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BANARIPARA PAURASHAVA

MASTER PLAN: 2011-2031

December, 2014

Technical Assistance: Local Government Engineering Department (LGED)

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Local Government Division

Ministry of Local Government, Rural Development & Cooperatives

BANARIPARA PAURASHAVA MASTER PLAN: 2011-2031

STRUCTURE PLAN

URBAN AREA PLAN:

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

WARD ACTION PLAN

December, 2014

BANARIPARA PAURASHAVA

BANARIPARA, BARISAL

BANARIPARA 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, Banaripara 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 Banaripara Paurashava.

Master Plan of Banaripara Paurashva has been prepared following the pre-requisite of the Local Government (Paurashva) Act, 2009. To prepare the Master Plan, LGED engaged consulting firm named Sheltech Consultants (Pvt.) Ltd in association with Design Planning and Management Consultants 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. Paurashava 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 Banaripara Paurashava together with land use control and effective management of service facilities.

The Paurashava 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 Banaripara Paurashava will be necessary to implement this Master Plan successfully and make this Paurashava developed and livable. I hope Banaripara Paurashava will be a model Paurashava in Bangladesh through building itself green and sustainable by successful implementation of this Master Plan.

(Mr. Golam Saleh Monju Mollah)
Mayor
Banaripara Paurahsava.

EXECUTIVE SUMMARY

The presentation of this Master Plan Report is in compliance to the Terms of Reference for the preparation of Master plan for Banaripara Paurashava under the project titled “Upazila Town Infrastructure Development Project”. Banaripara was upgraded as B category Paurashava in 2001. It occupies an area of 2.09 sq. km and consists of 9 wards and 3 mauzas. At present the total population is almost 10366 of which 5365 are male and 5001 are female. Density of population is about 5573 persons per sq. km and literacy rate is about 88.5%. It has moderate level of economic activities and economic potentials to flourish as an urban centre in near future. Under such circumstances a development plan can help creating advantages for living and working in the Paurashava that would indirectly help attracting investment for economic growth leading to employment generation. The current development plan of the Banaripara Paurashava focuses mainly on infrastructure development and control of haphazard spatial development through the instrument of land use zoning.

The plan aims of preparing the master plan is to identify the infrastructural facilities needed for socio economic and physical development and activities of the people living in the Paurashava so to improve their living condition.

The Master plan has the three components- the Structure Plan, the Urban Area Plan and the Ward Action Plan. The **Structure Plan** basically concerned with the physical development of broad strategies for managing and promoting efficient urban development over the long term (2011-2031) and attempts to integrate economic, physical and environmental objectives. It also identifies the basic strategic options available to accommodate the anticipated growth. The Structure Plan also outlines major sector wise policies to guide development in the desired manner over a longer period of time (for 20 years).

Second Component is the **Urban Area Plan** which is synthesized with upper tier of the Plan, the Structure Plan. The Urban Area plan provide an interim mid-term strategy for 10 years (2011-2021) for the development, of the Paurashava following the broad guidelines set by the longer term structure plan. The plans can be prepared for specific sections of the urban area identified in the structure plan for rapid development or for special projects and improvements. It gives detailed information on the preferred development pattern, showing location of roads, infrastructure, community facilities and land use zones. Considering the development growth trends, an estimated growth rate for Banaripara Paurashava has been fixed at 1.36% using Exponential formula. Urban Area Plan is comprised of four components that is Land use Plan, Transportation and Traffic Management Plan, Drainage and Environmental Management Plan and Plan for Urban Services.

Land Use Plan is mainly confined to the land use zoning. Total 19 categories of landuse zones have been identified in Banaripara Paurashava. About 29.52% lands are preserved for residential purpose and 23% of total built up area and new urban area is reserved as Urban deferred. Relevant land development control regulations and necessary implementation guidelines have also been incorporated.

Transportation and Traffic Management Plan includes existing condition of transportation facilities, intensity of traffic volume, travel demand forecasting for next 20 years, future traffic volume and transportation development plan. The plan proposed 11.86 km of new road network with adequate width and hierarchy. Proposal has also been made for widening of existing narrow

roads which is about 33.99 km and linking the missing links. Here is also proposal of bus terminal (1.01 acre), bus stand (0.76 acre), truck stand (0.29 acre), truck terminal (1.18 acre), fuel station (0.53 acre), rickshaw stand (0.49 acre), and tempo stand (0.74 acre) respectively in ward no. 1, 9, 9,1,1,1, and 1. Moreover transportation system management and plan implementation strategies are also described in this plan.

Drainage and Environmental Management Plan is third part and subdivided into two segments- Drainage and Environment. Existing drainage network, land level, plan for drainage management and flood control, plan implementation strategies are also described in this plan. Existing environmental condition, solid waste management, environmental pollution, plan for environmental management and plan implementation strategies are also included. Projection on existing and proposed urban services, have been provided in this plan. To promote future drainage management, proposals have been made to create hierarchical drainage network throughout the future town with recovery of encroached khals to serve as primary drains and excavation of filled in areas of the natural khals. Preserving the major ponds as alternatives sources of water, have been suggested. CBO based local waste collection system will have to be introduced at local level for waste management including establishment of a dumping site (6.01 acre in extension area), and a number of transfer stations in every ward with a total area of 1.42 acres to collect waste for transportation to the dumping site. There is also a proposal of Electric Sub-station with an area of 1.08 acre in ward no. 4.

The Third component is **Ward Action Plan (WAP)** where ward wise priority schemes, phasing of the schemes is made. Prioritization of no. of wards based on existing development pattern and need of development is also identified.

It is also mentioned here that the final plan has been prepared on the basis of comments made by the PMO and the Paurashava. It is suggested that to follow up the plan proposals and recommendations of different sectors to keep balance with demand and supply of citizens' requirements. The Master Plan will facilitate the agglomeration of people with the view to provide all facilities that will be help full for boosting up their socioeconomic condition. It should be kept in mind that master plan is a guideline for development and control of growth in a systematic manner. Without proper regulation or rules it would not be possible to manage the Master Plan. However appropriate authority must be obligatory for the execution of the Master Plan. Recommendations have been made to strengthen the financial and managerial capacity of the Paurashava including creation of a planning section to handle preparation and implementation of the town plans and manage development control system. Suggestions have been made to reduce dependency on the central government for financing development and improve its own financial capacity by strengthening its own sources of revenue earning, particularly focusing on the holding tax.

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List of Abbreviations and Acronyms

BBS	:	Bangladesh Bureau of Statistics
BDT	:	Bangladeshi Taka (Currency)
BM	:	Bench Mark
BTCL	:	Bangladesh Telecommunication Company Limited
BWDB	:	Bangladesh Water Development Board
CBO	:	Community Based organization
CS	:	Cadastral Survey
DGPS	:	Differential Global Positioning System
EMP	:	Environmental Management Plan
EPA	:	Environment Protection Authority
GCP	:	Ground Control Points
GIS	:	Geographic information System
Govt.	:	Government
GPS	:	Global Positioning System
H.Q.	:	Head Quarter
H/hold	:	Household
JICA	:	Japan International Cooperative Agency
KM/ km	:	Kilometer
LAN	:	Local Area Network
LCC	:	Lambert Conformal Conic
LGED	:	Local Government Engineering Department
LPG	:	Liquid Petroleum Gas
MV	:	Motorized Vehicle
NGO	:	Non-Government Organizations
NMV	:	Non Motorized Vehicle
O-D	:	Origin – Destination
Orgs.	:	Organizations
PCU	:	Passenger Car Unit
PD	:	Project Director
PMO	:	Project Management Office
R.F.	:	Representative Fraction
RHD	:	Roads and Highways Department
RoW	:	Right of Way
RS	:	Revenue Survey
RTK-GPS	:	Real Time Kinematics Global Positioning System
SoB	:	Survey of Bangladesh
SPSS	:	Statistical Package for Social Science
TCP	:	Temporary Control Point
TIN	:	Triangulated Irregular Network
ToR	:	Terms of Reference

Part A. Structure Plan

Chapter-1

INTRODUCTION

1.1 Introduction

A massive program to prepare master plan of 223 Paurashavas and Kuakata Tourism Centre under the project titled “Upazilla Towns Infrastructure Development Project’ (UTIDP) funded by the Government of Bangladesh has been taken by Local Government Engineering Department (LGED), Ministry of Local Government, Rural Development and Cooperatives, Government of the People’s Republic of Bangladesh. The aim of master plans for the Paurashavas is to identify the infrastructural facilitates needed for overall socio-economic and physical development and activities of the people living in the respective Paurashava so as to improve their living conditions.

However, the main rationale of preparing master plan of Banaripara Paurashava is to prepare Land Use Plan, Ward Action Plan, and related Infrastructural Plans as visualized in the Terms of Reference (TOR). The Master Plan of Banaripara Paurashava is to be prepared based on the topography survey, physical feature survey, land use survey, socio-economic survey and other different types of sector surveys/studies. However, the plan consists of three volumes known as Master Plan. These are:

- **Structure plan**
- **Urban Area Plan**
  -Landuse Plan;
  - Transportation and Traffic Management Plan;
  -Drainage and Environmental Management Plan; and
  -Plan for Urban Services.
- **Ward Action Plan**

The following features have been addressed in preparing the master plan for Banaripara Paurashava:

- Guide/regulate planned development of infrastructure and facilities;
- Facilitate socio-economic development activities;
- Ensure conservation of natural streams and addressing properly environmental concerns;
- Apprehend existing unplanned growth;
- Stop further encroachment of the fertile agricultural lands and potential beach areas;
- Proper and optimal use of land;
- Facilitate provision of utilities, services and facilities for the resident population;
- Spatial layout for public sector, private sector and public- private sector investments; and
- Facilitate conservation of bio-diversity.

1.2 Philosophy of the Master Plan

The master plan will facilitate among the people of a defined place for improving their socio-economic condition by providing all supportive facilities for them. Moreover, considerable care has to be given to improve their quality of life through providing some other facilities such as recreational, municipal facilities etc. But it should be kept in mind that master plan is a guideline for development and control of growth in a systematic manner. Without proper regulation or rules it would not be possible to manage the master plan. However, appropriate authority will be obligatory for the execution of the master plan.

1.3 Objectives of the Master Plan

According to the Terms of Reference (TOR) the objectives of the Master Plan are as follows:

- Find out problems and potentialities of developing various sectors;
- Facilitating the provision for all types of infrastructure and service facilities needed for development as well as socio-economic facilities and infrastructure for the local people;
- Supporting protection of the local environment/ecology;
- Preparing a 20-year Master Plan used as tool to guide and regulate planned physical growth and development;
- Facilitating job opportunities for the local people so as to address the issue of poverty reduction in line with the national policy of poverty reduction; and
- Keeping provision for short, medium and long-term investment plans by the public sector, the private sector and the PPP in implementing the Banaripara Paurashava plan.

1.4 Conceptualization

Structure Plan

The term Structure Plan includes a full analysis of the existing scenarios, emphasize the existing condition of different sectoral infrastructures, identification of sectoral issues and interventions, recommendation 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.

Urban Area 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 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 10 years. Delineation of the Urban Area Plan should be based on the urban growth area as identified in the Structure Plan. It will contain more details about specific programs and policies that require to be implemented over the medium term. The UAP is consisted with the Land Use plan, Transportation and traffic Management plan, Drainage and Environmental Management Plan and Community Services Plan.

Ward Action Plan

This 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. Problems need immediate attention and scope of development is the basis of this plan. The problems and their recommendations as prescribed in the Urban Area Plan are being emphasized for immediate implementation with the help of ward Action Plan

1.5 Approach and Methodology

The project is aimed for development of infrastructure and services for the Paurashava with optimum provision of opportunities for local people and extending services to surrounding areas.

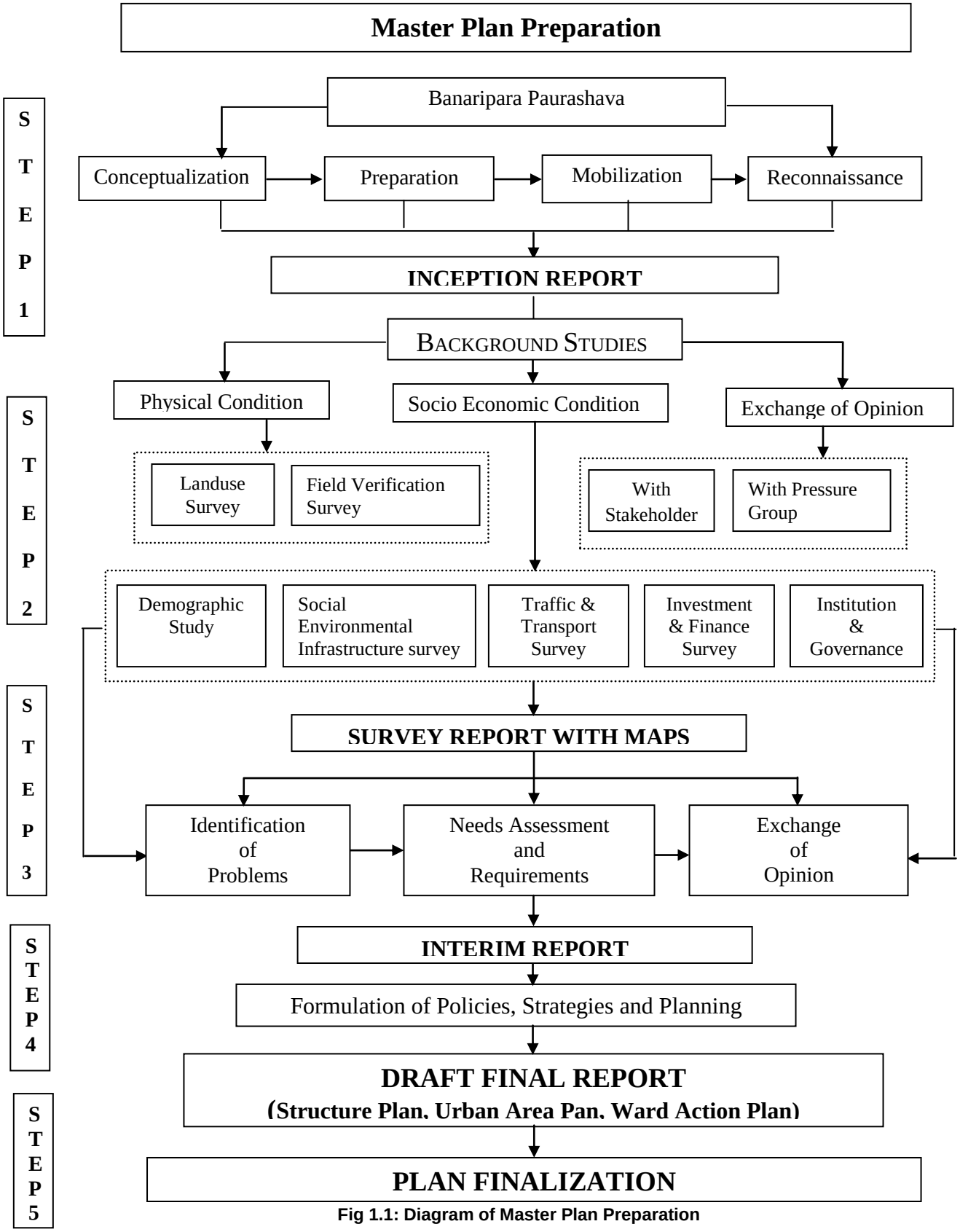


Fig 1.1: Diagram of Master Plan Preparation

1.5.1 Demarcation of the Planning Area

The demarcation of the study area is an important task in order to gather information and data. As per TOR, the study area or the planning area should be determined by the consultants reviewing its growth potential, geographical and geological context, tourism aspects and other relevant issues. Determining the planning area for Banaripara Paurashava, the consultants had exercised above issues and fixed the area of the Paurashava. The total area of the Banaripara Planning Area is 516.99 acres (2.09 sq km) and there is extended area in the structure plan. However, in demarcating the study area, the following aspects have been considered:

- the existing and future road linkages;
- physical growth directions; and
- physical features of the area and the surrounding areas.

1.5.2 Preparation of the Base Map

The following steps have been followed to prepare the base map:

- Collection of RS Mouza Maps;
- Identification of GCP (TIC) on Digitized Maps;
- Scanning of Mouza Maps;
- Edge Matching and Preparation of Study Area Map;
- Digitization of RS Mouza Maps;
- Edit Plot Check of Digitized Coverage; and
- Geo-referencing of Mouza Maps.

1.5.3 Surveys

1.5.3.1 Topographic Survey

Topography survey was conducted by using RTK-GPS and Total Station (TS) survey technique. Topographic survey has included the following features:

- Land levels/spot levels for contours at 50m intervals with denser intervals for undulations;
- Alignment and crest levels (not exceeding 50m) of roads, embankments, dykes and other drainage divides;
- Alignment of rivers, lake, canal, drainage channels etc;
- Outline of bazars, water body, swamps and forest, etc;
- Type, width, length and name of road above flood level;
- For closed boundary/outline of homestead, water bodies, swamps, forest etc. junctions, spot heights or land levels will be taken roughly at 10m intervals in normal cases and contour will be at 0.3 meter interval; and
- Crest levels will not exceed 50m along all dyke, roads and drainage divide.

1.5.3.2 Physical Feature Survey

Physical feature surveys have provided the basis for understanding many planning problems. To know existing information about physical features of Banaripara Paurashava, physical feature survey was carried out. The physical features map was prepared on RS/CS map on 1''=165´ scale showing the following features:

- Cross Section, long section, type, width, length and name of road, road level above datum, slopes, flooding lands, slopes, borrow pit;

- Identification of any bridge or culvert on the road with their length & width and span of the bridge, condition of abutments, condition of the deck, wing walls abutments;
- Type, size, inlet and outlet location of drain along with flow direction, width of the canal, place of encroachment;
- Type of sewer system, size, type and location of sewerage line, location of bins, identification of any other sewerage collection system;
- Identification of the water supply system, location of overhead water tank and its capacity, catchments area of overhead tank;
- Identification, location and capacity of electricity, telephone service; and
- If any, new items identified during the survey period will also be surveyed;

1.5.3.3 Land use Survey

Utilizing the Base Map, (physical features survey overlay on survey map) the land use map was prepared indicating the broad categories of land uses. And it described using a suitable land use code reference. The characteristics of each land use area were described in the survey report. The Land Use Maps were prepared on the Base Map.

1.5.3.4 Socio-economic Survey

The planning principle directs towards people and their needs concerning housing, shopping, recreational, employment, education, and health services, etc. Detail information on population is essential for estimation of land requirement for future needs. It is also essential for allocating land between various competing uses.

A socio-economic survey for collection of primary data was conducted at Banaripara Paurashava. The sample size of socio-economic survey was 5% as per ToR. It is clearly understood that the purpose of this socio-economic survey is to obtain the project related socio-economic data on households in the project area. All data were collected from the primary sources through a specially designed socio-economic questionnaire survey.

1.5.3.5 Drainage and Environmental Study

The consultants have undertaken a drainage survey and environmental study at Banaripara Paurashava. The preparation of master plan for the next 20 years for the Paurashava seeks environmental investigation of development activities that will be undertaken in next 20 years. The issues/aspects that were investigated as per the TOR are as follows:

Existing Infrastructure

- Drainage
  - Man-made (drainage network, gradient, attachment area, out let)
  - Natural (flow direction, hydrology, usability)
- Water supply (network, coverage)
- Sewerage (location/network, condition)
- Solid waste management-existing system, location of garbage disposal, management aspect

Environmental Aspects

- Humidity, rainfall and temperature of the study area;
- Climatic and Disaster Condition, Soil and topographic Condition;
- Environmental Pollution (air, water and noise pollution);
- Identification of hazards;
- Existing mitigation/coping measures, if any; and
- Identification of environmental protection laws/regulations.

1.5.4 Data and Information Management

All the data and information collected from the primary and secondary sources have been sorted/edited and computerized and analyzed. Projections were done in the case of populations so as to estimate the spatial requirements of different services and facilities for the resident population. All these were accomplished in line with the objectives of the plan so as to estimate the land requirements for different service and facilities. Elaborate information regarding projection and estimation of land requirements are available in the following concern chapters.

1.5.5 Adopted Planning Standards

The planning standard provided by the PMO office of UTIDP has followed to prepare the Master Plan.

1.5.6 Stakeholders' Consultations

After preparation of a draft plan, a consultation meeting has conducted with the concerned authority and local people of Banaripara Paurashava to acquire aspirations, demand, problems and prospects of the area and community as well as the views of service proving agencies and local administration and share the master plan with them. After incorporating their views and demands, the master plan has prepared.

1.6 Scope of Work

The scope of the work is to cover all aspects related to the preparation of Master Plan / Urban Area Plan which include Land Use Plan, Traffic Management Plan, Drainage and Environment Plan and Ward Action Plan. Prepare a plan to set out proposed Master Plan at three levels namely Structural Plan, Master Plan / Urban Area Plan and Ward Action Plan. In order to prepare these plans following activities has been conducted:

- Visits to the Banaripara Paurashava have been made in different stages for the preparation of Master plan;
- An inception meeting at the Paurashava level has been conducted to inform Paurashava about the scope of work for the preparation of Master Plan for 20 years development vision;
- The study area has been determined on the basis of existing condition demand of the Paurashava and the potentiality for future development;
- Different types of survey activities have been conducted from primary and secondary source;
- A comprehensive drainage master plan for a period of 20 years has been prepared;
- Assessing existing condition an integrated transportation plan is proposed for next 20 years;
- Ward action plan with list of priority schemes for the development of roads parks and other social facilities are proposed which need to implement during the first five years of the plan period;
- Consultation meeting has been organized with the help of concerned Paurashava and local stakeholders; and
- Master plan and report with required standard have been prepared and submitted as required TOR.

Chapter-2

STRUCTURE PLAN

2.1 Background of the Paurashava

Banaripara upazila is situated in Barisal district. It is located between $22^0$45′ and $22^0$52′ north latitudes and between $90^0$02′ and $90^0$13′ east longitudes. It is bounded on the north and on the east by Wazirpur Upazila, on the south by Nesarabad Upazila of Pirojpur Zila and Jhalakati Sadar Upazila of Jhalakati Zila and on the west by Nazirpur Upazila of Pirojpur Zila. Banaripara Paurashava occupies an area of 2.09 sq. km. (including 0.23 sq. km. extension area). It consists of 9 Wards.

Banaripara is the smallest Upazila of Barisal district is located at the southern part of the country. Banaripara came into existence in 1980. Banaripara Paurashava consists of 9 Wards and 2 mauzas. The Paurashava was established in 22nd July, 1990. However, Banaripara Paurashava consists of 9 wards with an area of1.86 sq.km and extension area with an area of 0.23 sq. km. (Field Survey, 2010).

2.2 Vision of the Structure Plan

The vision of the Structure Plan is oriented with the policy development for the project area in relation with national and regional policies or framework through close liaison between planning authority and government departments. In a word, it will provide the basis of Co-coordinating decisions. It will be considered as the upper level planning guideline component for next two levels of planning i.e. Urban Area Plan and Ward Action Plan. Structure Plan will identify the urban growth area based on which the Master Plan area will be delineated. It will set policy framework which will be more detailed in Urban Area Plan. Moreover, it will provide the basis of development control in pursuing the Urban Area Plan. Subsequently, the indication of action areas and the nature of treatment in different sectors will also be considered here. It will define the location of action areas but not the boundaries, also the priority, possible effect of actions proposed. Pertaining with Action Area Plan, the combination of Public and Private Agency or individuals' involvement to implement the proposed actions will be stated here.

2.3 Objectives of the Structure Plan

The main objectives of preparing master plan of Banaripara Paurashava are to prepare Structure Plan, Urban Area Plan and Ward Action Plan as envisaged in the Terms of Reference (TOR). The structure plan has the following objectives:

- To identify the main development issues facing the Paurashava (town) with major opportunities and constraints;
- To identify the growth and possible physical expansion of the city as foreseen considering economic base and Trend;
- To provide a view of required and suitable lands for future physical expansion;
- To develop the sector wise strategies pursuing the future development control in a desirable direction; and
- To identify the resources which are needed to strengthen the financial resources of the town
  - Establishment of inter sectoral goals, policies and general proposals for urban spatial development, and
  - Provide framework for the next hierarchy of Banaripara Paurashava Master Plan and Ward action plan.

2.4 Content and Format of Structure Plan

As per Terms of References (TORs) the Structure Plan of Banaripara Paurashava has been prepared for 20 years in long term. The Urban Area Plan (UAP) will be an interpretation of Structure Plan in Medium Term and Ward Action Plan in Short Term. Figure 2.1 shows the content of structure plan.

Demarcation of Structure Plan Area

The issues have been adopted for demarcating the study area for Banaripara Paurashava comprises the following:

- Study the existing Paurashava boundary with existing growth trend and pattern Analysis of the physical development constraints and potentialities;
- Study of the existing and future national, regional and local linkages with Banaripara;
- Consultation with local governments; and
- Consultation with local people, members of civil societies and other stakeholders.

According to the gazette notification, the Banaripara Paurashava comprises 2 mauzas namely Banaripara and Kundohar. The total Paurashava area is about 516.99 acre (about 2.09 sq.km). The following table shows mauza wise area of Banaripara Paurashava. **Map 1.1** delineates the structure plan area of Banaripara Paurashava.

Table 2.1: Mouza Wise Area of Banaripara Paurashava

Name of Mouza		J.L. No	Sheet No.	Map Category	Area	
					in Acre	in Sq.km
Paurashava Area	Banaripara	42	01	RS	255.56	1.03
	Kundohar	74	00	RS	204.51	0.83
	Total	**2**			**460.07**	**1.86**
Extension Area	Banaripara	**-**	-	RS	24.56	0.10
	Machrang	**-**	-	RS	32.36	0.13
	Total				**56.92**	**0.23**
Sub-Total					**516.99**	**2.09**

Source: Paurashava, 2012.

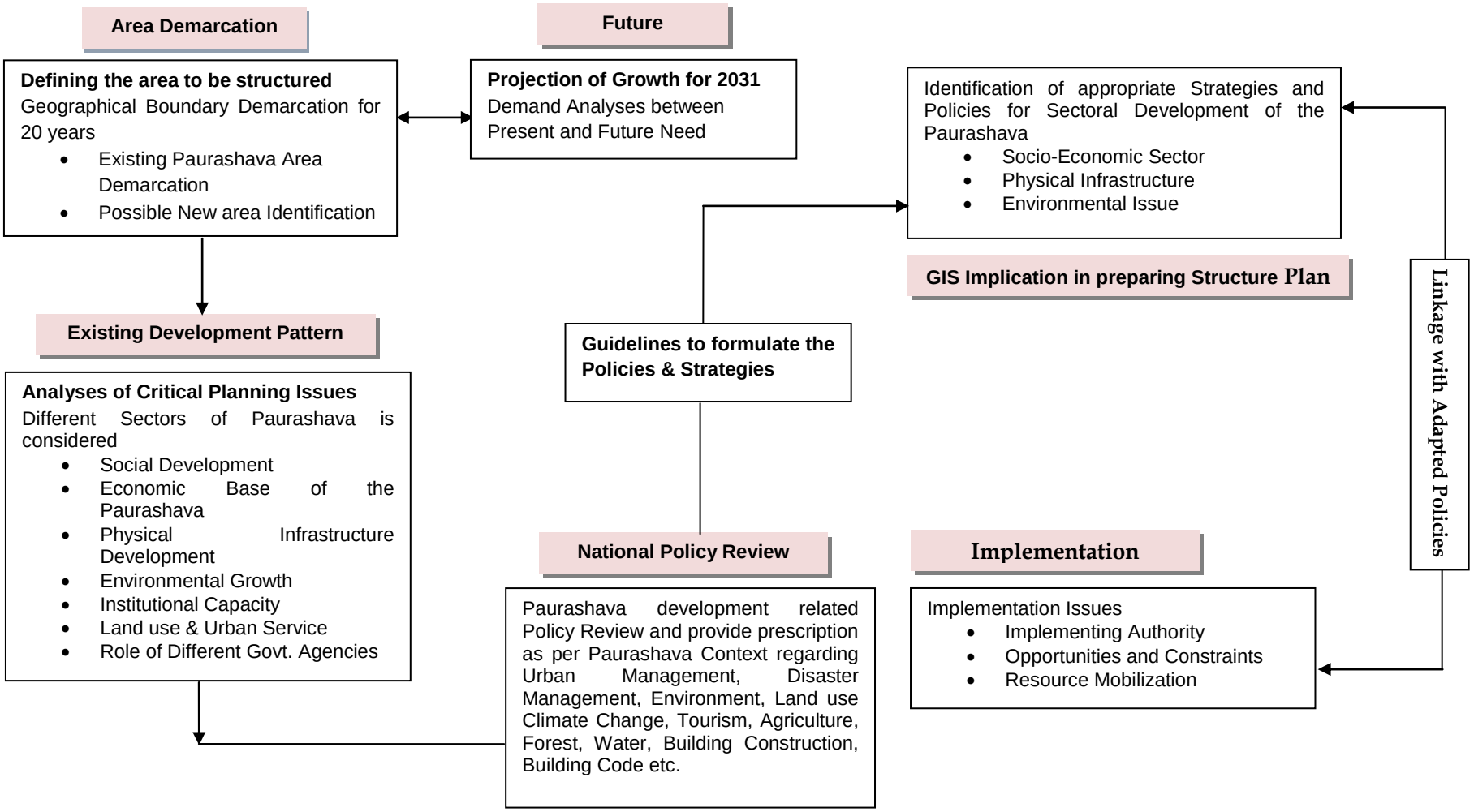


Fig 2.1: Content of Structure Plan

3.1 Social Development

In Banaripara Paurashava, about 46.7% and 34.4% households concentrated in the potential core area and fringe area. This indicates that Banaripara is semi-urbanized area where mainly commercial development concentrated on core area, influential or affluent people live in the potential core area and the urban poor those are always likely to live in fringe area.

The educational status of an area is the major determinant of society building. As per BBS 2011, in Banaripara Paurashava the literacy rate is about 88.5% where the national level the literacy rate is about 51.8%.

It is seen that almost all the wards have similarity in occupation, and small business is dominant in every ward. As regards, 3.2% of the people are unemployed (Socio Economic Survey, 2010).

Most of the households (76.7%) own their house by inheritance whereas about 13.3% of the households purchased their house. Considering other assets it has been observed that according to BBS 2001, about 28.7% households have own agricultural lands.

There are different types of income groups of people living at Banaripara Paurashava area. About 39.3% of the households' incomes are within the range of Tk 5001.00 – Tk.10, 000.00 per month. Further, 18.5% of the household have income per month Tk. 2500.00 – Tk. 5000.00; 24.4% Tk. 10,001.00 - Tk. 15,000.00 and 3.6% Tk. 15,001.00 – Tk. 20,000.00.

3.2 Economic Development

In Bangladesh, the economy is composed of formal and informal sectors. But statistics on the size of the informal economy in Bangladesh are difficult to find out. Formal economic activities sector of Banaripara Paurashava mainly comprises Trade and Commerce, Agriculture, Service Sector, Industry, Transport and so on. The major occupational group is involved in agricultural activity (Socio Economic Survey, 2010). About 88.8% of all the households' members irrespective of sexes of Banaripara Paurashava are within the age group of 16-57 years. This indicates majority of the household members are economically active group. Besides, the Shandhya River which has been passed beside the Paurashava area can be used for the development of fishing industry.

3.3 Physical Infrastructure Development

There are some segmented and sporadic physical developments occurred over the years in different parts of the Banaripara Paurashava. There is a river named Shandhya which is located western part of the Paurashava. There are two big canals, one is gone though middle of Paurashava covering eastern periphery and the other is northern part. Both canals are connected with Shandhya River. Most of the lands on both side of middle canal are developed as residential and commercial use areas. Ward no 1 and 2 are the main commercial zone in the planning area. Administrative structures are mostly developed at ward no 5 of the Paurashava.

In the planning area, a significant percentage of lands are devoted for agricultural purpose. From the landuse map, it is depict that agricultural lands are mostly developed in periphery area. However, major concentration is observed in ward no 1, 2, 4, 8 and 9. Residential structures are mostly developed in core and potential core area. From the land use survey it has been also observed that every ward located within the study area has more or less residential land use and five wards like Ward-01, Ward-02, Ward-05, Ward-08 and Ward-09 have highest concentration of residential lands.

There is no public park at the Banaripara Planning area except the playgrounds of educational institutions.

Most of the roads of all wards are pucca and the overall condition is moderate except access roads. All these areas have been well linked up with functional road network but some roads are narrow especially access roads which are required to be more widened.

The existing natural features having river and khals are playing a vital water ways in connecting the area with that Bay of Bengal.

3.4 Environmental Growth

Banaripara Paurashava is located in the southern part of Bangladesh. It is very close to the Bay of Bengal. It enjoys generally a sub-tropical monsoon climate. While there are six seasons in a year, three namely, the winter, the summer and the Monsoon are prominent. Winter which is quite pleasant begins in December and ends in February which ranges from of 7.8^{o}-14^{o} C. The establishment of Water Treatment Plant beside the River will be required for ensuring the good drinking water. In addition, it is possible to preserve the environment before any advanced development as industrial development is very low.

3.5 Population

Banaripara Paurashava is about 1.86 sq. kilometers (460.08 Acres) and comprises around 10366 numbers of people (male 5365 and female 5001). Area of Banaripara Paurashava is not a moderate density area compared to upazila density. The average population density of Banaripara Paurashava area is 5573 person /sq.km.

Table 3.1: Population Distribution of Banaripara Paurashava Area at 2011

Ward	Population at 2011	Area (acre)	Density (person per acre)
Ward 1	1770	112.34	16
Ward 2	1459	87.14	17
Ward 3	991	19.56	51
Ward 4	1220	35.33	35
Ward 5	1032	28.36	36
Ward 6	870	18.37	47
Ward 7	536	28.01	19
Ward 8	882	46.19	19
Ward 9	1606	84.78	19
Total	**10366**	**460.08**	**23**

Source: BBS 2011, Community Series, Zila: Barisal, 2012, BBS 2011 and Field Survey, 2010

3.6 Institutional Capacity

In Banaripara Paurashava, the plan implementation and main power executing authority will be the Paurashava itself. Therefore, effective execution capacity in terms of revenue generation, manpower capacity of the Paurashava is required to evaluate to implement the plan. There are two major component of income generation. These are: 1) Revenue, 2) Development.

In most of the Paurashavas of Bangladesh the main income source is Revenues from different sources. But in Banaripara Paurashava, in last 5 years the income from development section has contributed about 73% on an average to the overall income of Paurashava whereas revenue sector has contributed about 27% on an average to the overall income.

Analyses reveal that highest income expenditure ratio (1.07) is observed in 2008-09 year and lowest ratio (0.83) is observed in 2006-07. It indicates that in 2006-07, the expenditure was greater than income and in 2008-09 the income was higher than the expenditure. Besides, in the year 2010-11, the income expenditure ratio shows a balanced condition (1.00).
Existing Manpower of Banaripara Paurashava is consisted of 1 elected Mayor, 12 councilors (9 male and 3 female), and 3 Departments.

These are:

1. Engineering Department;
2. Administrative Department; and
3. Health, Family Planning & Conservancy Department.

These three departments comprised of 29, 26 and 14 persons respectively. The manpower of Banaripara Paurashava is not so much capable to implement the Paurashava Master Plan. The Existing posts are not fulfilled by the required manpower. Besides, it may require more efficient, technical and experienced manpower to implement the master plan. It has been observed that in Engineering Department about 42% posts are vacant, in Administration Department about 77% posts are vacant and in Health and Family Planning Department the percentage of vacant posts are 100%.

Moreover at present, there is no town planning unit at Banaripara Paurashava. Engineering Department is responsible for monitoring the development control issues of this Paurashava.

3.7 Urban Growth Area

As per as the physical growth directions of Banaripara Paurashava is concerned, the Paurashava is expanding along the major roads. But the roads do not follow any regular pattern. Residential developments are expanding along with both sides of roads. Commercial development is already spread out on the bank of Shandhya River. In the ward no 1, commercial activity developed along with the khal. Moreover, a major portion of northern and south west part is remaining agricultural land.

The existing growth agglomerations along core and potential core area accommodate mostly the residential areas. Specially for getting advantage of high lands, residential areas developed on these areas that are accelerating growth of the Paurashava on the east side.

Scattered industrial development is found in the Paurashava. It is required to concentrate industrial development in a specific area rather than expanding towards other areas. The industrial development should not be mixed-up with residential development. On the other hand, existing industrial area is being mixed with the commercial area.

Educational, religious and other community facilities should be provided in consideration of Ward-wise population as explained in Chapter-4 in interim report. Potentialities of zoning for important landuse can be considered in determining the present growth of Paurashava.

Moreover, present and proposed road network would be a major determinant for growth of the Paurashava.

3.8 Catchments Area

Catchment area of the Banaripara Paurashava is calculated according to the agriculture commodities and movement of dwellers for rendering services. From Banaripara Paurashava, agriculture commodities marketed to the Dhaka, Barisal, Khulna and Pirojpur. Rice, jute, mustard and sugarcane are the major agriculture products marketed in those areas. Except agriculture production, fish and poultry productions also distributes in those areas. The Paurashava dwellers for rendering their services go to the Dhaka, Barisal and Pirojpur.

3.9 Land Use and Urban Services

Land use is one of major determinant of planning especially in a developing country where technical component is being upgraded still. Suitable land use planning not only controls the development but also it can affect the traffic generation and degeneration of a particular area. At Banaripara Paurashava, there is dominance of residential land (about 32.58% of the total) followed by water bodies (about 28.74%) and 27.74% agricultural land.

Each ward is more or less covered by residential land use. Most of the ward area shares more than 38% residential land use except ward no. 1, and ward no. 2. The highest residential land use (55.55%) is observed in ward no. 5. Most of the wards have commercial land use in some extent. Among them, ward no. 4, 5 and 6 have only 0.2 to 1% uses which are negligible. The major commercial and administrative development has been observed in ward no. 6 with 21.82% coverage. In Banaripara Paurashava area there is little industrial activities. Ward no.1, and 2 shares 0.03-0.43% land for industrial purpose.

The condition of recreational facilities in Paurashava area is not good enough. At present, only ward no. 3 (0.63%) has potentiality of recreational facility though lands are still available as open space.

3.10 Paurashava Functional Linkage with Regional and National Network

Barisal district is located in the southern part of Bangladesh on the bank of the river Kirtankhola. It is bounded by Madaripur, Shariatpur, Chandpur and Lakshmipur district on the north, Patuakhali, Barguna and Jhalokati districts on the south, Bhola and Lakshmipur districts on the east, Jhalokati, Pirojpur and Gopalganj districts on the west.

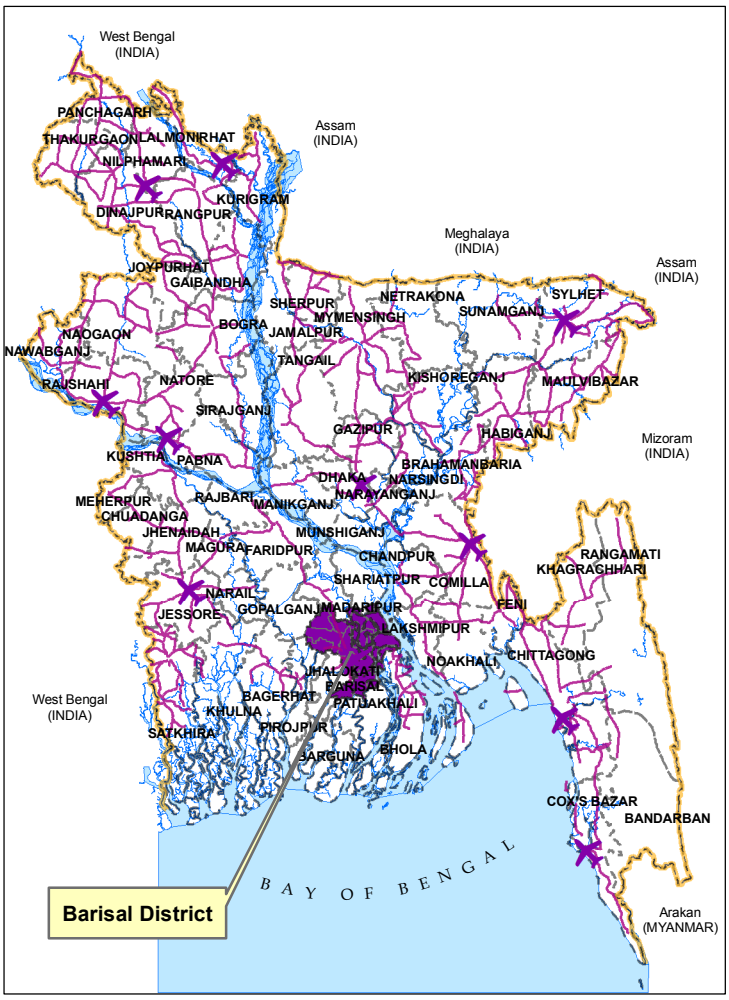
The northern part of the upazila has silty clay loam of the Ganges River. The southern part of this upazila has grey silty clay of the Meghna River and so is the central part of Banaripara. The district has hot summer and a mild winter. It is frequently affected by the cyclones and tidal surges that originate over the Bay of Bengal. Temperatures rise steadily from February to April, remain fairly steady from April to October and then fall to reach the lowest in January. The night in winter remains foggy till March when sea breeze begins to blow. The district has a unique network of a large number of tidal river and their distributaries. Many important rivers such as the lower Meghna, Arial Khan, Katcha, Kirtankhola Tetulia, Naya Bhanga, Jayanti, Swarupkathi, Sandhya and Amtali pass through the district. All the rivers are connected with streams and tidal channels and flow down to the Bay of Bengal. All the rivers are navigable throughout the year.

