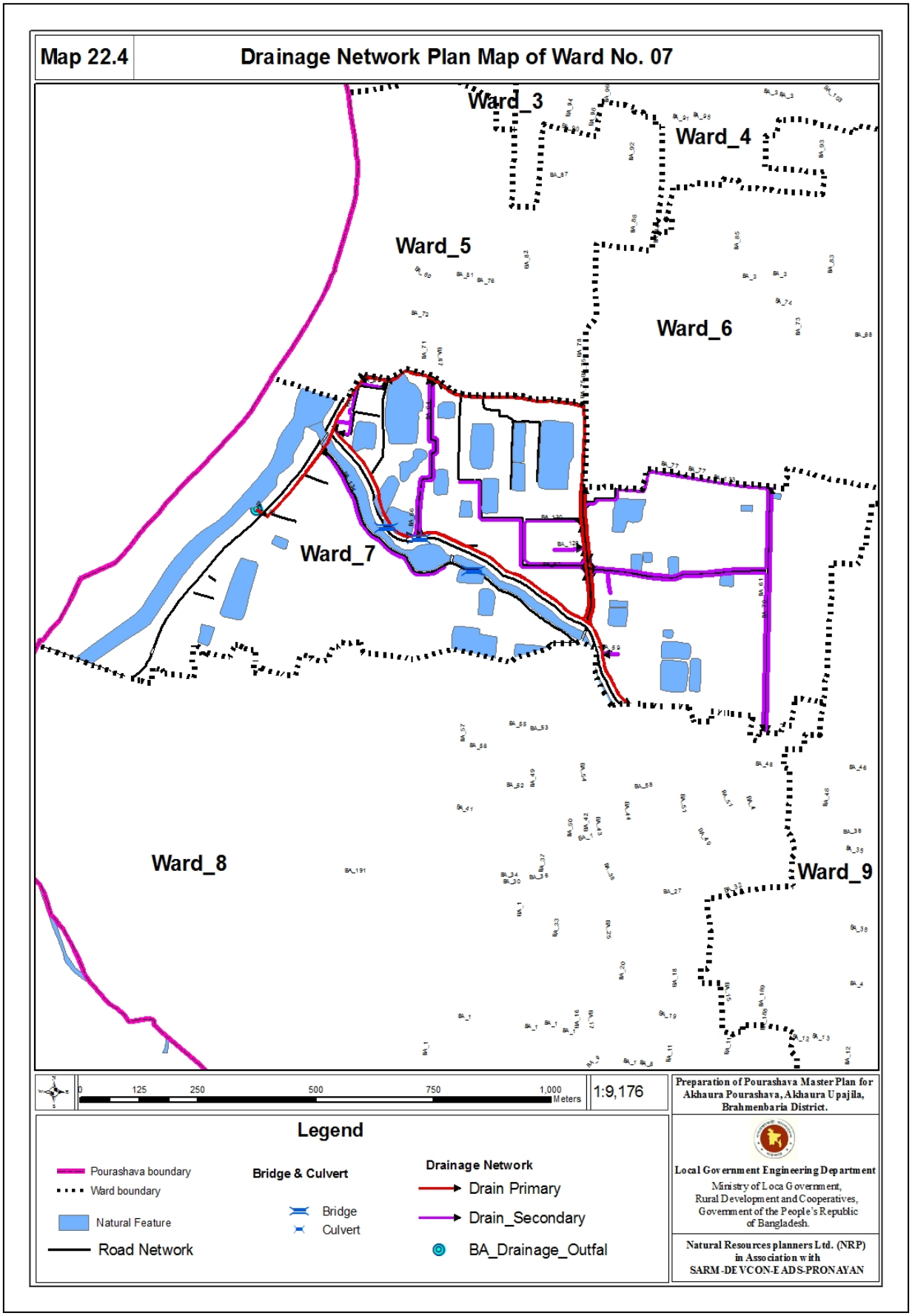
Drainage Development Plan

There is no man-made drainage system at Ward no. 07. The existing drainage of the ward mainly depends on the natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. Table 22.6 and Map 13.6 show the details.

Table 22. 6: Drainage Proposal in first Ward Action Plan for Ward no. 07

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area (acre)
SD_N_4	Drain Secondary	1.50	1904.00	0.94
SD_N_190	Drain Secondary	1.50	18.00	0.01
TD_N_59	Drain_Tertiary	1.00	34.00	0.02
TD_N_61	Drain_Tertiary	1.00	397.00	0.20
TD_N_62	Drain_Tertiary	1.00	222.00	0.11
TD_N_63	Drain_Tertiary	1.00	88.00	0.04
TD_N_64	Drain_Tertiary	1.00	176.00	0.09
TD_N_65	Drain_Tertiary	1.00	30.00	0.02
TD_N_66	Drain_Tertiary	1.00	180.00	0.09
TD_N_70	Drain_Tertiary	1.00	254.00	0.13
TD_N_128	Drain_Tertiary	1.00	64.00	0.03
TD_N_130	Drain_Tertiary	1.00	167.00	0.08
TD_N_133	Drain_Tertiary	1.00	494.00	0.24
TD_N_134	Drain_Tertiary	1.00	202.00	0.10
Grand Total			4230.00	2.10

Drainage network Proposal for Ward no. 06 have been shown under the Map 22.4



Map 22. 4: Proposed Drainage Network Plan for Ward No. 07

22.3.2 Urban Services

Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. The consultant proposes one solid waste transfer stations in this ward. It is recommended that home collection system is introduced in the ward by creation of local CBOs.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Titash River. A water treatment plant will be established on the bank of the Titash River.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. The consultant proposes one public toilet in this area which covered 0.02 acre.

Education Facility

There is one primary school,two madrasa and one Secondary school exist in this ward. Additionally, one Primary school is proposed and another is widen in this Ward.

Recreation and Open Space

one local playground with 6.34 acre land have been proposed to fulfill the requirement of adjoining area. Detail was given in Table 10.17 in Chapter 10, Part-B of this report.

Ward Center

In every ward one ward center has been proposed in ward 0.26 acre land proposed for ward centre.

Table 22. 7: Development Proposal for Ward no. 07

Propose Activities	Area in acre	Mouza Name	Plot No.
Neighborhood Market	0.61	Debgram	901, 902, 903
Primary School	2.90	Debgram	15, 16, 17, 18, 19, 20, 24, 25,
Ward Center	0.26	Debgram	541
Neighborhood Park	6.31	Debgram	105, 106, 113, 116, 117, 118, 499, 501, 502, 559, 565, 99999
Rickshaw & Tempo Stand	0.39	Debgram	564

Chapter Twenty Three: Action Plan for Ward 08

23.1 Proposals and Plans for Ward 08

Ward No. 08 of Akhaura jurisdiction area is starts from the Southern part of the Paurashava. According to the Urban Area Plan, Ward No. 08 consists of New Urban Area, Peripheral Area and Agricultural area. Ward no. 08 occupies 17.83% of total lands of the Paurashava where 30.68% of total lands of the Ward is using as Agricultural purposes. Table 23.1 shows demographic profile of Ward No. 08. Existing Land uses of Ward No. 7 have been shown in the Map 22.1.

Table 23. 1: Population Statistics of Ward No. 08

Item	Year	
	2011	2031
Area (acre)	429.95	429.95
Population	5158	7694
Density of Population (acre)	12.00	17.90

Analyzing the over all demand and planning activities, detail requirements have been discussed under the structure plan and Urban area plan. In the Urban area Plan this part of the Paurashava is quite important as this part have been considered as for Residential Area , some part have been proposed as Peripheral Area, and some of the part have been proposed for Agricultural Area. Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 23.1**).

Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 08 are-

- Lands have to acquire for widening the existing roads and for the proposed new roads within first two years (2040 to 2014).
- Construction of drains for the Catchments area (vide **Map 13.6**) (2040 to 2016).
- Providing all the Municipal facilities as to provide as the area to grow up as residential use area.