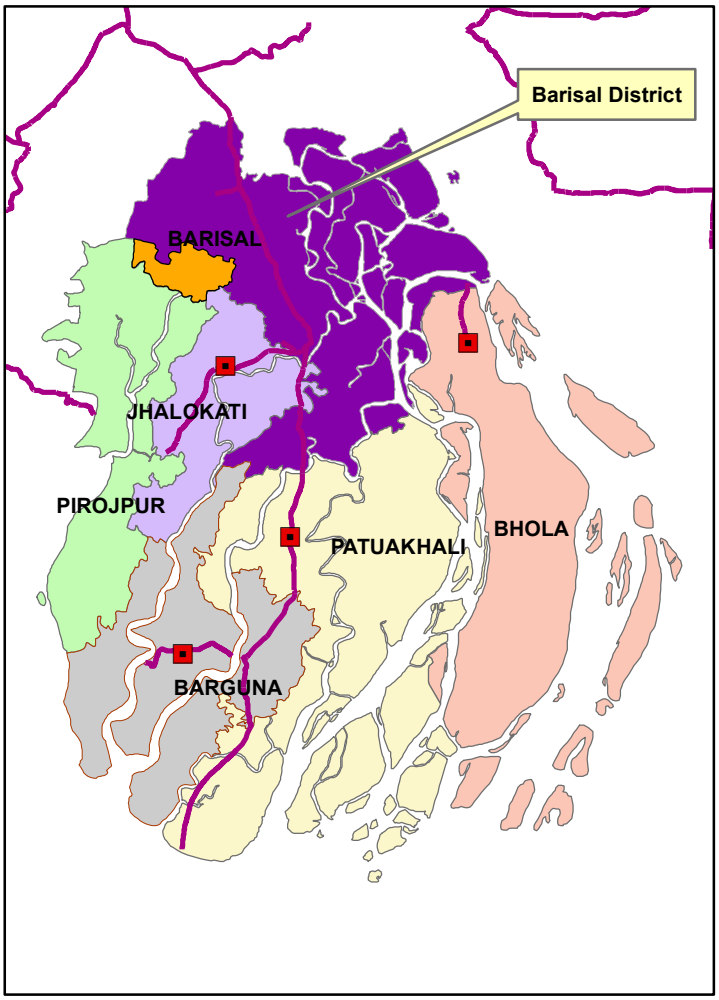
Barisal is divisional headquarter of Barisal Division. Communication system of Barisal district is comparatively better than any other district of this region. National and regional highways are gone through Barisal district. Banaripara Paurashava is one of smallest Paurshava of Barisal district. Banaripara is not directly connected with other districts. Barisal is used as via route. Two zila roads are gone through Banaripara Purashava. One is connected with national highway and other is connected with Nazirpur and Swarupkati. Moreover, among ten upazilas of Barisal district, almost all are connected by water ways. So in case of Barisal district water ways improvement should be given priority. The regional linkage map of Banaripara Paurashava has presented on **Map 3.1.**

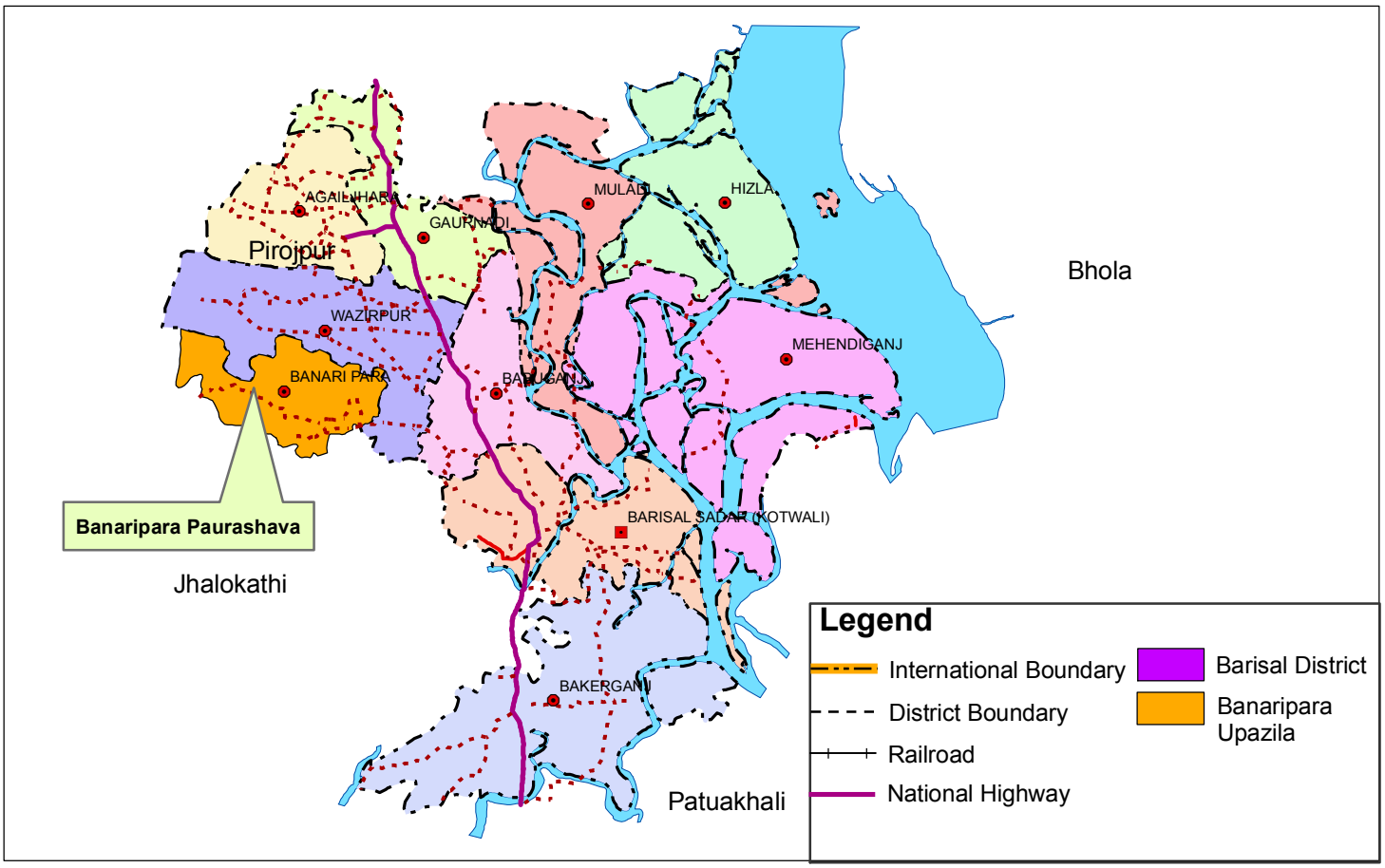
Banaripara upazila has great agricultural potentiality. People of this area are mainly involved in agriculture and business activities. At present from Banaripara Paurashava; Paddy, wheat, potato, brinjal, radish, rice, supari, coconut, etc, products are supplied to different district by water way through Launch or trawler. Also, different types of fishes are available here which are caught from Shandhya River which is adjacent to Banaripara Paurashava. Theses fishes are also distributed to all over the country. Thus, this upazila is contributing to national economy.

Moreover, most of the trading activities are concentrated in the bazaar area of the Paurashava. People from different locations come here for daily bazaar. Here is an urgent need for preparing well defined master plans for all those Paurashavas to accommodate all physical developments enhancing socio-economic developmental activities so as to boost up living condition of the people living in the urban area.

Map 3.1: Regional Linkage Map of Banaripara Paurashava







3.11 Role of Agencies for Different Sectoral Activities

Banaripara is a C Class Paurashava. The collaboration among different agencies is essential to execute the plan and make a linkage with national plan and investment. Therefore, the role of different agencies or organizations is required to identify and understand.

LGED

The major functions of LGED can be broadly categorized as follows:

- Rural infrastructure development;
- Urban infrastructure development; and
- Small scale water resources development

Urban Infrastructure Development consists of Planning and implementation of integrated town centre (bus terminals, markets etc.), municipal roads, bridge/culverts, drainage, water supply and sanitation projects, solid waste management projects, slum upgrading projects, development of Land use plan, improve planning & management capacity and resources mobilization & management, Institutional development of municipalities through training and computerizations, preparation of district and upazila town master plan, Development of technical specifications and manuals for construction of urban infrastructures.

RHD

RHD is responsible for the construction and the maintenance of the major road and bridge network of Bangladesh. It has a sustainable capacity to plan, manage and deliver its full range of responsibilities in respect of the main road and bridge network and to be accountable for these duties.

PWD

Public Works Department (PWD) plays a pivotal role in the implementation of government construction projects. It also undertakes projects for autonomous bodies as deposit works. The specific functions are:

- Construction of Buildings for Other Agencies on a Deposit Work Basis;
- Maintenance of Public Parks;
- Design and Construction of Public Buildings except those of RHD, T&T, Postal Department;
- Construction of National Monuments;
- Repair and Maintenance of Public Buildings;
- Preparation of Book of Specifications and Code of Practice;
- Acquisition and Requisition of Land for construction Work;
- Procurement of Materials & Equipment Required for Construction Work; and
- Valuation of Land and Property and Fixing of Standard Rent.

BWDB

Bangladesh Water Development Board (BWDB) is the principal agency of the government for managing water resources of the country. It was given the responsibility of accomplishing the tasks of executing flood control, drainage and irrigation projects to increase productivity in agriculture and fisheries.

DPHE

The Department of Public Health Engineering (DPHE) with its development partners is trying to ameliorate the sufferings caused by the lack of safe water. Alternative options for safe water supply are being catered in worse affected areas. Similarly for excreta and other waste management DPHE is implementing different projects to achieve an improved environment.

Besides, ensuring water supply and sanitation services/ facilities during and after the natural disasters/ calamities is another major function of DPHE.

PDB

Major roles of Bangladesh Power Development Board (BPDB) are

- To deliver quality electricity at reasonable and affordable prices with professional service excellence;
- To make electricity available to all citizens on demand by the year 2020;
- To provide specialized skilled services in Operation and Maintenance with outstanding performance in Generation, Transmission and
- Distribution for promoting competition among various power sector entities; and also
- To reach self sufficiency by increasing of its income and reduction of expenditure.

BIWTA

An advisory committee has subsequently been constituted to advise the authority in respect of all matters related to development, maintenance and operation of inland water transport and of inland waterways in Bangladesh.

- Draw up programmers of dredging requirements and priorities for efficient maintenance of existing navigable waterways and for resuscitation of dead or dying rivers, channels, or canals, including development of new channels and canals for navigation;
- Develop, maintain and operate inland river ports, landing/ferry ghats and terminal facilities in such ports or ghats;
- Carry out removal of wrecks and obstruction in inland navigable waterways; and
- Ensure co-ordination of Inland Water Transport with other forms of transport, with major sea ports, and with trade and agricultural interests for the optimum utilization of the available transport capacity.

Regulatory functions

a) Fixation of maximum and minimum fares and freight rates for Inland Water Transport on behalf of the Government;
b) Approve time tables for passenger launch services; and
c) Act as the Competent Authority of Bangladesh for the protocol on Inland Water Transit and Trade, looking after the use of waterways of Bangladesh on behalf of the Govt. of Bangladesh for the purpose of trade and transit between Bangladesh and India as provided in the Protocol

Land Registration Department

Land Registration Committee responsible for land registration. This Registration department records land mutations arising through sale, inheritance or other forms of transfer, reports changes to the Ministry of Land, and collects the Immovable Property Transfer Tax.

Chapter-4

CRITICAL PLANNING ISSUES

4.1 Physical Infrastructure

Following are the physical development constraints for preparing the master plan for Banaripara Planning area:

- As this Paurashava is located in a disaster prone area, its geographical location itself a constraint to develop the infrastructure in the Paurashava.
- Low land elevation and the distribution of water bodies make it difficult to provide the utility services, road network development over the Paurashava and also hinder well investment to encourage any industrial development
- The internal roads are developed in an unplanned way and also most of the access roads are katcha and narrow. Moreover, there is traffic management system which causes lack of planning in transport network development. This situation hinder the economic development but also the potentiality of physical development of Paurashava
- Lack of maintenance and facilities creating negative impact on physical development of Paurashava
- There are no gas supply and sewerage disposal facilities. This has also lack of adequate electricity supply. These are the major hindrances in economic and physical development of the city.
- Unplanned and lack of drainage network make it difficult to drain out the flood or rainfall water. As a result, water logging problem is common in the planning

4.2 Socio-Economic

The overall condition of different available urban utilities/civic services at Banaripara Paurashava area is not satisfactory. No gas supply facility is available for the households of Banaripara Paurashava which is one of the fundamental urban facilities for the residents living there. At present there is no dustbin and waste disposal facility at Banaripara Paurashava. It appears that wastes are thrown here and there which pollute the area and create environmental problems. The people of this area also suffer for disaster problems such as flood, water logging, cyclone, etc. people also face some pollution problems like water pollution, noise pollution, beach pollution, etc. There is also lack of recreational facility at the Banaripara Paurashava. The households of Banaripara Paurashava face some communication problems in their daily life such as narrow road problem, flood erosion problem, road jam problem and lacking of town bus service. However, this aspect needs vital consideration.

Most of the economic activities in Banaripara area are rudimentary in nature. Poor technology, unskilled labor force, low investment makes such economic activities uncompetitive with other cities and towns. Public investment in Banaripara area is not enough to generate growth impulses. Public investment in appropriate areas is a must for revitalizing its economy. The local people, particularly those who are rich usually apathetic toward investment. The main reason can be explained in two points: first, the investment is not safe and the second the rich must in big cities where there investments are safe. Lack of availability of funding sources/agencies viz. bank, etc is also acting as hindrance for economic development.

4.3 Environment

Climatic and disaster condition of the Paurashava is very rough. Floods and water-logging are comparatively low in the Planning area.

Saline water intrusion is mostly seasonal in Bangladesh; in winter months the saline front begins to penetrate inland and the affected areas rise sharply from 10 percent in the monsoon to over 40 percent in the dry season. As the impact of climate change, the sealevel rise cause severe impacts on coastal areas in Satkhira, Khulna, Bagerhat, Barguna, Patuakhli and Barisal are the

victims of salinity intrusion. Agricultural production, fisheries, livestock and mangrove forests are being affected by higher salinity in the dry season. Following figure shows the impact of sealevel rise and the probability of rising salinity intrusion in coastal region.

4.4 Transport and Communication

Van and rickshaw are two major transport vehicles in the planning area. Bicycle is the main mode for private users. Movement of motorcycle is also identified as major private mode. Inadequacy of bus service found normal scenario in the Paurashava. The peak hour traffic movement is found in morning from 9am to 10am and in the afternoon from 4pm to 5pm in general. Overall traffic congestion is low, let it should not be increased. The movements of auto rickshaw which is very risky need to restrict to keep the urban area risk free, clean and sound. Establishment of bus route within the planning area is another prior demand of the people.

The hat / bazar in the planning area serves by bituminous and brick soling roads. But the area is not served by well defined road hierarchy, nor is required now due to sparse use of roads by motorized vehicles. However, the induced activities due to the prospects of upward economic change may need to provide road network befitting with the need.

Highway traffic is comparatively low dominated by mixed type of vehicles including non-motorized. Generally, surface of the highways excepting for a larger part is excellent. The road network is not facilitated by designated parking area, bus terminal and bus bay. As a result, sometimes congestions and chaotic situation occurs for a little while. In spite of this situation, present road network is functioning well. But it has to be upgraded to accommodate the future increase of traffic volume that is expected to increase due to the implementation of master plan.

4.5 Landuse Control

At the present time, there is no control over land development at Banaripara Paurashava. The master plan is intended to prove a broad guideline to control the future development and to organize all types of development in a planned manner.

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. During implementation of Urban Area Plan / Ward Action Plan, necessary control should be imposed according to the following manner.

- High value agriculture land should be preserved only for agriculture purposes.
- Water body should be preserved to maintain the natural drainage system of the area.
- Easy accessibility with the surrounding upazila and regional linkage has to be ensured.
- Rural characteristics of the rural settlement have to be strictly maintained.
- All the municipal services have to be designed covering all the residents of the planning area.
- Land encroachment should be strictly outlawed.
- Agricultural lands can be used for other purposes considering the importance of the use and considering the quality of land in terms of its production.

4.6 Disaster

Disaster is the tragedy of a natural or man-made hazard that negatively affects society or environment. Disaster can be classified into two categories: natural disaster and man-made disaster. Natural disaster is the effect of flood, volcanic eruption, earthquake or landslide, draught, epidemic, etc. that affects environment and leads to financial, environmental or human losses. Man-made disasters is resulting from human intent, negligence or error, or involving a failure of a man-made system.

The Paurashava including the Banaripara Upazila has affected by the several major natural disasters ranging from Cyclone, Flood to Water-logging and Draughts, etc. The periods of those disasters are 1998, 2000, 2004, 2007 and 2008. Very scanty 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 Banaripara 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.

4.7 Laws and Regulations

The laws and regulations prescribed (mentioned in Chapter 5 section 5.2) are not directly related with the physical development activities and their control. The East Bengal Building Construction Act, 1952 is called the mother regulation to control all type of physical development but no instruction is being included in the Paurashava Ordinance, 2009 regarding EBBC 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 Paurashava and Surrounding Area Ordinance, 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. However, eligible development authority will be required to exercise proper rules and regulations for controlling the development considering various related issues.

5.1 General

Planning law must clearly define the extent and content of the rights of the Government and the people. Thus, legislative measures can help to frame policies for best use of land and its policies to control. Law should aim at a clear definition of the responsibilities and functions of various Government departments and its respective powers. For urban development, law has profound implications. It defines the system of urban Government, establishes the system of urban planning and regulation of urban development.

5.1.1 Local Government (Paurashava) Act, 2009

After the independence (1971), all local government systems were abolished by the Presidential Order No. 7 in the year 1972 and appointed an administrator in each of the Municipality. After this Order, name of the Local Governments were changed as Town Panchayat instead of Union Committee, Shahar Committee instead of Town Committee and Pourashava instead of Municipal Committee. Shahar Committee was renamed as Pourashava in the year 1973 with a Presidential Order No. 22 and introduced election procedure for the Chairman and Vice-chairman. Thana Parishad Ordinance, 1976 (Ordinance No. XXXII of 1976) was enacted in 21st May 1976 to provide for the constitution of Thana Parishad. Pourashava Ordinance was enacted and notified in the year 1977. Nine Commissioner and selection of female Commissioner in every Pourashava was provisioned in the Ordinance. According to the Pourashava (amendment) Ordinance, 1998, re-distribution of Pourashava Wards was introduced and the Pourashava belongs with 3 Wards proposed for 9 Wards and 12 Wards instead of 4 Wards. One Commissioner for every Ward and one-third Ward of every Pourashava was reserved for female Commissioner who was elected by the general election of the country. Local Government (Pourashava) Ordinance, 2008 (Ordinance No. XVII of 2008) was provisioned 9 Wards, one Mayor and 3 female Councilors for every Pourashava. Mayor and Councilors will be elected through general election. The provision remains in the Local Government (Pourashava) Act, 2009.

From the year 1977 to 2009, Pourashava Ordinance, 1977 enforces by the Pourashava authority and the name of the statute was Pourashava Ordinance, 1977. After promulgation of the same statute, name of the Ordinance has changed as Local Government (Pourashava) Act, 2009. Generally, people call it Pourashava Ordinance, 2009.

For the management of all physical development activities, a wide range of functions have been prescribed in the Second Schedule of the Ordinance. 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.

Table-5.1: Functions in brief prescribed in the Local Govt. (Pourashava) Act, 2009

Major activity	Specific functions	Functions in brief
Town planning	Master plan	The Pourashava shall draw up a master plan for the city which shall provide for a survey of the Pourashava 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 Pourashava.
	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;

Major activity	Specific functions	Functions in brief
		(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 Pourashava; (d) the land to be aquired by the Pourashava; (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 Pourashava 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 Pourashava 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 Pourashava, nobody can construct, re-construct any building in the Pourashava area. The Pourashava 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 Pourashava within 15 days. The Pourashava may inspect the building and if found any violation of the provision prescribed in the Master Plan or in the Site Development Scheme, the Pourashava 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 Pourashava 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 Pourashava 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 Pourashava may take the necessary steps itself and the cost incurred thereon by the Pourashava 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 Pourashava may prohibit the occupation of such building till it has been suitable repaired to the satisfaction of the Pourashava.
Development	Development plans	The Pourashava 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 Pourashava 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 (d) such other matters as may be necessary.
	Community Development Projects	The Pourashava may, sponsor or promote community development projects for the Pourashava or any part thereof and may in this behalf perform such functions as may be prescribed.
	Commercial schemes	The Pourashava 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 Pourashava 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 Pourashava and of the visitors thereto.
	Streets	No new street shall be laid out except with the previous sanction of the Pourashava. The Pourashava 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

Major activity	Specific functions	Functions in brief
	Streets	Pourashava may have the necessary work done through its agency, and the cost incurred thereon by the Pourashava shall be deemed to be a tax levied on the person concerned.
	General provisions about streets	The Pourashava 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 Pourashava, remove the same.
	Street lighting	The Pourashava shall take such measures as may be necessary for the proper lighting of the public streets and other public places vesting in the Pourashava.
	Street watering	The Pourashava 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 Pourashava 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 Pourashava any public vehicle other than a motor vehicle except under a license granted by the Pourashava, 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 Pourashava except under a license granted by the Pourashava.
Water supply and drainage	Water supply	The Pourashava 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 Pourashava shall be subject to control, regulation and inspection by the Pourashava. 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 Pourashava.
	Drainage	The Pourashava 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 Pourashava
	Drainage scheme	The Pourashava 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 Pourashava 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 Pourashava.
	Dhobi ghat and washer men	The Pourashava 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 Pourashava may declare any source of water, spring, river, tank, pond, or public stream, or any part thereof within the Pourashava, which is not private property, to be a public watercourse.
	Public ferries	The Pourashava 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 Pourashava, and there upon the Pourashava shall manage and operate the public ferry in such manner and levy such tolls as prescribed.
	Public fisheries	The Pourashava may declare any public watercourse as a public fishery, and there upon the right of fishing in such water course shall vest in the Pourashava which may exercise such right in such manner as may be prescribed.

5.1.2 Urban Management Policy, 1999

The adopted policies under the policy statement are:

- Paurashavas shall provide and maintain the following services to their constituents: (i) Water supply, (ii) storm water drainage (iii) solid waste disposal, (iv) public sanitation, (v) roads and traffic control systems, (vi) public markets, (vii) public transport terminals, (viii) recreational parks and reserves, (ix) community centres, (x) street lighting, etc**.**
- Municipalities shall develop Public Investment Programs (PIP) which will reflect the priority infrastructure needs and appropriate fiscal practices needed to accomplish these;
- The capital budgeting process by municipalities and project selection shall be made transparent;
- Land use plans shall be prepared by Paurashavas in consultations with local communities and shall be periodically updated. Such plan shall form the basis for all property and land development and the assessment of taxes. Each Paurashava and Surrounding Area shall endeavor to appoint a full time qualified Urban Planner to its staff for this purpose, and until such appointment is executed; such services shall be contracted out;
- All external financing extended either directly to Paurashavas by multilateral or bilateral sources or on-lent via the MDF for municipal investments shall be provided on comparable terms;
- Paurashava and Surrounding Area will adopt as early as possible a double entry accounting system on a cash basis. Training and technical assistance shall be provided on a priority basis to facilitate computerization in the transition to double entry accounting;
- Paurashavas shall generate sufficient revenues from their own sources to meet, at a minimum, all of their operating expenses;
- The Government shall review in consultation with municipalities the current intergovernmental revenue transfer system and make appropriate changes to make it transparent, rational, and predictable and to some extent performance based;
- Paurashavas shall endeavor to contract out service provision in whole or in part to private providers in areas such as solid waste disposal, public sanitation, and road maintenance;
- Paurashavas shall conduct periodic public meetings to advise their constituents regarding their activities as well as to engage the public in consultations regarding investment choices, decisions and priorities. As part of this increased transparency; and
- Maximizing the participation of women shall be accorded high priority.

5.1.3 National Housing Policy, 2008

The salient features of the housing strategy envisaged in the National Housing Policy are:

- The role of the government in housing will be to supply serviced land at reasonable price and to help create and promote housing financing institution;
- Efforts will be made to increases affordability of the disadvantaged and the low income groups through providing credit for income generation;
- Improvement and rehabilitation of the existing housing stock will be given priority by the government alongside new housing;
- Encroachment on public land and unauthorized constructions will be discouraged;
- Facilities incremental house building and ensure wider application resources; and
- Conservation of the natural environment and preservation of cultural heritage in new housing projects.

In this policy, there are some specifications are illustrated for Urban and Rural Housing. As the urban and rural context in Bangladesh is different, so the strategies and policies of these sectors are also different. Though the context is different but rural area and urban area are economically, socially and environmentally dependent on each other.

Rural Housing

Clause 5.9 of the Housing Policy describes about the rural housing. In the Housing Policy, following measures are suggested to improve rural housing:

- Avoiding unnecessary displacement of rural settlements due to development projects and where unavoidable, makes proper rehabilitation of the households, with full community involvement;
- Encroachment on agricultural land by proliferation of homestead should be discouraged. Efforts should be made for planned densification of rural homesteads. Subject to availability of khas lands, programs similar to 'Adarsha Gram' program of the Ministry of land will be undertaken in rural areas;
- The coordinated provision of water supply, sanitation, electricity, roads and other basic infrastructure services to existing and new habitations;
- Providing assistance by way of providing credit, dissemination of appropriate technology and delivery system for promoting housing;
- Initiating schemes for increased employment opportunities and income generation by extending appropriate credits and advice, so that housing affordability is enhanced;
- Establishing suitable institutional structure including strengthening of existing organizations at district and local level, with the responsibility for planning, financing, implementation, supervision and monitoring of rural housing schemes, and with the full involvement of beneficiaries, NGOs and CBOs, giving special attention to the needs of the poorest segments, specially women and disadvantaged persons; and
- Linking the development of housing sites and the up gradation of rural housing with the activities under the Bangladesh Rural Development Board (BRDB) and other programs for the creation of rural assets and employment.

5.1.4 Population Policy, 2004

The following strategies will be adopted to slow down the growth of urban population:

- Satellite towns and growth centers should be established with adequate facilities to provide alternative destinations to rural migrants. Roads and communication systems should be linked with the growth centers; along with health, education housing and other welfare services created in those places. Headquarters of important Government and non-Government Organizations, educational institutions and industrial units may also be shifted or relocated to other cities;
- Relax rules relating to going abroad of skilled workers and make provision for dual citizenship;
- Impart education and skill training to the young men and women to become competent and skillful to handle many new and emerging fields in the cities and towns; and
- Create skilled manpower for overseas employment.

5.1.5 National Land Use Policy, 2001

Main Components of the Policy

- use as much as required for agriculture purposes and land use cannot be changed with permission of the appropriate authority;

- ensure use of land owned by the land lord absentee;
- keep limit the process of division of agricultural land into small pieces;
- identification of zones for land uses by Paurashavas and other places of Upazilas;
- provision of assistance by the Revenue Office of District Administration in preparing zoning maps by the local government organizations;
- existence of zoning law in the country; Abide this law to implement the zoning map prepared by the local government organizations;
- encouragement to construct multi-storied buildings instead of single storied in the rural and urban areas so as to ensure optimum use land for residential purposes;
- identification of the forest land by the Ministry of Forest and Environment;
- undertake measures for protection, maintenance and expansion of the existing forest land;
- encouragement for development of the social forestry;
- keep open the exiting water bodies and those are not to be filled in. Entrust the responsibility of maintaining small ponds by the owners and large water bodies such as river, channels, haor, baor and beel by the community people and the Government. To this effect, these water bodies are to be re-excavated regularly;
- use of embankments for controlling flood as roads as far as possible;
- planned tree plantation on the embankments;
- use ditches and other water bodies for fish production and rearing ducks created during cutting of earth for constructing embankments. Not to dig new land as much as possible during constructing embankments rather re-excavate the existing filled in water bodies;
- ensure not to create water-logging by constructing embankments;
- no acquisition of land for the purpose of road construction other than/except national highways, regional and district to Upazila roads, Upazila to Upazila connecting roads. Avoid human settlements and fertile agricultural land to acquire land wherever land acquisition is of utmost need. Construct inter and intra village roads in planned manner;
- construct/establish industries in the designated places keeping view on the availability of support services for industrialization;
- not to pollute/infect land or environment through discharging waste from the industries and follow strictly to treat industrial waste;
- construct service roads along the main roads of the country so as to ensure safe movement of traffic as well as set aside 10 feet to 20 feet of land for plantation trees on the both sides of roads;
- discourage construction of small and cottage industries within 10 kilometers of radius if industries are accommodated within the BSCIC industrial area; and
- protection of social rights of possessing land by the indigenous people living in the different parts of the country following their traditional laws.

5.1.6 National Agriculture Policy, 1999

The following steps will be taken to ensure planned utilization of land for crop production:

- Land zoning program 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; and
- Programs will be taken up to motivate the landowners not to keep their land unused without any acceptable reason.

5.1.7 Transportation Policy

At present there is no standard design and national unit cost for construction and maintenance of various roads and bridges and culverts. As a result substantial cost difference has been proposed by the agencies for same type of road / bridges for the same area. Following tasks of a road projects will be adopted:

- The Committee reviewed the design standards for the Union, Upazila, Zila Roads, and concluded that the key design criteria for all roads should be traffic and axle loads, and not the classification of the roads;
- The six design standards agreed by the Committee to form a logical progression in terms of road width and pavement thickness, all based on traffic considerations. They are not directly related to road classification;
- The agreed design standards are to be used by all road agencies. Road agencies will be required to use appropriate standards for roads according to traffic criteria;
- Reconstruction- full pavement reconstruction on an existing embankment;
- New road Construction - completely new embankment and road pavement, including bridges, culverts and any necessary slope protection. This is likely to prove a rare category of road project in Bangladesh;
- Widening- road widening and upgrading, including full re-construction of the existing pavement; and
- Strengthening- removing existing road surfacing and providing a new base layer of Base Type-1 and surfacing.

5.1.8 Environment Policy

Bangladesh National Environment Policy was approved and published in 1992. Key elements of the Policy are –

- Maintain ecological balance and overall physical development progress of the country through protection and development of different sectors. Protection from natural disaster is one of them;
- Identification and regulation all type of activities which pollutes and degrade the environment;
- Ensuring proper Environment Impact Assessment prior to undertaking of industrial and other development projects; and
- Ensuring sustainable use of natural resources.

5.1.9 Coastal Zone Policy, 2005

The following are the broad components of the policy:

Economic growth

- Efforts shall be made to enhance annual growth rate to a level required to achieve national goal for poverty reduction and economic growth;
- Available opportunities of the coastal zone will be used through sustainable management to enhance standard of living of coastal communities by investing in different sectors;
- A strategy shall be formulated covering all routes to development taking multidimensional nature of poverty;
- Emphasis will be given on building efficient power, transportation and telecommunication links, particularly with islands;
- Special emphasis will be given to utilize gas-based power, manufacturing and processing industries;
- Settled isolated chars and islands will be brought under 'special rural development programs';
- Necessary measures will be taken to increase the flow of investments in the coastal zone including direct foreign investment (DFI), especially by setting up more export processing zones (EPZ); and
- Steps will be taken for medium and small private investments for coastal development.

Basic needs and opportunities for livelihoods

To meet basic needs of the coastal people and enhance livelihood opportunities, the Government policy will be as follows:

- Alleviation of poverty through creation of job opportunities and finding options for diversified livelihoods would be the major principles of all economic activities. Economic opportunities based on local resources will be explored to enhance income of the people;
- The intensity of coverage of primary education, health care, sanitation and safe drinking water facilities will be increased;
- Food production will be continued at the self-sufficiency level and of higher production of diversified high-value export goods;
- Private sector and the non-governmental organizations (NGO) will be encouraged to implement activities for the poor people;
- Collateral-free credit under easy terms will be arranged as part of all livelihood enhancement programs and activities;
- No alteration or stoppage of an existing employment opportunity shall be made without creating opportunities for alternative employment;
- Special measures will be taken during the period of disaster;
- *Khas* land will be distributed among the landless and a more transparent process of land settlement will be ensured;
- An effective program for land reclamation will be developed;
- Provide facilitate for the coastal navigation;
- An integrated network of communication including roads and waterways will be developed;
- The law and order situation will be improved by setting up police outposts in remote and far flung areas; and
- Free flow of information for the people will be ensured.

Reduction of vulnerabilities

In order to reduce the vulnerabilities of the coastal poor from disasters like cyclone, drainage congestion, land erosion, drought, etc, the Government policy is as follows:

- Reduction to vulnerability to natural disasters would be an integral aspect of the national strategies for poverty reduction;
- Integration will be made with 'Comprehensive Disaster Management Plan' on aspects concerning the coastal zone;
- Effective measures will be taken to enhance coping capacity of the poor during the period of disaster and to initiate insurance scheme for improving their social security;
- Effective measures will be taken for protection against erosion and for rehabilitation of the victims of erosion;
- Safety measures will be enhanced by combining cyclone shelters, multi-purpose embankments, road system and disaster warning system. It should include special measures for children, women, the disabled and the old;
- Earthquake management will be strengthened and capacity to cope with earthquakes will be enhanced;
- Adequate provision will be made for safety of livestock during disaster and post-disaster period;
- Programs shall be taken to encourage all for tree plantation in a planned manner in the coastal zone. Emphasis will be given to social forestry and other forms of plantations, plant care and maintenance; and
- The asset base of the poor, with special focus on women, shall be improved through ownership or access so that their coping capacity improves.

Sustainable management of natural resources

The Government policy to ensure sustainable management of both biotic and abiotic coastal resources will be as follows:

- Every possible steps shall be taken to secure just share from all international rivers reaching the coastal zone and the Bay of Bengal;
- Suitable measures will be taken for sustainable use of renewable resources and, to that end, limit harvesting, extraction or utilization to the corresponding cycles of their regeneration;
- Sustainable use of coastal resources shall be ensured. Combination of resource use, e.g. agriculture, forestry and fishing including aquaculture is often the major economic activity. Efforts will be given to make this sustainable;
- Optimum utilization of resources will be ensured by taking advantage of the complementarities and trade-offs between competing uses;
- Rigid enforcement of conservation regulations will affect the livelihoods of many people and such conservation efforts will be linked, as far as possible, with alternative opportunities of employment; and
- Initiation of plan and its implementation will be ensured by participation of people of all sectors.

Land

- Planning will be done under land use policy to control unplanned and indiscriminate use of land resources. Strategies for new chars will be developed. Zoning regulations would be formulated and enforced in due course; and

- Through its responsible agencies, the Government will proper plan and implement schemes for reclamation of balanced land from the sea and rivers.

Water

- Adequate upland flow shall be ensured in water channels to preserve the coastal estuary ecosystem threatened by the intrusion of soil salinity from the sea;
- Small water reservoirs shall be built to capture tidal water in order to enhance minor irrigation in coastal areas. Appropriate water management system within the polder utilizing existing infrastructures will be established for freshwater storage and other water utilization;
- Rainwater harvesting and conservation shall be promoted;
- Ponds and tanks will be excavated for conservation of water and local technology for water treatment (such as, pond sand filtering - P.S.F.) will be used for the supply of safe water; and
- Step will be taken to ensure sustainable use and management of ground water.

Capture fisheries

- Comprehensive policies, as dealt in the National Fish Policy, in relation to exploitation, conservation and management of marine fisheries resources will be followed; and
- Fishers' right will be established on open water bodies for sustainable fisheries management

Aquaculture

- Environmentally adopted and socially responsive shrimp farming will be encouraged. In this regard, internationally accepted quality control measures will be introduced; and
- All opportunities and potentials of aquaculture will be utilized in the coastal zone. Crab culture, pearl culture, sea grass will be encouraged.

Agriculture

- Programs for intensification of agriculture and crop diversification for improving the economic conditions of both male and female farmers and increasing food security at local and regional level shall be supported;
- Special development programs will be taken-up with a view to increasing the production of crops suitable for the coastal area with attention to maintenance of soil health;
- Use of chemical fertilizers and pesticides will be reduced, while organic manure and integrated pest management will be encouraged;
- Salt-tolerant crop varieties will be developed and extended along with possible measures to resist salinity; and
- The scope of irrigation facilities will be explored and / or extended and a comprehensive water management for agriculture will be implemented.

Livestock

- Grazing land for livestock will be arranged. Facilities for livestock development will be enhanced; and
- Facilities for rearing of poultry of different species including the local ones will be enhanced.

Energy

- Assessments shall be made on the prospect of tidal and wave power in coastal areas' as potential energy source;

- An assessment of all types of energy resources (e.g., oil, gas, coal, nuclear minerals, hydropower, biomass fuels, solar, wind and tidal waves) will be undertaken on a regular/continuous basis by the appropriate authorities. Special measures will be undertaken for exploration and appraisal of petroleum resources in the offshore areas without undermining the nature;
- Potentials of area-based renewable sources of energy will be assessed;
- Remote and isolated areas including offshore islands, which are not likely to be brought under the networks of commercial fuels in a foreseeable future, are to be considered as potential sites for implementing renewable energy technologies, in spite of their high capital cost. Solar photovoltaic will be used for cyclone shelters; and
- Special projects will be identified, for example power plants in the offshore islands. Plans for the generation of electricity in isolated and remote areas like offshore islands will be prepared separately.

Equitable distribution

To ensure right of the neglected and disadvantaged groups, the Government policy is as follows:

- Actions will be designed to reach the poorest and the remote rural areas (including the cyclone prone coastal regions, chars and river erosion affected areas), which are vulnerable to adverse ecological processes and those with high concentrations of socially disadvantaged;
- In order to ensure equitable distribution of national economic benefits, priority will be given to exposed Upazilas and coastal islands;
- In order to ensure equity, the thrust should be on human development of the poor for raising their capability through education, health, nutrition, employment-oriented skill training and social interventions; and
- Measures will be adopted that increase access to natural resources for the poor and the disadvantaged (on which they are dependent for their livelihood).

Empowerment of communities

Mainstreaming of the coastal people will be done by enhancing their safety and capacity. In this context, Government policy will be as follows:

- Equal participation of all stakeholders shall be ensured and establishing effective co-operation between the government agencies, local government institutions and non-governmental organizations;
- Co-management procedures shall be established that will bring decision-making power to the grass root levels;
- Specific vulnerabilities of the coastal communities shall be addressed: like farmers in the saline zone, marine fishers, salt producers, dry fish processors, people living on forestry resources, ship breaking workers, vulnerable ethnic communities and so forth;
- Vesting on local government institutions, at the union, upazila and district levels, the power and responsibilities for design, formulation and implementation of local level development programs and projects;
- An awareness campaign shall be mounted about the long-term benefits of ICZM, recent initiatives in the coastal zone, and coastal development strategy among the NGOs, private sector, civil society and coastal communities; and
- Initiatives will be taken to keep up the cultural heritage of different communities living in the coastal zone.

Women's development and gender equity

In this respect, the Government policy will be as follows:

- A gender sensitive and participatory approach will be adopted that focuses at the reduction of gender inequalities and that takes into account differences in needs and interests between men and women;
- Efforts will be made to close the gender gap, giving priority to women's education, training and employment and special support for broadening their coping capacity;
- Special attention will be paid towards employment generation for women, the promotion of women entrepreneurs as well as the removal of restrictions on women's employment and economic opportunities;
- During distribution of newly accreted khas lands, special attention will be paid to the allocation of land titles to women;
- Special projects will be implemented exclusively addressed to livelihoods enhancement and empowerment of disadvantaged women; and
- Necessary institutional measures including mass awareness and motivation on violence against women will be taken.

Conservation and enhancement of critical ecosystems

The Government policy will be as follows:

Conserving the ecosystems

- Meaningful conservation shall be enforced of critical ecosystems including ECAs, heritage sites and marine reserves;
- Special measures will be taken for conservation and development of the natural environment of Sundarbans;
- The programs for institutional strengthening and capacity building shall be supported along with further development of the regulatory framework for the protection of the environment;
- The role of the Coast Guard will be acknowledged with emphasis and its capacity will be enhanced so that it can be used on behalf of all relevant institutions as a common resource for enforcement of different regulations applicable to the coastal zone;
- For activities that have direct adverse consequences on bio-diversity, steps will be taken to stop those activities and specific mitigation measures will be taken to minimize those effects;
- To protect the environment, all commitments shall be honored as signatory to different international protocols and guidelines in planning and implementation;
- Efforts shall be made to harmonize in the provisions of different existing laws and enact new laws, where required, to protect and preserve the coastal environment and its resources;
- Special measures will be taken for bio-diversity conservation; and
- Measures will be taken for hill management including prohibition of hill cutting.

Pollution Control

- Zoning regulations will be established for location of new industries in consideration of fresh and safe water availability and effluent discharge possibilities;
- All industrial units will be required to install built-in safeguards against pollution within a given timeframe and will help them in obtaining financial support from international bodies to carry out the adjustments. Units failing to comply with the pollution standards will be required to pay "green tax" for cleanup of the environment polluted by them;

- Sewage treatment plants will be set up for the major cities like Chittagong, Khulna and Barisal and gradually in other urban centers;
- Steps will be taken to handle the issue of discharge of bilge water from ships and oil-spill according to international conventions to which Bangladesh is a signatory; and
- A review of the desirability of supporting ship breaking as an industry `will be done and, in the event of its continuation, environmental standards will be prescribed under which it has to conduct its activities.

Climate Change

- Existing institutional arrangements for monitoring of climate change in Bangladesh will continue. Steps will be taken to support upgrading of technology and institutional strengthening for enhancing their capacity for generation of better data and more accurate long-term prediction and risk related to climate change;
- Implementation of adaptive measures identified in relation to climate change for coastal zone and resources shall be gradually undertaken;
- Efforts shall be made to continuously maintain sea-dykes along the coastline as first line of defense against predicted sea-level rise; and
- An institutional framework for monitoring/detecting sea level rise shall be made and a contingency plans for coping with its impact.

5.1.10 Industrial Policy, 2005

Bangladesh is a developing country, and the present government is striving relentlessly to attain rapid economic development in the country. Despite a lack of resources faced by the Government, development programs in the key sectors have continued. Therefore, the Government in the Ministry of Industries has taken the role of a facilitator. In order to establish economically prospective industries in industrial sub-sectors, there are plans to set up industrial parks and special economic zones so that huge amount of unused and abandoned land can be utilized. All this is aimed at fostering industrialization and economic development and generating employment opportunities in the country. To reduce poverty and generate employment opportunities, more efforts are needed to establish agro-based industries as well as to raise agricultural production. This will ensure the protection and fair price of agricultural products and employment of a huge number of unemployed people. In order to create further employment opportunities beyond the agricultural sector, initiatives should be taken to set up small, medium and large industries across the country. In order to attain this growth in this sector, special importance has been given in the Industrial Policy on agro-based and agro - processing industries and on steps to overcome possible adverse conditions in the export-oriented garment sector. Importance has also been given on considering the SMEs and cottage industries as one of the major driving forces, providing assistance to women entrepreneurs on a priority basis, setting up special economic zones in different parts of the country, improving the quality of industrial products to world standard, marketing of goods at competitive prices, and enhancing productivity in the industrial sector.

5.1.11 Health Policy

National Health Policy was approved and published by the government in the year 2000. Aim of the Health Policy is:

- To develop a system to ensure easy and availability of health services for the people living in urban and rural areas;
- To ensure optimum quality, acceptance and availability of primary health care including government medical services at the Upazila and Union level;
- To adopt satisfactory measures for ensuring improved maternal and child health at the Union level and install facilities for safe 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 / staffs, provide and maintain necessary equipment and supplies at each of the Upazila Health Complexes and Union Health and Family Welfare Centres;
- 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 explore ways to make the family planning program more acceptable, easily available and effective among the extremely poor and low-income communities; and
- To arrange special health services for mentally retarded, physical disabled and for elderly population.

5.1.12 National Urban Policy

The major objectives of national urban policy 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 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 in to account, particular needs of women, men, children, youth, 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; and
- Ensure good governance by enhancing transparency and establishing accountability.

5.1.13 Rural Development Policy

The projects and programs as mentioned in the Rural Development Policy of Bangladesh are:

(i) Food for Works Program, (ii) G.R Program (Gratuitous Relief Program), (iii) T.R Program (Test Relief Program), (iv)V.G.D Program (Vulnerable Group Development Program), (v)V.G.F Program (Vulnerable Group Feeding Program), (vi) Single-House Single-Farm Program, (vii) Back to home Program, (viii) Food for Education Program, (ix) Rural Occupational Project, (x) Poverty Reduction Project, (xi) Self-employment Program for Women, (xii) Women

Empowerment Program, (xiii) Coordinated Women Development Program, (xiv) Peace Home Program, (xv)Shelter Support Program, (xvi) Educational Allowance Program, (xvii) Aged-allowance Program, (xviii) Micro-credit Program and (xix)Allowances for Widowed, Poor and Husband-renouncement Women Program, etc.

Some of the aims and objectives of the Rural Development Policy is presented here:

- To increase the income and provision of jobs for the Villagers, especially for women and people under low-living standard in the rural areas;
- To confirm sustainable economic and social development through poverty reduction;
- To encourage self-employment opportunities in the rural areas;
- To emphasize for the development of rural wealth according to the equal distribution of economy and national development as prescribed in the Constitution of Bangladesh;
- To give confirmation to the rural people about infrastructural development, equal distribution of wealth and marketing of the agricultural production;
- To produce technologically efficient people about education, technical education and trainings in rural areas;
- Identification of demand and their fulfillment for socio-economic development of rural poor, persons involved with the production, especially small farmers and landless people; and
- To reduce distances between towns and villages about services prevail through collective efforts and develop gradually.

5.1.14 Disaster Management and Climate Change Policy

The issues prescribed under Climate Change Policy are:

- Mitigation, adaptation and technology transfer is a must measure to fight climate change enhanced vulnerabilities of poor;
- The complementarily of current policy regime in relation to adapting to climate change should be analyzed in order to define which aspects of adaptation are already in place. This would not only advance national (also regional and local) development processes, but also would reduce vulnerability of people to climate change;
- A micro-level climate change risk reduction plan should be developed by the communities. The process should initiate local level action ensuring the participation of grassroots people, NGOs, civil societies, academic and research institutes etc.
- A community centered approach should be taken to develop policies which should address development as well. The policy action plan should also promote appropriate technologies such as resilient crop varieties, irrigation schemes, and renewable energy sources, so that they are available and affordable for low-income communities of Bangladesh; and
- It's been believed by the economists that climate change is the greatest market failure of the history of mankind. Climate is natural, therefore a common property. For this reason, climate change related economic does not follow the prevailing market mechanism. Therefore, it should be understood that, the rich countries which are polluting should start paying for adaptation for the LDC and also start paying for mitigation within their countries. Bangladesh should make its position clear in favor of this logic in all negations and raise its voice.

5.2 Laws and Regulations

5.2.1 Urban Development Control

The president of Pakistan in the year of 1960 was enacted the Municipal Administration Ordinance, 1960. In the year 1977 through the Pourashava Ordinance, 1977 some of the Municipalities were upgraded as Pourashava and in the year 2009 Pourashava Ordinance is

renamed as local government Ordinance 2009. The Pourashava may provide the function as prescribed in the Ordinance but no provision is being outlined to control and manage those functions. The Pourashava may enforce those regulations according to their capacity. The Ordinance proves that the Pourashava is independent and self regularity body, but due to absence of necessary man power technical support staff and the government initiative in financial matter, the Pourashava is dependent and control by central government.

5.2.2 Building Construction rules 1996

Land use planning Rules

These are statutory rules to control land use according to planning standard. It is based on land use policies including Local Plans, such as residential density, road standard, provision of infrastructure and services. The relevant Acts Local Government (Paurashava) Act, 2009, Building Construction Act, 1952 and BNBC, 1993) and Master Plans of the cities are the main legal instruments, which is in force with regard to exercise planning control and standards.

Control of public estates

Different government agencies have developed some housing, commercial and industrial estates in different urban areas and they have leased them out. Terms and conditions of lease deed reflected control provisions included in them.

Non-compliance of development control by some government and semi-government agencies

A portion of urban lands of the urban area are owned by different government and Autonomous agencies including universities, colleges. According to Building Construction Act, 1952 (amended in 1996, followed by Paurashava) each public building needs approval from the concerned development agencies. It is observed that most of the agencies are still ignoring the regulations and they construct their buildings within their premises.

Control of private housing estates

Large numbers of pockets of urban infill and privately owned low lying peripheral lands have been developed by private companies. In some cases small scale real estate development permission is obtained occasionally but deviations from the approved plan are most common practice of the developers.

Control of informal Development

A number of unregulated or informal settlements are taking place in urban area as urbanization proceeds. Paurashava can hardly control these haphazard development activities. The Slum Up-gradation Projects, Slum Improvement Projects (SIPs), provision of basic needs etc. are taken up at time when the problems had already overtaken the situation.

Density Control

Density Control is considered as an important development control tool. It includes the number of units, people allowed per parcel of plot size, unit limitation, height of the building etc. In the Government and Semi Government institutions, building permission is hardly obtained and therefore, density control rules and regulations are not in practice. At present, Paurashava follows Building Construction Rule, 1952 (amended in 1996) which restricts the height of Building in respect of adjacent road. Therefore, density control is possible to exercise in practical.

Taxation

Urban taxation is another effective development control tool. Different types of taxation policies may to change urban land use and urban character. As an example, the industrial estates are encouraged to set up outside the city areas for tax holiday and other ancillary facilities. On the other hand, exemption of tax on urban vacant land encourages growing unauthorized settlements like slums and squatters.

Payment of Betterment fee

For every town planning scheme for an existing town, some owners of the property will be affected and as such they will have to be paid some amount as compensation. In the same time, some owners will be benefited by the proposed scheme. The share of increase in the value of the properties of such owners to be paid to the Paurashava is known as Betterment fees.

5.3 Strength and weaknesses of the Existing Policies

Local Government (Paurashava) Act, 2009

Although the Paurashava has been given the rights to prepare Master Plan and implement them, prepare development plans and projects for systematic development of Paura- city, building control, roads and streets plans etc. Besides, the replacement of Ordinance amended in 2008 by Paurashava Act 2009 ensures the citizen participation in a new way. But there are some drawbacks or weaknesses in this which are as follows:

- The engineering department has been given the responsibility to implement the Master Plan, but this department is not equipped enough to implement it properly;
- To implement the Master Plan/ Land Use Plan, the staff requires professional training, but no one has received any training regarding implementation activities;
- Central Government does not exert any pressure to implement the Land use Plan;
- Paurashavas do not enjoy real autonomy to solve local problems; and
- More critical problem is the weak or even non-existent co-ordination amongst development partners.

Urban Management Policy

The Policy statement recognized the decentralization could enhance efficiency of public expenditures by allowing local governments to be more responsive to local needs and preferences. The policy also envisions strengthening the beneficial aspects of urbanization and at the same time effectively dealing with its negative consequences so as to achieve sustainable urbanization, keeping in view the multi-dimensional nature of the urbanization process. On the other hand, the policy principles gave emphasis more on physical aspect of development rather than on social, environmental. Besides, issues on poverty reduction are missing in the policy outlines.

Land Use Policy, 2001

The National Land Use Policy, 2001 of the Ministry of Land highlights the Need, the importance and modalities of land zoning for integrated planning and management of land resources of the country. It also mentioned the need of formulating a Zoning Law and Village Improvement Act for materializing the identified land zoning area. The National Land Use Policy specially highlights the need for land zoning for the coastal area of Bangladesh. It describes about the need for definite guidelines and raises the possibility of doing coastal land zoning through an inter-ministerial task force. The policy observes that maximum utilization of lands and water resources depends on the effective land use plan. But there is no policy prescription for any specific area as context requires and also the proper methodology, technology to be used, institutional capacity

are not designated. Besides, the policy is strong on conservation of khas lands but not clear on distribution of khas land distribution program.

Industrial Policy, 2005

One of the foremost objectives of the Industrial Policy 2005 is to set up planned industries considering the real domestic demand, prospect of exporting goods abroad, and discouraging unplanned industries in the light of past experience. The policy also encourages the agro-based industries and involvement of Women Entrepreneurs in Industrial sector, equal profit distribution among workers, owners and government. But the interests of small farmers, small business owners, artisans, and workers, are generally not well represented. This limits the benefits of trade expansion for small businesses, small farmers, artisans, and workers consequently create impacts on the key export industries. These groups are involved in import and export activities of the country indirectly. In addition, no specific mention has been made on protection of coastal environment from industrial pollution.

Coastal Zone Policy, 2005

The strong point of Coastal zone policy is that it provides integration among all sectoral policies such as land use, industrial, fisheries etc. It defines specific objectives for coastal development and the jurisdiction and extent of the coastal zone. The main stakeholders in coastal development are identified, along with their role in the development process.

Agriculture Policy, 1999

The key point of the National Agriculture Policy in relation to ICZM is its simultaneous recognition of the importance of shrimp farming as foreign exchange earning activity and its environmental consequences. However, the policy does not mention conflicts between farmer and shrimp-gher owners and thus fails to indicate any mitigation measures. Land use zoning may offer instruments to reduce conflicts. Bio-saline agriculture, practiced elsewhere, could be tried in the coastal zone.

Population Policy, 2004

It defines the strategy of population declination but no detailing has been given on the instruments that are required to reduce the population growth. Also, the responsible stakeholders that are directly and indirectly linked to this sector are not identified. A general policy prescription is given without specific group identification.

National Housing Policy, 2008

The policy provides prescription for urban and rural area individually considering the context. Though one of the major objectives of the Housing Policy was to ensure housing for all with particular emphasis on the disadvantaged, destitute, the shelter less poor and the low and middle-income groups of people, yet very little efforts have been taken on the part of the government in providing housing loans to the low-income strata of the population. Nationalized commercial banks introduced housing loans also limited for the high income group. There is virtually no credit financial mechanism for housing of low-income people in urban areas. Besides, there is no specification for private developers. No direction is given for future housing demand and supply.

6.1 Introduction

Population growth rates in developing countries are much more than of the developed countries of the world. Moreover, migration to urban areas in the developing countries has been increasing over the years. Due to increased urbanization trend in the coming years, the cities in the developing country will face housing and settlement problems, infrastructural deficiencies for increased number of populations, slum and squatter settlements, environmental degradation, etc. In practical, it is difficult to attain the actual number of population but more accuracy in population projection will encourage the future investment as projection shows the population demand. It is assumed that Banaripara Paurashava, as a Paurashava will face such influx of job seekers in the coming days. As such, besides natural population growth immigrants will increase the population significantly in the coming decades.

6.2 Projection of Population

In order to get an idea about the population growth rate of Banaripara Planning area, the population data of 2001 has been compared to 2011 data of population. Urban and rural growth rate is different. But in case of Banaripara Paurashava, difference between rural & urban growth rate is not considered due to lack of data. Normally growth rate has been calculated on the basis of population data 2001 to 2011. As urban growth rate of Banaripara is very low, average of zila growth rate and national growth rate is considered as medium growth rate. From this it has been observed that the annual growth rate is 1.36% that is parallel with both national growth rate and urban growth rate. Total population in the area on the basis of exponential growth the population will be 11093, 11872, 12704, and 13596 in the years of 2016, 2021, 2026 and 2031.

$\mathbf{P_n = P_0 (1+r_1)^n}$

$16882=14894(1+ r_1)^{10}$

$r_1=0.0126$

$\mathbf{r= (r_1+ r_2)/2}$

$=(0.0126+0.0147)/2$

$=0.01365$

P_n =Population of Target Year (2011)

P_0 = Population of Base Year (2011)

n = Target Year

r_1 =Upazila Growth Rate

r_2 =National Growth Rate

r=Annual Growth Rate

Growth Rate is 1.36%

Basic Assumptions

- The characteristics of the more recent periods of development for the local are expected to continue into the future;
- The existing density of population, major activities of Paurashava i.e., Trade, Commerce and Service and higher sex ratio reveals the flourishing economic development of the Paurashava in recent years.

Methods Used

Population projection has been conducted on the basis of following determined methods and techniques:

- The base year for such above mentioned projection is 2011 as per available census data
- Future population is estimated for the future year 2016, 2021, 2026 and 2031 considering 20 years planning period

- Finally, Exponential Population Projection is used to conduct the Population Projection. Projected growth rate is 1.36%.

According to Population projection, population of Banaripara Paurashava will be 13596 in the year 2031. Table 6.1 depicts ward wise projected population (2016-2031) of Banaripara Paurashava based on medium growth rate.

Table 6.1: Projected Population during the Year 2016-2031

Ward No.	Population at 2011	Projected Population at Different Years			
		2016	2021	2026	2031
1	1770	1894	2027	2169	2321
2	1459	1561	1671	1788	1914
3	991	1061	1135	1215	1300
4	1220	1306	1397	1495	1600
5	1032	1104	1182	1265	1354
6	870	931	996	1066	1141
7	536	574	614	657	703
8	882	944	1010	1081	1157
9	1606	1719	1839	1968	2106
Total	**10366**	**11093**	**11872**	**12704**	**13596**

Source: Consultants Estimation

6.3 Identification of Future Economic Opportunities

The city of Banaripara must thrive on its own potential natural resources. Fish resource is very much potential for the area. Food industries can be initialized based on fish resources. There are a number of areas where such prospects can be managed. First, catching fish has to be increased. Second, freezing facilities has to be enhanced. Third fish drugging facilities to be expanded and finally, small and low investment plants for processing fish resources can be initialized. Bangladesh Fisheries Development Corporation (BFDC) has taken effective projects aiming to develop the country's fisheries sector and boost export. Fish landing centers, fish preserving and fish marketing centers for traders would be set up. Warehouse facilities and ice supply for traders would also be extended under this project and ice factories in Banaripara, Barisal would also be built. According to the Fishermen, a great numbers of fishing trawlers were engaged in hilsa fishing in Banaripara. Therefore, fish merchants have urged development of processing industry, setting up of cold storage and ensuring electricity and ice supply for preservation and availability of hilsa round the year.

About 27.26% of the total lands of Banaripara Paurashava are devoted for agricultural purposes. So emphasize have to be given on the scientific procedure of agricultural production and these productions may be used as input of agro-based industries.

Economically active labor forces are not being properly used in production sector. This labor force can be utilized in those fishing or agro-based sector.

6.4 Projection of Land Uses

Future landuse of Banaripara Paurashava has been calculated on the basis of projected population. After population projection, it has been observed that in the year of 2031, resident population will be around 13596. In some cases, landuse projection may vary considering landuse characteristics of the area.

At present, the landuse of Banaripara Paurashava is not appropriate and has not developed following standard. Therefore, this master plan has addressed the issue and efforts have been done to formulize required standards for various facilities that should be followed in preparing the master plan. As per planning standard, future demand of land in various sectors is discussed in table 11.2, chapter 11-Land use Plan, Part B.

7.1 Strategies for Optimum Use of Urban Land Resources

Banaripara Paurashava is peri-urban area with urban infrastructures and also valuable agricultural lands, water resources. Therefore, in identifying the strategies or possible techniques for optimum use of Urban Land Resources, it is required to understand the urban land characteristics. According to town Improvement Act 1953 it is required to identify the strategies for optimum use of urban land resources as there exist competition amongst agriculture, urbanization and industrial development.

7.1.1 Land use Zoning

Land use Zoning can be a very powerful planning tool as it permits the government to select which type of land use should be allowed. The term differs from the 'general plan' that Zoning plan regulates the private developments and general plan controls both public and private developers. Zoning plan is integral part of general plan.

Total area of Banaripara Paurashava is segregated under some broad classes that will basically guide future growth with wide aspects. Definitions of the broad classes are given below for conceptualizing focus of the future magnitude as well as illustration of the policies and strategies.

A. Agriculture
B. Core Area
C. Peripheral Area
D. Fringe Area
E. New Urban Area
F. Major Circulation Network
G. Water Body

Table 7.1: Broad Land use Zones

Zoning	Description of Zones	Area (acre)	%
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.	41.30	7.98
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 (2011-2021) period.	31.42	6.07
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	162.97	31.51
Fringe Area	This zone is developing areas which will take further decades to reach the population densities of the urban		

Zoning	Description of Zones	Area (acre)	%
Fringe Area	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.	39.98	7.73
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.	31.28	6.05
Major Circulation Network	Major circulation contains major road network and railways linkage with regional and national settings.	86.73	16.77
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.	123.58	23.89
Total		**517.26**	**100.00**

Source: Consultants Estimation

7.1.1.1 Agriculture

41.30 acres (7.98%) land out of total 517.26 acres is for agricultural use under structure plan covering almost all wards. Maximum portion of agriculture is in ward no. 1.

7.1.1.2 Core Area

31.42 acres (6.07%) land out of total 517.26 acres is proposed here as core area covering ward no. 1, 2, and 3. Among these three wards, ward no. 2 has maximum portion of land of core area.

7.1.1.3 Fringe Area

39.98 acres (7.73%) land out of total 517.26 acres is proposed here as fringe area covering ward no. 1, 2, 4, 5, and 9. Among these wards, ward no. 2 and 4 has maximum portion of land of fringe area.

7.1.1.4 New Urban Area

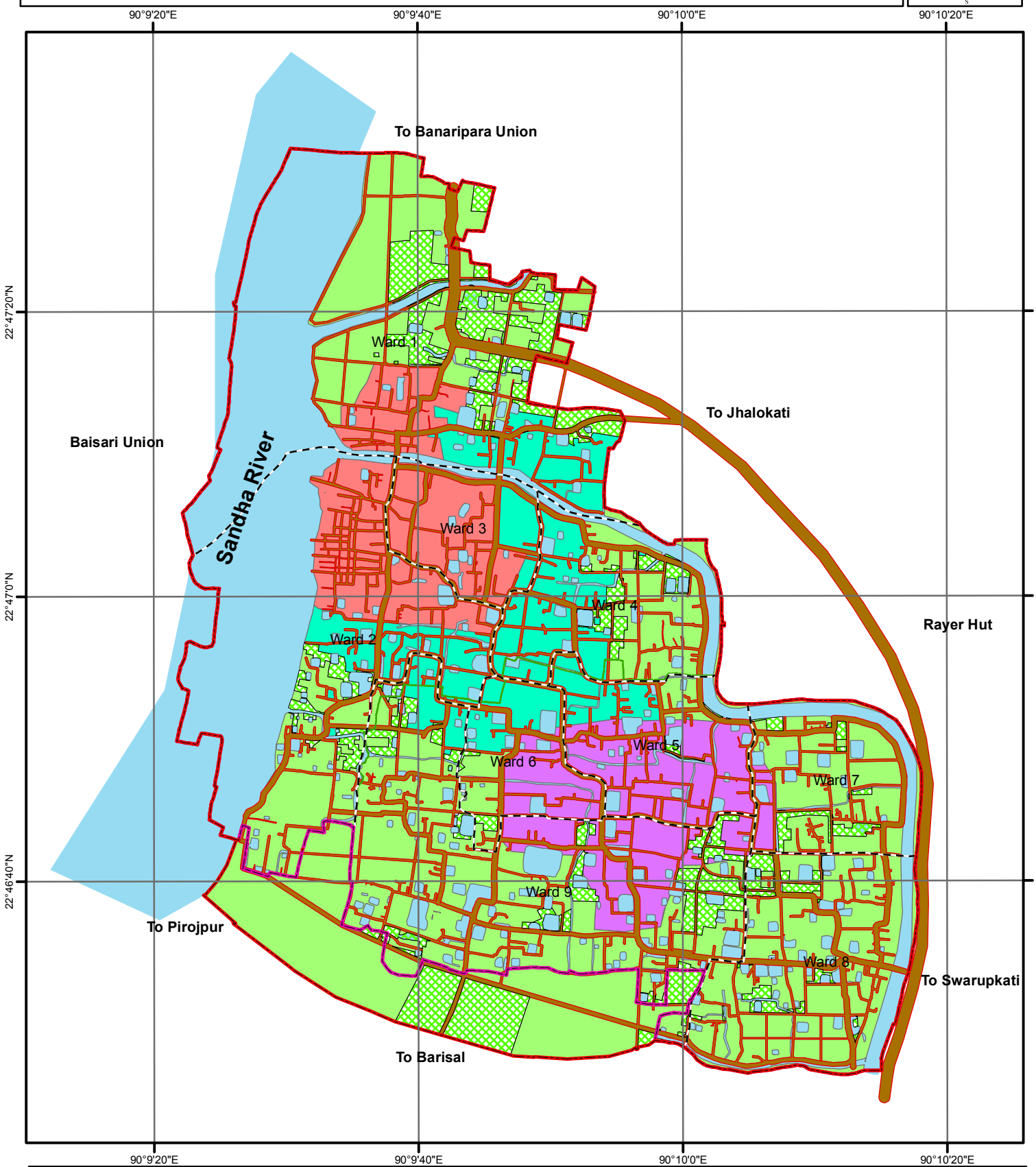
31.28 acres (6.05%) land out of total 517.26 acres is proposed here as new urban area covering ward no. 5, 6, and 9. But among these three wards, ward no. 5 has maximum portion of land of new urban area.

7.1.1.5 Peripheral Area

162.97 acres (31.51%) land out of total 517.26 acres is proposed here as peripheral area covering almost all wards. But among all wards, ward no. 7, 8, and 9 has maximum portion of land of peripheral area.

Map 7.1 shows the structure plan of Banaripara Paurashava.

Map 7.1 :Structure Plan of Banaripara Paurashava



Legend

- Planning Area Boundary
- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Agriculture
- Circulation Network
- Core Area
- Fringe Area
- New Urban Area
- Periphery Area
- Waterbody

0 50 100 200 300 400 Meters

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development and Cooperatives Local Government Division

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In Association with

7.1.2 Land Acquisition and Requisition

Land acquisition is a process in which a public agency or non-profit land conservation organization purchase all the ownership rights vested to the land from a willing seller. In every case, land acquisition must mean the transfer of ownership. For implementation of any urban development program, availability of land and its control are necessary not only for future growth but also for a large number of public uses. In Bangladesh, Land Acquisition Act, 1894 is one of the most important legal tools. But as the law failed to meet the emergency needs for requisition of lands, the Acquisition and (emergency) Requisition of Immovable Property Ordinance, 1982 has been come in forth.

7.1.3 Policy Formulation

Apart from this the recommendations for Road networks can be adopted from the recommendation from national relevant policies. This will direct the future land use pattern.

7.1.3A Planned Development of Undeveloped Areas

Land Readjustment

It is a community building project of resident or for residents where: Land for public facilities is contributed fairly from land owners and lease holders. Where part of development benefits are provided by land owners to an implementing body to finance project cost, not in cash but in the form of reverse land.

Guided Land Development

It is a land management technique for accelerating the provision of serviced land through partnership between public sector and local communities. Its main objectives were to ensure;

1. fair return on investment to the private owner/developer;
2. a relatively large proportion of serviced sites for allotment to low income families; and at the same time;
3. recover at least part of offsite infrastructure cost for the public agency.

Site and Service

This sort of design provides the low-income people or target group with a plot and basic infrastructure. The beneficiaries either buy or lease the allocated land. Often they are provided with loan for the construction of houses.

7.1.3B Redevelopment of Developed Areas

Land Sharing

The principle behind this has been that the land is shared equitably between the land owner and the tenants (quasi). The land owner develops the land in such a manner that the original inhabitants in that area are given shelter in the very same area, lands for public facilities is made available to the planning agency and the remaining area is developed and sold freely in the market.

Slum Improvement

It provides land or housing to the urban poor near their work place. The scheme is also applicable to land reserved for public purposes on the condition that land on reduced scale is made available for the reserved purpose.

7.1.4 Different Fiscal Measures

Property Tax

Property tax has been the principal tax related to land and buildings. This tax according to provisions of Local Government (Paurashava) Act, 2009 is levied on the annual ratable value which is to be determined on the basis of area of lands or buildings.

Betterment Levy

The policy measures which can achieve optimum use of urban land use in practice still remain to be sharpened and coordinated. The measures can be classified as a) direct government investment b) legal and regulatory; and c) fiscal. Examples of these are:

1) Direct government investment in land development for provision of infrastructure, housing or overall town development through large scale compulsory land acquisition or other land development scheme
2) Statutory provisions for compulsory acquisition of land at less than market price, regulations regarding land use zoning, development control and building codes for health and safety
3) Fiscal measures in the form of appropriate taxation that can help achieve the land policy

7.2 Plans for New Urban Area Development

The Paurashava is not an ideal township due to the agriculture domination. Agriculture based township should be encouraged in the preparation of Urban Area Plan. Growth of population is the natural trend and at the sametime, expansion of non-agricultural use on agriculture land is also natural tendency of the people. This will be controlled through the Compact Township concept with the encouragement of vertical development. In case of government services, specific building may accommodate different type of offices.

Future landuse will be calculated according to the development control for the masses. In case of public land, existing use and khas land will be emphasized. Willingness and participation of the people in development activities will be the key factor for future landuse demarcation. Slow change of landuse will be emphasized rather than rapid change. Let the people do whatever he likes on own land – such concept should not be considered for future projection of landuses. Three parts of the projection are landuse change, landuse control and landuse restriction will be included in the Master Plan. In any case, river front areas should be restricted for human habitation. As a result, river water will safe from contamination.

The agriculture land should be preserved (according to the Agriculture Policy) from any type of physical development. It should not be decreased with the expansion of habitable area or formation of new settlement, may be increased with the formation of char lands. In case of road, embankment, drainage and new urban area, the agriculture land may be used but such use should be guided according to this plan. For the development of pisciculture, all ponds (not lower than 0.15 acres) and ditches may be preserved, in some exceptional cases; small number of ditches and ponds may be used for physical development activities.

People's willingness will be considered as important base for the projection because the Master Plan is for the inhabitants of the Paurashava. They will be the beneficiary group of that Master Plan. Their willingness in case of use and land allocation, location, expansion provision will be the important consideration. On the basis of fulfillment of their demand, they will like to involve them willingly in the implementation procedure of the Master Plan.

Policies and Strategies

A large number of constraints are involved with the development of new area. Following strategies are involved with the development of new areas:

- Low incomes;
- Difficulties associated with assembling parcels of land which are large enough to make viable development sites;
- Disputes over ownership;
- Absence of private sector land developers;
- Lack of access (capable of resolution often only by works on land under the control of others); and
- The need in most cases for land to be prepared in some way prior development either by filling where it is subject to flooding or by earth moving where it is too steep to develop. In both cases, drainage works have to form an essential part of the land preparation task.

The policies and strategies of the Paurashava related to new area development are –

Explore and Implement means of increasing the number and pace of public sector land development projects: This is one area where government can have a direct influence on accelerating the rate of conversion of non-urban to urban land.

Explore and Implement, with the private sector, means of increasing the number and pace of private sector land development projects: In moving towards realization of the objective of government supporting the private sector in its development role (i.e. acting as an enabler rather than a provider), the Paurashava will examine, with the private sector, the means of overcoming the constraints to new area development. Realization of the above two strategies is likely to require changes in legislation and administrative procedures at the national level. The other strategies of the Paurashava relating to new area development are set out below.

Promote upgrading of the existing urban area: As densities within the existing Paurashava Town increase, there will be growing pressure for upgrading to ensure that infrastructure provision is adequate and that living conditions are acceptable.

Most of the parts of the Paurashava are in agriculture practice and few parts are in urban area will require no upgrading at all. Accordingly the Paurashava will set priorities throughout the study area and ensure, through its own efforts or the efforts of others, that upgrading projects are necessary. Obvious areas for early consideration will be slum and squatter settlements. Local community and NGOs may involve with the upgrading projects.

Ensure that land is available for all income groups: In accordance with Government's commitment to poverty alleviation, as expressed in the Poverty Reduction Strategy and the objectives of the National Housing Policy, a further major task facing the Paurashava is to ensure that land is made available for all income groups.

Reconsider the role that development control plays in the planning and management of new area: Where development control is institutionally well-established (with adequate legislation, administrative resources and enforcement power) it can be a very effective 'tool' in restricting new area development where it is considered unsuitable; encouraging it in areas where it is considered suitable; and influencing the type of development that takes place in any particular location. It can attempt to strengthen development control institutionally to enable it to perform its role more adequately. On the other hand, it can consider restricting the role of development control to those functions which it considers critical such as ensuring that development does not take place in corridors required for new road construction or road widening, or ensuring that polluting industry takes place only in areas which are suitable for it.

Encourage the development of unused or underutilized land rather than new areas: The Paurashava is characterized by having much unused or underutilized land within the heart of the town. This land represents a wasting asset. If maximum use is to be made of the existing investment in infrastructure and if journey times are to be kept short, then fuller utilization of this land is essential. The Paurashava will examine the reasons why such land remains unused or underutilized and will endeavour to overcome the constraints to its development.

7.3 Areas for Conservation and Protection

In Banaripara Paurashava, there are no heritage sites under Paurashava area. One of the major land uses of the Paurashava area is the agriculture which covers about 27% of total area. The agricultural land is direct and indirect source of income and has a great contribution to trade and commerce of Paurashava. It has been observed that among all wards, ward no. 1, ward no 2, ward no. 7 and ward no. 8 have about 30.52%, 12.16%, 12.04% and 18.88% coverage of total agricultural land area & about 34.07%, 17.50%, 34.70% and 32.70% of total land area of respective wards. In ward no. 1, 2 and 7 about 40.86%, 49.21% and 22.46% lands of total ward area are covered under water bodies. So these show that about 74.93%, 66.71%, and 57.16% lands are covered under agriculture and water bodies at ward no. 1, 2, and 7.

Other feature which requires protection is the water bodies of the Paurashava. Though encroachment rate of the Khals/drains by the unauthorized construction and unauthorized cultivation on the bed of khals including aqua-culture is very low. But due to lack of regulations encroachment may occur in near future. Besides with the appropriate use and management of these natural lines, it might be possible to manage the drainage situation of the area. In addition, 'Playfield, Open Space, Park and Natural Water Reservoir Conservation Act, 2000' should be followed in preservation of these water bodies as per requirement. Most of water bodies are using at present for fishing purpose. So, the preservation of these water bodies not only required for drainage but also it will be potential for economic activities.

Chapter-8

STRATEGIES AND POLICIES FOR SECTORAL DEVELOPMENT OF THE PAURASHAVA

8.1 Socio- Economic Sectors

Once Banaripara was a prosperous and rich area in the island; fish, and rice was main exportable item from upazila. Recently river erosion has appeared as a silent killer and disordered everything in the upazila. The area is now an out migrant prone, and losing its population.

From the population projection it has been observed that about 3230 additional population has to be accommodated in the existing planning area during the plan period. Present density of population is 22 persons per acre. At the end of the plan period, the estimated density would be 29 persons per acre.

8.1.1 Land use Control

Policy-01: Ensure best possible use of land

Reason: To contribute to the land for economic development and employment generation proper landuse is necessary. In Banaripara Paurashava, plots devoted to agriculture purpose can be utilized for economically more profitable manner. Within Paurashava area, land is limited and agriculture has been discouraged.

Promotion: Prevent indiscriminate and misuse of land and initiate the relevant development projects.

Controls: Preservation and identification of resource based lands are as follows:

- Agricultural land for other urban uses.
- Inland Water bodies for fishery purpose and recreational purpose.
- Khas land will be distributed among the landless and a more transparent process of land settlement will be ensured

Implementation Agency: Paurashava**,** DOA, Settlement Office (Land Office), BWDB.

8.1.2 Economic Development

Banaripara Upazila is dependent on service activity and fisheries through direct or indirect involvement. Cyclone, water logging and subsequently salinity problem is common in Banaripara. Emphasis is given to accelerating the economic development by restoring the economic base of the Paurashava.

Policy-01: Creation of storage facilities and cold storage

Promotion: Emphasis should be given to the following issues:

- Establishment of cold storage
- Inland Open Water preservation

Implementation Agency: DOF, BFDC, LGED.

Policy-02: Light Industries need to be developed to flourish the industrial sector development

Reason: To accelerate the economic development of Banaripara Paurashava in the long run, it is required to encourage the industrial establishment within Paurashava area.

Control: To control the haphazard industrial development measures will be undertaken:

- Follow the category of industries as categorized by DOE (Green Category) and Bangladesh National Building Code (low and medium category hazards)
-

- Follow Bangladesh National Building Code, 1993 and Building Construction Regulation, 1952 (amendment in 1996) for providing Road, setback before construction of any industrial structures
- Following the Coastal Zone Management Policy, 2005 all industrial units will be required to install built-in safeguards against pollution within a given time-frame. Units failing to comply with the pollution standards will be required to pay "green tax" for cleanup of the environment polluted by them

Implementation Agency: DOE, BSCIC.

8.1.3: Employment Generation

Policy-01: Encourage investment in business

Justification: Local people can be encouraged to invest in business.

Implementing Agency: Paurashava, Private Sector.

Policy-02: Reduce cost of doing business

Justification: Authority can reduce cost, revenue on business to encourage people.

Implementing Agency: Paurashava, Private Sector.

Policy 03: Employment Generation through Development of Potential Sectors

Reason: To sustain economic activity of Paurashava people for longer period. The economic activity of existing Banaripara Paurashava is oriented with mainly Agriculture, Fishing and Water-way Transport Sector in some extent. Proper planning and co-ordination among these sectors and future potential sectors it would be possible to engage active labor force.

Promotion: Following measures will be encouraged to implement this policy implication:

- Industrial Zone declaration in Land Use Zone (mainly light industries)
- Infrastructure development to flourish fishing industry (Market, Ice Factory, Storage facility, electricity supply etc.)
- Water-way network development (more trawlers, launches, etc.)
- Involvement of active labor force and community participation in different management activities of Paurashava such as solid waste management in transferring the wastes from Solid-waste transfer sites, road maintenance, public sanitation

Implementation Agency: Paurashava**,** DOA, Settlement Office (Land Office), BIWTA.

8.1.4 Housing and Resettlement Zone Development

Pourahava, NHA and other public agencies can pursue the following policies to develop housing facilities and planned development for housing units. But there is no local office of the NHA to execute housing program at upazila level. Paurashava can facilitate housing areas with site and services in designated housing zones including resettlement areas.

Policy-01: Making provision of affordable housing for the low income people

Justification: Paurashava has to think about housing facilities for the low income people. Private sector will be operated for profit earning, the low income people will not access to these scheme. Thus to reduce unplanned development, the development authority may take initiative for low income people. Also by providing services the general people can be encouraged to build their own houses.

Implementing Agency: Paurashava. NHA.

Policy-02: Establishing resettlement zone for erosion affected people

Justification: Paurashava has to think about the erosion affected people & also about the people who are affected by any type of development project. Affected people will not be able to access to the schemes offered by private sector.

Implementing Agency: Paurashava**,** NHA.

Policy-03: Continuous monitoring of land and housing market

Justification: The authority should monitor the main aspects of land and housing market through data base. The Paurashava and land registry office can maintain data base and can undertake studies from time to time using GIS.

Implementing Agency: The Paurashava and land Registry office.

8.1.5 Social Amenities and Community Facilities

All social and community facilities like health, education, religious, community centre and other facilities are included in this category. In terms of number and size of facilities the allocation land with approximate location can be determined by analyzing the pattern of existing facilities and the calculation of the requirements in future. In addition some policies recommendations were made on health, education and other facilities.

Policy-01: Social amenities and community facility to be provided as per requirement of existing and forecasted population

Justification: To enhance access to land with secure tenure and to promote a social lively environment for an increasing population. Both Public and private sector investments are encouraged.

Provision of standards, rules and regulations are followed in allocating Educational Religious, Community Centre and Other components in Land Use Plan of Urban Area Plan.

Implementing Agency: Paurashava, NGO, CBO.

Policy-02: Creation of Training facilities at the grassroots level family planning workers for motivational activities

Justification: Grassroots workers can give door-to-door motivational services to the local people.

Implementing Agency: Ministry of health and family planning, Ministry of Mass Education, NGO.

8.1.6 Recreational Facilities

Policy: Ensuring community level recreational facilities like open space, park, and play ground etc.

Justification: To provide a livable environment for the Paurashava people, community level recreational facilities should be preserved. In the long run, preservation of recreational lands for future generations should be ensured. At present, only 0.03 acre is devoted for Recreational facilities. Parks should be created at central and at neighborhood level through Master Plan and Ward Action plan.

Both public and private sectors investment is encouraged.

Standard wise recreational facilities such as Play ground, Neighborhood parks, Stadium, Cinema hall will be provided as described in Land Use Plan of Volume II.

Implementing Agency: Paurashava, Public / Private sector.

8.1.7 Safety and Security

Considering the present law and order situation and its impact on the urban life it is necessary to face the challenge of restoring law and order. The major responsibility of these tasks goes to police department. Law and order in the Paurashava and its surrounding has to be ensured.

Policy: Improvement of law and order services for all citizens

Justification: Improvement of law and order is a national issue. Anyway local level community policing can be organized for ensuring security at local level.

Implementing Agency: Paurashava, Home Ministry.

8.2 Physical Infrastructure Sectors

8.2.1 Traffic and Transportation

Traffic is the function of landuse. It is also mention here that traffic network and the traffic generated induces the growth of landuse. Road networks will play strategic role in opening up undeveloped areas of the future term and shape up its structure. There is an interrelation between road network and utility services which together play key role to guide physical development in the town and Paurashava.

Policy-01: Develop efficient inter town communication facilities

Justification: To avoid traffic congestion within the Paurashava, the roads have to be widened. The main artery of the Paurashava has to be kept free from any development.

Implementing Agencies: Paurashava, RHD.

Policy-02: Maintenance or repairing of roads

Justification: To develop and facilitate easy means of transport, the authority should give emphasis on the maintenance or repairing of existing roads where needed.

Implementing Agencies: Paurashava.

Policy-03: Development of missing linkages

Justification: For easy, convenient, and safe movement, it is recommended that all missing linkages on roads are to be linked.

Implementing Agencies: Paurashava, RHD.

Policy-04: For better accessibility transport terminals should be located at major roads of the Paurashava

Justification: To develop and facilitate easy means of transport consultant suggest that the promotion of public transport is to be encouraged.

Implementing Agencies: Paurashava, RHD.

Policy-05: Functional and hierarchical road network development

Justification: Road Network has been developed without following any planned pattern.

Controls: Following the existing condition, of Banaripara Paurashava, some strategies will be persuaded before incepting the Transportation Development Plan.

- Make a priority for in space allocation of ROW for better space utilization and promoting non-motorized traffic avoiding interruption, ensuring speed with motorized traffic.
- 10-20 ft. plantation at road side will be proposed.
- The Road Hierarchy of Banaripara Paurashava will be modified and proposed on the basis of Road width Standards as described Chapter 3, Transportation and Traffic Management Plan, Volume-II.
- Follow up the basic rules mentioned in Building Construction Act, 1996 at Major Intersections of the Paurashava. Some basic rules are:

    - ✓ In each Corner plot of major intersection 1m×1m land area has to be open for traffic movement.

    - ✓ At the cross section of two or three roads within 50 meter distance, construction of commercial complex, Cinema Hall etc. are prohibited. But, 500 square meter area in total is permitted for commercial purpose (Shopping Complex), road width is 23 meter or greater.

- Promote efficient traffic management system within Paurashava by pursuing Regulatory measures (parking control and speed control in Highway Road, access control of trucks in Paurashava area,) and Design measures (Details of lay-out of Proposed Primary Road and Secondary Road in Paurashava area, use of lighting equipment etc.) in Paurashava Road Transportation System

Implementing Agency: RHD, LGED, Paurashava.

Role of Bangladesh Inland Water Transport Authority
The Shandhya River is flowing on the eastern part of the Paurashava from north to south. Bangladesh Inland Water Transport Authority (BIWTA) is responsible for maintaining its navigable character. Unauthorized encroachment in different locations of this river is performing by the dwellers. At present, the BIWTA is not performing any responsibility regarding this river. Apparently no major problem in the area of water transport services is found.

8.2.2 River Erosion Control and Drainage

Policy: Incepting drainage network plan in response of water logging problems

Justification: Lack of adequate and planned drainage facility in Banaripara causes Water logging problem. The depth of maximum internal inundation ranges from 2-5 ft and duration varies 3 to 4 hours.

Following strategies should be reflected in Drainage Network Plan:

- A planned Drainage network will be provided in Drainage and Environment management Plan considering the standards, appropriate method and formula
- Regular maintenance of existing man-made and natural drainage network with Community involvement
- Illegal encroachment of Water bodies by Water Reservoir Conservation Act, 2000 ensuring storm water drainage
- Scattered throw of solid waste in water bodies by proper solid waste management activities

Implementing Agency: Paurashava, BWDB.

8.2.3 Utility Services

Policy-01: Facilitating access for all citizens to basic level of services in water supply and sanitation

Justification: To reduce the incidence of water borne diseases and increasing the present coverage of safe drinking water by lowering the average number of users per tube well.

- Facilitate safe drinking water supply and safe sanitation to each household as per demand in 2031 through various means, including:

  - Piped Water Supply System
  - Water treatment plant, Overhead Tank
  -Rainwater Harvesting and Conservation

Prescribed Standards have to be followed in providing facilities as mentioned in Urban Area Plan under Plan for Urban Services.

Implementing Agency: DPHE, Paurashava.

Policy-02: Facilitating access for all citizens to electricity supply

Justification: According to BBS, community series 2011-Barisal, at Banaripara Paurashava, about 93.5% (2342 households) of the total households has electricity connection. Besides, to accelerate the industrial development (Agri-based, fishery) in Banaripara Paurashava electricity, gas supply must be ensured.

Consumption of wood and other natural resources based fuel will be reduced. Also alternative energy sources will be encouraged (biomass, solar etc.)

Implementing Agency: PDB, REB.

8.3 Environmental Issues

The Policies will strike a realistic balance between the existing livelihood requirements of the people and round environmental resources management that can ensure the livelihood in long term.

Policy-01: Preservation of ponds

Justification: To ensure natural water bodies and fish resources which are crucial to sustain the livelihood and to retain the eco-system.

Small and large sale fisheries Communities/Groups will be given incentives, training program will be developed on new and modern fish harvest techniques, conservation, distribution, pursing. Permitted land use will be maintained in the demarcated areas that are as follows:

- Irrigation
- Provision of water way transportation in wet season
- Fishing/Fish Culture

Implementing Agency: BIWTA, BWDB, Paurashava, DOA.

Policy-02: Identifying the erosion risk zones

Justification: As Banaripara Upazila is an island, Cyclone is the frequent hazard and flood is the secondary impact and most apparent impact accrued from Cyclone Hazard. During Cyclonic

hazard the level of water is raised up to 8-10 ft (<=3.05 m) (maximum). Therefore, strengthening disaster preventing and mitigating mechanisms to enhance the coping capability to the Poor in times of natural disaster is vital in this Paurashava context.

Environmental Management Plan will be prepared under Urban Area Plan for all possible hazards (Cyclone, Flood, River Erosion, etc.). The Plan will provide the adaptation, prevention (structural/non-structural measures), mitigation, Preparedness techniques against a natural disaster through comprehensive disaster risk management.

To reduce the impact of hazards same manures will be undertaken which are as follows:

- Embankment, flood control sluice gates and other structural measures
- Early Warning System
- providing of multi-purpose cyclone shelter

Implementing Agency: Paurashava, BWDB, LGED.

Policy-03: Ensuring safe sanitation for citizen

Justification: In Banaripara Paurashava, the sanitation condition of Paurashava is not so much satisfactory. There exist two types of latrine viz. katcha and Pucca. Besides, dumping of solid wastes in a scattered way is a common phenomenon.

Following strategies should be promoted in ensuring sanitation:

- Dumping Site and solid waste transfer sites demarcation in Land Use Plan of Paurashava area ensuring effective management including community participation
- Proposal of Solid Waste Dumping site
- Installing public toilets in schools, bus stations, launch Terminal, Markets, important public places and community latrines in densely populated poor communities or slums

The illegal connection of existing latrines with drains needs to be controlled through proper monitoring and in future

Implementing Agency: Paurashava, DPHE, LGED.

Policy-04: Pollution Control

Justification: Pollution level such as water, air and soil pollution rate is very low. As the area is located in coastal region, saline and iron also contaminate the water but at negligible rate. Besides air and soil pollution rate is also negligible. But this should not allow increasing pollution rate. To ensure safe environment for the Paurashava area, maintenance of the surface water quality is vital.

To control pollution following measures will be required:

- Make free surface waters form domestic wastes and other types of wastes which require proper solid waste management
- Riverside dumping needs to be restricted and dumping site has to be located through prescribed land use planning
- Discourage the high hazarders industries (Only Green Category Industries of DOE)
- Excessive pesticides and fertilizers use in Agriculture field cause soil pollution, therefore it is required to follow the Pesticides law, 1985

Implementing Agency: Paurashava, DPHE, DOE, DOA.