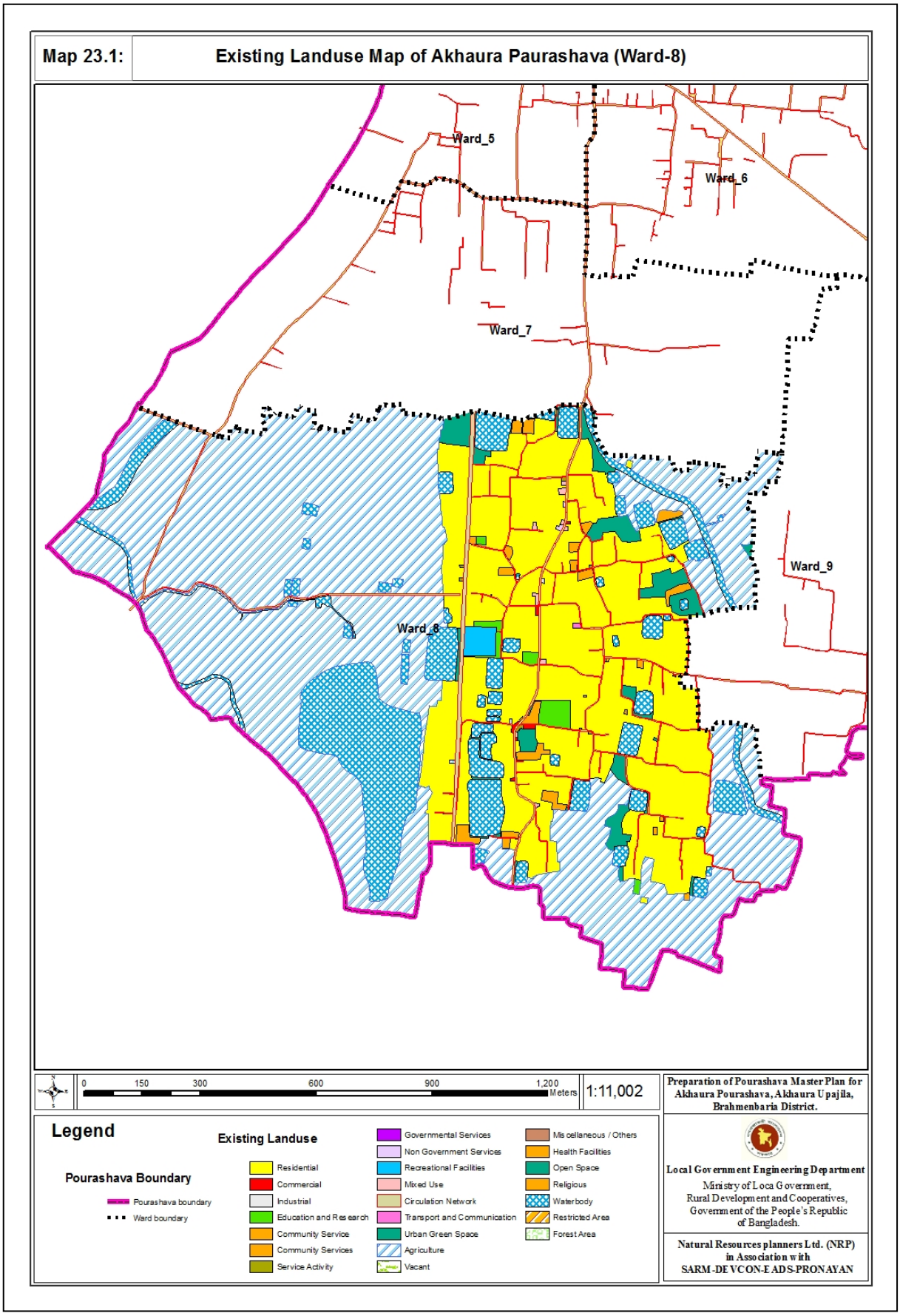
23.2 Priority Tasks

Land acquisition for proposed development is the main tasks for development of Ward No. 08 as few portion of this ward have been proposed for the mixed residential and ix administrative area.

Attempt should make to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land.

23.3 Ward Action Plan Proposals

Ward no. 08 is mainly rural and urban mixed up area in character. Table 23.1 and Table 23.2 shows the existing land use pattern of Ward no. 08 of Akhaura Paurashava.



Map 23. 1: Existing Land Use Map of Ward No. 08

23.3.1 Proposed Land Use Zoning

The category wise proposals are presented here. Table 23.2 shows the amount of land existing and proposed uses in Ward no. 8.

Table 23. 2: Landuse proposals for Ward No. 08

Sr. no	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
1	Residential	120.88	28.12	1	Urban Settlement	150.76	35.06
					Rural Settlement	0.00	0.00
2	Commercial	0.24	0.06	2	Commercial	5.09	1.18
3	Industrial/ Manufacturing/ Processing	0.06	0.01	3	Industrial/ Manufacturing/ Processing	0.00	0.00
4	Education & Research	2.48	0.58	4	Education & Research	9.41	2.19
5	Community Services	4.57	1.06	5	Community Services	3.83	0.89
6	Utility Service	0.18	0.04	6	Utility Service	1.16	0.27
7	Governmental Services	0.00	0.00	7	Governmental Services	0.40	0.09
8	Non Government Services	0.05	0.01	8	Non Government Services	0.00	0.00
9	Recreational Facilities	1.49	0.35	9	Recreational Facilities	0.00	0.00
10	Mixed Use	0.38	0.09	10	Mixed Use	0.14	0.03
11	Circulation Network	9.10	2.12	11	Circulation Network	44.18	10.28
12	Transport and Communication	0.07	0.02	12	Transport and Communication	0.36	0.08
13	Open Space	10.55	2.45	13	Open Space	1.34	0.31
14	Agricultural	221.17	51.44	14	Agricultural	153.03	35.59
15	Health Service	0.00	0.00	15	Health Service	0.35	0.08
16	Miscellaneous / Others	0.00	0.00	16	Miscellaneous / Others	0.02	0.01
17	Water body	58.72	13.66	17	Water body	56.61	13.17
18	Restricted Area	0.00	0.00	18	Restricted Area	0.00	0.00
19	forest Area	0.00	0.00	19	forest Area	0.00	0.00
20	Recreational Facilities*	0.00	0.00	20	Recreational Facilities*	0.00	0.00
21	Historical and Heritage Site	0.00	0.00	21	Historical and Heritage Site	0.00	0.00
22	Urban Deferred	0.00	0.00	22	Urban Deferred	3.29	0.76
23	Overlay Zone	0.00	0.00	23	Overlay Zone	0.00	0.00
24	Beach	0.00	0.00	24	Beach	0.00	0.00
25	Miscellaneous	0.00	0.00	25	Miscellaneous	0.00	0.00
Total		429.95	100.00	Total		429.96	100.00

Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 20.2**).

Urban Residential Zone

In existing land uses, urban residential area has been considered as residential use as a whole. In Ward Action Plan, more than 150.76 acres of land has been earmarked for urban residential use which will occupy 35.06% of the total land. Map 23.1 and Table 23.2 shows the detail.

Education and Research

In Ward Action Plan, one Primary school is proposed and one secondary school is extended here. Total 9.41 acres, which is 2.2% of total land will require in this purposes.

Commercial Activity

5.09 acres of land has been proposed for this commercial purpose which will occupy only 1.18% of total land. Additionally, other commercial functions are provided at mixed use zone, along with administrative and community facilities for this ward.

Circulation network

for any type of development, circulation net-work is an important facility.To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 44.18 acres of land and more than 10.29% of the total area.