Chapter-9

IMPLEMENTATION ISSUES

This chapter deals with the issues of implementation of the Master Plan. Here, recommendations have been made about capacity building and resource mobilization for the implementation of the plan.

9.1 Institutional Capacity Building of the Paurashava

In the present context of spatial and legal jurisdiction of the Paurashava for planned development of its area, some recommendations are made here. Also, observing the financial and Institutional strength of individual stakeholders in relation to their liabilities and identifying their shortages and absence of any perfect coordinating body, some suggestions have been made as remedial measures as a whole.

- All urban local governments including Upazila level Paurashavas must be given more independence and autonomy to perform their responsibilities. At the same time, their accountability to the government and people regarding their performance has to be ensured. For this purpose the legal framework of the urban local governments has to be reviewed and updated. The legal provisions have to be consolidated and simplified and make them compatible to changing circumstances. Opportunities must be created in the Act allowing scope for privatization of service providing activities.
- To avoid duplication of development functions, there should be clear line of separation between central government and the urban local government.
- A double entry cash accounting system has to be introduced to modernize the accounting system. For this purpose, massive training programme has to be arranged for the relevant municipal staff.
- To improve revenue collection, the urban local governments should be given more power and responsibilities. Measures should be taken for strengthening the Paurashava administration for municipal development.
- Section-50 of the Local Government (Paurashava) Act, 2009 needs to be revised and more power should be given to the Executive Officer for appointment of employees.

It cannot virtually function effectively as a Paurashava under such a stringent financial condition. To function, effectively, it must raise its revenue earning. But it is reported that the Paurashava cannot collect all its holding tax from the citizens. Holding tax is the most important source of its own revenue earning. It must take care to ensure 100% recovery of holding tax. The Paurashava cannot function effectively depending upon government grant only. The existing manpower position of the Engineering, Development control and Accounts should be substantially raised to handle future volume of work. Moreover, additional staff especially for the implementation of Master Plan will soon be required.

The present plan package imposes a large number of development projects on Banaripara Paurashava for implementation. Paurashava will not only be the custodian of the plan, it will also directly implement much of the development projects. Besides, it will also be responsible for monitoring and implementation of the development projects by other urban development and service giving agencies. This situation calls for strengthening of the existing capability of Paurashava.

9.1.1 Staffing and Training

As a traditional system of the Paurashava, engineer and secretary are appointed directly by the Ministry of Local Government and other staffs are appointed locally through the approval of the Ministry after the advertisement on the newspapers. In Banaripara Paurashava, the revenue income is too low. That's why it is not capable to pay the salary of all the officials and staffs. The salary is recovered from the government grant and BMDF allocation. This is the main reason for under staffing of the Paurashava.

There is no proper arrangement for staff training. As a result, the staffs are mostly unskilled. They cannot deliver proper service to the citizens. Besides, most of them are not qualified enough to render proper services.

9.1.2 Lack of Automation

Most works in the Paurashava are done manually. Such practice delays works and deprives the citizens from services. This is also a source of mal-practice and corruption. Modern office and working equipment should be installed. Use of modern technology will increase efficiency in planning and record keeping, finally expedite decision making process.

9.1.3 Town Planning Capacity

9.1.3.1 Institutional Framework

To rearrange the institutional framework for the Paurashavas recently the government has made a committee for the categorization of all the Paurashavas of Bangladesh. According to the clause no. 72-78 (Paurashava Officer & staff, provident fund etc) of Local Government (Paurashava) Act 2009 and on the basis of the type and category of works, the committee suggested different divisions within the Paurashava framework. Planning unit or division will be necessary to set sequentially as the authority can perform its' mandatory responsibility town development and control' well and serve the inhabitants presently as well as in the future. The planning unit/division may have some sections that are as follows

Planning Div:
a) IT Section
b) Planning Section
c) Beautification and recreation Section

According to the division and its' relevant sections, what so ever appropriate with the necessity and capacity over time, it is recommended to set up necessary manpower for each category of Paurashava. Possible scope of proposed planning unit/division is given bellow:

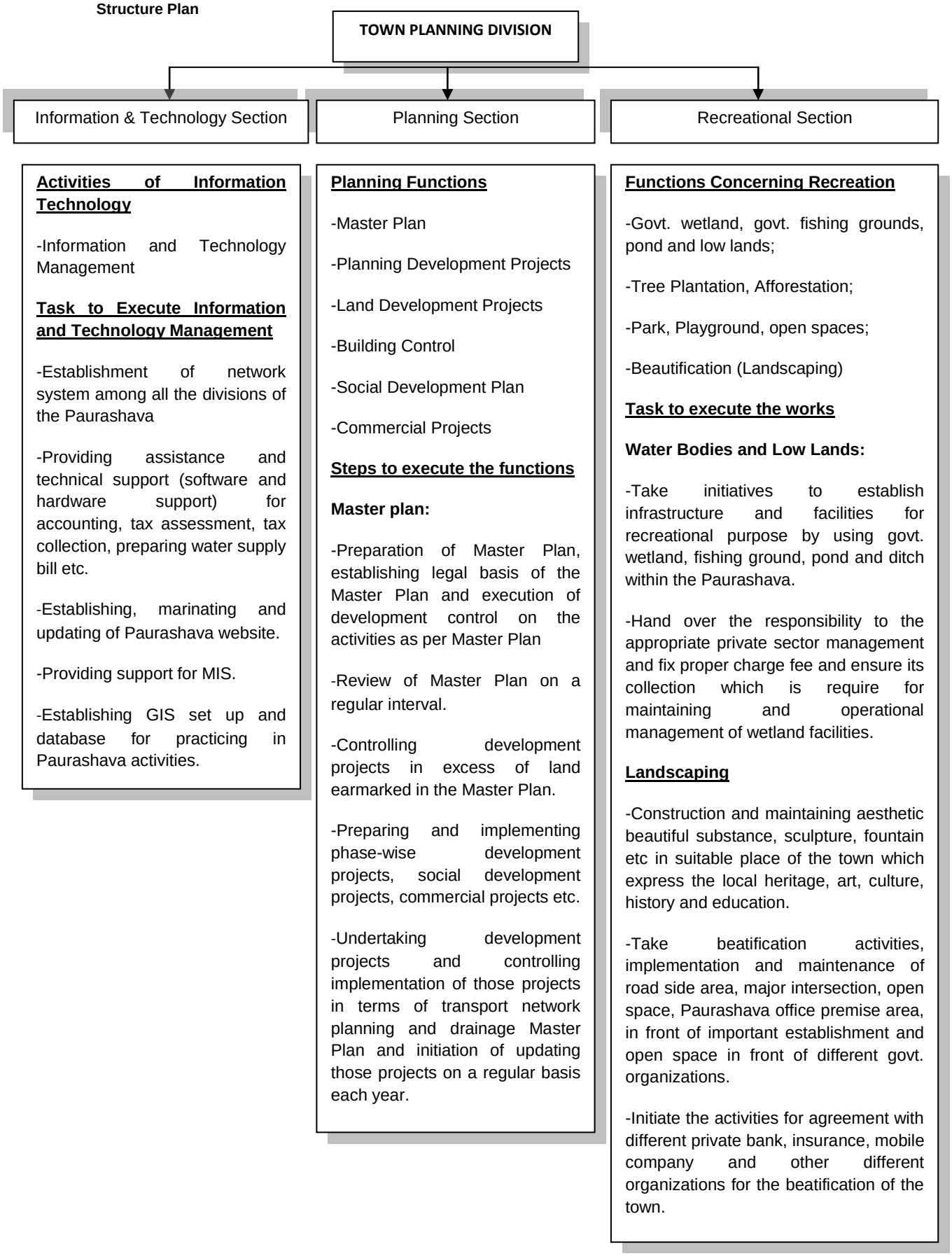


Fig 9.1: Scope of Work for Planning Division

9.1.3.2 Lack of Paurashava Town Planning Capacity

At present, the Paurashava has no town planning section or any appropriate manpower to prepare and implement the Master Plan. For proper implementation of the Master Plan for each Paurashava under UTIDP, establishment of a separate planning unit is indispensable. The Paurashava must strengthen its capacity to implement its Master Plan when it will be completed. It will otherwise be in trouble for implementation, monitoring and updating the Master Plan.

Banaripara is a 'C' class Paurashava. For the 'C' class Paurashava Government approved an organogram/ manpower requirement. If we compare the existing manpower with the approved organogram we find that there is a huge gap between the two. Many positions have been vacant since the inception of Paurashava. However, strengthening of the Town Planning Division is a pre-requisite for successful implementation of the Master Plan. Paurashava authority supported with the line ministry should take necessary steps to set up planning unit and strengthen all units/division of the Paurashava for its better performance.

9.1.4 Legal Aspects

The drive to establish strong urban local governance in the Paurashava is yet to be legalized. The governance programs at present are operated project wise based on the formulated policies of the implementing agencies of the national government. The Laws that the country inherited are mostly prepared during the colonial rule to serve its own interests. Even after independence from the British, the issue of good governance was not infused into the new Acts formulated.

9.1.5 Good Governance in Legal Provisions

There is hardly any Act where the elements of good governance are clearly visible. The consultant has identified some Acts, where some elements of good governance can be traced.

The Paurashava/Municipal Act/Ordinances prepared at different times since 1960's have iterated for the preparation of Master Plan by the Paurashava/Municipality for its planned development. So far urban local government Ordinances/Acts made in 1967, 1977, 2008 and 2009, all suggested for planned development. The Local Government (Paurashava) Act, 2009 has made the provision of having a Master Plan prepared by a Paurashava within five years of its inception. The function of the Paurashava also includes that it ensures planned development following the rules of the Ordinance. But there is no provision for public participation in the Local Government (Paurashava) Act, 2009. In all these legal documents, people's role has been ignored which is the violation of the norms of good governance.

The constitution of the Peoples' republic of Bangladesh clearly spells out that the Government should work to minimize the gap between urban and rural areas. A planned Paurashava development in that pursuit can provide necessary services to improve quality of life in both urban and rural areas within the Upazila.

9.1.6 Financial Issues

Governance in Banaripara Paurashava

Financial governance refers to transparency and accountability of financial matters. All financial matters must be transparent to all. People must know about the policies and programs of the Paurashava, how much revenue is collected each year and the amount of expenditure made on annual development. They must also be answerable to the people on how the public money is being spent and accounts being maintained.

The Ministry of LGRD and Cooperative has undertaken a number of projects in respect of establishing governance in upgrading Paurashava accounts system, like, UGIIP, STIFPP. Computer and accessories are supplied under these projects for automation of the accounts system. Besides, trainings are also offered to the Paurashava accounts staff for enabling introduction of automation in accounts system. But all these services have not yet reached Banaripara Paurashava.

Revenue Management

The Paurashava still follows a traditional management system in tax collection and revenue management though a scheme of computerized automotive financial system has already been introduced in this Paurashava. Assessment section is responsible to assess the tax of the Paurashava and tax collection, and license and bazar section are responsible to collect the tax of the Paurashava. The public is mainly informed about tax collection during the presentation of annual budget. They may, however, get information from the councilor or Paurashava accounts office.

Paurashava's Financial Capacity and Plan Execution

The main focus of Paurashava financial governance is to establish automation in entire financial management. This includes computerization of accounts system, holding tax management, and billing of different service charges. Software for above functions have been supplied and installed

in the Paurashavas covered by financial automotive projects. The projects also provided training to the relevant staffs for functioning of the systems. With the implementation of these projects people can now instantly know about the status of their tax payment, bill payment, and licensing. This has not only made the functions of the Paurashava easy, but also has freed the citizens for paying bribe, and experiencing hassle.

The size of annual budgets of the Paurashavas indicates the poor financial status of the Paurashavas. With low income, Banaripara Paurashava will have to depend substantially on the government funding for implementing the development projects. But the government has limitations of its resources. In such a situation, if the Paurashava cannot raise its own revenue adequately, it will not be able to execute much of the development projects under the Master Plan.

9.1.7 Monitoring, Evaluation and Updating

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 execution on the 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 Banaripara 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, monitoring of plan implementation will be seriously affected. However, plan evaluation can be accomplished by means of out sourcing as and when it is required.

9.1.8 Periodic Review and Updating

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 professionals and requisite fund that are highly lacking in Banaripara Paurashava. As there is no planner or planning section in the Paurashava, review and updating of the Master Plan will require service of senior level planners that Paurashava might 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. It is necessary that the entire plan document (including all planning and land use proposals) should be reviewed every 4th year of the plan period and will come into execution from the 5th year. The aim of the review will be to analyze the status of implementation of plan provisions, the changing physical growth pattern, infrastructure development, and the trend of public and private physical development including growth direction.

A new set of plans will 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 set up a planning section with a number of planners 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.

9.2 Resource Mobilization

Resource mobilization will be one of the most challenging tasks in implementing the current plan package. Though the development proposals are said to be executed by a large number of development agencies, but it is beyond doubt that the heaviest burdens will have to be shouldered by the Paurashava. As a local government agency, it suffers from resource constraint due to low level of urbanization and investment by both public and private sectors. The land value will maintain perpetually low growth rate in the town. Therefore, prospect of mobilization of substantial resource from sale of serviced land is extremely meager. For the same reason, revenue earning from betterment fee, planning permission and other sources may also remain low. Paurashava is heavily dependent on the government for executing its development projects as it is unable to collect sufficient revenue from its tax and non-tax sources. Therefore, it is clear that execution of development projects under the current plan will depend heavily on the government response to supply adequate fund. This situation calls for increasing revenue earning by generating new revenue sources.

9.3 Concluding Remarks

From the past experience, it has been observed that plans are prepared for organized development, but development control has been subject to negligence. In most cases, execution has been piece-meal. It is unfortunate that town planning has not yet become a part of our urban development culture. Individuals develop lands and construct buildings with a little respect for planned development, and the concerned authority is also unable to exercise full control on development. Some strict measures are necessary to make stakeholders follow up plans and development rules. Awareness is to be built among the people to follow the Master Plan provisions and plan. Government agencies must be compelled to follow plans. Existing laws in this regard must be updated incorporating provisions of plan execution.

Part B. Urban Area Plan

Chapter-10

INTRODUCTION

10.1 Introduction

The Land use Plan is one of the four components of Urban Area Plan. Land use Planning rules are statutory rules to control land use according to planning standard. It is based on land use policies including Local Plans, such as residential density, road standard, provision of infrastructure and services. The relevant Acts and Master Plans of the cities are the legal instruments, which is in force with regard to exercise planning control and standards. Therefore, future land use of Banaripara Paurashava is shaped by intermingling relation between existing and proposed land use.

The Terms of Reference (TOR) specify that the Urban Area Plan (UAP) / Multi- sector Investment Plan (MSIP) will consist of the following plans:

- Land use Plan
- Transportation and Traffic Management Plan
- Drainage and Environmental Management Plan
- Plan for Urban Services

10.2 Goals and Objectives

The overall land use plan makes an approach that balances economic, environmental and aesthetic concerns which preserve the natural resources and quality of life in Banaripara Paurashava. Moreover, this plan will also make recommendations for the plan's implementation to guide Paurashava Town Planner and other officials when managing future growth and development of Banaripara Paurashava. The specific goals and objectives of land use plan are described below:

Goal A: Provide a well-balanced mix of residential, commercial, recreational, and other urban services uses to serve the future needs of the community and to maintain the Paurashava as a desirable place to live

Objectives:

- Guide the development considering density standards including High, Medium and Low Density area
- Guide new development within or adjacent to existing development
- Explore possibilities to support industrial, business and commercial growth within Paurashava area by demarcating industrial, commercial zone that operates in a manner that protects the environment and uses our natural resources efficiently
- Recognize the need to accommodate all age groups in recreational pursuits
- Provide basic urban services to the Paurashava people

Goal B: Preserve and protect the aesthetic, ecological quality, function, and other values of the Paurashava's land and natural resources

Objectives:

- Discourage development within environmentally sensitive areas such as wetlands, floodplain and lowlands
- Require natural buffers where they exist, and require native tree planting or tree replacement in areas without natural buffers to minimize the potential of land use conflicts.

Goal C: Increase community awareness, support, and involvement in growth management and land and natural resource conservation efforts

Objectives:

- Improve public access and understanding of available land use, planning, zoning and environmental information
- Balance community improvements with available funding sources to ensure equitable taxation

Goal D: Provide and maintain a safe and reliable transportation network

Objectives:

- Ensure that new roads can connect to future streets on abutting properties, whenever possible
- Ensure practice of relevant laws and regulations to control the development of city pertaining with land use and road development

10.3 Delineation of Planning Areas

For determining the existing planning area, consultants have discussed with honorable Mayor, Councilors and the local people and they expressed their valuable opinion about this issue. Moreover, consultants have dully considered several issues such as population growth rate, direction of existing growth potentials, location and distance of Upazila and District Headquarter in respect of Paurashava location, land value within and surrounding the Paurashava, tax collection status, socio-economic status, other future national development plan, if any, etc. Considering the all issues, the planning area of Banaripara has been considered 2.09 sq. kilometers (including 0.23 sq. km. extension area).

11.1 Existing and Projected Land Use and Land Use Proposals

Land use Planning rules are statutory rules to control land use according to planning standard. It is based on land use policies including Local Plans, such as residential density, road standard, provision of infrastructure and services. The relevant Acts and Master Plans of the cities are the legal instruments, which is in force with regard to exercise planning control and standards. Therefore, future land use of Banaripara Paurashava is shaped by intermingling relation between existing and proposed land use.

11.1.1 Existing Land Use

The existing land uses of the project area are shown in Table 11.1. In the land use pattern of the Paurashava, 15 types of land uses are found. It is clearly evident from the table that agricultural landuse (36.53%) dominates the Paurashava area; followed by residential landuse (26.39%), water body (25.58%), circulation network (5.46%) and Commercial (1.87%). **Map 11.1** shows the existing landuse of Banaripara Paurashava.

Table 11.1: Existing Land use of Banaripara Paurashava

Landuse Category	Area (Acre)	%
Administrative	5.39	1.04
Agricultural	189.35	36.63
Circulation Network	28.22	5.46
Commercial	9.65	1.87
Community Services	0.87	0.17
Education and Research	5.8	1.12
Health Facility	1.12	0.22
Industrial/ Processing and Manufacturing	0.33	0.06
Miscellaneous/Others	0.18	0.03
Mixed Use	1.51	0.29
Recreational and Open Space	5.52	1.07
Residential	136.43	26.39
Transportation & Communication	-	-
Utility Services	0.38	0.07
Water bodies	132.24	25.58
Total	**516.99**	**100.00**

Source: Land Use Survey, 2010.

11.1.2 Estimation on the Requirement of Different Land Uses

This section proposes land use zoning plan for different land uses of the future town. The estimations have been made according to the Planning Standard approved by the client.

11.1.2.1 Land Use Standards

According to the projected population density it has been observed that in 2031, this area will not be a high density area. On the basis of projected population and considered the planning standard additional demands for land had been calculated for various facilities such as residential, commercial, industrial, educational, public land, etc.

Agricultural lands, Water bodies will be preserved as existed unless lack of land availability is observed in providing urban services. In that case, non-productive agricultural lands can be devoted for specific urban services and also to control the density of the Paurashava area.

11.1.2.2 Land Requirement and Proposal

After the projection for the target year and analyses of existing Land Use, designation of different land uses is the foremost vital step to prepare Land Use Plan as the first component of Urban Area Plan. Before incepting the Land Use Plan for the year 2031, basic principles for different category of Land Uses have been considered. In precedence, future land use designation and land use zoning have been identified. Finally, Implementation, Monitoring and Evaluation issues have been discussed as the steps after the plan completion to make the Land Use Plan perpetual through plan period.

To allocate the land in Urban Area Plan, one uniform planning standards has been followed and also some basic assumptions have been identified considering Land use Category. The population growth, existing growth direction, economic sector and overall Paurashava Context have been emphasized in Urban Area Plan. The assumptions are mainly reflection of Building Construction Act, 1952 (amendment 1996) which is the practiced law in Banaripara Paurashava for approving Building plan or site plan. Fifteen Land use categories had been considered for Survey and interim phase but for Land use plan nineteen categories have been considered. Detail analysis of required land based on the standard provided by PMO, LGED is presented in the Table 11.3. Detail Land use plan has presented on **Map 11.2** and Table 11.2.

Table 11.2: Land Requirement, Existing and Proposed Land use of Banaripara Paurashava for the Year 2031

Sl. No.	Landuse Categories	Types of Landuses	Recommended Standard	Projected Required Land for 2031(Acre)	Existing Land (Acre)	Deficiency/ Surplus (Acre)	Proposed Land (acre)
1	Residential	General residential	100 – 150 persons/1 acre	135.96	136.43	-0.47	16.19
		Real Estate – Public/Private	200 population/ 1 acre				
		Total		***135.96***	***136.43***	***0.47***	***16.19***
2	Education and Research	Nursery	0.5 acre/10,000 population	0.68			
		Primary School/ kindergarten	2.00 acres/5000 population	5.44			
		Secondary/High School	5.00 acres /20,000 population	3.40			
		College	10.00 acres/20,000 population	6.80			
		Vocational Training Centre	5 - 10 acres / Upazila	5			
		Other	5.00 acres / 20,000 population	3.40			
		Total		***24.72***	***5.80***	***18.92***	***5.96***
3	Open Space	Play field/ground	3.00 acres/20,000 population	2.04			
		Park	1.00 acre /1000 population	13.60			
		Neighborhood park	1.00 acre /1000 population	13.60			
		Total		***29.24***	***5.42***	***23.82***	***12.73***
4	Recreational Facility	Stadium/sports complex	5 – 10 acres/ Upazila HQ	5			
		Cinema/ Theatre	1.0 acre /20,000 population	0.68			
		Total		***5.68***	***0.10***	***5.58***	***4.64***
5	Health Service	Upazila health complex/ hospital	10 -20 acres/ Upazila HQ	10			
		health centre/Maternity clinic	1.00 acre/ 5,000 population	2.72			
		Total		***12.72***	***1.12***	***11.60***	***4.11***
6	Community Facilities	Mosque/Church/Temple	0.5 acre /20,000 population	0.34			
		Eidgah	1.0 acre/20,000 population	0.68			
		Graveyard	1.00 acre /20,000 population	0.68			
		Community centre	1.00 acre /20,000 population	0.68			
		Cremation Place	1.00 acre /20,000 population	0.68			
		Total		***3.06***	***0.87***	***2.19***	***6.11***

Sl. No.	Landuse Categories	Types of Landuses	Recommended Standard	Projected Required Land for 2031(Acre)	Existing Land (Acre)	Deficiency/ Surplus (Acre)	Proposed Land (acre)
7	Commercial	Wholesale market	1.0 acres/ 10000 population	1.36			
		Retail sale market	1.0 acres/ 1000 population	13.60			
		Corner shops	0.25 acre/per corner shop	0.25			
		Neighborhood market	1.00 acre/per neighborhood market	1.0			
		Super Market	1.50 – 2.50 acres/per super market	1.50			
		Total		***17.71***	***9.65***	***8.06***	***5.75***
8	Utility Services	Drainage	As per local requirement				
		Water supply	1.00 acre /20,000 population	0.68			
		Gas	1.00 acre /20,000 population	0.68			
		Solid waste disposal site	4-10 acres/Upazila HQ	4			
		Waste transfer station (9 nos)	0.25 acres/per waste transfer station	2.25			
		Fire Service	1.00 acre/20,000 population	0.68			
		Telephone exchange	0.5 acre/20,000 population	0.34			
		Water Treatment Plant	1.00 acre/20,000 population	0.68			
		Overhead tank					
		Total		***9.31***	***0.38***	***8.93***	***8.52***
9	Industrial	Small scale /cottage/agro-based	10 acre/Paurashava	10.00			
		Total		***10.00***	***0.33***	***9.67***	***7.37***
10	Transportation Facilities	Bus terminal	1.0 acre /20,000 population	0.68			
		Truck terminal	0.50 acre /20,000 population	0.34			
		Launch/steamer terminal	1.00 acre /20,000 population	0.68			
		Railway station	4.00 acre / per Station				
		Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand	0.25			
		Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand	0.25			
		Passenger Shed	0.25 acre /one baby taxi/tempo stand	0.25			
		Fuel Station	0.5 acre/20,000 population	0.34			
		Total		***2.79***	***0***	***2.79***	***5.10***

Sl. No.	Landuse Categories	Types of Landuses	Recommended Standard	Projected Required Land for 2031(Acre)	Existing Land (Acre)	Deficiency/ Surplus (Acre)	Proposed Land (acre)
11	Administrative	Upazila complex	15.00 acres	15			
		Paurashava office (Ward Councilor's Office)	3 – 5 acres	5			
		Police Station	3 – 5 acres/Upazila HQ	3			
		Police Box/outpost	0.5 acre/ per box	0.5			
		Post office	0.5 acre /20,000 population	0.34			
		Telephone Exchange Office	0.5 acre /20,000 population	0.34			
		Total		***24.18***	***5.39***	***18.79***	***5.65***
12	Circulation Networks	Paurashava primary roads	150 – 100 feet				
		Paurashava secondary roads	100 – 60 feet				
		Paurashava local roads	40 - 20 feet				
		Total			***28.22***		***57.56***
13	Agriculture	Agri-extension Farm	10 acres/Upazila HQ	10	189.35	-179.35	-148.59
		Total		***10.00***	***189.35***	***179.35***	***148.59***
14	Restricted Area	Jail/Sub Jail	10 acres/Upazila HQ	10	**0**	**10**	-
		Electric Sub station	1.00 acre /20,000 population	0.68	**0**	**0.68**	1.08
		Total		***10.68***	***0***	***10.68***	***1.08***
15	Urban Deferred	Urban Deferred	10 percent of the total build up area	6.18	0	6.18	14.34
		Total		***6.18***	***0***	***6.18***	***14.34***

Source: The Consultants' Estimation

* Here – indicates surplus of land, * indicates estimated by the consultants

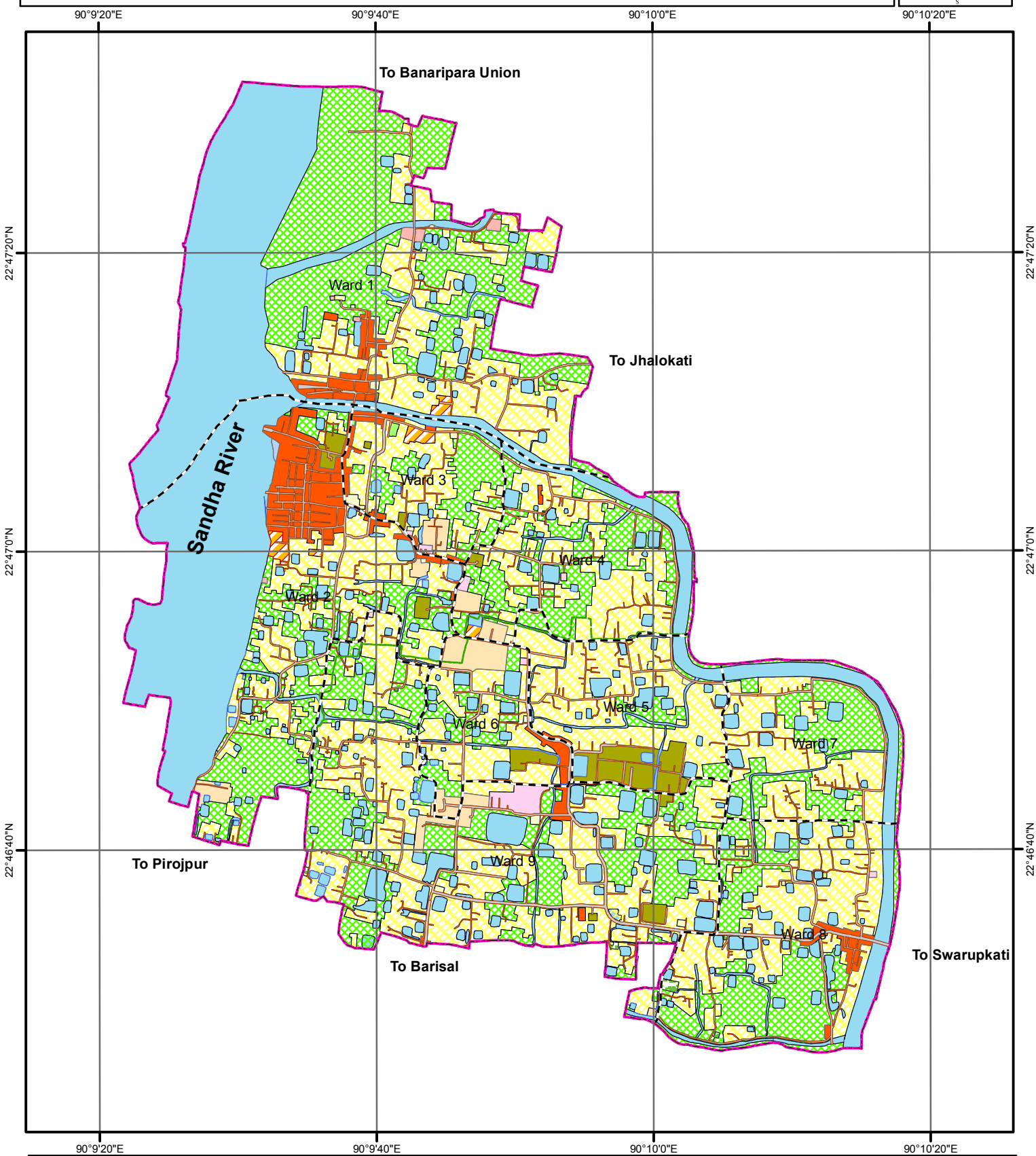
Table 11.3: Proposed Major Land use of Banaripara Paurashava

Sl. No.	Land use Category	Remarks	Area (Acre)	%
1	Administrative	All Government Offices except large scale service based offices as Civil Surgeon Office, DC Office, Police Box, Police Fari, Police Station, LGED Office, Pourashava Office, Settlement Office, Union Parishad Office, Upazila Headquarter, BADC Office, Fisheries Office, Ansar/VDP Office, Agriculture Office, Zila Parishad Office, Post Office, Telephone Exchange Office and Other Government Offices.	11.04	2.14
2	Agriculture	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.	40.97	7.88
3	Circulation Network	Road and Rail communication	85.54	16.59
4	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 extremely important to a community's economy. Commercial land includes established markets and areas earmarked for markets.	15.40	2.98
5	Community Facilities	All community facilities including funeral places and other religious uses	6.98	1.35
6	Education & Research	All kinds of educational institutes like Primary/secondary/other Schools/ Colleges etc are mentioned to calculate the land use for education and research purpose.	11.87	2.28
7	Health Facility	Health Facilities include Upazila Hospital, Health Center, Maternity Clinic, Clinic etc.	5.23	1.01
8	General Industrial Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	7.71	1.49
9	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with minimum building structure)	21.87	4.23
10	Recreational Facility	Facilities other than those mentioned to Open Space and indoor based facilities with designated building structure i.e. Cinema Hall, Theater Hall etc.	1.06	0.20
11	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 of this zone, less service and facilities will be provided.	25.92	5.01
12	Transport 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.	5.10	0.99
13	Mixed Use	Mixed land use refers to the area without dominant land use (Residential, commercial, industrial etc.).	5.23	1.01

Sl. No.	Land use Category	Remarks	Area (Acre)	%
14	Urban Deferred	Optional depending on the Paurashava and the Consultant's judgment	14.34	2.77
15	Urban Residential	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.	126.91	24.53
16	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.	8.90	1.56
17	Overlay Zone	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	Not applicable	-
18	Forest	Forest Designated Forest Area	Not applicable	-
19	Beach	Sea Beach	Not applicable	-
20	Historical and Heritage Site	The entire mentionable historical and heritage site.	Not applicable	-
21	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	123.29	23.83
Total			**517.36**	**100**

Source: Consultants Estimation

Map 11.1:Existing Landuse Plan of Banaripara Paurashava



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Agricultural
- Circulation Network
- Comercial Activity
- Community Service
- Education and Reasearch
- Governmental Service
- Industrial and Manufacturing
- Miscellnious
- Mixed Use
- Non Governmental Service
- Recreational Facilities
- Residential
- Service Activity
- Urban Green Space
- Waterbody

0 45 90 180 270 360 Meters

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development and Cooperatives Local Government Division

CONSULTANT
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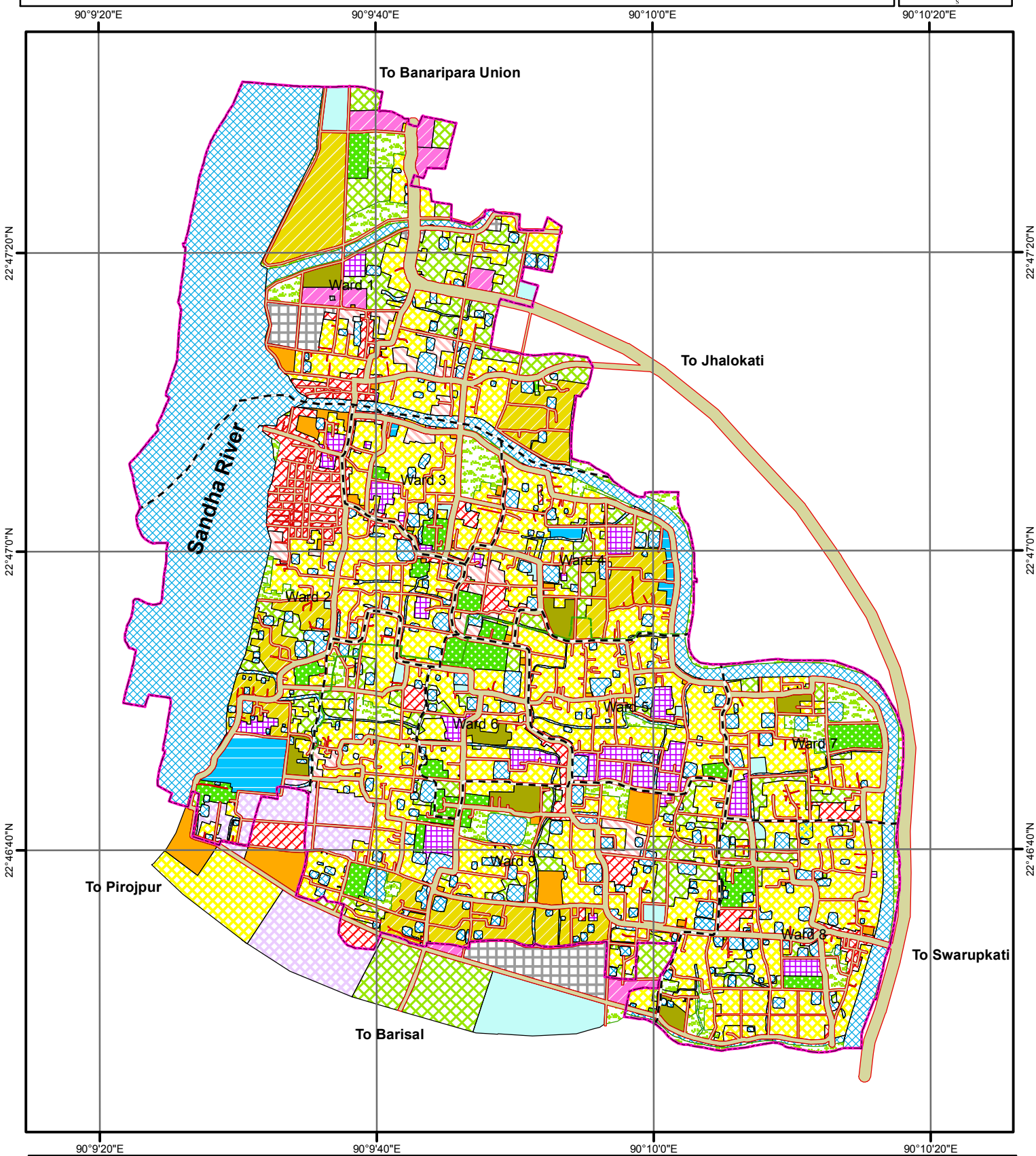
In Association with

Map 11.2:Proposed Landuse Plan of Banaripara Paurashava



Legend

- Planning Area Boundary
- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

0 50 100 200 300 400 Meters

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A) Residential Zone

Residential zone refers to all categories of urban residential areas, including exiting ones and the residential land use proposed under the present Master Plan. Here, residential zone comprises urban residential area. In order to accommodate the projected urban resident population in the study area, around 135.96 acres of land would be required up to the year 2031. On the other hand, 136.43 acres of land have already existed as residential plots in the Banaripara area. There is considered net density of 57 persons per acre. There is new proposed land of 16.19 acre for residential purpose. The list of plot number and Mauza are given below:

Table 11.4: Development Proposal for Residential Zone

Landuse Name	Area (acre)	Ward No	Plot No	Mouza Name
Cluster Village	5.94	1	21, 27-29,44-49,919	Banaripara
Housing Area	4.18	8	475-76,485-86,497-04	Kundohar
Resettlement Zone	6.07	Extension Area	-	-
Total	**16.19**			

B) Commercial Zone

The commercial zone is intended to provide locations, where commercial activities including retails and wholesale can be set up and function without creating hazards to surrounding land uses. In order to accommodate the commercial land in the year 2031, about 17.71 acre land will be required. On the other hand, 9.65 acres of land have already existed as commercial plots in the Banaripara area. In response to the requirement, about 5.75 acres of land is proposed in the Master Plan. Table 11.5 shows the distribution of commercial land in the study area.

Table 11.5: Development Proposal for Commercial Zone

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Super Market	0.75	9	407,410,412-15	Kundohar	Land Acquisition and establish	Continue the development	
Shopping Complex	0.58	8	395,398	Kundohar	Land Acquisition and establish	Continue the development	
Kitchen Market	0.69	7	333-35,343-44, 347	Kundohar	Land Acquisition and establish	Continue the development	
Retailsale Market	1.40	2	809	Banaripara	Land Acquisition and establish	Continue the development	
Wholesale Market	0.78	9	108-09	Kundohar	Land Acquisition and established	Continue The development	
Pauro Market	0.38	3	521-22,527-28, 530	Banaripara	Land Acquisition and establish	Continue the development	

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Neighborhood Market	1.16	4	888-89,895	Banaripara	Land Acquisition and establish	Continue the development	
		9	8,13	Kundohar			
Total	**5.75**						

C) Industrial Zone

Banaripara Paurashava is basically an island. Small business, agriculture and fishing are the main base of the economy of the area. The plan needs to accommodate such industries those have growth potentiality related to the base of economy of Banaripara Paurashava. Due to the environmental and ecological condition, the plan discourages growth of heavy industries in the planning area. The plan segregated industries generally in to two classes; (I) General Industrial Zone in where processing units, small scale and harmless medium scale industries can be placed and, (II) Heavy industries in where all type of medium, heavy and toxic industries can be placed. To allow industrial set up in the demarcated zone of Banaripara, the plan will follow two norms:

I) For categorizing, allocating land and providing guideline to set up industries, the plan will strictly follow the "The Environment Conservation Rule, 1997".

II) For allocating land to set up industries, the plan will prioritize environmental & ecological condition and base of the economy of Banaripara Paurashava.

About 7.37 acres of land is proposed for industrial set up in Banaripara Paurashava.

Table 11.6: Development Proposal for Industrial Zone

Type of Facility	Area (Acre)	Ward no	Plot No	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Industrial Zone	2.32	1	176-77,183-84, 192,195-96, 919	Banaripara	Land acquisition and development all facilities	Development Infrastructure	Full function Activity
	5.05	9	142,458	Kundohar	Land acquisition and development all facilities	Development Infrastructure	Full function Activity
Total	**7.37**						

D) Agricultural Zone

Agricultural zone denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. Out of the total area (516.99 acres) of Banaripara Paurashava, the areas need to preserve from unplanned development to fulfill objectives sited in various national policies along with the Master Plan. Agricultural zone covers activities related to agriculture and agriculture related production activities; farm, fisheries, pasture, horticulture etc.

E) Administrative

Government Office refers such areas encompass accommodation of the offices of various government authorities along with semi-government and autonomous bodies. A few number of private bodies formed especially for public services can also be accommodated in this zone.

According to the projection, about 24.18 lands will be required for this purpose to meet the administrative demand of projected people in the year of 2031 whereas at present 5.65 acre land is used for administrative purpose. In case of Paurashava Office 5 acres of land will have to be proposed respectively based on the standard. It is expected that in near future the authority will expand Paurashava area to meet its standard requirements. Other uses have been proposed in accordance with the standards. Table 11.7 reveals the distribution of proposed land of government offices at Banaripara Paurashava.

Table 11.7: Development Proposal for Government Services

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Ward Center	5.65	1	55-56,58-59	Banaripara	Land acquisition	Development Infrastructure	
		2	823-24,828-29, 837,842	Banaripara			
		3	501-02, 504, 925, 930-32	Banaripara			
		4	591,596-97	Banaripara			
		5	221-222	Kundohar			
		6	31-35,66	Kundohar			
		7	312,316-17,319-23	Kundohar			
		8	508-11,513,635	Kundohar			
		9	117,133-35	Kundohar			

F) Recreational Facilities

There exists only 0.10 acres of land for recreational facilities. According to the standard 5.68 acre of land is required for this purpose in the year 2031. Considering future need about 4.64 acre of land is proposed for recreational purpose. A proposed stadium with 3.68 acres of land is present at ward no 2.

Table 11.8: Development Proposal for Recreational Facilities

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Stadium	3.68	2	811-13 ,829-32,836-37	Banaripara	Land acquisition	Development Infrastructure	
Cinema Hall	0.37	4	559-62,570,584-86,588-89,592-93	Banaripara		Land acquisition and development all facilities	
Tourist Spot	0.59	4	600-02, 604, 99999	Banaripara	Land acquisition	Development Infrastructure	
Total	**4.64**						

G) Open Space

Open space includes play field / play ground, park, neighborhood park etc. according to the standard about 29.24 acres of land is required for projected population in the year 2031 while at present only 5.42 acres of land is used for this purpose. A number of Linear Parks are provided which are covering the wards no 4, 5, and 7. Table 11.9 shows the proposed lands to meet up the demand of projected people.

Table 11.9: Development Proposal for Open Spaces

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Community Park	1.88	3	508-09,512-15,530-38, 550	Banaripara	Land acquisition and development all facilities	Development Infrastructure	Full function Activity
Linear Park	1.07	4	474	Kundohar	Land acquisition and development all facilities	Development Infrastructure	Full function Activity
			550,99999	Banaripara			
		5	474	Kundohar			
		7	474	Kundohar			
Playground	3.25	1	14-15,17-18, 21,23-24,34	Banaripara		Development Infrastructure	Full function Activity
		2	844,861	Banaripara			
		7	288-89,301-03	Kundohar			
		8	544-48,637-39	Kundohar			
		9	1-2,106-07, 114-15	Kundohar			
			861-62	Banaripara			
Park	6.59	1	32-33,35,37-38,41-44,50, 59-60, 67, 181-83, 196, 919,953-54	Banaripara		Development Infrastructure	Full function Activity
		2	448-49, 656, 658-60	Banaripara			

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
		5	186,222-23, 225-27,247-48,261	Kundohar			
		7	289-91,296-98	Kundohar			
		8	465,476-85	Kundohar			
		9	4-8, 83, 133, 136,162,164-68,170-71, 629	Kundohar			
Total	**12.79**						

H) Health Facilities

Health Facilities includes Upazila Health complex, health center or maternity clinic. Considering projected population in the year 2031, about 12.72 acres of land is required for various Health facilities whereas 1.12 acre land is used in recent. To accommodate unanticipated spatial requirement of Health facilities about 4.11 acres of land is proposed in the master plan. Table 11.10 shows the proposed lands to meet up the demand of projected people.