Community Facilities

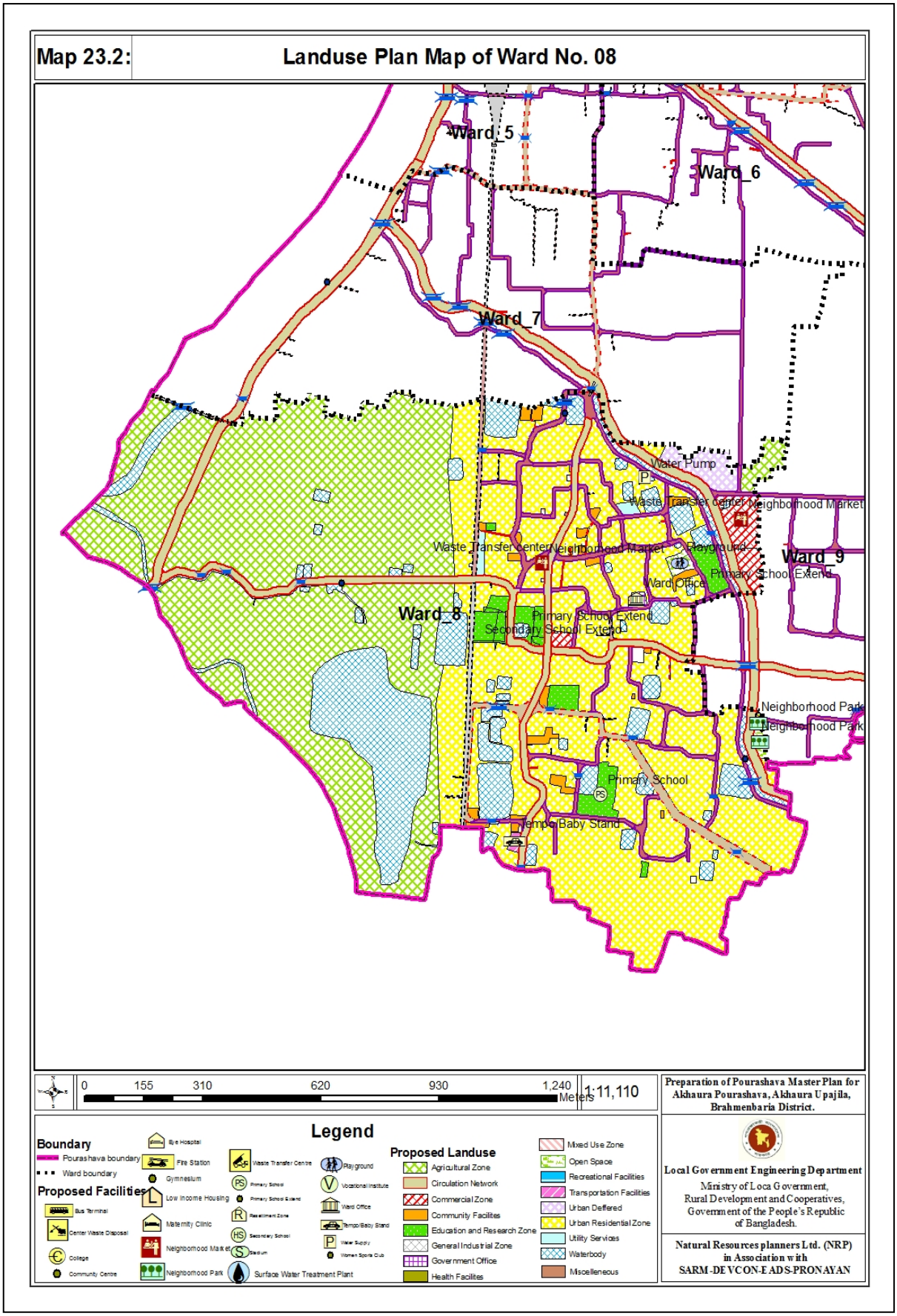
Land for community facilities will be 3.83 acres.

Agricultural Area

The total area under Agriculture use has been estimated as about 153.03 acres of land covering 35.59% of the total land. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

Open Space

Land for Open space will be 1.34 acres.



Map 23. 2: Proposed Land Use Map of Ward no. 08

Proposed Road Infrastructure Development

A total of 13.57 km of road development has been proposed in first ward action plan for Ward no. 08 of Akhaura Paurashava. Length of the local road will be 7.57 km and width of these roads 25ft which covers almost 55% of total road network development proposal. Total length of secondary road will be 1.3 km and width is 40ft. 3.2 km primary road will be developed and its width will be will be varied from 60 ft to 90ft for this ward.

Table 23. 3: Summary of Road Network Proposal at Ward no. 08 of Akhaura Paurashava

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25.00	Local Road	7572.23	55.80	2353.53	74.36	5218.71	52.30
40.00	Secondary Road	1332.71	9.82		0.00	1332.71	13.36
60.00	Primary Road	2952.41	21.76		0.00	2952.41	29.59
80.00		1285.32	9.47	811.57	25.64	473.75	4.75
Existing Road		428.33	3.16		0.00		0.00
Total		13571.01	100.00	3165.09	100.00	9977.58	100.00

Again a total of 3.16 km of new road has been proposed in Ward no. 08. Table 23.3 and Table 23.4 show the details.

Table 23. 4: New Road Proposal for Ward no. 08

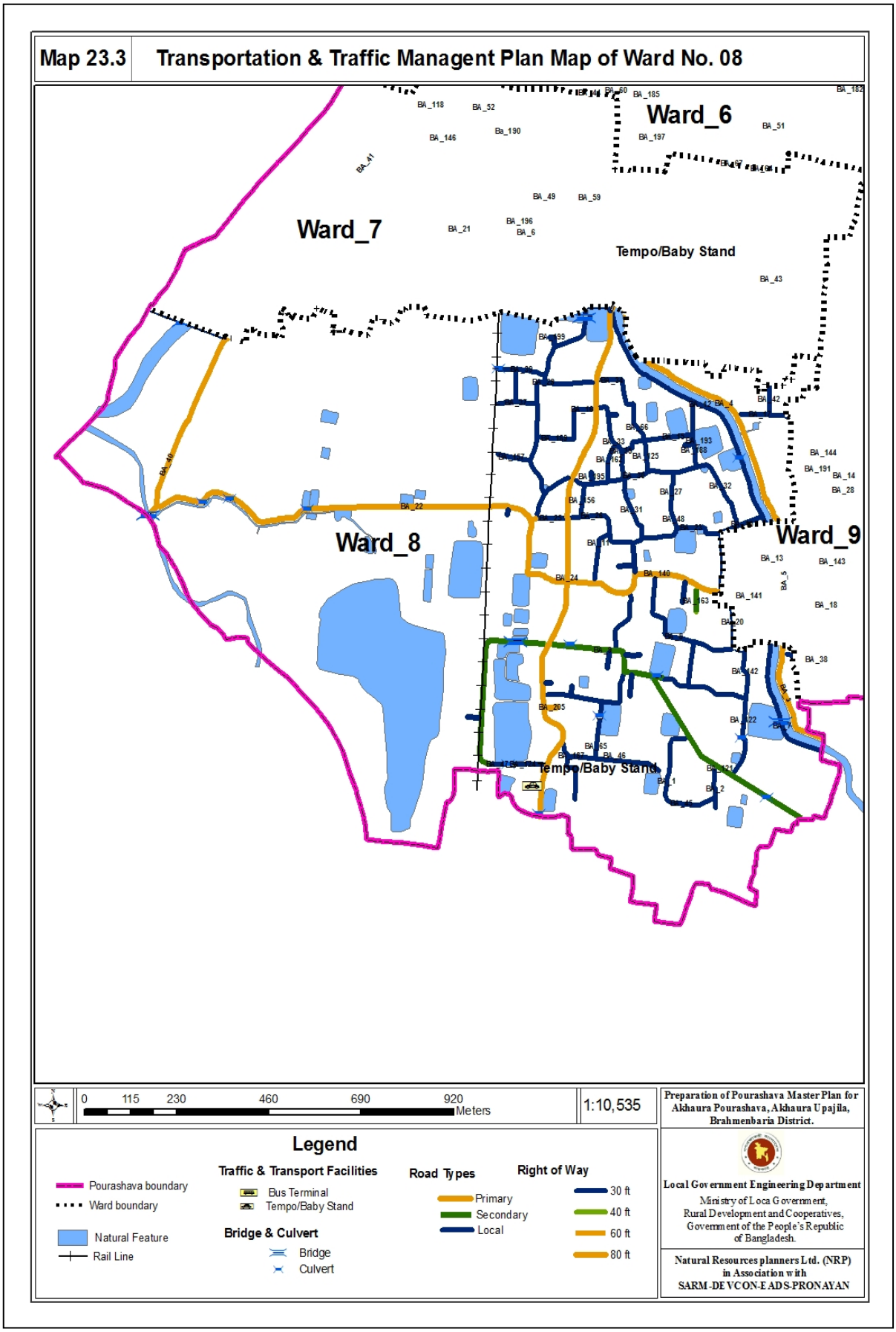
Proposed ID	Type of Road	Proposed Width(in Feet)	Length in Meter
PR_N_3	Primary	80	276.26
PR_N_4	Primary	80	535.30
LR_N_1	Local	25	87.34
LR_N_10	Local	25	92.79
LR_N_11	Local	25	123.10
LR_N_12	Local	25	611.74
LR_N_15	Local	25	237.91
LR_N_16	Local	25	121.55
LR_N_17	Local	25	110.68
LR_N_42	Local	25	67.16
LR_N_45	Local	25	107.37
LR_N_46	Local	25	227.14
LR_N_47	Local	25	67.15
LR_N_48	Local	25	39.49
LR_N_65	Local	25	54.83
LR_N_66	Local	25	79.66
LR_N_7	Local	25	325.63
Grand Total			3165.09

A total of 9.97 km of road widening has been proposed for this ward. Table 23.5 shows the details.