Table 11.10: Development Proposal for Health Facilities

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Clinic	3.12	1	49-55	Banaripara	Land acquisition	Development Infrastructure	
		2	833-35,843	Banaripara			
		6	16,31,66-67	Kundohar			
		7	288-89	Kundohar			
		8	465-66,480	Kundohar			
		9	465-66,480	Kundohar			
Hospital	0.99	4	205-06	Kundohar	Land acquisition	Development Infrastructure	
			892-94,896-99, 903-05,907	Banaripara			
Total	**4.11**						

I) Community Facilities

Community Facilities includes Mosque/Temple/Church, Eidgah, Community Center and Graveyard. Considering projected population in the year 2031, about 4.43 acres of land is required for various Community Facilities whereas 0.87 acre land is used in recent. To accommodate unanticipated spatial requirement of Community Facilities about 6.11 acres of land is proposed in the master plan. Table 11.11 shows the proposed lands to meet up the demand of projected people.

Table 11.11: Development Proposal for Community Facilities

Type of Facility	Area (Acre)	Ward No.	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Community Center	0.95	9	415,435-37	Kundohar	Land acquisition	Development Infrastructure	
Eidgah	0.86	9	448,450-52	Kundohar			
Graveyard	1.09	1	194-96	Banaripara	Land acquisition	Development Infrastructure	
		2	258-61,331	Banaripara			
Shamshan Ghat	1.53						
Total	**4.43**						

J) Education and Research Zone

Educational zone refers all kind of educational set up; School, Colleges, Madrasha and even such institutions operated for education like; training institutions, research institutions etc. In order to meet up the demand of projected population (2031), about 24.72 acre lands will be required. In the proposal 6.07 acres of land is given for educational purpose. Most of the primary schools are proposed in the residential areas. Table 11.12 presents the distribution of proposed land under education and research institutions.

Table 11.12: Development Proposal for Education and Research Zone

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
College cum Cyclone Shelter	1.39	7	291-96,299-01	Kundohar		Land acquisition and development all facilities	
Vocational Training Institute	1.01	8	390-93, 395, 400,422	Kundohar		Land acquisition and development all facilities	
Kindergarten	0.56	3	498-01,504	Banaripara		Land acquisition and development all facilities	
		5	251-56,260, 651	Kundohar			
Primary School cum Cyclone Shelter	1.98	1	21,24,27,29-30,919	Banaripara		Continue the developme nt	
		2	844-45,861	Banaripara			
		8	503,508-09, 653	Kundohar			
Secondary	1.13	6	85,87-88,128	Kundohar		Land acquisition and	

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
School cum Cyclone Shelter		9	85,106-07,128	Kundohar		development all facilities	
Total	**6.07**						

K) Water Body

Water body contains all natural streams; canals, khals, irrigation canal, depressions like; beel, wetland, low laying areas and ponds. No standard is being prescribed for water body from the UTIDP. The Paurashava is rural-based urban area. In the proposal about 123.23 acres of water body are being preserved though existing total water body is 132.24 acres. These waterbodies have been preserved under the 'Playfield, Open Space, Park and Natural Water Reservoir Conservation Act, 2000'. The rest of the lands have been used to meet up the requirements of other facilities at Paurashava.

L) Circulation Network

Circulation Network refers all kind of public roads along with related facilities; footpaths, walkways etc. and embankment, railway (if exist in the area). According to the Traffic and Transportation Management Plan, about 85.78 acres of land have been proposed for circulation network at Banaripara Paurashava area whereas at present only 21.22 acre land has been used for these purposes.

M) Transportation Facilities

Transportation facilities include Bus / Truck Terminals, Launch Terminal, Other Vehicle Parking Space, Gas/ Fuel Station, etc. Considering projected population in the year 2031, about 2.79 acres of land is required for various transportation and communication facilities whereas only no land is used in recent. To accommodate unanticipated spatial requirement of transportation and communication sectors about 5.10 acres of land is proposed in the master plan including various facilities such as bus terminal, truck terminal, launch terminal, other vehicle parking, etc. Table 11.13 shows the proposed lands to meet up the demand of projected people.

Table 11.13: Development Proposal for Transportation Facilities

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Bus Terminal	1.10	1	9-11,15-19, 21, 919	Banaripara	Land acquisition	Development Infrastructure	
Bus Stand	0.76	9	467-68,472	Kundohar		Land acquisition and development all facilities	
Truck Stand	0.29	9	142	Kundohar		Land acquisition and development all facilities	

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Truck Terminal	1.18	1	50-52,174,179-82,	Banaripara	Land acquisition	Development Infrastructure	
Fuel station	0.53	1	72,81-83	Banaripara		Land acquisition and development all facilities	
Rickshaw Stand	0.49	1	10,12-13,15, 99999	Banaripara		Land acquisition and development all facilities	
Tempo Stand	0.74	1	13	Banaripara		Land acquisition and development all facilities	
Total	**5.10**						

N) Utility Service

Utility Service includes Solid waste disposal site, waste transfer station, Water Treatment Plant and fire service. Considering projected population in the year 2031, about 9.31 acres of land is required for various Utility Services whereas only 0.38 acre of land is used in recent. To accommodate unanticipated spatial requirement of Utility Services about 8.52 acres of land is proposed in the master plan. Table 11.14 shows the proposed lands to meet up the demand of projected people.

Table 11.14: Development Proposal for Utility Services

Type of Facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Waste Dumping Site	6.01	Extension Area	-	-		Land acquisition and development all facilities	
Electric Sub-station	1.08	4	919	Banaripara		Land acquisition and development all facilities	
Waste Transfer Station	1.42	1	82,93	Banaripara		Land acquisition and development all facilities	
		2	653,854	Banaripara			
		3	519,521-23	Banaripara			
		4	614-17,891	Banaripara			
		5	221	Kundohar			
		6	20-22,37	Kundohar			
		7	306,313	Kundohar			
		8	324-25,327	Kundohar			
		9	10-11	Kundohar			
Total	**8.51**						

O) Restricted Area

Restricted Area includes Electric substation and Sub jail. Considering projected population in the year 2031, about 10.68 acres of land is required for Restricted Area, whereas no land is used in recent. To accommodate unanticipated spatial requirement of the Area about 1.08 acres of land is proposed at Ward No.04 covering plot no. 919 as Electric Sub-Station.

P) Urban Deferred

Urban deferred area includes potential land reserved for future use. Standard shows 10% of total core area and new urban area should be used as Urban Deferred area. According to it, 14.34 acre land has been conserved for this purpose.

11.2 Land Use Zoning

Zoning is a classification of land use that limits what activities can or cannot take place on a parcel of land by establishing a range of development options. Zoning has been defined as an action through legislation provided to a development authority/Paurashava to control a) heights to which buildings may be erected; b) the area of lots that must be left un-built upon; and c) the uses to which buildings may be constructed.

11.2.1 Area / Use Zoning

The objective of area zoning is to specify which types of land use are considered appropriate for different areas or 'zones', and it therefore indicates the planning control objectives of the authority or municipality for its administrative area. The authority is obliged under the planning acts to designate in its development plan objectives for the use solely and primarily of particular areas for particular purposes.

The zoning is defined as the regulation by law of the use of land and buildings and of the height and density of buildings in specific areas for the purpose of securing convenience, health, safety and general welfare of the community. Thus, the term zoning is used to include two aspects of planning-allocation of land for specific purposes and control of the use, height and construction of the buildings.

Though the future land requirements are the first priority of planning for a city but considering the existing land use there should be provision of zoning. The zoning will demarcate specific land use for a specific zone or area. The zones are usually classified into the following four categories with suitable sub-divisions in each zone:

a. **Residential zone:** the character and location of this zone will depend on various factors such as nearness to the markets; freedom from nuisance, noise and smoke; nearness to parks and playgrounds etc.

b. **Commercial zone:** this zone should be near the centers of traffic and preferably it should about the roads. It includes the uses of land for banks, offices, godowns, shops etc.

c. **Industrial zone:** great care should be exercised in providing units of industrial zone in various part of the town. The light industries and factories running on electric power and causing no nuisance to nearby areas may be allowed to be set close to residential areas. On the other hand,

the heavy industries giving out obnoxious gases and fumes and developing noisy atmosphere may be placed on the outskirts of the town.

d. **Recreational zone:** This zone includes mainly parks and playgrounds and in a broad sense, it may be considered to include various recreational centers such as cinemas, theatres, town halls, clubs, libraries, restaurants, stadium and other community needs.

Besides these any special land use can get special emphasis on the basis of its intensity, significance on local, national economy etc.

11.2.2 Density / Bulk Zoning

Aim of the density zoning is to provide an acceptable density which is related to the designed facilities and amenities especially for the residential areas. This will ensure a healthy community and enjoyable community life. In a particular area, how much number of buildings will be permitted and constructed, the decision is under the density zoning. Provisioning of setback rule and percent of land uses for different purposes is the prime consideration of density zoning. The proposed percentage mentioned in the land use table is the only tool to control building density in the Paurashava.

11.2.3 Height Zoning

This zoning provides height limits for structures and objects of natural growth and standards for use of an area which encourage and promote the proper and sound development of areas. It is also applicable to height restrictions for flight safety around airports or other similar purposes.

For effective development control, in addition land use zoning individual facility and the structures therein is complied certain regulations imposed to ensure desirable end. Relation between ground cover of buildings and the land parcel that house it, minimum setback of building from the adjoining plot boundaries and the maximum floor area that can be constructed in relation to plot size and the connecting road among many other details, are controlled by Building Construction Rules 1996.

According to the Building Construction Rule, 1996, minimum permissible road width for obtaining plan permission is to shown, construction is allowed on plots connected by narrow roads provided the plot owner leaves formally half of the addition area needed to make the road 6m for widening the road to the permitted minimum. Perhaps the intension behind this was that gradually the whole road would rise up to 6m in short time and it is true for new areas. But congested unplanned area represents an alarming picture. In commercial area, most of the plots are occupied almost entirely by pucca structures covering the property line connected by the narrow pathways. Those owners did not bother for Paurashava's plan permission and a handful of those who obtained plan permission did not care to follow them. It is suggested that existing rules need to be modified to tackle the environmental problems created by illegal building construction.

11.3 Plan Implementation Strategy

11.3.1 Land Development Regulations to Implement the Land use Plan

Effective implementation of a plan is the most important part of the planning process. The process of Implementation needs to be carried out with care and efficiency in order to produce best outcomes. This chapter highlights various measures needed to be taken in order to implement the land use plan proposals.

Implementation of the Land use Plan depends on successful pursuit of the policies specified in the Structure Plan. Those policies represent a significant challenge face with the responsibility of planning and managing the development of the Paurashava area. However, at present no authority is responsible for planning and managing physical development activities in the Paurashava and no regulation except Local Government (Paurashava) Ordinance, 2009 for controlling physical development. This poses a serious constraint to the implementation of the Land use Plan and in fact any other form of development plans.

The factors that have been taken into account in deciding the priority include such things as – the importance of the issue that the policy addresses, its potential impact on the lives of the population, the ease with which it can be implemented, its urgency and its interdependence with other policies.
Prior to introduction of the regulations to implement the land use plan, legislative involvement is recommended here.

1. To control the air, water, noise and soil pollution, Conservation of Environment and Pollution Control Act, 1995 (Act No. I of 1995) was enacted. In the Paurashava, there is no authority for enforcing the provisions prescribed in the said Act. The pollution related with the implementation of land use component may be controlled with this Act.

2. Impose control on all type of buildings in the Paurashava according to the setback rule prescribed in the Building Construction (Amendment) Rules, 1996 (Notification No. S. R. O. No. 112-L/96). Building permission for extended areas shall be according to the land use provision prescribed in the plan. Any permission for building construction, front road width shall not be less than 16 ft. and the construction must follow the Building Construction (Amendment) Rules, 1996.

3. Haphazard development of commercial activities is the general scenario of the Paurashava. It is necessary to impose control on commercial activities provisioned in the Shops and Establishments Act, 1965 (Act No. VII of 1965).

4. In case of man-made canal, regulations prescribed in the Canal and Drainage Act, 1873 (Act No. VIII of 1873) is the best weapon. For the linking of canal with others and river considering drainage facilities the Act may be enforced.

5. For the conservation of archeological monuments or structures or historical development the Ancient Monuments Preservation Act, 1904 (Act No. VII of 1904) may be enforced. Archeological Department of Bangladesh and Paurashava authority through a partnership process may preserve such type of development.

6. To control air pollution due to brick burning with the establishment of brick field, Brick Burning Control Ordinance, 1989 (Ordinance No. VIII of 1989) is the appropriate regulation. The Paurashava authority may enforce this Ordinance with the authorization given by the government to him.

7. To control the medical practitioner, establishment of private clinics and pathological laboratories, the statute named Medical Practice, Private Clinics and Laboratories (Regulation) Ordinance, 1982 (Ordinance No. IV of 1982) was enacted. For efficient enforcement of the Ordinance, the Paurashava authority may execute the Ordinance with the authorization of government.

8. The Paurashava will have to exercise strictly Playfield, Open space, Garden and Natural Tank in Urban Areas Preservation Act, 2000 (Act No. XXXVI of 2000) to some specially important areas like, riverfront and water bodies, drainage channels, low land below certain level, designated open space, etc. Development restrictions are needed around security and key point installations. The provision of restriction will strengthen the power of the plan to safeguard its development proposals and land use provisions.

9. The government is authorized for establishment of hat and bazar with the acquisition of land through the statute named Hat and Bazar (Establishment and Acquisition) Ordinance, 1959 (No. XIX of 1959). In case of private hat and bazar, a management body is being empowered through the Bangladesh Hats and Bazars (Management) Order, 1973 (P.O. 73/72). The Paurashava authority is also empowered establishing hat and bazar in his jurisdiction through the Local Government (Paurashava) Act, 2009. Coordination may be framed among the government (Upazila Parishad), Paurashava and private owner for the establishment, development and management of the hat and bazar located in the Paurashava premises.

10. In the Paurashava premises, industrial development is controlled by the Bangladesh Cottage Industries Corporation through Bangladesh Cottage Industries Corporation Act, 1973 (Act No. XXVIII of 1973), Industrial Development Corporation through East Pakistan Industrial Development Corporation Rules, 1965 (No. EPIDC / 2A-2/63/354) and Factory Inspector through Factories Act, 1965 (Act No. IV of 1965). Locational aspects and issuing of trade license is controlled by the Paurashava authority. A joint coordination cell among those four authorities may control the establishment of factories and industries in the Paurashava.

11. In the Paurashava, for rain water harvesting, some specific ponds / tanks will needed to be preserved. A number of derelict tanks may be improved through tank improvement project and in this case Tanks Improvement Act, 1939 (Act No. XV of 1939) will support the Paurashava is regulatory aspects.

12. Except Khas land, a considerable amount of public land in the Paurashava may be identified as fallow land or unproductive land. In regulatory term those lands are considered as cultivable waste land and those lands are being fallow during five consecutive years. Those lands may be utilized under the guidance of Cultivable Waste Land (Utilization) Ordinance, 1959 (Ordinance No. E.P. XIII of 1959).

13. The Paurashava should raise its efforts on the imposition and realization of betterment fees to raise its income. In this case, East Bengal Betterment Fees Act, 1953 may be enforced.

11.3.2 Implementation, Monitoring and Evaluation of the Land use Plan

Implementation through Multi-Sectoral Investment Program

Major infrastructure development works such as primary roads, water supply, drainage, etc., will largely be controlled by Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Programme (MSIP).

Objective of a Multi-Sectoral Investment Programme (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Land use Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects

Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control

Land use zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, land use control may be applied; careful consideration requires the following ideologies:

- purpose to be achieved by the development controls;
- where controls should be applied;
- what aspect of development needs to be controlled;
- what type of development controls are required;
- what degree or level of development control is required;
- who will be affected by the required control;
- who will be affected by the controls and in what manner;
- when the controls should be applied;
- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

Development control as an instrument of plan implementation may be selectively applied within the Land use Plan. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.

Implementation by Facilitating Private Investment

Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient lay out of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Land use Plan would simply be tools for guiding and encouraging the growth and development of the Paurashava in a preferred manner. In a rapidly changing urban environment, the Land use Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Land use Plan be made a legal requirement.

For implementation of the various program components of the Land use Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time.

Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by Paurashava Mayor, LGED representative and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Paurashava should have close interaction with the citizen of Paurashava at large in order to make people aware of the benefits of a good plan and, therefore, their social responsibility to promote plan implementation in one hand and also resist contraventions on the other. A specific interactive cell is recommended to operate in this regard with following responsibilities:

- Provide pre-application advice to residents, consultants and developers about land use management issues and application procedures for the submission of development applications.
- Enforce planning and land use management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.
- Investigate and resolve land use management complaints, illegal land use and prosecuting contraventions.

Such interactive windows may be opened in various convenient locations to ensure ease of the answers to commonly asked questions may be shown in the internet. Besides, those may be shown in the print and electronic media time to time.

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to

give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to be handled with utmost care and patience. The best results can be accrued only by wining people's confidence. In case the authority fails to get peoples co-operation they should exercise power of compulsory acquisition of land. Attempts may be made to engage NGOs / CBOs to work as catalysts in negotiation.

12.1 Introduction

Transportation occupies a high place in modern life. Transportation has great influence in the advancement of all spheres of life. Transport planning is a science that seeks to study the problems that arise in providing transportation facilities in an urban, regional or national setting and to prepare a systematic basis for planning such facilities. Town and country planning is a science that deals with the study of the urban or country “system” communications through channels. Transport planning is an important part of overall Town and Country Planning, since it deals with the transport network which is an important channel of a communication. Transportation and Traffic Management Plan is one of the Components of Urban Area Plan.

In Bangladesh, Transport Planning is not in practice still. Recently, government has developed the National Land Transport Policy, 2004 in order to provide a safe, integrated, effective transport system. Also, attempt has been taken to link relationship with land, economic activities and road network development. In preparing the Traffic and Transport Management Plan (Component-2) for Banaripara Paurashava under Urban Area Plan (Volume-II), the Survey Phase and Interim phase has been completed successfully. In precedence of these activities, this plan is incepted.

12.2 Approach and Methodology

Transport study provides special attention to urban transportation planning as it greatly influences the location decisions and travel behavior of people, goods and services. Transportation is critical for the efficiency of towns contributing to their productivity and economic growth. 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 cities and 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 Banaripara 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.

Traffic volume survey has been conducted to find out the scenario of average daily traffic, peak hour traffic and off-peak hour traffic. Origin-Destination survey has been carried out to know the pattern of traffic generation, traffic distribution, modal split etc. Speed and delay survey has been conducted at 2 points on major local roads.

Bus and tempo fleet data were collected from local transport owners’ offices like, Bus Owners’ Association, Tempo Owners’ Association. They also provided information about routes, trips and movement data. Information about bus station and tempo station were collected from the respective owners’ association and the Paurashava/District Administration. Year wise data of non-motorized traffic were collected from the Banaripara Paurashava, where these vehicles are registered.

12.3 Existing Conditions of Transportation Facilities

This section describes existing transportation facilities namely roadway and water way characteristics, modal share of vehicular traffic, level of service which incorporate degree of traffic congestion and delay and analysis existing deficiencies in transport sector of Banaripara Paurashava.

12.3.1 Road Network

12.3.1.1 Roadway Characteristics and Functional Classification

The primary roads are the urban highways whose function is to channelize the longer movement from one place to another and beyond. The primary road of Banaripara Paurashava is connected in north and south (Banaripara Union and Barisal-Swarupkathi Highway) directions and these roads maintain connectivity with the outside areas of Paurashava. Moreover, the primary roads are also connected with secondary and access roads and all these roads maintain good connectivity within the Paurashava area. Secondary road cannot provide access to individual buildings because the consequent frequency of interruptions would give rise to traffic dangers. Tertiary road connect secondary road with access road. But in Banaripara Paurashava most of the roads cannot be defined according to road hierarchy.

From the physical feature survey it has been observed that about 7.08% (6500.43 sq.m) of the roads are Katcha, 72.07% (66203.82 sq.m) roads Pucca and the rest of the roads are Semi-pucca 20.86% (19158.22 sq.m). There are 9 bridges at Banaripara Paurashava. All the bridges are pucca and condition of pavement are good. There are 24 box culverts and 2 pipe culverts exist at Banaripara Paurashava.The rest of the roads are primary roads. **Map 12.1** shows existing road network of Banaripara Paurashava.

Table 12.1: Type Wise Length and Area of Existing Road

Types of road	Area (in sq.m)	%	Length (in km)	%
Katcha Road	6500.43	7.08	3240.71	9.79
Pucca Road	66203.82	72.07	19503.86	58.91
Semi pucca Road	19158.22	20.86	10362.58	31.3
Total	**91862.47**	**100.00**	**33107.14**	**100**

Source: Physical Feature Survey, 2011.

Traffic volume survey has been conducted at two major intersection comprising seven road links that are the dominant traffic generating links of Paurashava Area. These two major intersections are Banaripara Post Office More (Nasirpur Road, Bazar Road, and Cinema Hall Road) and Dak Banglo More (Badar Road, Dak Banglo Road, Monosha Mandir Road, and Durga Mandir Road). Width of access road varies 1-4.5 m. Mainly LGED is responsible for construction and maintenance of most of the roads within the Paurashava.

12.3.1.2 Mode of Road Transport

There is no public or private bus service available for intra-zonal movement within Banaripara Paurashava. Intra-zonal movement among the Paurashava area is mostly done through the non-motorized vehicles such as rickshaw, bi-cycle, van, etc. People also use some motorized vehicles such as motorcycle, Auto Rickshaw, etc. Additionally, van is used for carrying both passengers and goods. Rickshaw is the most dominant transport for intra zonal movement. The average percentages of traffic composition are Truck 0.6%, Bus 0.5%, Car/micro-bus 0.9%, Auto rickshaw 5.8%, Motor cycle 6.1%, Rickshaw/van 68.0% and Bi-cycle 18.0%.

12.3.1.3 Intensity of Traffic Volume

Traffic volume survey has been conducted to find out total discharging traffic volume both in peak hour and off peak hour at there is no bus stand in Banaripara Paurashava.

Peak Hour has been considered from 8.00 to 12.00 and 16.00 to 20.00 because most of the educational and commercial movement has been accomplished within the time periods and traffic characteristics of these time periods is different and higher than other time periods.

As there is a designated day as hat day in Banaripara Paurashava, working day, weekend and Hat day traffic volume is counted for transportation survey. Survey result shows that non-motorized vehicle (86.1%) acts dominant role in Banaripara Paurashava.

Survey result shows that Post office to Nasirpur Road has the highest Peak Hour Traffic Volume of 378.6 PCUs whereas Durga Mandir Road has the lowest 289.6 PCUs. Post office to Nasirpur Road has the highest Off Peak Hour Traffic Volume (182.2 PCUs) per hour and Durga Mandir Road has the lowest Off Peak Hour Traffic Volume (115.1 PCUs) per hour.

Analyzing the characteristics of Peak Hour and Off Peak Hour traffics, it has been observed that the Peak Hour Traffic is more than 3 times higher than Off Peak Hour Traffic in all of the surveyed road sections.

There is also traffic volume variation at hat day and non-hat day. Generally hat time starts from afternoon. So, variation of traffic volume also exists. In case of hat day it has been observed that specially the two road links that are connected with bazaar area face peak hour traffic volume 8.00-12.00 and 16.00-20.00.

12.3.1.4 Level of Service: Degree of Traffic Congestion and Delay

In order to prepare a fruitful traffic management plan, it is really important to evaluate the level of service of the road sections. Level of service of the surveyed road sections has been evaluated using the ratio of volume and capacity. The V/C ratio is defined as the ratio of maximum actual volume of traffic in the peak hour in a road way, expressed in PCUs per hour to capacity of that roadway expressed in PCUS per hour. Capacity of roadway largely depends on number of lane, road width and roadway condition. In Banaripara Paurashava area all the surveyed road sections are one lane road.

In Banaripara Paurashava all the roads have free flow and transport density is low. The major inter sections are not signalized so no delay is exist here.

12.3.1.5 Facilities of Pedestrians

Pedestrian facility is one of the Transportation facilities which are required to create a pedestrian friendly environment. Most of the roads at Banaripara Paurashava do not have foot-path. So, pedestrian facility is very poor at Banaripara Paurashava. But this facility is one of the vital needs for urban life.

12.3.1.6 Primary Considering Issues for Planning

Major deficiencies of transportation and traffic management are below:

- Present road network has developed without maintaining any hierarchy or planning rules.
- Poor and damaged road conditions are the most dominant transportation problem of Banaripara Paurashava.
- Narrow road and lack of transport modes are another transportation problems of the area
- Absence of stand and proper parking spaces grounds haphazard condition and congestion.
- Lack of traffic management system and low quality transports result low quality of service to the residents of Banaripara Paurashava.
- Absence of signalized crossing.
- The Paurashava has no pedestrian facility that directly hampers the safety of the people
- Lack of traffic control aids, street furniture, street lighting, etc.
- Water transport vehicles are not adequate and service quality is not satisfactory

Roadway Capacity Deficiency

Roadway Capacity deficiencies occur wherever the travel demand on a road is close to or higher than the vehicle capacity of that roadway. In order to identify the road capacity deficiency, it is required to make a comparison between existing Level of service (LOS) of major roads with the standard one. By comparing those it has observed that all the surveyed roads of Banaripara Paurashava have free flow and transport density is low. Existing capacity of major roads are not consistent with standard capacity limit and the future traffic flow and demand may exceed the limit.

Moreover, the average width of the primary roads and secondary roads of Banaripara Paurashava are 4 meter and 3.5 meter and 3.75 meter respectively whereas according to the PMO standard the right of way of primary road, secondary road and access road will be 18-24 meter, 13-16 meter and 6-8 meter respectively. So these roads have designed without maintaining any standards. However, these roads have to be widened where possible and essential.

Operational, Safety, Signal and other Deficiencies

- At present, there is no selected authority for the management of traffic at Banaripara Paurashava. Generally The Police Department's Traffic wings are the main eligible.
- As the roads of Banaripara Paurashava have free flow of traffic and most of the traffic are non-motorized both in hat and non-hat day, road safety exists naturally in the Paurashava.
- Traffic signaling system is totally absent in the Paurashava. On some specific point of primary and secondary roads, traffic signaling may be needed.

12.3.2 Condition of Water Transport

In the Banaripara Paupashava area there is two Lanch ghat. One is located western part of Ward no 1 and the other is near to Banaripara Paurashava which is also used by the residents of Banaripara Paurashava. Water transport network of Banaripara Paurashava has significant importance in carrying goods. Launch and trawler are used for carrying both passenger and commodity frequently.

12.3.3 Condition of other Transport

At this stage there is no need to propose car way, rail way in this Paurashava.

12.4 Future Projections

With the increase of population, demand on travel will be increase with the time. Estimating the demand for transportation facilities and services is one of the most important analysis tasks in transportation planning. The demand includes not only passenger travel but also the movement of goods. Whether conducting a regional transportation planning study or examining the impacts of transportation of a new development site, estimating expected travel demand at some future date is critical point of departure for transportation planning.

12.4.1 Travel Demand Forecasting for Next 20 Years

At Banaripara Paurashava, the existing road network is quite sufficient for accommodating present volume of traffic. At Banaripara Paurashava about 9.79% of the roads are katcha and needs to be constructed as pucca or at least semi-pucca. Moreover, most of the roads are narrow. Road Alignment should be straight in main road for improving transport quality. Widening of these roads and new construction of some roads will act as a vital role for accommodating future traffic volume. Moreover, the people of Banaripara Paurashava depend on both road network and water transport network. This will also help to reduce pressure on road transport network. Forecasting travel demand requires variety of data such as historical data on traffic, missing link, economic importance, trip generation and distribution pattern, routes choice, modal spilt, etc. Growth direction is also a considerable component for the demand analysis of the road.

12.4.2 Transportation Network Considered

The primary road of Banaripara Paurashava is well connected in both north and south directions within the Upazila areas and the primary roads are also connected with secondary and access roads and all these roads maintain good connectivity within the Paurashava area. But these roads are not wide enough on the basis of standard. So, the narrow roads have to be widened on the basis of standards and katcha roads will be improved with the time and also traffic management system will be improved. Besides, some new roads also have been proposed to

accommodate the future travel demand. Moreover, footpath facilities have to be introduced to meet up the demand of pedestrians.

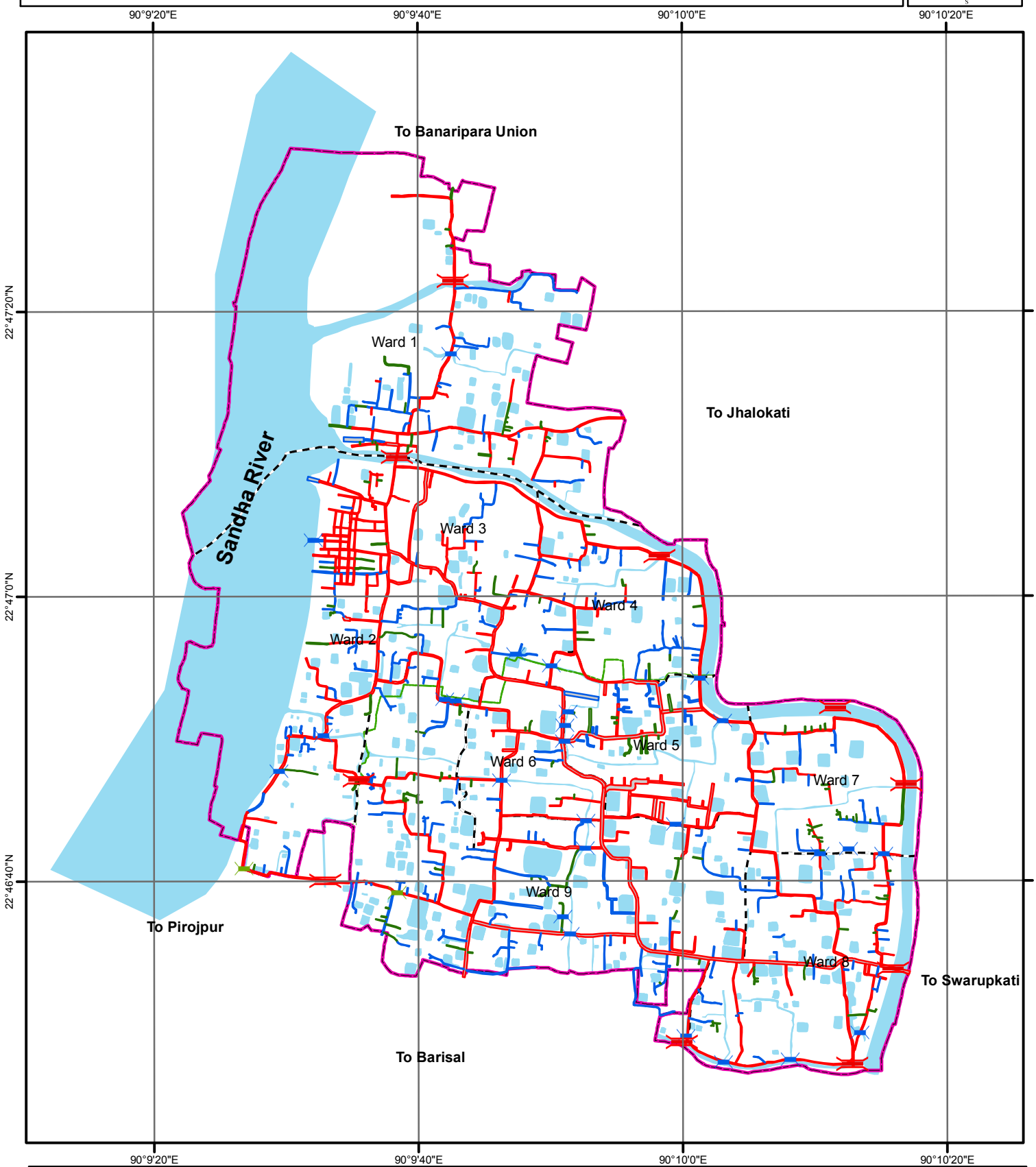
12.4.3 Future Traffic Volume and Level of Service

In the year 2011, the population of Banaripara Paurashava is about 10366 and after 20 years it will be 13596 (2031). At present highest PCU/hr are about 378.6 at non-hat day and at hat day is about 2132.8. It means traffic congestion is not alarming.

It is expected that gradual implementation of the components prescribed in the Master Plan will increase traffic volume. But at the same time the roads will be widened and new roads will be constructed. So, the increase traffic will be accommodated by these roads.

After the improvement of roads, commercial and industrial activities will also be boost up. This may increase traffic volume of the area. The proposed transport network and traffic management system will make it possible to remain the traffic scenario stable for next 20 years.

Map 12.1 :Existing Transportation Network of Banaripara Paurashava



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Bridge
- Culvert
- Pipe Culvert
- Katcha
- Pucca
- Semi-pucca

0 50 100 200 300 400 Meters

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development and Cooperatives Local Government Division

CONSULTANT
SCPL Sheltech Consultants (Pvt.) Ltd.
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In Association with

12.5 Transportation Development Plan

The current chapter of the report is about Transport Development Plan covering its development plan proposals and management of the proposed project area up to the year 2031. The report describes existing transportation facilities and proposal on the important facilities such as, bus terminal, rickshaw stand, fuel station and passenger sheds.

12.5.1 Road Network Plan

The standards are meant for use by UTIDP, LGED and other planning and development agencies. The standards have been adopted by the consultants to draw up the transportation development plan. Following are the suggested planning standards (Table 12.2) for road network development. These road hierarchies are proposed based on the functional linkage of the road of Banaripara Paurashava:

Table 12.2: Standards of Roads proposed by PMO

Landuse Category	Hierarchy of Roads	Right of Way (ROW)
Circulation Network	Primary Roads	150-100 feet
	Secondary Roads	100-60 feet
	Tertiary Road	20-40 feet

Source: UTIDP, PMO, LGED.

Banaripara is a small town with a very low volume of internal and external traffic movement. Considering traffic volume and discussion with Paurashava authority and local stakeholders consultants have established a road hierarchy based on the functional area within the Paurashava as well as the internal and external linkage. Existing Access roads will be connected with Tertiary and Secondary roads for better mobility. Following table shows the standard of future development of road network.

Table 12.3: Standard for future development of the Road Network of Banaripara Paurashava

Landuse Category	Hierarchy of Roads	Right of Way (ROW)
Circulation Network	Paurashava Primary Roads	60-80 feet
	Paurashava Secondary Roads	30-50 feet
	Paurashava Local Roads	20-25 feet

Source: Proposed by Consultants

12.5.2 Design Principals and Standards

In preparing detail design some basic principals have been followed:

- Road Hierarchy Standards provided by PMO
- Relevant regulations of Building construction Act, 1952 (amendment in 1996), followed by Paurashava
- follow up the National Urban Land Transport Policy, 2004
- follow up the Transport planning relevant Books, articles and papers (Ref: Traffic Engineering and Transport Planning, Dr. L.R. Kadiyali)

Fig 12.1: Channelization Measures at Major Intersections

A) Intersection improvement

This measures can be categorized into 2 types, are as follows:

a. Channelization
b. Improvement of Intersection geometry

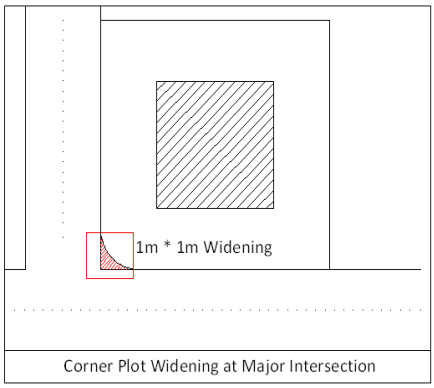


Fig 12.2: Corner Plot Widening at Intersections

a. Channelization

Channelization of intersection at grade is the separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians. Channelization is done for:

- Separation of conflicts (by using roundabout, raised island, etc.)
- Reduction of conflict points
- Reduction of excessive pavement areas

b. Improvement of intersection geometry includes:

- Corner Plot widening
- Establishment of Traffic islands

According to Building Construction Act, 1996, in each Corner plot of major intersection, 1m×1m land area has to be open for traffic movement.

B) Land use Proposals at the Major Intersections

According to Building Construction Act, 1996, the construction permission of Shopping Complex, Cinema Hall or similar type of buildings are restricted within 50 m (164 ft) from major road intersections to avoid traffic congestion.

C) Prioritization in ROW Space Allocation according to Road Hierarchy

In pertaining with the National Land Transport Policy, 2004, for promoting an efficient road transport system, provision of Motorized and Non-motorized vehicles is prioritized. Therefore, effective road space allocation and utilization is also emphasized in national policy. At first, a uniform priority has been fixed for designing the whole Road Network Development.

Basis of Prioritization

Prioritization has been formed in light of National Land Transport Policy, 2004.

- To promote the speed and mobilize the activities, motorized vehicles (especially Bus lane) are encouraged
- To make a environmental and economical balance (employment pattern and Income level), provision of non-motorized vehicles are kept
- To ensure safe movement of citizens, footway should be provided

Though, uniform space allocation is formed but Right Of Way (ROW), land use and the demand of different type of vehicles are not same throughout the whole Paurashava area. So, the design priority has been differed at road hierarchy as follows:

Space Allocation at ROW considering Road Hierarchy

Priority	Primary Road	Secondary Road	Tertiary Road	Access Road
1	Provide one lane (3.0m) for motorized vehicles including Bus, Car and Jeep etc. The width of each lane is minimum 3 m depending on the availability of space.	Provide one lane (3.0 m) for motorized vehicles including Bus, Car and Jeep etc. The width of each lane is minimum 2.5 m depending on the availability of space.	Provide one lane (3 m) for motorized and non-motorized vehicles including Car, Jeep, Motorcycle and Rickshaws etc. The width of each lane is minimum 2.5 m depending on the availability of space.	Provide one lane (3 m) for motorized and non- motorized vehicles including Car, Jeep, Motorcycle and Rickshaws etc. The width of each lane is minimum 2.5 m depending on the availability of space.
2	Non-motorized vehicle paths (Service lane), 2.5m wide in each direction with over-taking lane including physical segregation of .5ft wide and 1ft height concrete block.	Non-motorized vehicle paths (Service lane), 2.5m wide in each direction with over-taking lane including physical segregation of .5ft wide and 1ft height concrete block.	Pedestrian paths as per existing demand (minimum 1.5 m)	Pedestrian paths as per existing demand (minimum 1.5 m)
3	Pedestrian paths as per existing demand (minimum 1.5 m)	Pedestrian paths as per existing demand (minimum 1.5 m)	Provide one lane for motorized and non-motorized vehicles including Car, Jeep, Motorcycle and Rickshaws etc. depending on the availability of space.	
4	2 to 3 or more lanes for motorized vehicles. The width of each lane is minimum 2.5m depending on the availability of space.	2 to 3 lanes for motorized vehicles. The width of each lane is minimum 2.5m depending on the availability of space.		

Figure 12.3 shows the cross section of different types of roads.

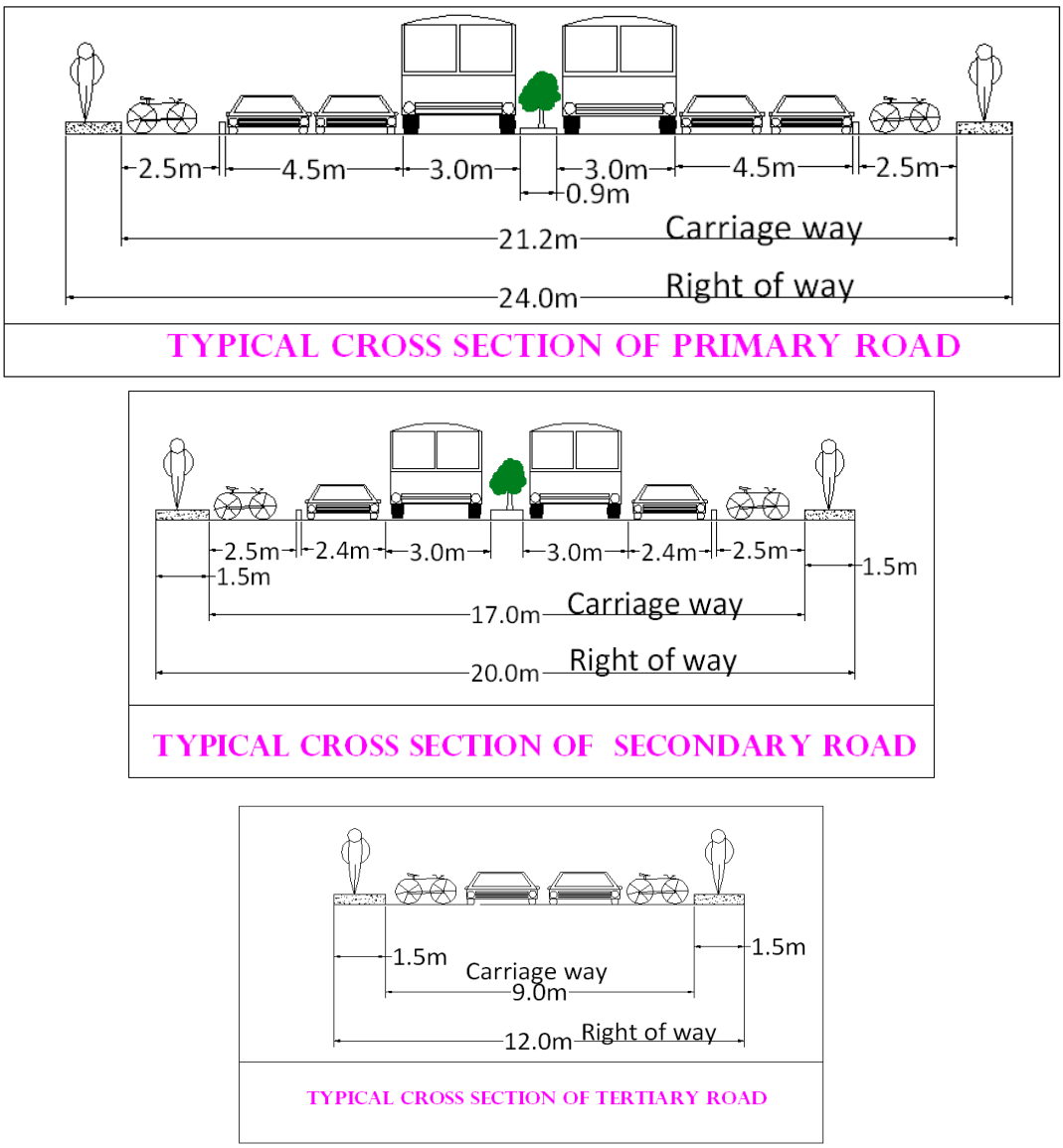


Fig 12.3: Typical Cross-Section of Various Types of Roads

12.5.3 Proposal for Improvement of the Existing Road Networks

The improvement plan for existing road network has been prepared considering two categories, which are as follows:

A. Roads connect Paurashava with Regional Road Network
B. Roads provide internal network of the Paurashava

All of the road should be developed in 20 years implementation time. It will be done in three phases; 1st phase (1st 5 years), 2nd phase (2nd 5 year) and 3rd phase (last 10 year). In the master plan, about 33.99 kilometers roads have been proposed for widening. Phase wise road widening proposal has been shown in Table 12.4.