Table 23. 5: Road Widening Proposal in first Ward Action Plan for Ward no. 08

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length in Meter
PR_W_40	BA_315	Primary	80	10.23	473.75
PR_W_140	BA_141	Primary	60	6.63	416.98
PR_W_22	BA_181	Primary	60	10.23	1219.15
PR_W_24	BA_65	Primary	60	6.63	1316.28
SR_W_121	BA_316	Secondary	40	6.66	509.08
SR_W_163	BA_57	Secondary	40	9.91	55.89
SR_W_3	BA_6	Secondary	40	20.47	448.51
SR_W_9	BA_96	Secondary	40	10.23	319.23
LR_W_1	BA_10	Local	25	10.30	106.59
LR_W_12	BA_107	Local	25	10.30	70.97
LR_W_122	BA_117	Local	25	5.05	92.17
LR_W_124	BA_12	Local	25	10.00	66.96
LR_W_125	BA_136	Local	25	21.32	67.46
LR_W_142	BA_153	Local	25	10.23	136.36
LR_W_15	BA_182	Local	25	20.47	145.93
LR_W_187	BA_184	Local	25	26.44	151.32
LR_W_188	BA_200	Local	25	14.86	73.03
LR_W_189	BA_203	Local	25	6.63	78.52
LR_W_2	BA_204	Local	25	10.23	91.12
LR_W_20	BA_206	Local	25	10.23	73.87
LR_W_23	BA_239	Local	25	6.72	335.18
LR_W_25	BA_243	Local	25	10.23	63.37
LR_W_26	BA_249	Local	25	20.47	180.80
LR_W_27	BA_260	Local	25	10.23	88.18
LR_W_29	BA_288	Local	25	10.23	789.64
LR_W_30	BA_293	Local	25	10.23	381.76
LR_W_31	BA_300	Local	25	10.23	148.71
LR_W_32	BA_301	Local	25	13.45	185.09
LR_W_33	BA_340	Local	25	10.23	275.59
LR_W_34	BA_367	Local	25	5.05	138.19
LR_W_35	BA_380	Local	25	6.76	34.01
LR_W_37	BA_4	Local	25	10.23	93.35
LR_W_38	BA_5	Local	25	10.23	102.93
LR_W_39	BA_58	Local	25	10.23	183.87
LR_W_4	BA_59	Local	25	10.23	86.97
LR_W_5	BA_60	Local	25	10.23	75.04
LR_W_6	BA_62	Local	25	10.23	251.82
LR_W_7	BA_67	Local	25	10.23	214.96
LR_W_8	BA_68	Local	25	10.23	434.96
Grand Total					9977.58

Proposed Circulation Network for this Ward have been shown in the Map 23.3



Map 23. 3 : Proposed Circulation Network Map of Ward No. 08

Drainage Development Plan

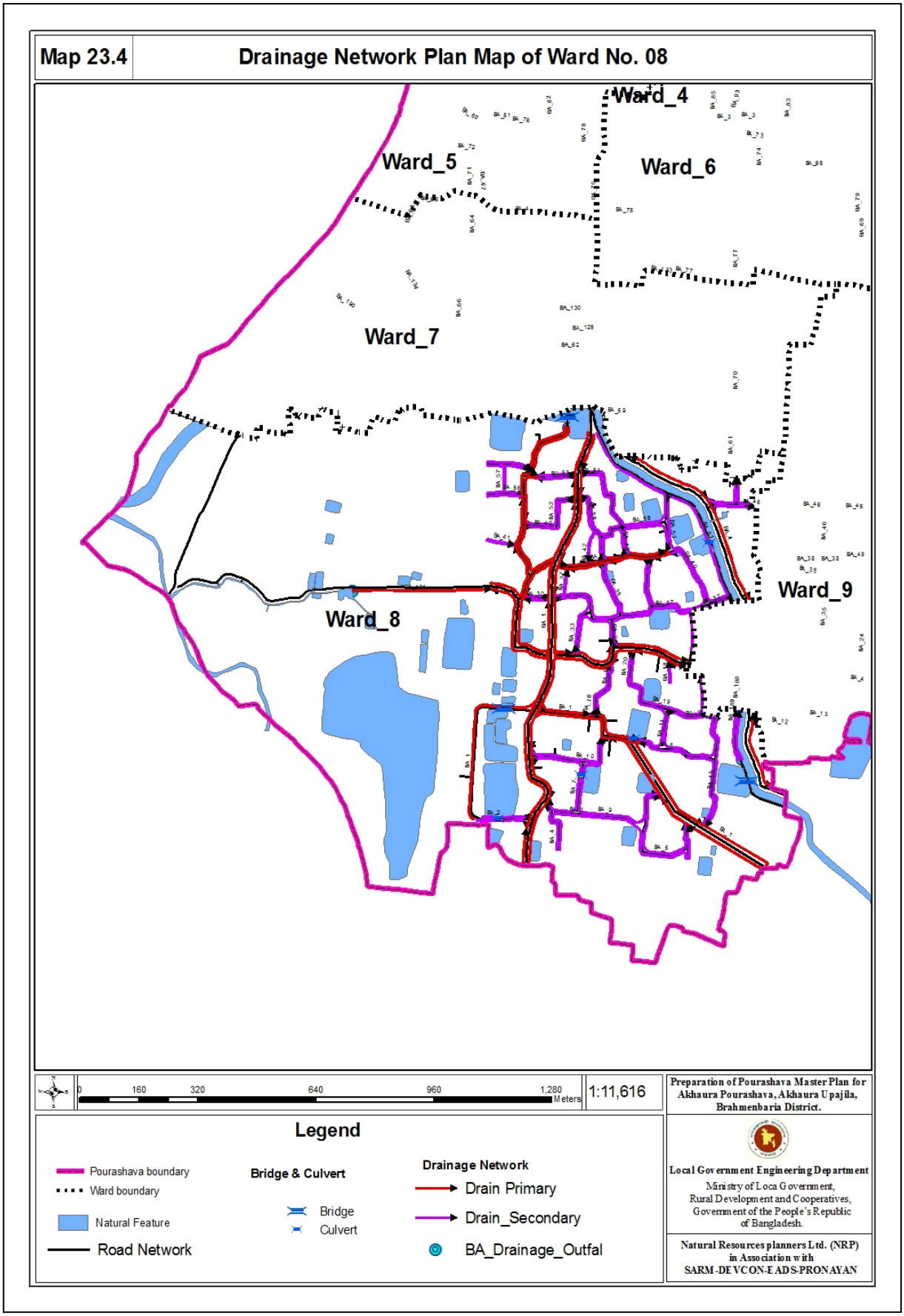
There is no man-made drainage system at Ward no. 08. The proposed drainage facilities will be developed based on these natural channels. Table 23.6 show the details.

Table 23. 6: Proposed Drainage Development Plan Proposals

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area (acre)
SD_N_1	Drain Secondary	1.50	5992.00	2.96
SD_N_4	Drain Secondary	1.50	557.00	0.28
SD_N_191	Drain Secondary	1.50	394.00	0.20
SD_N_1	Drain Secondary	1.50	1.00	0.00
SD_N_191	Drain Secondary	1.50	1.00	0.00
TD_N_1	Drain_Tertiary	1.00	74.00	0.04
TD_N_2	Drain_Tertiary	1.00	66.00	0.03
TD_N_3	Drain_Tertiary	1.00	325.00	0.16
TD_N_4	Drain_Tertiary	1.00	70.00	0.04
TD_N_5	Drain_Tertiary	1.00	174.00	0.09
TD_N_7	Drain_Tertiary	1.00	179.00	0.09
TD_N_8	Drain_Tertiary	1.00	196.00	0.10
TD_N_9	Drain_Tertiary	1.00	260.00	0.13
TD_N_10	Drain_Tertiary	1.00	127.00	0.06
TD_N_11	Drain_Tertiary	1.00	220.00	0.11
TD_N_12	Drain_Tertiary	1.00	9.00	0.00
TD_N_13	Drain_Tertiary	1.00	10.00	0.01
TD_N_15	Drain_Tertiary	1.00	156.00	0.08
TD_N_16	Drain_Tertiary	1.00	75.00	0.04
TD_N_17	Drain_Tertiary	1.00	77.00	0.04
TD_N_18	Drain_Tertiary	1.00	57.00	0.03
TD_N_19	Drain_Tertiary	1.00	207.00	0.10
TD_N_20	Drain_Tertiary	1.00	192.00	0.10
TD_N_25	Drain_Tertiary	1.00	118.00	0.06
TD_N_27	Drain_Tertiary	1.00	211.00	0.10
TD_N_30	Drain_Tertiary	1.00	33.00	0.02
TD_N_32	Drain_Tertiary	1.00	40.00	0.02
TD_N_33	Drain_Tertiary	1.00	124.00	0.06
TD_N_34	Drain_Tertiary	1.00	32.00	0.02
TD_N_36	Drain_Tertiary	1.00	47.00	0.02
TD_N_37	Drain_Tertiary	1.00	203.00	0.10
TD_N_39	Drain_Tertiary	1.00	184.00	0.09
TD_N_40	Drain_Tertiary	1.00	228.00	0.11
TD_N_41	Drain_Tertiary	1.00	77.00	0.04
TD_N_42	Drain_Tertiary	1.00	81.00	0.04
TD_N_43	Drain_Tertiary	1.00	94.00	0.05
TD_N_44	Drain_Tertiary	1.00	120.00	0.06
TD_N_48	Drain_Tertiary	1.00	60.00	0.03
TD_N_49	Drain_Tertiary	1.00	101.00	0.05
TD_N_50	Drain_Tertiary	1.00	96.00	0.05

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area (acre)
TD_N_51	Drain_Tertiary	1.00	346.00	0.17
TD_N_52	Drain_Tertiary	1.00	100.00	0.05
TD_N_53	Drain_Tertiary	1.00	53.00	0.03
TD_N_54	Drain_Tertiary	1.00	202.00	0.10
TD_N_55	Drain_Tertiary	1.00	52.00	0.03
TD_N_56	Drain_Tertiary	1.00	92.00	0.05
TD_N_57	Drain_Tertiary	1.00	197.00	0.10
TD_N_58	Drain_Tertiary	1.00	326.00	0.16
TD_N_61	Drain_Tertiary	1.00	70.00	0.04
TD_N_70	Drain_Tertiary	1.00	49.00	0.02
TD_N_188	Drain_Tertiary	1.00	65.00	0.03
TD_N_189	Drain_Tertiary	1.00	68.00	0.03
Grand Total			12888.00	6.39

Drainage network Proposal for Ward no. 06 have been shown under the Map 21.4



Map 23. 4: Proposed Drainage Network Plan for Ward No. 8

23.3.2 Urban Services

Solid Waste Management

The Planning team proposed two solid waste transfer stations in this ward.Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. The consultant proposes one solid waste transfer stations in this ward. It is recommended that home collection system is introduced in the ward by creation of local CBOs.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Titash River. A water treatment plant will be established on the bank of the Titash River.

Recreation and Open Space

One Neghibourhood Park and total of 1.34 acres of land have been proposed for recreation and open space purpose to fulfill the requirement of adjoining area.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure.

Education Facility

There is one primary school,two madrasa and one Secondary school exist in this ward. Additionally, one Primary school is proposed and another Secondary school is widen in this Ward.

Ward Center

In every ward one ward center has been proposed in ward 0.4 acre land proposed for ward centre.

Table 23. 7: Development Proposals for ward no 8

Proposed Activities	Area in acre	Mouza Name	Plot No.
Neighborhood Market	3.02	Debgram	677, 678, 729, 730, 731, 732, 733, 734, 735, 745, 1027,
Primary School	2.36	Debgram	357, 433,
Ward Center	0.40	Debgram	808
Neighborhood Park	0.61	Debgram	759, 760, 1176
Play Ground	0.73	Debgram	838, 839, 840, 841, 842,
Public Toilet	0.17	Debgram	869, 99999
Waste Transfer center	0.22	Debgram	714, 715
Tempo Stand	0.33	Debgram	351

Chapter Twenty Four: Action Plan for Ward 09

24.1 Proposals and Plans for Ward 09

Ward No. 09 of Akhaura jurisdiction area is mainly the Southern part of the Paurashava. According to the Urban Area Plan, Ward No. 09 consists of Agricultural area and Peripheral area .Ward no. 09 occupies 10.11% of total lands of the Paurashava where 35.06% of total lands of the Ward is using as Residential purposes. Table 22.1 shows demographic profile of Ward No. 09

Table 24. 1: Population Statistics of Ward No. 09

Item	Year	
	2011	2031
Area (acre)	243.68	243.68
Population	3097.00	4620.06
Density of Population (acre)	12.71	18.96

Analyzing the over all demand and planning activities, detail requirements have been discussed under the structure plan and Urban area plan. In the Urban area Plan this part of the Paurashava is quite important as this part have been considered as for Agricultural land and Peripheral area. Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 24.1**).

Getting up to a planned way development with the local needs considering the future population growth for the people of Ward No. 09 are-

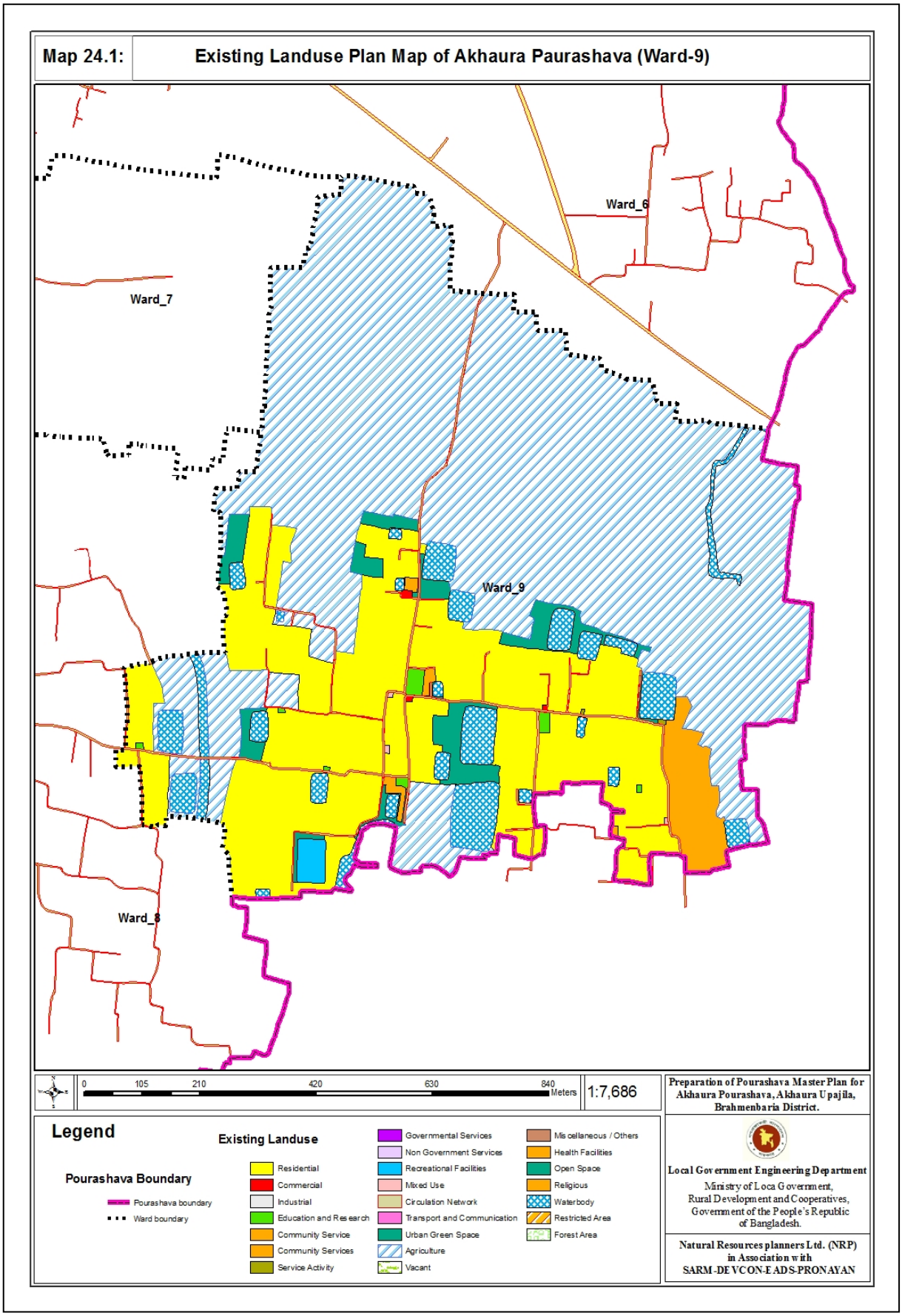
- Lands have to acquire for widening the existing roads and for the proposed new roads within first two years (2040 to 2014).
- Providing all the Municipal facilities as to serve the peripheral area (PUA).

24.2 Priority Tasks

Land acquisition for proposed development is the main tasks for development of Ward No. 09 as few portion of this ward have been proposed for the mixed residential and ix administrative area.

Attempt should make to seek contribution of land from adjacent landowners for widening of existing narrow roads. for new roads the landowners will be negotiated to sell their land to the development authority. In case the landowners fail to reach on an agreement the development authority may use its power of compulsory land acquisition to procure necessary land.

Existing Land uses of Ward No. 9 have been shown in the **Map 24.1**.



Map 24. 1: Existing Land Use Map of Ward No. 09

24.3 Ward Action Plan Proposals

Ward no. 09 is mainly rural in character. Table 24.1 and Table 24.2 shows the existing land use pattern of Ward no. 09 of Akhaura Paurashava.