Table 12.4 Phase Wise Road Widening Proposal for Existing Road

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
PR-1	Primary Road	80	308.90	1st
PR-2	Primary Road	80	232.37	1st
PR-3	Primary Road	80	11.59	1st

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
PR-4	Primary Road	80	3.97	1st
SR-2	Secondary Road	40	299.60	1st
SR-3	Secondary Road	40	24.79	1st
SR-6	Secondary Road	40	223.43	1st
SR-6	Secondary Road	40	0.12	1st
SR-8	Secondary Road	40	302.13	1st
SR-11	Secondary Road	40	106.98	1st
SR-11	Secondary Road	40	104.88	1st
SR-12	Secondary Road	40	456.29	1st
SR-12	Secondary Road	40	27.52	1st
SR-13	Secondary Road	40	66.33	1st
SR-14	Secondary Road	40	115.51	1st
SR-14	Secondary Road	40	135.54	1st
SR-16	Secondary Road	40	187.98	1st
SR-16	Secondary Road	40	168.09	1st
SR-16	Secondary Road	40	232.07	1st
SR-21	Secondary Road	40	115.35	1st
SR-21	Secondary Road	40	5.91	1st
SR-21	Secondary Road	40	0.01	1st
SR-21	Secondary Road	40	148.07	1st
SR-21	Secondary Road	40	548.96	1st
SR-21	Secondary Road	40	479.55	1st
SR-24	Secondary Road	40	172.59	1st
SR-24	Secondary Road	40	256.58	1st
SR-24	Secondary Road	40	232.36	1st
SR-24	Secondary Road	40	518.92	1st
SR-24	Secondary Road	40	31.62	1st
SR-25	Secondary Road	40	47.20	1st
SR-25	Secondary Road	40	276.85	1st
SR-25	Secondary Road	40	0.76	1st
SR-29	Secondary Road	40	59.67	1st
SR-31	Secondary Road	40	177.12	1st
SR-31	Secondary Road	40	273.74	1st
SR-35	Secondary Road	40	138.13	1st
SR-36	Secondary Road	40	183.45	1st
SR-36	Secondary Road	40	428.50	1st
SR-37	Secondary Road	40	249.78	1st
SR-38	Secondary Road	40	186.74	1st
SR-39	Secondary Road	40	231.43	1st
SR-49	Secondary Road	40	18.55	1st
SR-50	Secondary Road	40	32.74	1st
SR-50	Secondary Road	40	375.87	1st
SR-50	Secondary Road	40	25.16	1st
SR-51	Secondary Road	40	74.82	1st
SR-51	Secondary Road	40	2.83	1st
SR-54	Secondary Road	40	252.60	1st
SR-1	Secondary Road	30	290.95	1st
SR-4	Secondary Road	30	25.68	1st
SR-5	Secondary Road	30	155.61	1st
SR-7	Secondary Road	30	99.38	1st
SR-9	Secondary Road	30	74.52	1st
SR-10	Secondary Road	30	48.22	1st
SR-15	Secondary Road	30	110.95	1st
SR-15	Secondary Road	30	0.01	1st
SR-17	Secondary Road	30	105.32	1st
SR-18	Secondary Road	30	20.70	1st
SR-19	Secondary Road	30	553.86	1st
SR-19	Secondary Road	30	90.92	1st
SR-20	Secondary Road	30	125.57	1st
SR-20	Secondary Road	30	73.09	1st
SR-22	Secondary Road	30	138.17	1st
SR-22	Secondary Road	30	5.63	1st

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
SR-23	Secondary Road	30	391.84	1st
SR-23	Secondary Road	30	16.92	1st
SR-23	Secondary Road	30	2.64	1st
SR-26	Secondary Road	30	87.85	1st
SR-27	Secondary Road	30	58.79	1st
SR-28	Secondary Road	30	90.82	1st
SR-30	Secondary Road	30	0.12	1st
SR-30	Secondary Road	30	214.34	1st
SR-30	Secondary Road	30	140.70	1st
SR-30	Secondary Road	30	0.81	1st
SR-32	Secondary Road	30	91.79	1st
SR-33	Secondary Road	30	359.69	1st
SR-34	Secondary Road	30	252.03	1st
SR-34	Secondary Road	30	0.04	1st
SR-40	Secondary Road	30	128.54	1st
SR-41	Secondary Road	30	95.55	1st
SR-43	Secondary Road	30	21.20	1st
SR-52	Secondary Road	30	229.31	1st
SR-52	Secondary Road	30	33.06	1st
SR-55	Secondary Road	30	20.76	1st
TR-1	Tertiary Road	20	10.24	2nd
TR-2	Tertiary Road	20	12.43	2nd
TR-3	Tertiary Road	20	31.87	2nd
TR-4	Tertiary Road	20	53.75	2nd
TR-5	Tertiary Road	20	27.86	2nd
TR-6	Tertiary Road	20	9.15	2nd
TR-7	Tertiary Road	20	30.71	2nd
TR-8	Tertiary Road	20	24.42	2nd
TR-9	Tertiary Road	20	31.94	2nd
TR-10	Tertiary Road	20	22.26	2nd
TR-11	Tertiary Road	20	59.23	2nd
TR-12	Tertiary Road	20	61.74	2nd
TR-13	Tertiary Road	20	50.10	2nd
TR-14	Tertiary Road	20	71.71	2nd
TR-15	Tertiary Road	20	25.85	2nd
TR-16	Tertiary Road	20	97.90	2nd
TR-17	Tertiary Road	20	31.24	2nd
TR-18	Tertiary Road	20	96.22	2nd
TR-19	Tertiary Road	20	43.06	2nd
TR-20	Tertiary Road	20	24.76	2nd
TR-21	Tertiary Road	20	21.10	2nd
TR-22	Tertiary Road	20	61.74	2nd
TR-23	Tertiary Road	20	14.27	2nd
TR-24	Tertiary Road	20	24.53	2nd
TR-25	Tertiary Road	20	82.14	2nd
TR-26	Tertiary Road	20	43.81	2nd
TR-27	Tertiary Road	20	19.50	2nd
TR-28	Tertiary Road	20	29.57	2nd
TR-29	Tertiary Road	20	54.50	2nd
TR-30	Tertiary Road	20	19.39	2nd
TR-31	Tertiary Road	20	24.62	2nd
TR-32	Tertiary Road	20	40.58	2nd
TR-33	Tertiary Road	20	16.05	2nd
TR-34	Tertiary Road	20	28.32	2nd
TR-35	Tertiary Road	20	34.61	2nd
TR-36	Tertiary Road	20	44.67	2nd
TR-37	Tertiary Road	20	12.20	2nd
TR-38	Tertiary Road	20	25.91	2nd
TR-39	Tertiary Road	20	13.94	2nd
TR-40	Tertiary Road	20	13.28	2nd
TR-41	Tertiary Road	20	7.61	2nd
TR-42	Tertiary Road	20	6.80	2nd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-43	Tertiary Road	20	22.74	2nd
TR-44	Tertiary Road	20	11.98	2nd
TR-45	Tertiary Road	20	38.87	2nd
TR-46	Tertiary Road	20	17.14	2nd
TR-47	Tertiary Road	20	26.69	2nd
TR-48	Tertiary Road	20	53.61	2nd
TR-49	Tertiary Road	20	24.90	2nd
TR-50	Tertiary Road	20	68.81	2nd
TR-51	Tertiary Road	20	57.24	2nd
TR-52	Tertiary Road	20	10.77	2nd
TR-53	Tertiary Road	20	12.71	2nd
TR-54	Tertiary Road	20	56.93	2nd
TR-55	Tertiary Road	20	25.17	2nd
TR-56	Tertiary Road	20	64.49	2nd
TR-57	Tertiary Road	20	67.50	2nd
TR-58	Tertiary Road	20	20.01	2nd
TR-59	Tertiary Road	20	43.21	2nd
TR-60	Tertiary Road	20	70.99	2nd
TR-61	Tertiary Road	20	63.03	2nd
TR-62	Tertiary Road	20	34.64	2nd
TR-63	Tertiary Road	20	24.12	2nd
TR-64	Tertiary Road	20	20.79	2nd
TR-65	Tertiary Road	20	11.74	2nd
TR-66	Tertiary Road	20	46.77	2nd
TR-67	Tertiary Road	20	11.61	2nd
TR-68	Tertiary Road	20	12.37	2nd
TR-69	Tertiary Road	20	14.83	2nd
TR-70	Tertiary Road	20	36.06	2nd
TR-71	Tertiary Road	20	18.30	2nd
TR-72	Tertiary Road	20	19.62	2nd
TR-73	Tertiary Road	20	58.71	2nd
TR-74	Tertiary Road	20	18.58	2nd
TR-75	Tertiary Road	20	33.58	2nd
TR-76	Tertiary Road	20	28.71	2nd
TR-77	Tertiary Road	20	30.95	2nd
TR-78	Tertiary Road	20	29.49	2nd
TR-79	Tertiary Road	20	52.16	2nd
TR-80	Tertiary Road	20	42.48	2nd
TR-80	Tertiary Road	20	0.12	2nd
TR-81	Tertiary Road	20	27.51	2nd
TR-82	Tertiary Road	20	6.86	2nd
TR-83	Tertiary Road	20	77.44	2nd
TR-84	Tertiary Road	20	39.42	2nd
TR-85	Tertiary Road	20	19.00	2nd
TR-86	Tertiary Road	20	11.73	2nd
TR-87	Tertiary Road	20	24.41	2nd
TR-88	Tertiary Road	20	72.78	2nd
TR-89	Tertiary Road	20	11.70	2nd
TR-90	Tertiary Road	20	17.61	2nd
TR-91	Tertiary Road	20	14.65	2nd
TR-92	Tertiary Road	20	5.03	2nd
TR-93	Tertiary Road	20	4.63	2nd
TR-94	Tertiary Road	20	14.87	2nd
TR-95	Tertiary Road	20	114.61	2nd
TR-96	Tertiary Road	20	11.12	2nd
TR-97	Tertiary Road	20	5.94	2nd
TR-98	Tertiary Road	20	124.08	2nd
TR-99	Tertiary Road	20	16.74	2nd
TR-100	Tertiary Road	20	112.54	2nd
TR-101	Tertiary Road	20	72.05	2nd
TR-102	Tertiary Road	20	35.05	2nd
TR-103	Tertiary Road	20	76.72	2nd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-104	Tertiary Road	20	72.63	2nd
TR-105	Tertiary Road	20	163.83	2nd
TR-106	Tertiary Road	20	40.22	2nd
TR-107	Tertiary Road	20	18.08	2nd
TR-108	Tertiary Road	20	32.04	2nd
TR-109	Tertiary Road	20	41.99	2nd
TR-110	Tertiary Road	20	14.11	2nd
TR-111	Tertiary Road	20	29.41	2nd
TR-112	Tertiary Road	20	51.03	2nd
TR-113	Tertiary Road	20	51.16	2nd
TR-114	Tertiary Road	20	35.13	2nd
TR-115	Tertiary Road	20	33.07	2nd
TR-116	Tertiary Road	20	57.85	2nd
TR-117	Tertiary Road	20	35.64	2nd
TR-118	Tertiary Road	20	32.94	2nd
TR-119	Tertiary Road	20	40.70	2nd
TR-120	Tertiary Road	20	14.64	2nd
TR-121	Tertiary Road	20	68.91	2nd
TR-122	Tertiary Road	20	83.58	2nd
TR-123	Tertiary Road	20	13.55	2nd
TR-124	Tertiary Road	20	53.22	2nd
TR-125	Tertiary Road	20	23.88	2nd
TR-126	Tertiary Road	20	19.33	2nd
TR-127	Tertiary Road	20	40.69	2nd
TR-128	Tertiary Road	20	153.94	2nd
TR-129	Tertiary Road	20	159.25	2nd
TR-129	Tertiary Road	20	56.51	2nd
TR-130	Tertiary Road	20	22.20	2nd
TR-131	Tertiary Road	20	8.33	2nd
TR-132	Tertiary Road	20	19.00	2nd
TR-133	Tertiary Road	20	22.92	2nd
TR-134	Tertiary Road	20	28.81	2nd
TR-135	Tertiary Road	20	23.88	2nd
TR-136	Tertiary Road	20	27.04	2nd
TR-137	Tertiary Road	20	34.95	2nd
TR-138	Tertiary Road	20	48.73	2nd
TR-139	Tertiary Road	20	16.15	2nd
TR-140	Tertiary Road	20	65.85	2nd
TR-141	Tertiary Road	20	109.77	2nd
TR-142	Tertiary Road	20	15.73	2nd
TR-143	Tertiary Road	20	25.15	2nd
TR-144	Tertiary Road	20	15.95	2nd
TR-145	Tertiary Road	20	27.87	2nd
TR-146	Tertiary Road	20	24.92	2nd
TR-147	Tertiary Road	20	37.86	2nd
TR-148	Tertiary Road	20	23.12	2nd
TR-149	Tertiary Road	20	22.74	2nd
TR-150	Tertiary Road	20	106.94	2nd
TR-151	Tertiary Road	20	48.33	2nd
TR-152	Tertiary Road	20	51.24	2nd
TR-153	Tertiary Road	20	50.24	2nd
TR-154	Tertiary Road	20	26.82	2nd
TR-154	Tertiary Road	20	0.01	2nd
TR-155	Tertiary Road	20	86.78	2nd
TR-156	Tertiary Road	20	7.90	2nd
TR-157	Tertiary Road	20	79.83	2nd
TR-158	Tertiary Road	20	6.80	2nd
TR-159	Tertiary Road	20	139.42	2nd
TR-160	Tertiary Road	20	109.04	2nd
TR-161	Tertiary Road	20	31.04	2nd
TR-162	Tertiary Road	20	90.33	2nd
TR-163	Tertiary Road	20	33.16	2nd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-163	Tertiary Road	20	19.56	2nd
TR-164	Tertiary Road	20	69.01	2nd
TR-165	Tertiary Road	20	60.16	2nd
TR-166	Tertiary Road	20	18.08	2nd
TR-167	Tertiary Road	20	21.11	2nd
TR-168	Tertiary Road	20	18.53	2nd
TR-169	Tertiary Road	20	17.81	2nd
TR-170	Tertiary Road	20	0.09	2nd
TR-170	Tertiary Road	20	10.46	2nd
TR-171	Tertiary Road	20	68.11	2nd
TR-172	Tertiary Road	20	58.19	2nd
TR-173	Tertiary Road	20	51.25	2nd
TR-174	Tertiary Road	20	30.31	2nd
TR-175	Tertiary Road	20	13.53	2nd
TR-176	Tertiary Road	20	11.00	2nd
TR-176	Tertiary Road	20	0.02	2nd
TR-177	Tertiary Road	20	45.73	2nd
TR-178	Tertiary Road	20	71.43	2nd
TR-179	Tertiary Road	20	3.85	2nd
TR-180	Tertiary Road	20	5.45	2nd
TR-181	Tertiary Road	20	9.78	2nd
TR-182	Tertiary Road	20	23.13	2nd
TR-183	Tertiary Road	20	65.28	2nd
TR-184	Tertiary Road	20	105.43	2nd
TR-185	Tertiary Road	20	84.15	2nd
TR-185	Tertiary Road	20	5.41	2nd
TR-186	Tertiary Road	20	13.25	2nd
TR-187	Tertiary Road	20	9.26	2nd
TR-188	Tertiary Road	20	9.50	2nd
TR-189	Tertiary Road	20	59.94	2nd
TR-190	Tertiary Road	20	28.63	2nd
TR-191	Tertiary Road	20	16.23	2nd
TR-192	Tertiary Road	20	88.50	2nd
TR-193	Tertiary Road	20	32.72	2nd
TR-194	Tertiary Road	20	53.68	2nd
TR-195	Tertiary Road	20	36.37	2nd
TR-195	Tertiary Road	20	0.02	2nd
TR-196	Tertiary Road	20	40.40	2nd
TR-196	Tertiary Road	20	0.03	2nd
TR-197	Tertiary Road	20	40.12	2nd
TR-198	Tertiary Road	20	20.20	2nd
TR-199	Tertiary Road	20	15.34	2nd
TR-200	Tertiary Road	20	15.32	2nd
TR-201	Tertiary Road	20	84.18	2nd
TR-202	Tertiary Road	20	29.08	2nd
TR-203	Tertiary Road	20	102.32	2nd
TR-203	Tertiary Road	20	0.28	2nd
TR-204	Tertiary Road	20	40.15	2nd
TR-205	Tertiary Road	20	0.23	2nd
TR-205	Tertiary Road	20	71.23	2nd
TR-206	Tertiary Road	20	28.47	2nd
TR-207	Tertiary Road	20	136.87	2nd
TR-208	Tertiary Road	20	66.17	2nd
TR-209	Tertiary Road	20	22.87	2nd
TR-210	Tertiary Road	20	33.98	2nd
TR-211	Tertiary Road	20	17.38	2nd
TR-212	Tertiary Road	20	37.92	2nd
TR-213	Tertiary Road	20	22.27	2nd
TR-214	Tertiary Road	20	17.86	2nd
TR-215	Tertiary Road	20	24.73	2nd
TR-215	Tertiary Road	20	1.04	2nd
TR-216	Tertiary Road	20	130.22	2nd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-217	Tertiary Road	20	10.45	2nd
TR-218	Tertiary Road	20	29.89	2nd
TR-219	Tertiary Road	20	20.00	2nd
TR-220	Tertiary Road	20	19.20	2nd
TR-221	Tertiary Road	20	44.47	2nd
TR-222	Tertiary Road	20	66.87	2nd
TR-223	Tertiary Road	20	19.31	2nd
TR-224	Tertiary Road	20	22.41	2nd
TR-225	Tertiary Road	20	15.60	2nd
TR-226	Tertiary Road	20	15.70	2nd
TR-227	Tertiary Road	20	19.31	2nd
TR-228	Tertiary Road	20	19.43	2nd
TR-229	Tertiary Road	20	13.65	2nd
TR-230	Tertiary Road	20	12.15	2nd
TR-231	Tertiary Road	20	2.59	2nd
TR-231	Tertiary Road	20	23.53	2nd
TR-232	Tertiary Road	20	2.69	2nd
TR-232	Tertiary Road	20	37.77	2nd
TR-233	Tertiary Road	20	16.27	2nd
TR-234	Tertiary Road	20	33.33	2nd
TR-235	Tertiary Road	20	50.90	2nd
TR-236	Tertiary Road	20	72.71	2nd
TR-237	Tertiary Road	20	19.34	2nd
TR-238	Tertiary Road	20	11.20	2nd
TR-239	Tertiary Road	20	47.25	2nd
TR-240	Tertiary Road	20	36.25	2nd
TR-241	Tertiary Road	20	44.27	2nd
TR-242	Tertiary Road	20	50.70	2nd
TR-243	Tertiary Road	20	13.02	2nd
TR-244	Tertiary Road	20	6.87	2nd
TR-245	Tertiary Road	20	9.80	2nd
TR-246	Tertiary Road	20	21.39	2nd
TR-247	Tertiary Road	20	59.66	2nd
TR-248	Tertiary Road	20	74.31	2nd
TR-248	Tertiary Road	20	2.18	2nd
TR-249	Tertiary Road	20	53.59	2nd
TR-250	Tertiary Road	20	63.03	2nd
TR-251	Tertiary Road	20	20.56	2nd
TR-252	Tertiary Road	20	39.39	2nd
TR-253	Tertiary Road	20	24.26	2nd
TR-254	Tertiary Road	20	43.49	2nd
TR-255	Tertiary Road	20	39.82	2nd
TR-256	Tertiary Road	20	11.16	2nd
TR-257	Tertiary Road	20	25.15	2nd
TR-258	Tertiary Road	20	36.90	2nd
TR-259	Tertiary Road	20	31.26	2nd
TR-260	Tertiary Road	20	162.99	2nd
TR-261	Tertiary Road	20	14.97	2nd
TR-262	Tertiary Road	20	105.83	2nd
TR-262	Tertiary Road	20	4.72	2nd
TR-263	Tertiary Road	20	95.66	2nd
TR-264	Tertiary Road	20	20.23	2nd
TR-265	Tertiary Road	20	21.71	2nd
TR-266	Tertiary Road	20	1.27	2nd
TR-266	Tertiary Road	20	220.43	2nd
TR-267	Tertiary Road	20	22.46	2nd
TR-268	Tertiary Road	20	9.19	2nd
TR-269	Tertiary Road	20	30.11	2nd
TR-270	Tertiary Road	20	65.14	2nd
TR-271	Tertiary Road	20	15.22	2nd
TR-272	Tertiary Road	20	254.67	2nd
TR-273	Tertiary Road	20	9.06	2nd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-274	Tertiary Road	20	12.06	2nd
TR-275	Tertiary Road	20	75.72	2nd
TR-276	Tertiary Road	20	90.53	2nd
TR-277	Tertiary Road	20	107.09	2nd
TR-278	Tertiary Road	20	75.23	2nd
TR-279	Tertiary Road	20	69.86	2nd
TR-279	Tertiary Road	20	172.29	2nd
TR-280	Tertiary Road	20	2.28	2nd
TR-280	Tertiary Road	20	71.53	2nd
TR-281	Tertiary Road	20	16.01	2nd
TR-282	Tertiary Road	20	66.44	2nd
TR-283	Tertiary Road	20	21.57	2nd
TR-284	Tertiary Road	20	62.97	2nd
TR-284	Tertiary Road	20	1.09	2nd
TR-285	Tertiary Road	20	90.69	2nd
TR-286	Tertiary Road	20	129.33	2nd
TR-287	Tertiary Road	20	47.09	2nd
TR-288	Tertiary Road	20	210.97	2nd
TR-289	Tertiary Road	20	62.16	2nd
TR-290	Tertiary Road	20	83.19	2nd
TR-291	Tertiary Road	20	1.84	2nd
TR-291	Tertiary Road	20	27.14	2nd
TR-292	Tertiary Road	20	17.70	2nd
TR-293	Tertiary Road	20	50.44	2nd
TR-294	Tertiary Road	20	15.59	2nd
TR-295	Tertiary Road	20	7.50	2nd
TR-296	Tertiary Road	20	6.02	2nd
TR-297	Tertiary Road	20	29.43	2nd
TR-298	Tertiary Road	20	26.07	2nd
TR-299	Tertiary Road	20	10.05	2nd
TR-300	Tertiary Road	20	12.34	2nd
TR-301	Tertiary Road	20	0.12	2nd
TR-301	Tertiary Road	20	32.12	2nd
TR-302	Tertiary Road	20	0.13	2nd
TR-302	Tertiary Road	20	27.53	2nd
TR-303	Tertiary Road	20	50.30	2nd
TR-304	Tertiary Road	20	19.79	2nd
TR-305	Tertiary Road	20	11.10	2nd
TR-306	Tertiary Road	20	10.21	2nd
TR-307	Tertiary Road	20	20.16	2nd
TR-308	Tertiary Road	20	55.93	2nd
TR-309	Tertiary Road	20	37.41	2nd
TR-310	Tertiary Road	20	15.01	2nd
TR-311	Tertiary Road	20	32.56	2nd
TR-312	Tertiary Road	20	14.49	2nd
TR-313	Tertiary Road	20	11.34	2nd
TR-314	Tertiary Road	20	5.63	2nd
TR-315	Tertiary Road	20	6.55	2nd
TR-316	Tertiary Road	20	47.41	2nd
TR-317	Tertiary Road	20	29.82	2nd
TR-318	Tertiary Road	20	19.19	2nd
TR-319	Tertiary Road	20	50.99	2nd
TR-319	Tertiary Road	20	272.93	2nd
TR-320	Tertiary Road	20	147.58	2nd
TR-321	Tertiary Road	20	71.23	2nd
TR-322	Tertiary Road	20	34.02	2nd
TR-323	Tertiary Road	20	8.74	2nd
TR-324	Tertiary Road	20	22.80	2nd
TR-325	Tertiary Road	20	22.66	2nd
TR-325	Tertiary Road	20	45.24	2nd
TR-326	Tertiary Road	20	72.61	2nd
TR-327	Tertiary Road	20	43.64	2nd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-452	Tertiary Road	20	0.79	3rd
TR-467	Tertiary Road	20	7.92	3rd
TR-468	Tertiary Road	20	0.15	3rd
TR-468	Tertiary Road	20	13.55	3rd
TR-496	Tertiary Road	20	10.82	3rd
TR-497	Tertiary Road	20	187.75	3rd
TR-502	Tertiary Road	20	60.19	3rd
TR-503	Tertiary Road	20	190.85	3rd
TR-504	Tertiary Road	20	23.05	3rd
TR-505	Tertiary Road	20	12.06	3rd
TR-525	Tertiary Road	20	1.76	3rd
TR-525	Tertiary Road	20	199.95	3rd
TR-526	Tertiary Road	20	11.33	3rd
TR-527	Tertiary Road	20	22.17	3rd
TR-528	Tertiary Road	20	26.49	3rd
TR-529	Tertiary Road	20	23.49	3rd
TR-530	Tertiary Road	20	28.00	3rd
TR-531	Tertiary Road	20	22.73	3rd
TR-532	Tertiary Road	20	56.68	3rd
TR-536	Tertiary Road	20	39.93	3rd
TR-537	Tertiary Road	20	153.58	3rd
TR-560	Tertiary Road	20	127.91	3rd
TR-564	Tertiary Road	20	33.26	3rd
TR-565	Tertiary Road	20	22.92	3rd
TR-568	Tertiary Road	20	15.12	3rd
TR-572	Tertiary Road	20	20.07	3rd
TR-328	Tertiary Road	20	37.87	3rd
TR-329	Tertiary Road	20	12.41	3rd
TR-330	Tertiary Road	20	43.36	3rd
TR-331	Tertiary Road	20	84.19	3rd
TR-332	Tertiary Road	20	81.02	3rd
TR-333	Tertiary Road	20	26.00	3rd
TR-334	Tertiary Road	20	18.27	3rd
TR-335	Tertiary Road	20	122.28	3rd
TR-336	Tertiary Road	20	24.72	3rd
TR-337	Tertiary Road	20	76.53	3rd
TR-338	Tertiary Road	20	166.92	3rd
TR-339	Tertiary Road	20	27.12	3rd
TR-340	Tertiary Road	20	43.98	3rd
TR-340	Tertiary Road	20	1.17	3rd
TR-341	Tertiary Road	20	108.36	3rd
TR-342	Tertiary Road	20	29.18	3rd
TR-343	Tertiary Road	20	210.68	3rd
TR-344	Tertiary Road	20	123.90	3rd
TR-345	Tertiary Road	20	11.82	3rd
TR-346	Tertiary Road	20	23.78	3rd
TR-347	Tertiary Road	20	27.79	3rd
TR-348	Tertiary Road	20	10.15	3rd
TR-348	Tertiary Road	20	0.99	3rd
TR-348	Tertiary Road	20	0.99	3rd
TR-348	Tertiary Road	20	175.24	3rd
TR-349	Tertiary Road	20	51.17	3rd
TR-349	Tertiary Road	20	2.21	3rd
TR-350	Tertiary Road	20	30.28	3rd
TR-351	Tertiary Road	20	226.55	3rd
TR-351	Tertiary Road	20	2.19	3rd
TR-352	Tertiary Road	20	121.94	3rd
TR-353	Tertiary Road	20	5.59	3rd
TR-354	Tertiary Road	20	35.70	3rd
TR-355	Tertiary Road	20	38.50	3rd
TR-356	Tertiary Road	20	8.29	3rd
TR-357	Tertiary Road	20	8.08	3rd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-358	Tertiary Road	20	54.39	3rd
TR-358	Tertiary Road	20	3.89	3rd
TR-359	Tertiary Road	20	19.65	3rd
TR-360	Tertiary Road	20	56.48	3rd
TR-361	Tertiary Road	20	40.79	3rd
TR-362	Tertiary Road	20	16.51	3rd
TR-363	Tertiary Road	20	55.75	3rd
TR-364	Tertiary Road	20	30.24	3rd
TR-365	Tertiary Road	20	53.00	3rd
TR-366	Tertiary Road	20	58.10	3rd
TR-368	Tertiary Road	20	37.42	3rd
TR-369	Tertiary Road	20	27.87	3rd
TR-370	Tertiary Road	20	19.63	3rd
TR-371	Tertiary Road	20	68.61	3rd
TR-372	Tertiary Road	20	63.10	3rd
TR-373	Tertiary Road	20	16.49	3rd
TR-374	Tertiary Road	20	9.26	3rd
TR-375	Tertiary Road	20	115.68	3rd
TR-376	Tertiary Road	20	71.36	3rd
TR-377	Tertiary Road	20	35.10	3rd
TR-378	Tertiary Road	20	25.23	3rd
TR-379	Tertiary Road	20	7.69	3rd
TR-380	Tertiary Road	20	8.59	3rd
TR-381	Tertiary Road	20	11.62	3rd
TR-382	Tertiary Road	20	9.60	3rd
TR-383	Tertiary Road	20	31.00	3rd
TR-384	Tertiary Road	20	9.63	3rd
TR-385	Tertiary Road	20	26.62	3rd
TR-386	Tertiary Road	20	143.33	3rd
TR-387	Tertiary Road	20	36.18	3rd
TR-387	Tertiary Road	20	80.34	3rd
TR-388	Tertiary Road	20	75.99	3rd
TR-389	Tertiary Road	20	53.74	3rd
TR-390	Tertiary Road	20	74.69	3rd
TR-390	Tertiary Road	20	56.68	3rd
TR-391	Tertiary Road	20	75.40	3rd
TR-392	Tertiary Road	20	28.58	3rd
TR-393	Tertiary Road	20	176.83	3rd
TR-394	Tertiary Road	20	29.70	3rd
TR-395	Tertiary Road	20	23.77	3rd
TR-396	Tertiary Road	20	89.42	3rd
TR-397	Tertiary Road	20	22.28	3rd
TR-398	Tertiary Road	20	10.42	3rd
TR-399	Tertiary Road	20	18.91	3rd
TR-400	Tertiary Road	20	7.36	3rd
TR-401	Tertiary Road	20	11.42	3rd
TR-402	Tertiary Road	20	6.71	3rd
TR-403	Tertiary Road	20	8.44	3rd
TR-404	Tertiary Road	20	29.77	3rd
TR-405	Tertiary Road	20	22.94	3rd
TR-406	Tertiary Road	20	72.67	3rd
TR-407	Tertiary Road	20	24.48	3rd
TR-408	Tertiary Road	20	24.97	3rd
TR-409	Tertiary Road	20	171.95	3rd
TR-410	Tertiary Road	20	41.50	3rd
TR-411	Tertiary Road	20	43.51	3rd
TR-412	Tertiary Road	20	19.89	3rd
TR-413	Tertiary Road	20	12.50	3rd
TR-414	Tertiary Road	20	83.65	3rd
TR-415	Tertiary Road	20	45.03	3rd
TR-416	Tertiary Road	20	13.08	3rd
TR-417	Tertiary Road	20	72.11	3rd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-418	Tertiary Road	20	7.19	3rd
TR-418	Tertiary Road	20	1.28	3rd
TR-419	Tertiary Road	20	9.90	3rd
TR-420	Tertiary Road	20	13.90	3rd
TR-421	Tertiary Road	20	38.34	3rd
TR-422	Tertiary Road	20	17.37	3rd
TR-423	Tertiary Road	20	14.59	3rd
TR-424	Tertiary Road	20	42.22	3rd
TR-425	Tertiary Road	20	22.34	3rd
TR-425	Tertiary Road	20	2.29	3rd
TR-426	Tertiary Road	20	14.24	3rd
TR-426	Tertiary Road	20	1.68	3rd
TR-427	Tertiary Road	20	15.62	3rd
TR-428	Tertiary Road	20	20.77	3rd
TR-429	Tertiary Road	20	138.73	3rd
TR-430	Tertiary Road	20	27.62	3rd
TR-431	Tertiary Road	20	63.94	3rd
TR-432	Tertiary Road	20	7.71	3rd
TR-433	Tertiary Road	20	36.52	3rd
TR-434	Tertiary Road	20	58.74	3rd
TR-435	Tertiary Road	20	36.44	3rd
TR-436	Tertiary Road	20	50.28	3rd
TR-437	Tertiary Road	20	33.55	3rd
TR-438	Tertiary Road	20	0.09	3rd
TR-438	Tertiary Road	20	5.60	3rd
TR-439	Tertiary Road	20	21.83	3rd
TR-440	Tertiary Road	20	18.88	3rd
TR-441	Tertiary Road	20	7.15	3rd
TR-442	Tertiary Road	20	25.73	3rd
TR-443	Tertiary Road	20	78.31	3rd
TR-444	Tertiary Road	20	25.21	3rd
TR-445	Tertiary Road	20	6.92	3rd
TR-446	Tertiary Road	20	9.26	3rd
TR-447	Tertiary Road	20	25.37	3rd
TR-448	Tertiary Road	20	33.19	3rd
TR-449	Tertiary Road	20	133.37	3rd
TR-450	Tertiary Road	20	13.43	3rd
TR-576	Tertiary Road	20	19.26	3rd
TR-164	Tertiary Road	20	12.58	3rd
TR-358	Tertiary Road	20	0.00	3rd

A. Roads connect Paurashava with Regional Road Network

To avoid traffic congestion within the Paurashava, the road has been widened to 80 feet that goes to Barisal Swarupkathi Highway towards North-South direction. This road has considered the primary entrance of the Paurashava. Secondary road has proposed to connect east west direction of the area.

Hierarchically, the following types of roads have been proposed in the plan:

- major road having rights of way from 80 feet
- secondary road having rights of way from 30 to 40 feet of the right of way

B. Internal Network of the Paurashava

The above mentioned roads would be linked up with the proposed road so that eventually all parts of Banaripara Paurashava would be well connected.

Here, two types of roads have been proposed to cater the needs of the internal circulation of the Paurashava area. These are:

- secondary road having rights of way 30 to 40 feet
- local road having rights of way of 20 feet

Table 12.5: Proposed Roads of Banaripara Paurashava according to Hierarchy

Types of Road	Road Width (ft)	Number of Roads	Length (km)
Paurashava Secondary Road	30	10	1.24
	40	3	0.41
Sub-Total		**13**	**1.65**
Paurashava Tertiary Road	20	117	10.21
Total		**130**	**11.86**

Source: Proposed by Consultants

In the road network plan, more than 70% of the roads (according to road length) have proposed for widening.

12.5.4 Proposals for New Roads

To accommodate the traffic volumes about 10-15% land has been considered of total planning area. About 11.86 kilometers new roads have been proposed to ensure accessibility in the area. Phase wise newly proposed Road has been shown in Table 12.6.

Proposed Road Network of Banaripara Paurashava has been presented on **Map 12.2**.

Table 12.6: Phase wise Newly Proposed Road in Banaripara Paurashava

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
SR-42	Secondary Road	40	302.55	2nd
SR-42	Secondary Road	40	22.53	2nd
SR-42	Secondary Road	40	84.84	2nd
SR-44	Secondary Road	30	0.03	2nd
SR-44	Secondary Road	30	98.40	2nd
SR-45	Secondary Road	30	5.75	2nd
SR-46	Secondary Road	30	88.45	2nd
SR-46	Secondary Road	30	104.32	2nd
SR-47	Secondary Road	30	220.76	2nd
SR-48	Secondary Road	30	48.81	2nd
SR-53	Secondary Road	30	159.13	2nd
SR-66	Secondary Road	30	406.19	2nd
SR-66	Secondary Road	30	108.76	2nd
TR-451	Tertiary Road	20	169.28	3rd
TR-453	Tertiary Road	20	26.34	3rd
TR-454	Tertiary Road	20	41.26	3rd
TR-455	Tertiary Road	20	167.90	3rd
TR-456	Tertiary Road	20	20.56	3rd
TR-457	Tertiary Road	20	68.50	3rd
TR-457	Tertiary Road	20	0.14	3rd
TR-458	Tertiary Road	20	28.60	3rd
TR-459	Tertiary Road	20	48.71	3rd
TR-460	Tertiary Road	20	69.99	3rd
TR-461	Tertiary Road	20	39.39	3rd
TR-462	Tertiary Road	20	0.29	3rd
TR-462	Tertiary Road	20	35.95	3rd
TR-463	Tertiary Road	20	68.44	3rd
TR-464	Tertiary Road	20	136.36	3rd
TR-465	Tertiary Road	20	44.08	3rd
TR-466	Tertiary Road	20	91.80	3rd
TR-469	Tertiary Road	20	55.23	3rd
TR-470	Tertiary Road	20	97.93	3rd
TR-471	Tertiary Road	20	21.80	3rd
TR-472	Tertiary Road	20	42.99	3rd
TR-473	Tertiary Road	20	204.26	3rd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-474	Tertiary Road	20	0.14	3rd
TR-474	Tertiary Road	20	30.20	3rd
TR-475	Tertiary Road	20	0.06	3rd
TR-475	Tertiary Road	20	24.73	3rd
TR-476	Tertiary Road	20	77.02	3rd
TR-477	Tertiary Road	20	20.38	3rd
TR-478	Tertiary Road	20	184.10	3rd
TR-478	Tertiary Road	20	30.51	3rd
TR-479	Tertiary Road	20	27.69	3rd
TR-480	Tertiary Road	20	180.59	3rd
TR-481	Tertiary Road	20	46.11	3rd
TR-482	Tertiary Road	20	105.56	3rd
TR-483	Tertiary Road	20	54.29	3rd
TR-484	Tertiary Road	20	1.54	3rd
TR-484	Tertiary Road	20	34.81	3rd
TR-485	Tertiary Road	20	73.44	3rd
TR-486	Tertiary Road	20	85.85	3rd
TR-487	Tertiary Road	20	47.60	3rd
TR-488	Tertiary Road	20	148.76	3rd
TR-489	Tertiary Road	20	77.26	3rd
TR-490	Tertiary Road	20	114.50	3rd
TR-491	Tertiary Road	20	82.20	3rd
TR-492	Tertiary Road	20	108.16	3rd
TR-493	Tertiary Road	20	83.23	3rd
TR-494	Tertiary Road	20	81.62	3rd
TR-495	Tertiary Road	20	87.76	3rd
TR-498	Tertiary Road	20	40.05	3rd
TR-499	Tertiary Road	20	116.16	3rd
TR-500	Tertiary Road	20	14.14	3rd
TR-501	Tertiary Road	20	14.49	3rd
TR-506	Tertiary Road	20	6.03	3rd
TR-507	Tertiary Road	20	83.52	3rd
TR-508	Tertiary Road	20	45.21	3rd
TR-509	Tertiary Road	20	48.55	3rd
TR-510	Tertiary Road	20	44.74	3rd
TR-511	Tertiary Road	20	81.51	3rd
TR-512	Tertiary Road	20	105.66	3rd
TR-513	Tertiary Road	20	5.18	3rd
TR-514	Tertiary Road	20	10.18	3rd
TR-515	Tertiary Road	20	44.91	3rd
TR-516	Tertiary Road	20	38.37	3rd
TR-517	Tertiary Road	20	27.35	3rd
TR-518	Tertiary Road	20	11.86	3rd
TR-519	Tertiary Road	20	59.72	3rd
TR-519	Tertiary Road	20	0.77	3rd
TR-520	Tertiary Road	20	15.27	3rd
TR-521	Tertiary Road	20	111.37	3rd
TR-522	Tertiary Road	20	26.34	3rd
TR-523	Tertiary Road	20	76.89	3rd
TR-524	Tertiary Road	20	66.13	3rd
TR-533	Tertiary Road	20	151.36	3rd
TR-534	Tertiary Road	20	50.50	3rd
TR-535	Tertiary Road	20	287.87	3rd
TR-538	Tertiary Road	20	441.24	3rd
TR-539	Tertiary Road	20	334.15	3rd
TR-540	Tertiary Road	20	804.52	3rd
TR-541	Tertiary Road	20	186.83	3rd
TR-542	Tertiary Road	20	75.55	3rd
TR-543	Tertiary Road	20	158.11	3rd
TR-544	Tertiary Road	20	158.39	3rd
TR-545	Tertiary Road	20	45.28	3rd
TR-546	Tertiary Road	20	30.01	3rd

Road ID	Road Type	Width (in ft)	Length (in m)	Development Phase
TR-546	Tertiary Road	20	250.75	3rd
TR-547	Tertiary Road	20	157.42	3rd
TR-548	Tertiary Road	20	156.23	3rd
TR-549	Tertiary Road	20	3.01	3rd
TR-549	Tertiary Road	20	94.87	3rd
TR-550	Tertiary Road	20	177.05	3rd
TR-551	Tertiary Road	20	227.57	3rd
TR-552	Tertiary Road	20	139.31	3rd
TR-553	Tertiary Road	20	99.36	3rd
TR-554	Tertiary Road	20	0.02	3rd
TR-554	Tertiary Road	20	40.16	3rd
TR-555	Tertiary Road	20	140.32	3rd
TR-556	Tertiary Road	20	118.51	3rd
TR-556	Tertiary Road	20	0.29	3rd
TR-556	Tertiary Road	20	3.04	3rd
TR-557	Tertiary Road	20	101.47	3rd
TR-558	Tertiary Road	20	44.82	3rd
TR-558	Tertiary Road	20	91.10	3rd
TR-561	Tertiary Road	20	78.32	3rd
TR-562	Tertiary Road	20	51.57	3rd
TR-563	Tertiary Road	20	134.87	3rd
TR-563	Tertiary Road	20	72.42	3rd
TR-566	Tertiary Road	20	132.21	3rd
TR-567	Tertiary Road	20	26.56	3rd
TR-567	Tertiary Road	20	154.76	3rd
TR-569	Tertiary Road	20	13.27	3rd
TR-570	Tertiary Road	20	124.10	3rd
TR-571	Tertiary Road	20	106.97	3rd
TR-573	Tertiary Road	20	0.95	3rd
TR-573	Tertiary Road	20	91.30	3rd
TR-574	Tertiary Road	20	77.12	3rd
TR-575	Tertiary Road	20	178.52	3rd
TR-466	Tertiary Road	20	12.58	3rd
TR-524	Tertiary Road	20	0.00	3rd

12.6 Plans for Other Transportation Facilities

In the field of transportation facilities, the consultant has proposed such facilities as, bus terminal, truck terminal, rickshaw stands, baby taxi/tempo stands and passenger shed for local bus users.

12.6.1 Parking and Terminal Facilities

A) Parking Facilities

Parking facilities at Banaripara Paurashava has been provided considering two parameters:

- Individual Building: In this context, it is recommended to follow the Building Construction Act, 1996 (Sub-section 2&3, Section-13).
- Area wise Parking Facilities: As per area wise context, it is recommended to provide parking facilities in Commercial and Industrial area. As per Building Construction Act 1996, total 1st 0.26 acre land and 0.80 acre land will be declared as parking zone at commercial area and industrial area of Banaripara Paurashava.

B) Terminal Facilities

Considering future travel demand in next 20 years; Terminal facilities for Bus, Truck, Motorcycle, Rickshaw and other existing transports have been proposed.

- **Bus Terminal:** One bus terminal has been proposed at ward no1 and one bus stand has been proposed at ward no. 9. The proposed terminal will comprise about 1st 1.10 acre areas and bus stand occupies 0.76 acre area. Detail has been given in table 11.12, chapter 11, Landuse Plan, Part B.

- **Other Vehicle Parking:** At Banaripara Paurashava, no Parking area will be proposed. But every important intersection has sufficient on street parking area in rights of way. One rickshaw stand comprising 0.49 acre at ward no. 1 and one tempo stand comprising 0.74 acre at ward no. 1 has been proposed.