24.3.1 Proposed Land Use Zoning

The category wise proposals are presented here. Table 24.2 shows the amount of land existing and proposed uses in Ward no. 9.

Table 24. 2: Landuse proposals for Ward No. 09

Sr. no	Existing Land use	Area in Acres	%	Sr. no	Proposed Land use	Area in Acres	%
14	Agricultural	145.14	59.56	15	Agricultural	99.21	40.71
24	Beach	0.00	0.00	25	Beach	0.00	0.00
11	Circulation Network	3.04	1.25	12	Circulation Network	19.80	8.13
2	Commercial	0.10	0.04	3	Commercial	1.36	0.56
5	Community Services	6.18	2.54	6	Community Services	1.31	0.54
4	Education & Research	0.72	0.30	5	Education & Research	4.15	1.70
19	forest Area	0.00	0.00	20	forest Area	0.00	0.00
7	Governmental Services	0.00	0.00	8	Governmental Services	0.14	0.06
15	Health Service	0.00	0.00	16	Health Service	0.32	0.13
21	Historical and Heritage Site	0.00	0.00	22	Historical and Heritage Site	0.00	0.00
3	Industrial/ Manufacturing/ Processing	0.00	0.00	4	Industrial/ Manufacturing/ Processing	0.00	0.00
25	Miscellaneous	0.00	0.00	26	Miscellaneous	0.00	0.00
16	Miscellaneous / Others	0.00	0.00	17	Miscellaneous / Others	0.00	0.00
10	Mixed Use	0.07	0.03	11	Mixed Use	0.00	0.00
8	Non Government Services	0.96	0.39	9	Non Government Services	0.00	0.00
13	Open Space	7.46	3.06	14	Open Space	1.17	0.48
23	Overlay Zone	0.00	0.00	24	Overlay Zone	0.00	0.00
9	Recreational Facilities	0.00	0.00	10	Recreational Facilities	0.00	0.00
20	Recreational Facilities*	0.00	0.00	21	Recreational Facilities*	0.00	0.00
18	Restricted Area	0.00	0.00	19	Restricted Area	0.00	0.00
				2	Rural Settlement	0.00	0.00
12	Transport and Communication	0.00	0.00	13	Transport and Communication	0.00	0.00
22	Urban Deferred	0.00	0.00	23	Urban Deferred	0.00	0.00
1	Residential	64.87	26.62	1	Urban Settlement	101.14	41.51
6	Utility Service	0.04	0.02	7	Utility Service	0.42	0.17
17	Water body	15.10	6.20	18	Water body	14.64	6.01
Total		243.68	100.00	Total		243.69	100.00

Now the overall planning consideration and development of this Ward have been identified according to the considerations of land use Plan (vide **Map 20.2**).

Urban Residential Zone

In existing land uses, both the urban residential and rural homestead has been considered as residential use as a whole. In Ward Action Plan, more than 101.14 acres of land has been earmarked for urban residential use which will occupy 41.51% of the total land. Map 24.1 and Table 23.2 shows the detail.

Circulation network

for any type of development, circulation net-work is an important facility. To improve the efficiency of transport network of the ward, more roads are proposed which will consume almost 19.80 acres of land and more than 8.13% of the total area.

Agricultural Area

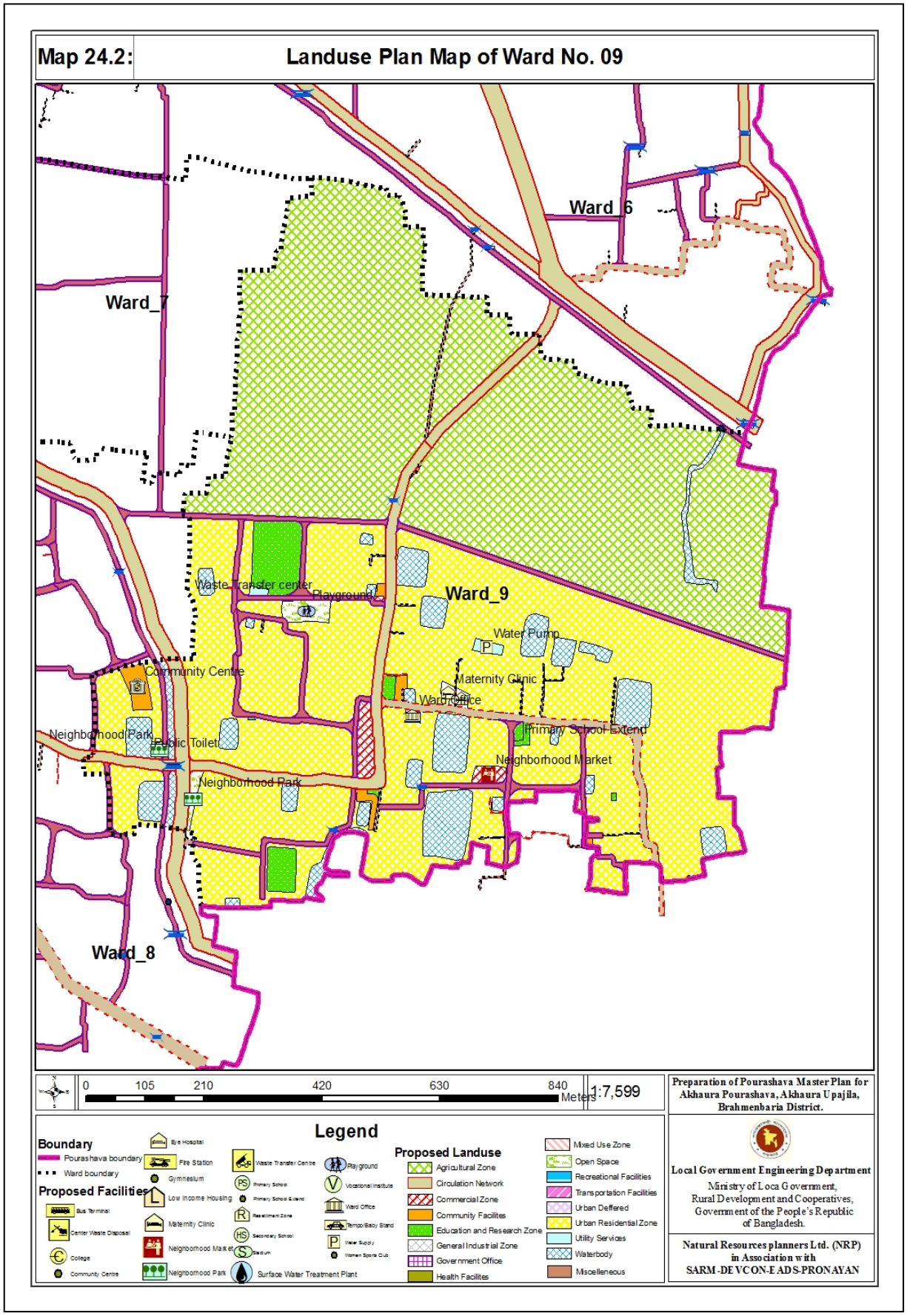
The Paurashava including Ward No. 09 has a vast area of agricultural land that demands formation of a separate zone like, agriculture zone. The highest amount of land of the Ward will remain for agricultural use up to the year 2031. The total area under this use has been estimated as 40.71% of the total land. Rural homestead will also perform some agricultural activities as farm, poultry or horticulture. This zone will serve as the hinterland for the town.

Open Space

Land for Open space will be 1.17 acres of land and more than 0.48% of the total area which includes open recreational facilities playground, Local Park.

Utility Services Zone

A total of 0.42 acre of land covering 0. 0.17% of total land is earmarked as Utility Services zone at Ward no. 09. Proposals are made for the establishment of two waste transfer stations in this zone.



Map 24. 2: Proposed Land Use Map of Ward no. 09

Proposed Road Infrastructure Development

A total of 7.4 km of road development has been proposed in first ward action plan for Ward no. 09 of Akhaura Paurashava. Length of the local road will be 4.27 km and width of these roads 25ft which covers almost 57.29% of total road network development proposal. Total length of secondary road will be 0.74 km and width is 40ft. 1.6 km primary road will be developed and its width will be will be varied from 60 ft to 80ft for this ward. The detailed scenario of road network development proposal is given in Table 24.3.

Table 24. 3: Summary of Road Network Proposal at Ward no. 09 of Akhaura Paurashava

Width in Ft	Type of Road	Total		New road		Road Widening	
		Length(m)	%	Length(m)	%	Length(m)	%
25.00	Local Road	4271.62	57.29	1250.86	80.73	3020.76	58.90
40.00	Secondary Road	742.33	9.96	0.00	0.00	742.33	14.47
60.00	Primary Road	1365.62	18.32	0.00	0.00	1365.62	26.63
80.00		298.58	4.00	298.58	19.27	0.00	0.00
Existing Road		777.40	10.43		0.00		0.00
Total		7455.54	100.00	1549.43	100.00	5128.71	100.00

Again a total of 1.54 km of new road have been proposed in Ward no. 09. Table 24.3 and Table 16.4 show the details.

Table 24. 4: New Road Proposal for Ward no. 09

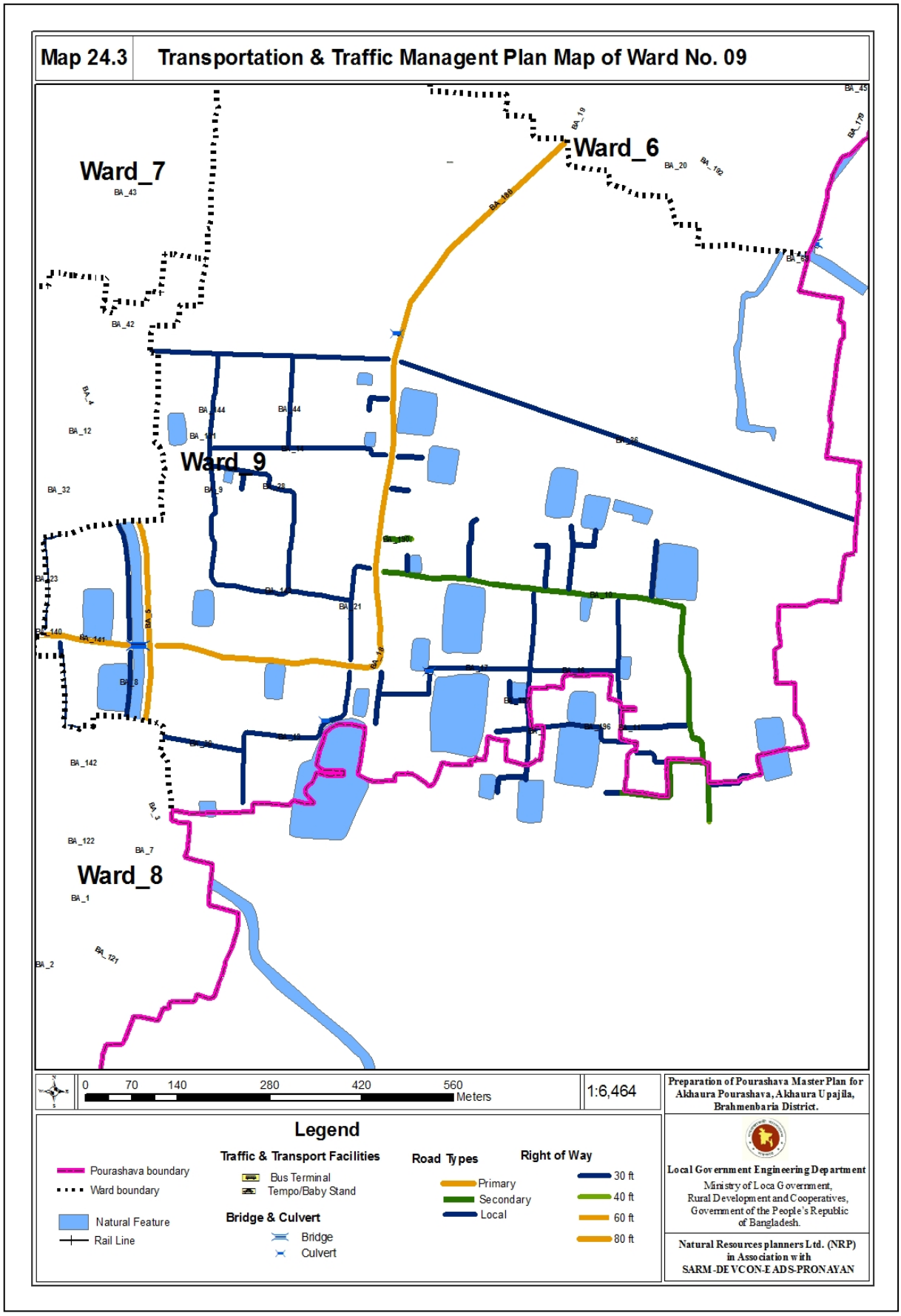
Proposed ID	Type of Road	Proposed Width(in Feet)	Length in Meter
PR_N_5	Primary	80	298.58
LR_N_10	Local	25	6.69
LR_N_13	Local	25	172.61
LR_N_14	Local	25	268.61
LR_N_18	Local	25	364.82
LR_N_38	Local	25	136.92
LR_N_44	Local	25	127.82
LR_N_8	Local	25	96.85
LR_N_9	Local	25	76.55
Grand Total			1549.43

A total of 5.12 km of road widening has been proposed for this ward. Table14.5 shows the details.

Table 24. 5: Road Widening Proposal in first Ward Action Plan for Ward no. 09

Proposed ID	Existing ID	Type of Road	Proposed Width(In Feet)	Existing Width(In Feet)	Length in Meter
PR_W_141	BA_123	Primary	80	10.23	149.88
PR_W_18	BA_188	Primary	80	10.23	942.80
PR_W_186	BA_344	Primary	80	13.32	272.94
SR_W_10	BA_28	Secondary	60	10.23	700.82
SR_W_190	BA_98	Secondary	60	8.30	41.51
LR_W_10	BA_104	Local	25	10.23	19.44
LR_W_11	BA_102	Local	25	10.23	253.19
LR_W_13	BA_103	Local	25	10.23	332.67
LR_W_14	BA_111	Local	25	10.23	261.71
LR_W_142	BA_116	Local	25	10.23	6.31
LR_W_143	BA_122	Local	25	6.63	313.42
LR_W_144	BA_136	Local	25	6.63	160.40
LR_W_16	BA_153	Local	25	10.23	124.97
LR_W_17	BA_202	Local	25	10.23	262.30
LR_W_20	BA_263	Local	25	10.23	45.64
LR_W_21	BA_300	Local	25	10.23	159.21
LR_W_23	BA_337	Local	25	10.23	68.31
LR_W_28	BA_374	Local	25	10.23	282.35
LR_W_36	BA_411	Local	25	6.69	730.84
Grand Total					5128.71