- **Launch Terminal & Ferry Ghat:** No new launch terminal and no new ferry ghat has been proposed rather the existing terminal and ghat has been proposed for expansion.

12.6.2 Development of Facilities for Pedestrians, Bicycles and Rickshaws

A) Pedestrians

Proposals regarding pedestrian walkway have been already depicted in proposed road network plan by providing separate walkway as per priority of facilities. About 1st .5m footpath has been already shown in primary and secondary roads.

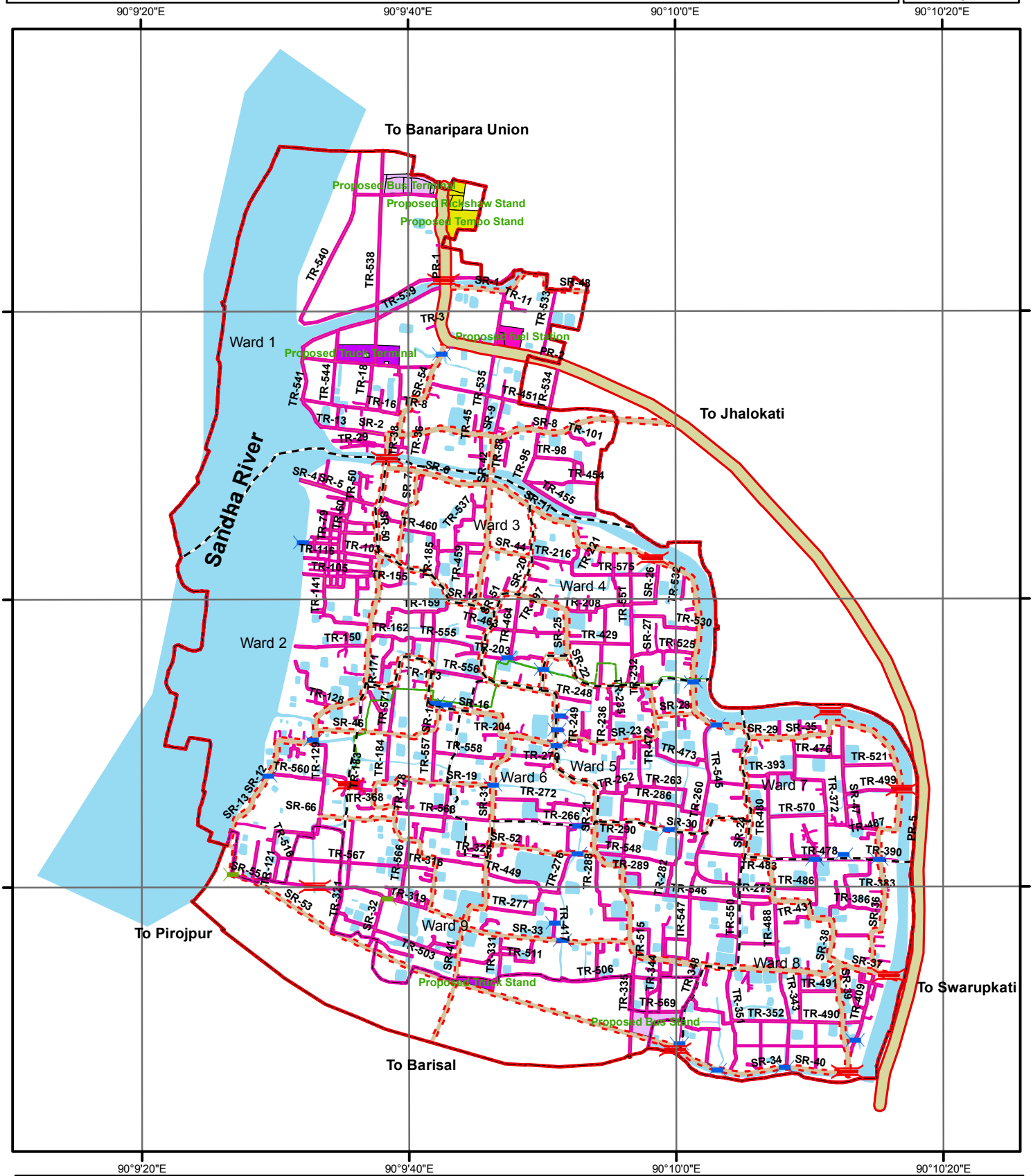
B) Bicycles and Rickshaws

Facility provision of bicycles and rickshaws has been already depicted in space allocation of Right of Way (ROW). Separate Service lane of 2.5 m has been already shown in Primary road and 18.m lane in Secondary Roads in figure 12.3.

12.6.3 Other Transportation Facilities

One fuel station has been proposed at ward no 1 comprising about 0.53 acre of land.

Map 12.2 :Proposed Transportation & Traffic Management Plan of Banaripara Paurashava



Legend

- Planning Area Boundary
- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Bridge
- Culvert
- Pipe Culvert
- Primary Road
- Secondary Road
- Tertiary Road
- Proposed Bus Terminal/Stand
- Proposed Truck Terminal/Stand
- Proposed fuel Station
- Proposed Rickshaw/Tempo Stand

0 50 100 200 300 400 Meters

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12.7 Waterway Development / Improvement Options

At present, water transport facility has significant importance for carrying passenger and commodity. If waterway network can be developed, this will reduce pressure on road network and will also boost up the economic development of the area. Therefore, some measures should be taken to promote the water transport network in Banaripara Paurashava area:

- Development of infrastructural facilities
- Dredging and maintenance of existing navigable waterways and for resuscitation of dead or dying rivers, channels, or canals, including development of new channels and canals for navigation
- Carry out removal of wrecks and obstruction in inland navigable waterways
- Ensure co-ordination of Inland Water Transport with other forms of transport and with trade and agricultural interests for the optimum utilization of the available transport capacity
- Promote good quality launch services
- Develop, maintain and operate landing/station and terminal facilities
- Prepare plans or schemes for carrying out any of the above mentioned functions by BIWTA.

12.8 TRANSPORTATION SYSTEM MANAGEMENT (TSM)

Fundamental traffic management (TM) regulations have been in practice from the very beginning for example, rules to use a particular side (left or right) of the road. However, the modern objectives of traffic management also include operational efficiency of traffic and improvement of environment.

The main purposes of traffic management are:

- To ensure safe movement of all vehicular and pedestrian traffic
- To improve operational efficiency (junction and network links) in terms of traffic flow
- To improve the environment

The most important aspect of traffic management is its major involvement in its efficient use of basically existing facilities. These may be in the form of:

- Rules and regulations governing the use of facilities. For example, right of use of a roadway, speed limit etc. and
- New works and improvements of limited scale like flow control and segregation measures and devices

12.8.1Strategies for Facility Operations

Parking Management

In Banaripara Paurashava, parking measures are considered for:

- Bus Stand
- Truck Terminal

To provide parking space, following regulations mentioned in Building Construction Rule, 1996 should be provided:

- Parking functions should be maintained with the Parking or Stand lot, Roads cannot used for maneuvering the vehicles

- For entrance and exit of Bus and Truck in the Terminal minimum 4.5 meter width should be provided
- On-Street Parking is applicable if:
    - Angular Parking should be provided within 45^{o}
    - Within 25 meter of Pedestrian Crossing or Intersection, no parking would be allowed
    - No parking will be allowed over the Highway

12.8.2 Strategies for Traffic Flow and Safety

Following strategies will be adopted to implement circulation network in the planning area:

- A comprehensive road network plan has been prepared for the Paurashava using the hierarchy of road network. Implementation will also be followed following this hierarchy.
- Proposed roads in those areas will be chosen for immediate construction that is needed to promote growth in that area.
- Service roads will be constructed along with the major roads to allow free flow of long distance traffic.
- Bill board should be installed conveying road safety messages and instructions.
- Speed breaker should be provided at the in-front school, colleges and hospitals etc.

12.8.3 Strategies for Traffic Management

- Connect the missing links of primary, secondary and access roads on priority basis.
- Separate lane for non-motorized vehicles should be provisioned on the primary and secondary roads.
- Widen the narrow roads to make networks for efficient circulation.
- Right of Way (ROW) should be kept free from any type of development activities.
- Provide adequate pedestrian facilities and off-street parking wherever needed.
- If requires, tidal flow operation method can be applied in case of some roads. For instance, the morning peak results heavy flow of traffic towards city centre and evening peak results heavy flow towards the outside from the City Centre. In this case, half of other side lane can be utilized for one direction traffic during peak hour.

12.9 Plan Implementation Strategies

The section describes the plan implementation strategies of transportation plan of Banaripara Paurashava. This also describes the regulation to implement transport pan, evaluation and coordination to implement the transport plan in the Paurashava.

Regulations to Implement the Transportation Plan

Following regulations will be needed for implementation of the plan.

Public Roads Act, 2004: Objectives of the Public Roads Act, 2004 is prescribed in the section 2. Those objectives are to:

(a) Establish ownership and responsibilities for roads;

(b) Establish the framework for managing the road network;

(c) Establish general principles for road management;

(d) Provide for general design and planning principles for roads;

(e) Confer powers and responsibilities on road authorities;

(f) Commit road authorities to provide and maintain safe roads, and to do so using resources efficiently;

(g) Provide for the establishment and classification of public roads;

(h) Provide for data bases of public roads, and public access to them;

(i) set out rights and duties of road users;

(j) Control activities on roads;

(k) Make special provision for restriction on access to roads;

(l) Identify characteristics of new road types;

(m) Provide a legal framework for private sector participation in road construction, operation and maintenance, including tolling of roads;

(n) Establish defenses for civil liabilities; and

(o) Create offences and provide for penalties.

Section 5 of the Public Roads Act, 2004 has defined public roads as-

(1st) The Government may declare a public road.

(2) The declaration may be made in relation to land, whether or not it is currently used for passage by members of the public.

(3) In the declaration, the Government shall classify the public road as:

(a) a national road; (b) a regional road; (c) a Zila road; (d) an urban road; (e) an Upazila road; (f) a union road; (g) a village road.

Motor Vehicles Ordinance, 1983 (Ordinance No. LV of 1983) was enacted in 22nd September, 1983. The Ordinance will be needed mostly for the registration of motor vehicles and issuing of driving license.

Stage Carriages Act, 1861 (Act No. XVI of 1861) was enacted in 7thJuly 1861. Section 1st of the Act has defined the term Stage Carriage and said, “every carriage drawn by one or more horses which shall ordinarily be used for the purpose of conveying passengers for hire to or from any place in Bangladesh shall, without regard to the form or construction of such carriage, be deemed to be a Stage Carriages within the meaning of this Act.” Again, according to the section 2, no carriage shall be used as a Stage Carriage unless licensed by a Magistrate.

The Paurashava may, in communication with the RHD and LGED and with the prime approval from the Government may enforce the regulations as mentioned above. Again, some of the relevant regulations of developed countries may be enforced by the appropriate authority for the betterment of accessibility, road safety and road management. In connection with this concept, **Highways Act of England and Wales** may be followed.

According to the section 70(1a) of the **Highways Act of England and Wales**, the owner or occupier of any structure and the owner or occupier of any land on which a structure is situated shall take all reasonable steps to ensure that the structure or the use of the structure is not a hazard or potential hazard to persons using a public road and that it does not obstruct or interfere with the safe use of a public road or the maintenance of a public road.

(b) Where a structure or the use of a structure is a hazard or potential hazard to persons using a public road or where it obstructs or interferes with the safe use of a public road or with the maintenance of a public road, a road authority may serve a notice in writing on the owner or occupier of the structure or on the owner or occupier of any land on which the structure is situated

to remove, modify or carry out specified works in relation to the structure within the period stated in the notice.

(2 a) The owner or occupier of land shall take all reasonable steps to ensure that a tree, shrub, hedge or other vegetation on the land is not a hazard or potential hazard to persons using a public road and that it does not obstruct or interfere with the safe use of a public road or the maintenance of a public road.

(b) Where a tree, shrub, hedge or other vegetation is a hazard or potential hazard to persons using a public road or where it obstructs or interferes with the safe use of a public road or with the maintenance of a public road, a road authority may serve a notice in writing on the owner or occupier of the land on which such tree, shrub, hedge or other vegetation is situated requiring the preservation, felling, cutting, lopping, trimming or removal of such tree, shrub, hedge or other vegetation within the period stated in the notice.

Again, section 71(1a) said that, any person who, without lawful authority or the consent of a road authority-

(i) erects, places or retains a sign on a public road, or

(ii) erects, places or retains on a public road any caravan, vehicle or other structure or thing (whether on wheels or not) used for the purposes of advertising, the sale of goods, the provision of services or other similar purpose, shall be guilty of an offence.

Section 76(1st) of the **Highways Act of England and Wales** have provisioned regulations for a road authority and said, a road authority may-

(a) construct and maintain drains in, on, under, through or to any land for the purpose of draining water from, or preventing water flowing onto, a public road,

(b) use any land for the temporary storage or the preparation of any gravel, stone, sand, earth or other material required for the construction or maintenance of a public road.

Implementation, Monitoring, Evaluation and Coordination of the Plan

Implementation through Multi- Sectoral Investment Program: Major infrastructure development works such as primary roads, secondary roads, transportation facilities etc., will largely be controlled by Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Program (MSIP).

Objective of a Multi-Sectoral Investment Program (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Transportation and Traffic Management Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects: Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control: Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, landuse control may be applied; careful consideration requires the following ideologies:

- the purpose to be achieved by the development controls;
- where controls should be applied;
- what aspect of development needs to be controlled;

- what type of development controls are required;
- what degree or level of development control is required;
- who will be affected by the required control;
- who will be affected by the controls and in what manner;
- when the controls should be applied;
- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

Development control as an instrument of plan implementation may be selectively applied within the Urban Area Plans. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.

Implementation by Facilitating Private Investment: Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation plot boundary readjustment, efficient layout of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Transportation and Traffic Management Plan would simply be tools for guiding and encouraging the growth and development of an urban area in a preferred manner. In a rapidly changing urban environment, the Transportation and Traffic Management Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Transportation and Traffic Management Plan be made a legal requirement.

For implementation of the various program components of the Transportation and Traffic Management Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time. Post implementation

evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by the Paurashava Mayor, LGED representative, RHD and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Co-ordination

A Planning Section of Paurashava should have close interaction with the citizen of Paurashava at large in order to make people aware of the benefits of a good plan and, therefore, their social responsibility to promote plan implementation in one hand and also resist contraventions on the other. A specific interactive cell is recommended to operate in this regard with following responsibilities:

- Provide pre-application advice to residents, consultants and developers about landuse management issues and application procedures for the submission of development applications.
- Enforce planning and landuse management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.
- Investigate and resolve landuse management complaints, illegal landuse and prosecuting contraventions.

Such interactive windows may be opened in various convenient locations to ensure ease of the answers to commonly asked questions may be shown in the internet. Besides, those may be shown in the print and electronic media time to time.

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to be handled with utmost care and patience. The best results can be accrued only by wining people's confidence. In case the authority fails to get peoples co-operation they should exercise power of compulsory acquisition of land through Acquisition of Requisition of Immovable Property Ordinance, 1982. Attempts may be made to engage NGOs / CBOs / RHD / LGED to work as catalysts in negotiation.

13.1 Drainage Management Plan

This chapter states about goals and objectives, and methodology of Drainage Development Plan. An inventory of the existing drainage system of Banaripara has been made as a part of the comprehensive topographical survey to be taken-up under this project. While assessing the drainage conditions, the serviceability, structural conditions, obstruction, siltation, blockages are taken into consideration. And finally describe the drainage and environmental management plan, and its implementation strategies.

13.1.1 Goals and Objectives

Provision of drainage facilities are important concern to human settlements to create better living environment. Failure to provide the adequate drainage facilities results in flooding and detrimental environmental quality. Drainage of high rainfall region particularly in the context of Barisal region is very important. The objectives of drainage planning are described as follows:

- To analyze drainage aspects in the planning of the Paurashava.
- To study geological fault and lineament of the project area and its surroundings.
- To study the existing water development, flood protection and flood control project (if any) in the area and their impacts in the Paurashava plan.
- To present planning options for drainage of the future Paurashava area.
- To study conservation of the natural resources like parks, open space, water bodies, existing ponds etc.
- To conserve place of historical, architectural (if any) and agricultural importance including natural fisheries.

13.1.2 Methodology and Approach to Planning

Drainage Network Survey for Banaripara Paurashava has been carried out through the guideline of ToR .In this survey explore the existing drainage network system at Banaripara Paurashava. The main vision of this survey is explored the length, depth, flow direction, coverage area and satisfactory level of the Paurashava inhabitants. The information of drainage network gathered from topographic, socioeconomic and physical feature survey (detail was given in Chapter 6, Section 6.2 of Banaripara Survey Report). Major feature of drainage and environment survey are as follow:

- Survey the main drainage channels from their heads to the outfalls and to estimate their capacity to discharge water.
- Collect and analyze meteorological data over time in the area to determine the meteorological conditions and predict storm surges.
- Determine the efficiency of the present drainage systems and make recommendation to government.
- Organize a public enlightenment campaign to expose the adverse effects of dumping refuse in drainage channels, through a mass media meeting.
- Drainage channels were surveyed by leveling from the head of the channels to the outfall using a surveyor's level. A zero datum was chosen at the head of each channel. This zero height was then used to level the channel from the head to the toe or outfall. In areas where water flow was observed, the velocity of the flow was recorded. The flow velocity was calculated by timing the flow rate within a 3-5m length of channel. In areas where sediment or refuse was observed to accumulate in the bottom of the channel, the thickness of such sediment or refuse was measured.

- A questionnaire was administered to local residents to collect information about flooding, refuse disposal and drainage channel patterns from local residents along flood prone areas. The answers to the questionnaire were statistically analyzed and use to decipher resident's opinion on the problem of flooding.

13.2 Existing Drainage System/ Network

13.2.1 Man Made Drains

Drainage network is very much insufficient at the study area. During survey drainage outlets and reservoir are found insufficient in the study area. Very few men made drains are found to drain out waste water and storm water. Table 13.1 shows inventory of major drain in Banaripara Paurashava.

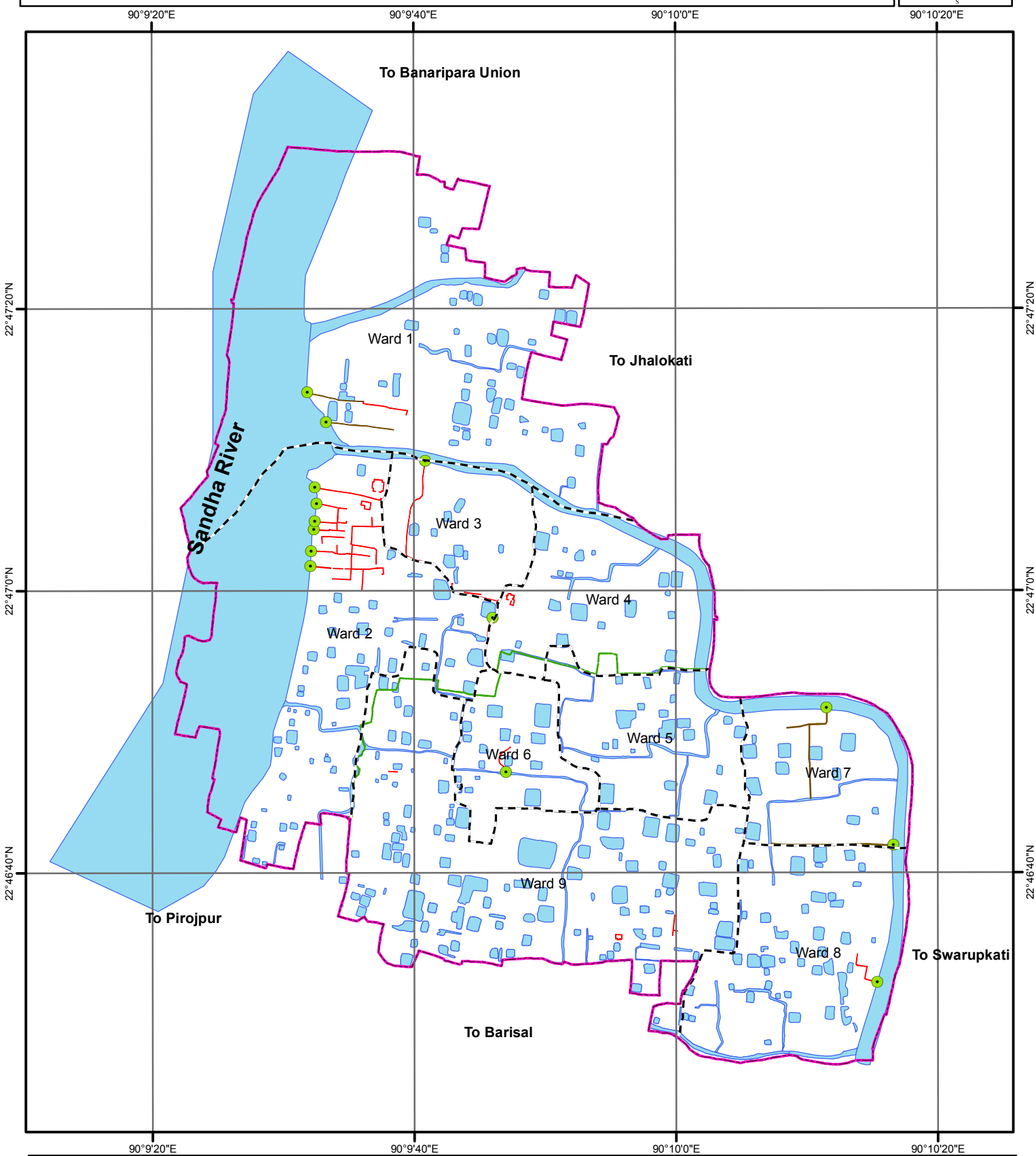
Table 13.1: Existing Inventory of Drains

Drain ID	Type	Width (in m.)	Length (in m)	Start Point	End Point
D-1	Katcha	2	278.58	Ward 7	Ward 7
D-2	Katcha	2.5	264.22	Ward 7	Ward 7
D-3	Katcha	2.5	1.67	Ward 7	Ward 7
D-4	Katcha	2.5	109.88	Ward 8	Ward 8
D-5	Katcha	2	3.31	Ward 7	Ward 7
D-6	Katcha	2	68.34	Ward 8	Ward 8
D-7	Katcha	2	124.17	Ward 1	Ward 1
D-8	Katcha	2.2	148.85	Ward 1	Ward 1
D-9	Pucca	1.21	47.49	Ward 9	Ward 9
D-10	Pucca	1.08	205.55	Ward 2	Ward 2
D-11	Pucca	1.08	20.50	Ward 9	Ward 9
D-12	Pucca	1.02	37.01	Ward 3	Ward 3
D-13	Pucca	1.08	20.89	Ward 3	Ward 3
D-14	Pucca	0.98	137.39	Ward 2	Ward 2
D-15	Pucca	0.98	69.94	Ward 6	Ward 6
D-16	Pucca	1.02	80.85	Ward 4	Ward 4
D-17	Pucca	1.12	44.11	Ward 2	Ward 2
D-18	Pucca	1.02	44.40	Ward 3	Ward 3
D-19	Pucca	1.12	55.51	Ward 9	Ward 9
D-20	Pucca	1.08	103.39	Ward 8	Ward 8
D-21	Pucca	1.08	63.29	Ward 2	Ward 2
D-22	Pucca	0.98	47.73	Ward 2	Ward 2
D-23	Pucca	0.98	47.33	Ward 2	Ward 2
D-24	Pucca	1.02	47.74	Ward 2	Ward 2
D-25	Pucca	1.02	69.84	Ward 2	Ward 2
D-26	Pucca	1.02	330.02	Ward 2	Ward 2
D-27	Pucca	1.02	144.49	Ward 2	Ward 2
D-28	Pucca	0.98	90.95	Ward 2	Ward 2
D-29	Pucca	1.02	111.57	Ward 1	Ward 1
D-30	Pucca	1.05	48.63	Ward 2	Ward 2
D-31	Pucca	1.02	24.93	Ward 8	Ward 8
D-32	Pucca	1.02	259.43	Ward 3	Ward 3
Total Length (m)			**3152.01**		

Source: Physical Feature Survey, 2010

Table 13.1 shows the ward wise manmade drainage coverage in Banaripara Paurashava. Total length of manmade drainage in Banaripara Paurashava is 3152.01 meter and it covers all Ward. **Map 13.1** Shows the existing Drainage Network of Banaripara Paurashava.

Map 13.1:Existing Drainage Network of Banaripara Paurashava



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Outfall
- Katcha
- Pucca
- Waterbody

0 50 100 200 300 400 Meters

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13.2.2 Natural Canal and River

General Description of Natural Canals

The existing natural canal network is spread like tree roots in total Paurashava area. In some portion of the area the condition of the khal and irrigation canal are being encroached by the local people and also by local authority and the situation is deteriorating day by day. So, it should be given much concern to sustain the natural canal.

At Banaripara Paurashava canals have an important role in drainage system. Total area of khal/canal at Banaripara is 23.39 acres. Table 13.2 shows the length and connectivity of Khals of Banaripara Paurashava. and ward wise area coverage of the canals are presented in table 13.2.

Table 13.2: Drainage Coverage of Existing Khals/Canals in Banaripara Paurashava

Name	Width (in m)	Length (in m)	Starting Point Connection	End Point Connection
Rayerhat Khal	1.40-39.96	4473.12	Ward-09	River
Canal-2	1.40-7.62	3359.78	Ward-05	River
Canal-3	1.49-36.57	828.86	Ward-01	Ward-01

Source: Physical Feature Survey, 2010

River

Banaripara Paurashava comprises one river namely Sandhya River which encloses about 74.19 acre of the Paurashava area covering ward no. 1 and 2. The river serves as primary drainage and is connected with the canals/khals at the Banaripara Paurashava.

Other Water Bodies (Pond-Dighi-Ditch and Dyke)

At Banaripara Paurashava, about 34.88 acre areas are under water bodies comprising ditch and pond. There are about 142 ditches covering 9.46 acres area and 247 ponds comprising 25.42 acres area. Among the all wards ward no. 9 has the highest number of ditches and ponds.

Table 13.3: Ward-Wise Area Coverage of Existing waterbodies at Banaripara

Ward No.	Ditch		Pond		Total	
	Number	Area (acre)	Number	Area (acre)	Number	Area (acre)
W-1	17	1.48	30	2.95	47	4.43
W-2	28	1.49	27	2.98	55	4.47
W-3	5	0.28	4	0.51	9	0.79
W-4	6	0.19	13	1.99	19	2.17
W-5	4	0.24	18	2.16	22	2.41
W-6	3	0.16	13	1.70	16	1.86
W-7	0	0.00	11	1.91	11	1.91
W-8	26	1.64	36	2.52	62	4.16
W-9	53	3.98	95	8.71	148	12.68
Total	**142**	**9.46**	**247**	**25.42**	**389**	**34.88**

Source: Physical Feature Survey, 2010

13.2.3 Topographic Condition of Existing Drainage Network

Existing natural drainage network and direction of natural flow depends on the elevation of the area. The minimum and maximum ground level varies from 0.30 m to 2.1 m and average height is 1.29 m. From the survey, the lowest spot height is 0.19m and the highest spot height is 2.58 m. Average height of land of the Paurashava area is 1.15 m. The flow of storm water will be from the high land to the lowlands and the ultimate destination is the river, cannels and ponds.

13.2.4 Analysis of Peak Hour Run Off Discharge and Identification of Drainage Outfalls

Drain as the structure is generally develops to free our living area from household waste water and rain water of storm water. The daily waste water discharge from a household is negligible so for the drainage design it is necessary to calculate the storm water. Urban storm drainage primarily concerns this surface run-off. The primary objective of urban drainage system design is to drain out this storm water either through open surface drains or through underground sewers. An important parameter for the design of storm water systems is the rate and volume of run-off to be conveyed through the system as a consequence of storms. Run-off estimates are carried out based on knowledge of the occurrences of heavy rainstorms and a relation between rainfall and the corresponding run-off. The quantity of run-off again depends on the geometry and physical properties of the catchments.

Rainfall occurs at irregular intervals, and intensities, and frequency and duration vary within catchments. Due to this random nature of occurrence of rain events, the storm drainage system is designed considering estimated run-off based on the analyses of past rainfall records. A widely used statistical description of heavy rainfall is that of intensity–duration–frequency curves that are developed by processing the data for a large number of storm events observed over a number of years, considering the time variation of the rainfall intensity.

Method Used

Storm and used water: The drains are designed to collect excess rainfall that comes as surface runoff from urban area, convey the runoff and finally discharge them to outfalls. The design of drains involves hydrological computations of rainfall intensity, its frequency of occurrence, duration etc., and the total run off of a particular area. The modified rational method shall be used for calculation of peak runoff for a definite frequency and duration from particular drainage basin. One limitation of this method is that it cannot be used for catchment area greater than 320 acres. The Natural Resources Conservation Service (NRCS) method formerly the US Soil Conservation Service (SCS) method shall be used.

In Modified Rational Method, the overall watershed is divided into zones that contribute to hydraulically significant points of concentration. The boundary of the zones is established based upon local topographic boundaries such as streets, existing drainage systems, etc., using good engineering practice. The design flow rate by Modified Rational Formula is

$Q = CsC\ r\ IA$

Q = Design runoff flow rate (cfs)

I = Rainfall intensity (in/hr)

Cs = Storage coefficient

Cr = Runoff coefficient

A = Drainage area (acres)

Rainfall Intensity (I): The rainfall intensity is the average rainfall rate for a particular drainage basin or sub-basin. The intensity is selected on the basis of the design rainfall duration and return period. The return period is established by design standards as a design parameter. Rainfall intensity with 5 years return period is generally employed for design of primary drains and canal improvement. Rainfall intensity with 3 years return period is employed for design of secondary drains. The design duration is equal to the time of concentration for the drainage area under consideration. Time of concentration is a critical parameter both for the Modified Rational Equation and SCS method. Time of concentration is generally defined as the longest runoff travel time for contributing flow to reach the outlet or design point, or other point of interest. It is frequently calculated along the longest flow path physically.

Estimating the time of concentration involves identification of an appropriate flow path or paths and estimating runoff travel times along the flow paths. Where post-development conditions include significant pervious surfaces, the time of concentration for just impervious portions of the basin may be required to calculate and compare peak flow response for the basin as a whole against that of the more rapidly-draining impervious surfaces alone. The Time of Concentration composed of the Initial Time of Concentration, sometimes referred to as the Inlet Time or Time of Entry and the Travel Time. Initial Time of Concentration is that time required for runoff to travel from the most remote point in the drainage area to the first point of concentration. This can be determined using the Kirpitch equation. The Initial Time of Concentration must be five minutes or longer. In instances where Initial Times of Concentration are estimated to be shorter than five minutes, five minutes shall be applied.

The second part of the Time of Concentration is the Travel Time that takes the flow to travel along the drain. Channel flow occurs in channels carrying integrated flows, pipes (flowing partially full), and streams. Where storage is not significant, Travel Times can be estimated by applying Manning's Equation, and using estimates of channel characteristics and appropriate roughness values for pipe, channel, or stream features as tabulated in Table 13.4.

$V=[1.49/n] [R^{2/3}] [S^{1/2}]$

V = Velocity of flow, feet/second
N = Manning's roughness coefficient for channel flow
S = Slope, feet/foot
R = Hydraulic radius, feet

And

$T_t = V / (60L)$

T_t = Travel time, minutes
V = Velocity, feet/second
L = Length, feet

Table 13.4: Manning's "N" Values for Channel Flow

Conduit Material	Manning's "n"	Conduit Material	Manning's "n"
Closed conduits		Pipes	0.011-0.015
Asbestos-cement pipe	0.011-0.015	Liner plates	0.013-0.017
Brick	0.013-0.017	Open Channels	
Cement-lined & seal coated	0.011-0.015	Lined channels	
Concrete pipe	0.011-0.015	Asphalt	0.013-0.017
Helically corrugated metal pipe (12'' – 48'')	0.013-0.023	Brick	0.012-0.018
Paved invert	0.018-0.022	Vegetation	0.030-0.400
Spun asphalt lined	0.011-0.015	Earth, straight and uniform	0.020-0.030
Spiral metal pipe (smooth)	0.012-0.015	Earth, winding, fairly uniform	0.025-0.040
3 – 8 in. diameter	0.014-0.016	Rock	0.030-0.045
10 – 12 in. diameter	0.016-0.018	Un maintained	0.050-0.140
Larger than 12 in. diameter	0.019-0.021	Fairly regular section	0.030-0.070
Plastic pipe (smooth interior)	0.01.-0.015	Irregular section with pools	0.040-0.100

Source: Municipality of Anchorage. Drainage Design Guideline, March 2007 ver.4.08 pp-62.

Storage Coefficient (Cs): Due to very flat topography of Bangladesh, the runoff is significantly slow. The rainfall after evaporation and infiltration accumulates first in the depressions, until these have been reached their capacity and then runoff. To take these effects a storage coefficient is used. The value of the storage coefficient is based on average ground slope and the nature of the ground surface. Some of the storage coefficients are listed in Table 13.5

Table 13.5: Storage Coefficients for flat land

Characteristics of surface	Storage Coefficient		
	Slope < 1: 1000	Slope < 1: 500	Slope < 1: 500
Residential urban	0.70	0.80	0.90
Commercial	0.80	0.90	1.00
Industrial	0.70	0.80	0.90
Residential Rural nature	0.60	0.70	0.80
Agricultural	0.50	0.60	0.70
Forest/woodland	0.30	0.40	0.50
Aquatic land	0.30	0.40	0.50
Paved area/road	0.80	0.90	1.00

Source: Countywide Comprehensive Plan (Master Drainage Plan) Exhibit-VIII.

Runoff Coefficient (Cr): The runoff coefficient (Cr) values shall be assigned to the various land use zoning classifications. The runoff coefficient values are based on the slope of the land surface, degree of imperviousness and the infiltration capacity of the land surface. The type of land use can greatly affect the amount of runoff. The quantity of runoff and peak flow rates are increased when the land is developed because the impervious surface area increases with the addition of roads, driveways, roofs, etc. The values of the runoff coefficient (Cr) for each land use classification are listed in Table 13.6

Table 13.6: Modified Rational Method Runoff Coefficients

Land use designation	Runoff Coefficient Cr	Land use designation	Runoff Coefficient Cr
Residential rural	0.30	Agricultural exclusive	0.25
Residential semi urban	0.40	Forest and watershed	0.20-0.25
Residential urban	0.5-0.60	Public facilities	0.30-0.60
Apartment professional	0.70	Forest/ woodland	0.25
Neighborhood Commercial	0.85	Paved area/road	0.99
Community Commercial	0.85	Slum area	0.50-0.55
Industrial	0.70-0.75		

Source: Countywide Comprehensive Plan (Master Drainage Plan) Exhibit-VIII.

Catchment Area: The size and shape of the catchment or sub-catchment for each drain shall be determined by plan metering topographic maps and by field survey. In determining the total runoff of a catchment area the following assumptions to be made:

a. The peak rate of runoff at any point is a direct function of the average rainfall for the time of concentration to that point.

b. The recurrence interval of the peak discharge is same as the recurrence interval of the average rainfall intensity.

c. The Time of Concentration is the time required for the runoff to become established and flow from the most distant point of the drainage area to the point of discharge.

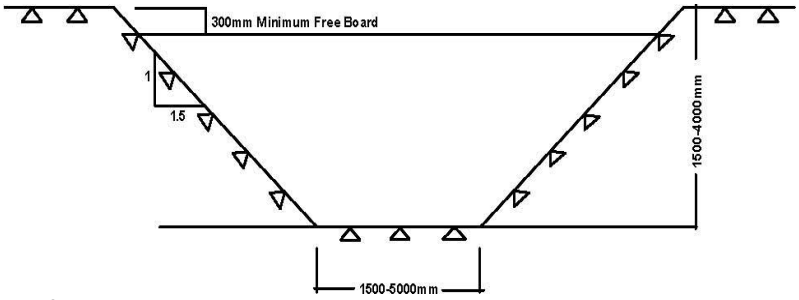
Projection

In implementing various infrastructures for development, 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 spent 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.

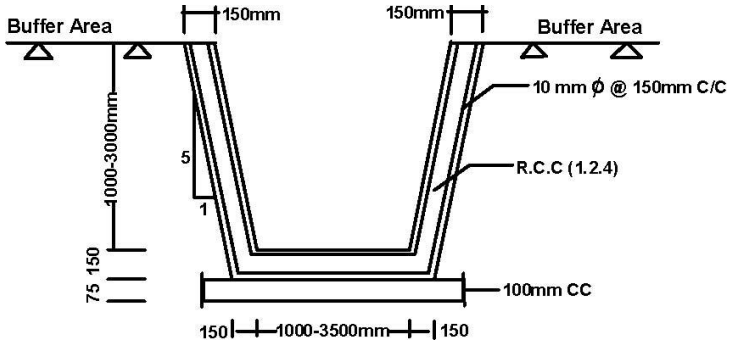
Drainage development for urbanization should start with drains. Drains can be classified as Plot drains, Block drains, Tertiary drains, Secondary drains and Primary drains. Other natural drainage infrastructure is lowland, outfall areas, khals and rivers. Man-made drains are Plot, Block, Tertiary, Secondary and Primary drains and others are natural drainage infrastructures. In planning for drainage network, care will be given on 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 of drainage infrastructures are discussed and presented in lower to higher order which will be considered as a method for drainage planning.

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. Figure 13.1 and 13.2 show the typical cross-section of the primary drain.



A Typical Earthen Primary Drain (Dimensions in mm)
Fig 13.1: Earthen Primary Drain



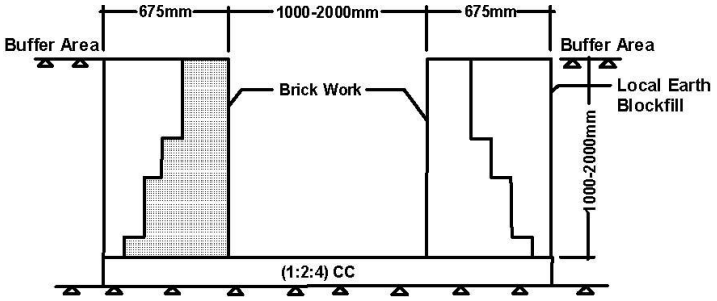
A Typical RCC Primary Drain (Dimensions in mm)
Fig 13.2: Typical RCC Primary Drain

Secondary Drain

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. The typical cross-section, size and shape, and its construction material are shown in figure 13.3.

Tertiary Drain

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. A typical tertiary drain is shown in figure 13.4.



A Typical Secondary Drain (Dimensions in mm)
Fig 13.3: A Typical Secondary Drain

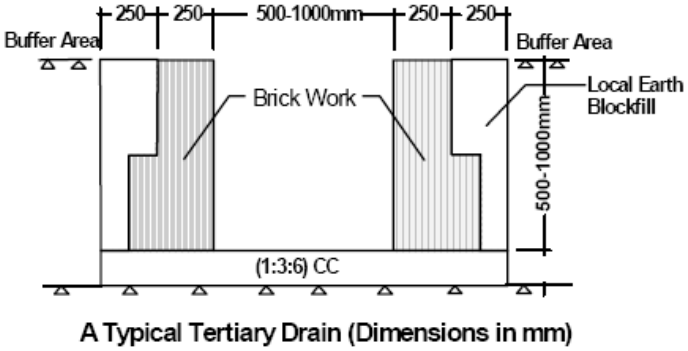
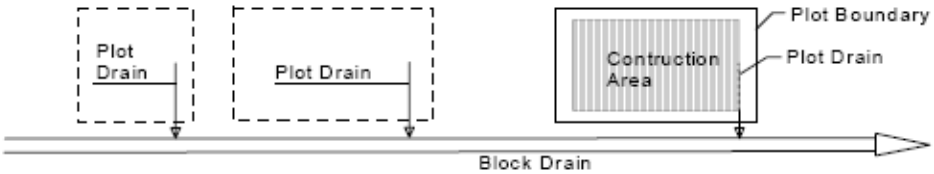


Fig 13.4: A Typical Tertiary Drain

Other kinds of drainage infrastructure are lowland, outfall areas, khals and rivers. Manmade drains are Plot, Block, Tertiary, Secondary and Primary drains and others are natural drainage infrastructures. 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. Figure 4.5 below gives an impression of plot drain usually constructed in a plot and block drains that follow plot drain.



A Sketch Showing Plot and Block Drain
Fig 13.5: Plot and Block 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 neighboring blocks or Mohallahs. Block drains carry

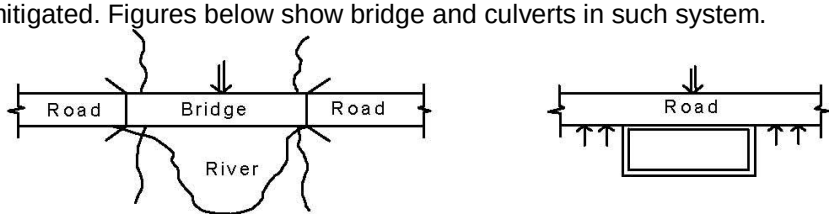
storm water coming from the plot drains. The shape of the block drain is also rectangular, but bigger than plot drains and its bottom is lower than plot drain. The sketch of the plot drain above also shows the block or Mohallah drain under plot drain.
Other Drainage Related Infrastructures

In order to facilitate or mitigate drainage issues some infrastructures are provided or used, these are namely

- Bridges, culverts, box culverts
- Drainage sluices, pipe sluices, siphons
- Flood protection embankments and flood walls
- Sluice gates, Regulators, Navigation lock
- Flood protection and drainage structures.

Bridges, Culverts and Box Culverts

These structures are provided at places wherever roads cross the drainage network system. Such structures are built on the roads to free passage of drainage water and sometimes to provide navigation/ boat passages. Consequently the conflict between drainage and road networks is mitigated. Figures below show bridge and culverts in such system.



Definition Sketch Bridge Definition Sketch Culvert
Fig 13.6: Bridge and Culvert

Drainage sluices, pipe sluices and siphons

Drainage sluices, pipe sluices and siphons are provided on the embankments. Embankments protect the area from floods coming from outside rivers and make the project area flood free.

However storm water from rainfall-runoff within the area causes localized flood, drainage congestion and submergence. A sketch below shows a few of such structures.

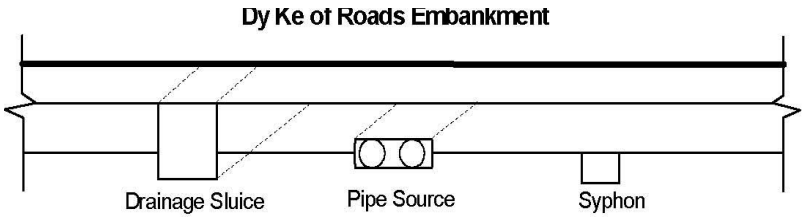


Fig 13.7: A schematic view of Drainage sluice, pipe sluice and siphon on embankment which relieve drainage congestion.

13.3 Plans for Drainage Management and Flood Control

13.3.1 Plan for Drain Network Development Drainage Network Plan

The Paurashava needs a hierarchical drainage system for easy and smooth discharge of storm and waste water comprising tertiary, secondary and primary drains. The existing natural khals will serve as primary drains.