Proposed Circulation Network for this Ward have been shown in the Map 20.3



Map 24. 3: Proposed Circulation Network Map of Ward No. 09

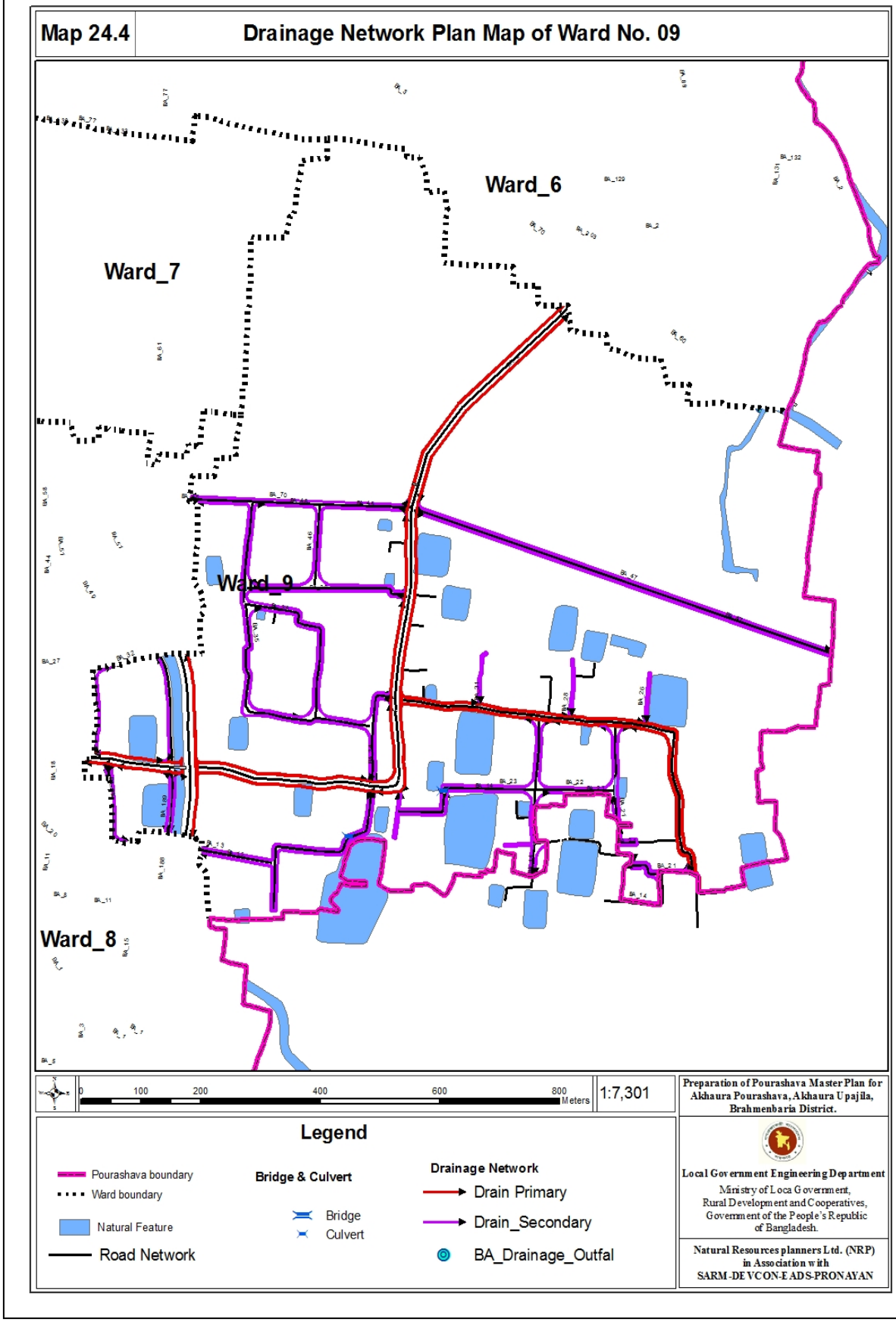
Drainage Development Plan

There is no man-made drainage system at Ward no. 09. The existing drainage of the ward mainly depends on the natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. Table 24.6 show the details.

Table 24. 6: Proposed Drainage Development Plan Proposals

DRAIN_ID	Drain_Type	WIDTH	LENGTH	Area (acre)
SD_N_1	Drain Secondary	1.50	251.00	0.12
SD_N_4	Drain Secondary	1.50	3140.00	1.55
TD_N_12	Drain_Tertiary	1.00	265.00	0.13
TD_N_13	Drain_Tertiary	1.00	185.00	0.09
TD_N_14	Drain_Tertiary	1.00	401.00	0.20
TD_N_15	Drain_Tertiary	1.00	70.00	0.04
TD_N_19	Drain_Tertiary	1.00	11.00	0.01
TD_N_21	Drain_Tertiary	1.00	281.00	0.14
TD_N_22	Drain_Tertiary	1.00	168.00	0.08
TD_N_23	Drain_Tertiary	1.00	199.00	0.10
TD_N_24	Drain_Tertiary	1.00	77.00	0.04
TD_N_26	Drain_Tertiary	1.00	81.00	0.04
TD_N_28	Drain_Tertiary	1.00	93.00	0.05
TD_N_31	Drain_Tertiary	1.00	87.00	0.04
TD_N_32	Drain_Tertiary	1.00	167.00	0.08
TD_N_35	Drain_Tertiary	1.00	260.00	0.13
TD_N_38	Drain_Tertiary	1.00	358.00	0.18
TD_N_45	Drain_Tertiary	1.00	202.00	0.10
TD_N_46	Drain_Tertiary	1.00	221.00	0.11
TD_N_47	Drain_Tertiary	1.00	735.00	0.36
TD_N_48	Drain_Tertiary	1.00	362.00	0.18
TD_N_70	Drain_Tertiary	1.00	184.00	0.09
TD_N_188	Drain_Tertiary	1.00	51.00	0.03
TD_N_189	Drain_Tertiary	1.00	51.00	0.03
Grand Total			7900.00	3.92

Drainage network Proposal for Ward no. 06 have been shown under the Map 24.4



Map 24. 4: Proposed Drainage Network Plan for Ward No. 09

24.3.2 Urban Services

Solid Waste Management

One waste transfer station is proposed is solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. The consultant proposes one solid waste transfer stations in this ward. It is recommended that home collection system is introduced in the ward by creation of local CBOs.

Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Titash River. A water treatment plant will be established on the bank of the Titash River.

Sanitation

It is apprehended that the government would not be able to provide network and treatment based sanitation system for the town. So the present system of sanitation will continue. However, the Paurashava must try to promote hygienic sanitation to ensure better public health. There is hardly any public toilet in the town to serve the visitors and the local people. The existing toilet of bus terminal area has to be developed as public toilet is required for the town people and as well as for the passengers waiting for departure. The consultant proposes one public toilet in this area which covered 0.063 acre.

Education Facility

There is one primary school,two madrasa exist in this ward. Additionally, one Primary school is widen in this Ward.

Recreation and Open Space

Total 1.17 acre land have been proposed to fulfill the requirement of adjoining area. Detail was given in Table 10.17 in Chapter 10, Part-B of this report.

Ward Center

In every ward one ward center has been proposed in ward 0.14 acre land proposed for ward centre.

Table 24. 7: Development Proposals for ward 9

Proposed Activities	Area in acre	Mouza Name	Plot No.
Neighborhood Market	0.41	Taragon King	585, 586, 587, 588
Maternity Clinic	0.32	Taragon King	447, 453
Ward Center	0.14	Taragon King	600
Neighborhood Park	0.41	Debgram	758, 759, 760, 1176
Play Ground	0.76	Taragon King	337, 338, 339, 356
Public Toilet	0.01	Taragon King	344
Waste Transfer center	0.12	Taragon King	344
Water Pump	0.25	Taragon King	459
Community Centre	0.73	Debgram	753

Chapter Twenty Five: Implementation Guidelines

25.1 Tasks of Paurashava Authority

As a planning and development authority Paurashava shoulders the responsibilities of undertaking and implementing Ward wise Action Plans. Discussion meetings and negotiations with local leaders will have to be carried out relentlessly for successful execution of any detailed area plan through their active participation. The Paurashava must have the Planning Unit

25.2 Institutional Strengthening

In Ward wise planning the most significant role will be played by Paurashava Authority. The Planning Section must have to launch in the Paurashava which will carry out the entire work of project initiation and plan formulation. These works are complicated and time consuming, and require multidisciplinary professionals.

25.3 Role of Municipal Authority

According to the section 35 of Paurashava Law-2009, Paurashava may, and if so required by the prescribed authority shall, draw up a Master Plan for the municipality within five years of its establishment. The Paurashava should have to ply an important role by implementing all the priority tasks without any delaying other wise the plan proposals will be inactive for implementation in wrong periods.

Chapter Twenty Six: Concluding Remarks

This master plan is developed a comprehensive vision for Akhaura in context with its location, natural resources, and visions of the community. Akhaura Master Plan will describe a strategy to address the need for facility improvements and for capital investments to support current and future development of the Paurashava. The community will be involved every step of the way. It will guild the future development of the Paurashava.

It is essential to recognize that the size, growth rate and distribution of the density of the Town have a crucial impact on the dependence on transit. Again future growth pattern should have to control by the land use control and it affects the transport design a lot. Ward wise application of Policies for increases in density around the existing roads and nodes and along transit corridors can achieve reductions in congestion and pollution and can maximize the transportation infrastructure.

Preparation of Akhaura Paurashava Master Plan not only addresses the short term needs or demand or Infrastructure improvement but also it addresses the very long term needs that that forecasted by using appropriate planning tools.

The Summary lists of proposals for mitigation of identified issues are:

⇒ A complete Traffic and Transport master Plan have been proposed.

⇒ Drainage network is proposed by analyzing elevation and precipitation of the area, which will reduce water logging in Akhaura Paurashava.

⇒ Most of the roads are proposed to widen to decrease traffic jam of the Akhaura area.

⇒ An embankment cum road is proposed beside Titas River which will act as flood protection wall.

⇒ Few new roads are proposed to increase the connectivity of a community with core area or, other communities.

⇒ Separate industrial zone is proposed for General Industries.

The Paurashava has an established market area. Planned industrial development will generate tremendous economic growth and huge urbanization in the Paurashava area. Hence, there is no other alternative than planned development in future. Because, a slight unplanned development will even result in much less economic gain as well as environmental degradation of the Paurashava areas. It is hoped that the Traffic and Transport Master Plan, Drainage Master Plan with updated Landuse Plan will guide towards planned development of the Paurashava. Since planning is a continuous process, the plan requires be monitoring and revising at regular basis, and it must be reviewed with necessary revision during every annual budget formation, and must be updated for continuing planned development of the Paurashava. Hence, engagement of at least one full time town planner is the utmost need for ensuring planned development of the Paurashava.