13.3.2 Proposal for Improvement of the Existing Drain Networks

Banaripara paurashava has only 2.15 km pucca drainage network. A narrow portion of the paurashava is served by this network system. Based on the results of drainage study it is recommended for the existing drain that:

- Rehabilitate broken drains;
- Cover the open drains based on budget allocation.
- Construction of new channels and rehabilitation of old ones with enough drainage head.
- Construct a new pump drainage network for the area towards Paira River.
- Remove all un-authorized structures, which developed on drainage structures.
- Regular cleaning and maintenance by the concerned authorities.
- Embarking on a sustained public enlightenment to discourage residents from dumping their refuse into drainage channels.

13.3.3 Outfall of Drains

Maximum drainage out fall exists at Banaripara Paurashava are in river, canal/ khals in different ward and low lying areas.

13.3.3.1 List of Proposed New Drains

There is proposal of only 0.81 km primary drain. In Banaripara paurashava, Sandhya River and Rayer Hut khal is flowing through the paurashava that can be served as good natural drainage. To emphasis on natural drainage system there is proposal of a little amount of primary drain. Based on this primary drain drainage network system of Banaripara Paurashava will be established. Table 13.7 shows the summary of proposed drainage facilities at Banaripara Paurashava. And Map 13.2 shows the drainage network proposal for Banaripara Paurashava. Shandhya River flowing through the Banaripara Paurashava will serve as the main out fall and main natural drainage network. Phasing of proposed drains has been shown in Table 13.8. **Map 13.2** represents the proposed drains in Paurashava.

Table 13.7: Summary of Proposed Drain

Type of Drain	Length (in m)	Length (in km)	%
Primary	811.46	0.81	1.92
Secondary	11524.67	11.52	27.27
Tertiary	29923.04	29.92	70.81
Grand Total	**42259.18**	**42.26**	**100.00**

Table 13.8: Proposals of New Drain

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
PD-1	Primary Drain	404.46	4.50-5.50	2.25-3.50	1st
PD-1	Primary Drain	130.72	4.50-5.50	2.25-3.50	1st
PD-2	Primary Drain	270.28	4.50-5.50	2.25-3.50	1st
PD-2	Primary Drain	6.01	4.50-5.50	2.25-3.50	1st
SD-1	Secondary Drain	171.27	3.50-4.50	1.25-2.25	1st
SD-2	Secondary Drain	234.14	3.50-4.50	1.25-2.25	1st
SD-2	Secondary Drain	6.17	3.50-4.50	1.25-2.25	1st
SD-3	Secondary Drain	299.18	3.50-4.50	1.25-2.25	1st
SD-4	Secondary Drain	103.06	3.50-4.50	1.25-2.25	1st
SD-4	Secondary Drain	93.59	3.50-4.50	1.25-2.25	1st
SD-5	Secondary Drain	223.23	3.50-4.50	1.25-2.25	1st
SD-6	Secondary Drain	57.34	3.50-4.50	1.25-2.25	1st
SD-7	Secondary Drain	56.03	3.50-4.50	1.25-2.25	1st
SD-36	Secondary Drain	0.12	3.50-4.50	1.25-2.25	1st
SD-37	Secondary Drain	67.99	3.50-4.50	1.25-2.25	1st

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
SD-38	Secondary Drain	65.95	3.50-4.50	1.25-2.25	1st
SD-39	Secondary Drain	159.77	3.50-4.50	1.25-2.25	1st
SD-40	Secondary Drain	84.34	3.50-4.50	1.25-2.25	1st
SD-41	Secondary Drain	29.76	3.50-4.50	1.25-2.25	1st
SD-47	Secondary Drain	118.02	3.50-4.50	1.25-2.25	1st
SD-48	Secondary Drain	52.19	3.50-4.50	1.25-2.25	1st
SD-49	Secondary Drain	181.49	3.50-4.50	1.25-2.25	1st
SD-50	Secondary Drain	11.43	3.50-4.50	1.25-2.25	1st
SD-51	Secondary Drain	26.43	3.50-4.50	1.25-2.25	1st
SD-52	Secondary Drain	0.20	3.50-4.50	1.25-2.25	1st
SD-53	Secondary Drain	71.14	3.50-4.50	1.25-2.25	1st
SD-54	Secondary Drain	102.50	3.50-4.50	1.25-2.25	1st
SD-55	Secondary Drain	15.78	3.50-4.50	1.25-2.25	1st
SD-56	Secondary Drain	52.61	3.50-4.50	1.25-2.25	1st
SD-57	Secondary Drain	19.17	3.50-4.50	1.25-2.25	1st
SD-58	Secondary Drain	96.90	3.50-4.50	1.25-2.25	1st
SD-59	Secondary Drain	55.46	3.50-4.50	1.25-2.25	1st
SD-8	Secondary Drain	151.02	3.50-4.50	1.25-2.25	2nd
SD-8	Secondary Drain	259.95	3.50-4.50	1.25-2.25	2nd
SD-9	Secondary Drain	151.80	3.50-4.50	1.25-2.25	2nd
SD-9	Secondary Drain	204.90	3.50-4.50	1.25-2.25	2nd
SD-10	Secondary Drain	1.05	3.50-4.50	1.25-2.25	2nd
SD-10	Secondary Drain	216.93	3.50-4.50	1.25-2.25	2nd
SD-11	Secondary Drain	82.64	3.50-4.50	1.25-2.25	2nd
SD-12	Secondary Drain	55.31	3.50-4.50	1.25-2.25	2nd
SD-13	Secondary Drain	373.10	3.50-4.50	1.25-2.25	2nd
SD-13	Secondary Drain	75.30	3.50-4.50	1.25-2.25	2nd
SD-14	Secondary Drain	280.15	3.50-4.50	1.25-2.25	2nd
SD-15	Secondary Drain	209.04	3.50-4.50	1.25-2.25	2nd
SD-16	Secondary Drain	356.85	3.50-4.50	1.25-2.25	2nd
SD-18	Secondary Drain	427.39	3.50-4.50	1.25-2.25	2nd
SD-18	Secondary Drain	5.14	3.50-4.50	1.25-2.25	2nd
SD-19	Secondary Drain	98.70	3.50-4.50	1.25-2.25	2nd
SD-19	Secondary Drain	230.23	3.50-4.50	1.25-2.25	2nd
SD-20	Secondary Drain	193.94	3.50-4.50	1.25-2.25	2nd
SD-21	Secondary Drain	354.80	3.50-4.50	1.25-2.25	2nd
SD-22	Secondary Drain	70.93	3.50-4.50	1.25-2.25	2nd
SD-22	Secondary Drain	255.75	3.50-4.50	1.25-2.25	2nd
SD-23	Secondary Drain	151.57	3.50-4.50	1.25-2.25	2nd
SD-23	Secondary Drain	65.58	3.50-4.50	1.25-2.25	2nd
SD-24	Secondary Drain	174.82	3.50-4.50	1.25-2.25	2nd
SD-28	Secondary Drain	138.84	3.50-4.50	1.25-2.25	2nd
SD-29	Secondary Drain	40.51	3.50-4.50	1.25-2.25	2nd
SD-29	Secondary Drain	6.81	3.50-4.50	1.25-2.25	2nd
SD-33	Secondary Drain	144.99	3.50-4.50	1.25-2.25	2nd
SD-33	Secondary Drain	108.48	3.50-4.50	1.25-2.25	2nd
SD-42	Secondary Drain	328.00	3.50-4.50	1.25-2.25	2nd
SD-43	Secondary Drain	202.64	3.50-4.50	1.25-2.25	2nd
SD-44	Secondary Drain	80.71	3.50-4.50	1.25-2.25	2nd
SD-45	Secondary Drain	24.20	3.50-4.50	1.25-2.25	2nd
SD-46	Secondary Drain	78.56	3.50-4.50	1.25-2.25	2nd
SD-62	Secondary Drain	201.49	3.50-4.50	1.25-2.25	2nd
SD-63	Secondary Drain	72.29	3.50-4.50	1.25-2.25	2nd
SD-64	Secondary Drain	62.76	3.50-4.50	1.25-2.25	2nd
SD-65	Secondary Drain	42.68	3.50-4.50	1.25-2.25	2nd
SD-66	Secondary Drain	87.10	3.50-4.50	1.25-2.25	2nd
SD-67	Secondary Drain	73.20	3.50-4.50	1.25-2.25	2nd
SD-68	Secondary Drain	218.16	3.50-4.50	1.25-2.25	2nd
SD-69	Secondary Drain	195.25	3.50-4.50	1.25-2.25	2nd
SD-70	Secondary Drain	68.85	3.50-4.50	1.25-2.25	2nd
SD-70	Secondary Drain	209.88	3.50-4.50	1.25-2.25	2nd
SD-70	Secondary Drain	41.42	3.50-4.50	1.25-2.25	2nd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
SD-71	Secondary Drain	0.72	3.50-4.50	1.25-2.25	2nd
SD-72	Secondary Drain	0.85	3.50-4.50	1.25-2.25	2nd
SD-73	Secondary Drain	2.31	3.50-4.50	1.25-2.25	2nd
SD-74	Secondary Drain	64.77	3.50-4.50	1.25-2.25	2nd
SD-75	Secondary Drain	251.51	3.50-4.50	1.25-2.25	2nd
SD-76	Secondary Drain	5.15	3.50-4.50	1.25-2.25	2nd
SD-76	Secondary Drain	88.67	3.50-4.50	1.25-2.25	2nd
SD-76	Secondary Drain	6.08	3.50-4.50	1.25-2.25	2nd
SD-26	Secondary Drain	91.83	3.50-4.50	1.25-2.25	2nd
SD-26	Secondary Drain	63.55	3.50-4.50	1.25-2.25	2nd
SD-14	Secondary Drain	0.12	3.50-4.50	1.25-2.25	2nd
SD-8	Secondary Drain	221.53	3.50-4.50	1.25-2.25	2nd
SD-8	Secondary Drain	346.36	3.50-4.50	1.25-2.25	2nd
SD-17	Secondary Drain	111.39	3.50-4.50	1.25-2.25	3rd
SD-25	Secondary Drain	115.32	3.50-4.50	1.25-2.25	3rd
SD-27	Secondary Drain	35.28	3.50-4.50	1.25-2.25	3rd
SD-30	Secondary Drain	0.35	3.50-4.50	1.25-2.25	3rd
SD-30	Secondary Drain	0.09	3.50-4.50	1.25-2.25	3rd
SD-31	Secondary Drain	205.10	3.50-4.50	1.25-2.25	3rd
SD-32	Secondary Drain	58.30	3.50-4.50	1.25-2.25	3rd
SD-34	Secondary Drain	57.14	3.50-4.50	1.25-2.25	3rd
SD-34	Secondary Drain	267.78	3.50-4.50	1.25-2.25	3rd
SD-34	Secondary Drain	83.16	3.50-4.50	1.25-2.25	3rd
SD-35	Secondary Drain	101.73	3.50-4.50	1.25-2.25	3rd
SD-60	Secondary Drain	15.94	3.50-4.50	1.25-2.25	3rd
SD-61	Secondary Drain	0.43	3.50-4.50	1.25-2.25	3rd
SD-30	Secondary Drain	0.27	3.50-4.50	1.25-2.25	3rd
TD-399	Tertiary Drain	45.93	2.50-3.50	0.64-1.25	1st
TD-401	Tertiary Drain	66.90	2.50-3.50	0.64-1.25	1st
TD-410	Tertiary Drain	53.78	2.50-3.50	0.64-1.25	1st
TD-411	Tertiary Drain	13.43	2.50-3.50	0.64-1.25	1st
TD-411	Tertiary Drain	108.31	2.50-3.50	0.64-1.25	1st
TD-422	Tertiary Drain	38.50	2.50-3.50	0.64-1.25	1st
TD-423	Tertiary Drain	39.74	2.50-3.50	0.64-1.25	1st
TD-424	Tertiary Drain	0.06	2.50-3.50	0.64-1.25	1st
TD-425	Tertiary Drain	124.68	2.50-3.50	0.64-1.25	1st
TD-431	Tertiary Drain	39.37	2.50-3.50	0.64-1.25	1st
TD-1	Tertiary Drain	215.31	2.50-3.50	0.64-1.25	2nd
TD-2	Tertiary Drain	149.54	2.50-3.50	0.64-1.25	2nd
TD-3	Tertiary Drain	202.87	2.50-3.50	0.64-1.25	2nd
TD-4	Tertiary Drain	30.71	2.50-3.50	0.64-1.25	2nd
TD-5	Tertiary Drain	30.42	2.50-3.50	0.64-1.25	2nd
TD-6	Tertiary Drain	60.23	2.50-3.50	0.64-1.25	2nd
TD-7	Tertiary Drain	45.89	2.50-3.50	0.64-1.25	2nd
TD-8	Tertiary Drain	25.85	2.50-3.50	0.64-1.25	2nd
TD-9	Tertiary Drain	91.24	2.50-3.50	0.64-1.25	2nd
TD-10	Tertiary Drain	33.83	2.50-3.50	0.64-1.25	2nd
TD-11	Tertiary Drain	96.22	2.50-3.50	0.64-1.25	2nd
TD-12	Tertiary Drain	44.76	2.50-3.50	0.64-1.25	2nd
TD-13	Tertiary Drain	27.07	2.50-3.50	0.64-1.25	2nd
TD-14	Tertiary Drain	63.72	2.50-3.50	0.64-1.25	2nd
TD-15	Tertiary Drain	20.11	2.50-3.50	0.64-1.25	2nd
TD-16	Tertiary Drain	43.81	2.50-3.50	0.64-1.25	2nd
TD-17	Tertiary Drain	19.50	2.50-3.50	0.64-1.25	2nd
TD-18	Tertiary Drain	29.57	2.50-3.50	0.64-1.25	2nd
TD-19	Tertiary Drain	54.50	2.50-3.50	0.64-1.25	2nd
TD-20	Tertiary Drain	19.39	2.50-3.50	0.64-1.25	2nd
TD-21	Tertiary Drain	24.62	2.50-3.50	0.64-1.25	2nd
TD-22	Tertiary Drain	45.10	2.50-3.50	0.64-1.25	2nd
TD-23	Tertiary Drain	28.32	2.50-3.50	0.64-1.25	2nd
TD-24	Tertiary Drain	28.87	2.50-3.50	0.64-1.25	2nd
TD-25	Tertiary Drain	50.30	2.50-3.50	0.64-1.25	2nd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
TD-26	Tertiary Drain	12.20	2.50-3.50	0.64-1.25	2nd
TD-27	Tertiary Drain	29.19	2.50-3.50	0.64-1.25	2nd
TD-28	Tertiary Drain	24.79	2.50-3.50	0.64-1.25	2nd
TD-29	Tertiary Drain	15.82	2.50-3.50	0.64-1.25	2nd
TD-30	Tertiary Drain	13.28	2.50-3.50	0.64-1.25	2nd
TD-31	Tertiary Drain	7.61	2.50-3.50	0.64-1.25	2nd
TD-32	Tertiary Drain	6.80	2.50-3.50	0.64-1.25	2nd
TD-33	Tertiary Drain	22.74	2.50-3.50	0.64-1.25	2nd
TD-34	Tertiary Drain	11.98	2.50-3.50	0.64-1.25	2nd
TD-35	Tertiary Drain	30.82	2.50-3.50	0.64-1.25	2nd
TD-36	Tertiary Drain	23.06	2.50-3.50	0.64-1.25	2nd
TD-37	Tertiary Drain	26.69	2.50-3.50	0.64-1.25	2nd
TD-38	Tertiary Drain	32.85	2.50-3.50	0.64-1.25	2nd
TD-39	Tertiary Drain	29.26	2.50-3.50	0.64-1.25	2nd
TD-40	Tertiary Drain	54.29	2.50-3.50	0.64-1.25	2nd
TD-41	Tertiary Drain	61.01	2.50-3.50	0.64-1.25	2nd
TD-42	Tertiary Drain	59.27	2.50-3.50	0.64-1.25	2nd
TD-43	Tertiary Drain	20.01	2.50-3.50	0.64-1.25	2nd
TD-44	Tertiary Drain	47.42	2.50-3.50	0.64-1.25	2nd
TD-45	Tertiary Drain	76.20	2.50-3.50	0.64-1.25	2nd
TD-46	Tertiary Drain	59.88	2.50-3.50	0.64-1.25	2nd
TD-47	Tertiary Drain	24.12	2.50-3.50	0.64-1.25	2nd
TD-48	Tertiary Drain	11.61	2.50-3.50	0.64-1.25	2nd
TD-49	Tertiary Drain	12.37	2.50-3.50	0.64-1.25	2nd
TD-50	Tertiary Drain	14.83	2.50-3.50	0.64-1.25	2nd
TD-51	Tertiary Drain	36.06	2.50-3.50	0.64-1.25	2nd
TD-52	Tertiary Drain	18.30	2.50-3.50	0.64-1.25	2nd
TD-53	Tertiary Drain	19.67	2.50-3.50	0.64-1.25	2nd
TD-54	Tertiary Drain	58.71	2.50-3.50	0.64-1.25	2nd
TD-55	Tertiary Drain	30.95	2.50-3.50	0.64-1.25	2nd
TD-56	Tertiary Drain	31.15	2.50-3.50	0.64-1.25	2nd
TD-57	Tertiary Drain	52.16	2.50-3.50	0.64-1.25	2nd
TD-58	Tertiary Drain	43.37	2.50-3.50	0.64-1.25	2nd
TD-58	Tertiary Drain	6.38	2.50-3.50	0.64-1.25	2nd
TD-59	Tertiary Drain	27.51	2.50-3.50	0.64-1.25	2nd
TD-60	Tertiary Drain	77.44	2.50-3.50	0.64-1.25	2nd
TD-61	Tertiary Drain	73.36	2.50-3.50	0.64-1.25	2nd
TD-62	Tertiary Drain	19.00	2.50-3.50	0.64-1.25	2nd
TD-63	Tertiary Drain	94.46	2.50-3.50	0.64-1.25	2nd
TD-64	Tertiary Drain	80.82	2.50-3.50	0.64-1.25	2nd
TD-65	Tertiary Drain	91.27	2.50-3.50	0.64-1.25	2nd
TD-66	Tertiary Drain	21.88	2.50-3.50	0.64-1.25	2nd
TD-67	Tertiary Drain	119.89	2.50-3.50	0.64-1.25	2nd
TD-68	Tertiary Drain	125.00	2.50-3.50	0.64-1.25	2nd
TD-69	Tertiary Drain	105.94	2.50-3.50	0.64-1.25	2nd
TD-70	Tertiary Drain	78.69	2.50-3.50	0.64-1.25	2nd
TD-71	Tertiary Drain	72.50	2.50-3.50	0.64-1.25	2nd
TD-72	Tertiary Drain	29.07	2.50-3.50	0.64-1.25	2nd
TD-73	Tertiary Drain	70.90	2.50-3.50	0.64-1.25	2nd
TD-74	Tertiary Drain	72.76	2.50-3.50	0.64-1.25	2nd
TD-75	Tertiary Drain	40.22	2.50-3.50	0.64-1.25	2nd
TD-76	Tertiary Drain	72.29	2.50-3.50	0.64-1.25	2nd
TD-77	Tertiary Drain	14.11	2.50-3.50	0.64-1.25	2nd
TD-78	Tertiary Drain	29.41	2.50-3.50	0.64-1.25	2nd
TD-79	Tertiary Drain	51.54	2.50-3.50	0.64-1.25	2nd
TD-80	Tertiary Drain	35.13	2.50-3.50	0.64-1.25	2nd
TD-81	Tertiary Drain	35.59	2.50-3.50	0.64-1.25	2nd
TD-82	Tertiary Drain	32.94	2.50-3.50	0.64-1.25	2nd
TD-83	Tertiary Drain	40.70	2.50-3.50	0.64-1.25	2nd
TD-84	Tertiary Drain	14.64	2.50-3.50	0.64-1.25	2nd
TD-85	Tertiary Drain	67.81	2.50-3.50	0.64-1.25	2nd
TD-86	Tertiary Drain	83.58	2.50-3.50	0.64-1.25	2nd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
TD-87	Tertiary Drain	59.52	2.50-3.50	0.64-1.25	2nd
TD-88	Tertiary Drain	23.88	2.50-3.50	0.64-1.25	2nd
TD-89	Tertiary Drain	19.33	2.50-3.50	0.64-1.25	2nd
TD-90	Tertiary Drain	40.69	2.50-3.50	0.64-1.25	2nd
TD-91	Tertiary Drain	145.96	2.50-3.50	0.64-1.25	2nd
TD-92	Tertiary Drain	170.89	2.50-3.50	0.64-1.25	2nd
TD-92	Tertiary Drain	0.67	2.50-3.50	0.64-1.25	2nd
TD-93	Tertiary Drain	15.66	2.50-3.50	0.64-1.25	2nd
TD-96	Tertiary Drain	83.93	2.50-3.50	0.64-1.25	2nd
TD-98	Tertiary Drain	46.48	2.50-3.50	0.64-1.25	2nd
TD-99	Tertiary Drain	17.31	2.50-3.50	0.64-1.25	2nd
TD-100	Tertiary Drain	60.64	2.50-3.50	0.64-1.25	2nd
TD-101	Tertiary Drain	13.21	2.50-3.50	0.64-1.25	2nd
TD-102	Tertiary Drain	23.31	2.50-3.50	0.64-1.25	2nd
TD-103	Tertiary Drain	20.58	2.50-3.50	0.64-1.25	2nd
TD-104	Tertiary Drain	51.24	2.50-3.50	0.64-1.25	2nd
TD-105	Tertiary Drain	50.24	2.50-3.50	0.64-1.25	2nd
TD-106	Tertiary Drain	111.21	2.50-3.50	0.64-1.25	2nd
TD-106	Tertiary Drain	7.34	2.50-3.50	0.64-1.25	2nd
TD-107	Tertiary Drain	26.07	2.50-3.50	0.64-1.25	2nd
TD-107	Tertiary Drain	7.47	2.50-3.50	0.64-1.25	2nd
TD-108	Tertiary Drain	88.39	2.50-3.50	0.64-1.25	2nd
TD-109	Tertiary Drain	85.81	2.50-3.50	0.64-1.25	2nd
TD-110	Tertiary Drain	130.50	2.50-3.50	0.64-1.25	2nd
TD-111	Tertiary Drain	105.12	2.50-3.50	0.64-1.25	2nd
TD-111	Tertiary Drain	3.91	2.50-3.50	0.64-1.25	2nd
TD-112	Tertiary Drain	31.04	2.50-3.50	0.64-1.25	2nd
TD-113	Tertiary Drain	56.55	2.50-3.50	0.64-1.25	2nd
TD-114	Tertiary Drain	42.05	2.50-3.50	0.64-1.25	2nd
TD-115	Tertiary Drain	45.62	2.50-3.50	0.64-1.25	2nd
TD-116	Tertiary Drain	281.45	2.50-3.50	0.64-1.25	2nd
TD-116	Tertiary Drain	86.24	2.50-3.50	0.64-1.25	2nd
TD-117	Tertiary Drain	52.16	2.50-3.50	0.64-1.25	2nd
TD-118	Tertiary Drain	63.83	2.50-3.50	0.64-1.25	2nd
TD-119	Tertiary Drain	23.13	2.50-3.50	0.64-1.25	2nd
TD-121	Tertiary Drain	84.09	2.50-3.50	0.64-1.25	2nd
TD-121	Tertiary Drain	12.98	2.50-3.50	0.64-1.25	2nd
TD-122	Tertiary Drain	59.94	2.50-3.50	0.64-1.25	2nd
TD-123	Tertiary Drain	28.63	2.50-3.50	0.64-1.25	2nd
TD-124	Tertiary Drain	57.82	2.50-3.50	0.64-1.25	2nd
TD-124	Tertiary Drain	19.04	2.50-3.50	0.64-1.25	2nd
TD-125	Tertiary Drain	182.50	2.50-3.50	0.64-1.25	2nd
TD-126	Tertiary Drain	35.56	2.50-3.50	0.64-1.25	2nd
TD-127	Tertiary Drain	40.43	2.50-3.50	0.64-1.25	2nd
TD-128	Tertiary Drain	44.01	2.50-3.50	0.64-1.25	2nd
TD-129	Tertiary Drain	28.12	2.50-3.50	0.64-1.25	2nd
TD-129	Tertiary Drain	6.37	2.50-3.50	0.64-1.25	2nd
TD-130	Tertiary Drain	102.81	2.50-3.50	0.64-1.25	2nd
TD-130	Tertiary Drain	5.95	2.50-3.50	0.64-1.25	2nd
TD-131	Tertiary Drain	38.96	2.50-3.50	0.64-1.25	2nd
TD-132	Tertiary Drain	66.31	2.50-3.50	0.64-1.25	2nd
TD-133	Tertiary Drain	28.47	2.50-3.50	0.64-1.25	2nd
TD-134	Tertiary Drain	22.87	2.50-3.50	0.64-1.25	2nd
TD-135	Tertiary Drain	33.98	2.50-3.50	0.64-1.25	2nd
TD-136	Tertiary Drain	61.88	2.50-3.50	0.64-1.25	2nd
TD-137	Tertiary Drain	19.40	2.50-3.50	0.64-1.25	2nd
TD-138	Tertiary Drain	24.09	2.50-3.50	0.64-1.25	2nd
TD-138	Tertiary Drain	6.84	2.50-3.50	0.64-1.25	2nd
TD-139	Tertiary Drain	122.19	2.50-3.50	0.64-1.25	2nd
TD-140	Tertiary Drain	30.54	2.50-3.50	0.64-1.25	2nd
TD-141	Tertiary Drain	40.47	2.50-3.50	0.64-1.25	2nd
TD-142	Tertiary Drain	38.52	2.50-3.50	0.64-1.25	2nd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
TD-143	Tertiary Drain	22.41	2.50-3.50	0.64-1.25	2nd
TD-144	Tertiary Drain	85.56	2.50-3.50	0.64-1.25	2nd
TD-145	Tertiary Drain	57.82	2.50-3.50	0.64-1.25	2nd
TD-146	Tertiary Drain	25.79	2.50-3.50	0.64-1.25	2nd
TD-147	Tertiary Drain	21.49	2.50-3.50	0.64-1.25	2nd
TD-148	Tertiary Drain	35.44	2.50-3.50	0.64-1.25	2nd
TD-149	Tertiary Drain	35.16	2.50-3.50	0.64-1.25	2nd
TD-149	Tertiary Drain	2.14	2.50-3.50	0.64-1.25	2nd
TD-202	Tertiary Drain	198.13	2.50-3.50	0.64-1.25	2nd
TD-256	Tertiary Drain	189.20	2.50-3.50	0.64-1.25	2nd
TD-338	Tertiary Drain	186.88	2.50-3.50	0.64-1.25	2nd
TD-338	Tertiary Drain	35.27	2.50-3.50	0.64-1.25	2nd
TD-396	Tertiary Drain	148.26	2.50-3.50	0.64-1.25	2nd
TD-398	Tertiary Drain	123.61	2.50-3.50	0.64-1.25	2nd
TD-408	Tertiary Drain	12.46	2.50-3.50	0.64-1.25	2nd
TD-409	Tertiary Drain	59.74	2.50-3.50	0.64-1.25	2nd
TD-413	Tertiary Drain	188.59	2.50-3.50	0.64-1.25	2nd
TD-414	Tertiary Drain	65.21	2.50-3.50	0.64-1.25	2nd
TD-416	Tertiary Drain	26.81	2.50-3.50	0.64-1.25	2nd
TD-417	Tertiary Drain	31.98	2.50-3.50	0.64-1.25	2nd
TD-418	Tertiary Drain	25.77	2.50-3.50	0.64-1.25	2nd
TD-419	Tertiary Drain	77.55	2.50-3.50	0.64-1.25	2nd
TD-420	Tertiary Drain	61.79	2.50-3.50	0.64-1.25	2nd
TD-421	Tertiary Drain	37.54	2.50-3.50	0.64-1.25	2nd
TD-426	Tertiary Drain	113.12	2.50-3.50	0.64-1.25	2nd
TD-427	Tertiary Drain	3.88	2.50-3.50	0.64-1.25	2nd
TD-428	Tertiary Drain	73.30	2.50-3.50	0.64-1.25	2nd
TD-428	Tertiary Drain	88.78	2.50-3.50	0.64-1.25	2nd
TD-429	Tertiary Drain	36.73	2.50-3.50	0.64-1.25	2nd
TD-435	Tertiary Drain	256.64	2.50-3.50	0.64-1.25	2nd
TD-436	Tertiary Drain	51.55	2.50-3.50	0.64-1.25	2nd
TD-439	Tertiary Drain	66.30	2.50-3.50	0.64-1.25	2nd
TD-2	Tertiary Drain	143.77	2.50-3.50	0.64-1.25	2nd
TD-150	Tertiary Drain	52.87	2.50-3.50	0.64-1.25	3rd
TD-150	Tertiary Drain	4.47	2.50-3.50	0.64-1.25	3rd
TD-151	Tertiary Drain	67.71	2.50-3.50	0.64-1.25	3rd
TD-152	Tertiary Drain	19.34	2.50-3.50	0.64-1.25	3rd
TD-153	Tertiary Drain	47.25	2.50-3.50	0.64-1.25	3rd
TD-154	Tertiary Drain	90.82	2.50-3.50	0.64-1.25	3rd
TD-155	Tertiary Drain	36.25	2.50-3.50	0.64-1.25	3rd
TD-156	Tertiary Drain	44.27	2.50-3.50	0.64-1.25	3rd
TD-157	Tertiary Drain	50.70	2.50-3.50	0.64-1.25	3rd
TD-158	Tertiary Drain	59.66	2.50-3.50	0.64-1.25	3rd
TD-159	Tertiary Drain	68.20	2.50-3.50	0.64-1.25	3rd
TD-159	Tertiary Drain	8.29	2.50-3.50	0.64-1.25	3rd
TD-160	Tertiary Drain	49.18	2.50-3.50	0.64-1.25	3rd
TD-161	Tertiary Drain	56.71	2.50-3.50	0.64-1.25	3rd
TD-162	Tertiary Drain	41.92	2.50-3.50	0.64-1.25	3rd
TD-163	Tertiary Drain	27.49	2.50-3.50	0.64-1.25	3rd
TD-164	Tertiary Drain	45.99	2.50-3.50	0.64-1.25	3rd
TD-165	Tertiary Drain	37.94	2.50-3.50	0.64-1.25	3rd
TD-165	Tertiary Drain	6.01	2.50-3.50	0.64-1.25	3rd
TD-166	Tertiary Drain	25.62	2.50-3.50	0.64-1.25	3rd
TD-167	Tertiary Drain	344.12	2.50-3.50	0.64-1.25	3rd
TD-167	Tertiary Drain	13.39	2.50-3.50	0.64-1.25	3rd
TD-168	Tertiary Drain	157.77	2.50-3.50	0.64-1.25	3rd
TD-169	Tertiary Drain	136.82	2.50-3.50	0.64-1.25	3rd
TD-169	Tertiary Drain	8.71	2.50-3.50	0.64-1.25	3rd
TD-170	Tertiary Drain	90.51	2.50-3.50	0.64-1.25	3rd
TD-171	Tertiary Drain	20.23	2.50-3.50	0.64-1.25	3rd
TD-172	Tertiary Drain	45.85	2.50-3.50	0.64-1.25	3rd
TD-173	Tertiary Drain	22.46	2.50-3.50	0.64-1.25	3rd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
TD-174	Tertiary Drain	36.48	2.50-3.50	0.64-1.25	3rd
TD-175	Tertiary Drain	58.00	2.50-3.50	0.64-1.25	3rd
TD-176	Tertiary Drain	223.17	2.50-3.50	0.64-1.25	3rd
TD-177	Tertiary Drain	96.89	2.50-3.50	0.64-1.25	3rd
TD-178	Tertiary Drain	102.33	2.50-3.50	0.64-1.25	3rd
TD-179	Tertiary Drain	63.62	2.50-3.50	0.64-1.25	3rd
TD-179	Tertiary Drain	172.29	2.50-3.50	0.64-1.25	3rd
TD-180	Tertiary Drain	7.44	2.50-3.50	0.64-1.25	3rd
TD-180	Tertiary Drain	71.53	2.50-3.50	0.64-1.25	3rd
TD-181	Tertiary Drain	16.01	2.50-3.50	0.64-1.25	3rd
TD-182	Tertiary Drain	69.40	2.50-3.50	0.64-1.25	3rd
TD-183	Tertiary Drain	21.57	2.50-3.50	0.64-1.25	3rd
TD-184	Tertiary Drain	60.67	2.50-3.50	0.64-1.25	3rd
TD-185	Tertiary Drain	90.69	2.50-3.50	0.64-1.25	3rd
TD-186	Tertiary Drain	122.01	2.50-3.50	0.64-1.25	3rd
TD-187	Tertiary Drain	42.12	2.50-3.50	0.64-1.25	3rd
TD-188	Tertiary Drain	68.29	2.50-3.50	0.64-1.25	3rd
TD-189	Tertiary Drain	91.12	2.50-3.50	0.64-1.25	3rd
TD-190	Tertiary Drain	7.05	2.50-3.50	0.64-1.25	3rd
TD-190	Tertiary Drain	27.14	2.50-3.50	0.64-1.25	3rd
TD-191	Tertiary Drain	45.51	2.50-3.50	0.64-1.25	3rd
TD-192	Tertiary Drain	26.99	2.50-3.50	0.64-1.25	3rd
TD-193	Tertiary Drain	19.79	2.50-3.50	0.64-1.25	3rd
TD-194	Tertiary Drain	27.17	2.50-3.50	0.64-1.25	3rd
TD-195	Tertiary Drain	21.60	2.50-3.50	0.64-1.25	3rd
TD-196	Tertiary Drain	27.72	2.50-3.50	0.64-1.25	3rd
TD-197	Tertiary Drain	19.79	2.50-3.50	0.64-1.25	3rd
TD-198	Tertiary Drain	17.23	2.50-3.50	0.64-1.25	3rd
TD-199	Tertiary Drain	33.61	2.50-3.50	0.64-1.25	3rd
TD-200	Tertiary Drain	15.01	2.50-3.50	0.64-1.25	3rd
TD-201	Tertiary Drain	28.08	2.50-3.50	0.64-1.25	3rd
TD-203	Tertiary Drain	30.38	2.50-3.50	0.64-1.25	3rd
TD-204	Tertiary Drain	149.88	2.50-3.50	0.64-1.25	3rd
TD-206	Tertiary Drain	88.63	2.50-3.50	0.64-1.25	3rd
TD-207	Tertiary Drain	188.73	2.50-3.50	0.64-1.25	3rd
TD-208	Tertiary Drain	22.80	2.50-3.50	0.64-1.25	3rd
TD-209	Tertiary Drain	74.25	2.50-3.50	0.64-1.25	3rd
TD-210	Tertiary Drain	69.23	2.50-3.50	0.64-1.25	3rd
TD-211	Tertiary Drain	38.18	2.50-3.50	0.64-1.25	3rd
TD-212	Tertiary Drain	37.87	2.50-3.50	0.64-1.25	3rd
TD-213	Tertiary Drain	12.41	2.50-3.50	0.64-1.25	3rd
TD-214	Tertiary Drain	43.36	2.50-3.50	0.64-1.25	3rd
TD-215	Tertiary Drain	78.95	2.50-3.50	0.64-1.25	3rd
TD-216	Tertiary Drain	76.88	2.50-3.50	0.64-1.25	3rd
TD-217	Tertiary Drain	21.86	2.50-3.50	0.64-1.25	3rd
TD-218	Tertiary Drain	13.73	2.50-3.50	0.64-1.25	3rd
TD-219	Tertiary Drain	114.84	2.50-3.50	0.64-1.25	3rd
TD-220	Tertiary Drain	24.72	2.50-3.50	0.64-1.25	3rd
TD-221	Tertiary Drain	82.70	2.50-3.50	0.64-1.25	3rd
TD-222	Tertiary Drain	166.92	2.50-3.50	0.64-1.25	3rd
TD-223	Tertiary Drain	4.53	2.50-3.50	0.64-1.25	3rd
TD-223	Tertiary Drain	28.51	2.50-3.50	0.64-1.25	3rd
TD-224	Tertiary Drain	5.13	2.50-3.50	0.64-1.25	3rd
TD-224	Tertiary Drain	108.89	2.50-3.50	0.64-1.25	3rd
TD-225	Tertiary Drain	117.87	2.50-3.50	0.64-1.25	3rd
TD-226	Tertiary Drain	11.82	2.50-3.50	0.64-1.25	3rd
TD-227	Tertiary Drain	23.78	2.50-3.50	0.64-1.25	3rd
TD-228	Tertiary Drain	21.19	2.50-3.50	0.64-1.25	3rd
TD-229	Tertiary Drain	51.15	2.50-3.50	0.64-1.25	3rd
TD-229	Tertiary Drain	4.12	2.50-3.50	0.64-1.25	3rd
TD-230	Tertiary Drain	142.30	2.50-3.50	0.64-1.25	3rd
TD-231	Tertiary Drain	27.07	2.50-3.50	0.64-1.25	3rd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
TD-232	Tertiary Drain	218.17	2.50-3.50	0.64-1.25	3rd
TD-233	Tertiary Drain	121.94	2.50-3.50	0.64-1.25	3rd
TD-234	Tertiary Drain	5.59	2.50-3.50	0.64-1.25	3rd
TD-235	Tertiary Drain	29.87	2.50-3.50	0.64-1.25	3rd
TD-236	Tertiary Drain	38.50	2.50-3.50	0.64-1.25	3rd
TD-237	Tertiary Drain	54.39	2.50-3.50	0.64-1.25	3rd
TD-237	Tertiary Drain	3.89	2.50-3.50	0.64-1.25	3rd
TD-238	Tertiary Drain	19.65	2.50-3.50	0.64-1.25	3rd
TD-239	Tertiary Drain	60.34	2.50-3.50	0.64-1.25	3rd
TD-240	Tertiary Drain	47.00	2.50-3.50	0.64-1.25	3rd
TD-241	Tertiary Drain	22.51	2.50-3.50	0.64-1.25	3rd
TD-242	Tertiary Drain	55.75	2.50-3.50	0.64-1.25	3rd
TD-243	Tertiary Drain	30.24	2.50-3.50	0.64-1.25	3rd
TD-244	Tertiary Drain	59.35	2.50-3.50	0.64-1.25	3rd
TD-245	Tertiary Drain	35.64	2.50-3.50	0.64-1.25	3rd
TD-246	Tertiary Drain	27.87	2.50-3.50	0.64-1.25	3rd
TD-247	Tertiary Drain	61.14	2.50-3.50	0.64-1.25	3rd
TD-248	Tertiary Drain	16.49	2.50-3.50	0.64-1.25	3rd
TD-249	Tertiary Drain	108.45	2.50-3.50	0.64-1.25	3rd
TD-250	Tertiary Drain	75.93	2.50-3.50	0.64-1.25	3rd
TD-251	Tertiary Drain	35.10	2.50-3.50	0.64-1.25	3rd
TD-252	Tertiary Drain	25.23	2.50-3.50	0.64-1.25	3rd
TD-253	Tertiary Drain	31.00	2.50-3.50	0.64-1.25	3rd
TD-254	Tertiary Drain	26.62	2.50-3.50	0.64-1.25	3rd
TD-255	Tertiary Drain	151.59	2.50-3.50	0.64-1.25	3rd
TD-257	Tertiary Drain	36.18	2.50-3.50	0.64-1.25	3rd
TD-257	Tertiary Drain	80.34	2.50-3.50	0.64-1.25	3rd
TD-258	Tertiary Drain	100.15	2.50-3.50	0.64-1.25	3rd
TD-259	Tertiary Drain	53.74	2.50-3.50	0.64-1.25	3rd
TD-260	Tertiary Drain	74.40	2.50-3.50	0.64-1.25	3rd
TD-260	Tertiary Drain	3.25	2.50-3.50	0.64-1.25	3rd
TD-261	Tertiary Drain	75.40	2.50-3.50	0.64-1.25	3rd
TD-262	Tertiary Drain	32.32	2.50-3.50	0.64-1.25	3rd
TD-263	Tertiary Drain	29.70	2.50-3.50	0.64-1.25	3rd
TD-264	Tertiary Drain	23.77	2.50-3.50	0.64-1.25	3rd
TD-265	Tertiary Drain	89.42	2.50-3.50	0.64-1.25	3rd
TD-266	Tertiary Drain	22.28	2.50-3.50	0.64-1.25	3rd
TD-267	Tertiary Drain	8.44	2.50-3.50	0.64-1.25	3rd
TD-268	Tertiary Drain	24.93	2.50-3.50	0.64-1.25	3rd
TD-269	Tertiary Drain	29.13	2.50-3.50	0.64-1.25	3rd
TD-270	Tertiary Drain	204.44	2.50-3.50	0.64-1.25	3rd
TD-271	Tertiary Drain	122.30	2.50-3.50	0.64-1.25	3rd
TD-272	Tertiary Drain	66.27	2.50-3.50	0.64-1.25	3rd
TD-273	Tertiary Drain	18.59	2.50-3.50	0.64-1.25	3rd
TD-274	Tertiary Drain	43.05	2.50-3.50	0.64-1.25	3rd
TD-275	Tertiary Drain	41.64	2.50-3.50	0.64-1.25	3rd
TD-278	Tertiary Drain	88.04	2.50-3.50	0.64-1.25	3rd
TD-279	Tertiary Drain	9.80	2.50-3.50	0.64-1.25	3rd
TD-280	Tertiary Drain	68.09	2.50-3.50	0.64-1.25	3rd
TD-281	Tertiary Drain	41.16	2.50-3.50	0.64-1.25	3rd
TD-282	Tertiary Drain	44.98	2.50-3.50	0.64-1.25	3rd
TD-283	Tertiary Drain	130.24	2.50-3.50	0.64-1.25	3rd
TD-284	Tertiary Drain	27.62	2.50-3.50	0.64-1.25	3rd
TD-285	Tertiary Drain	57.76	2.50-3.50	0.64-1.25	3rd
TD-286	Tertiary Drain	42.31	2.50-3.50	0.64-1.25	3rd
TD-287	Tertiary Drain	62.12	2.50-3.50	0.64-1.25	3rd
TD-288	Tertiary Drain	41.98	2.50-3.50	0.64-1.25	3rd
TD-289	Tertiary Drain	144.43	2.50-3.50	0.64-1.25	3rd
TD-290	Tertiary Drain	33.55	2.50-3.50	0.64-1.25	3rd
TD-291	Tertiary Drain	21.83	2.50-3.50	0.64-1.25	3rd
TD-292	Tertiary Drain	16.39	2.50-3.50	0.64-1.25	3rd
TD-293	Tertiary Drain	28.66	2.50-3.50	0.64-1.25	3rd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
TD-294	Tertiary Drain	27.97	2.50-3.50	0.64-1.25	3rd
TD-295	Tertiary Drain	27.32	2.50-3.50	0.64-1.25	3rd
TD-296	Tertiary Drain	33.19	2.50-3.50	0.64-1.25	3rd
TD-297	Tertiary Drain	13.43	2.50-3.50	0.64-1.25	3rd
TD-298	Tertiary Drain	0.79	2.50-3.50	0.64-1.25	3rd
TD-299	Tertiary Drain	38.59	2.50-3.50	0.64-1.25	3rd
TD-300	Tertiary Drain	41.26	2.50-3.50	0.64-1.25	3rd
TD-301	Tertiary Drain	173.46	2.50-3.50	0.64-1.25	3rd
TD-302	Tertiary Drain	28.59	2.50-3.50	0.64-1.25	3rd
TD-303	Tertiary Drain	74.53	2.50-3.50	0.64-1.25	3rd
TD-303	Tertiary Drain	5.30	2.50-3.50	0.64-1.25	3rd
TD-304	Tertiary Drain	48.71	2.50-3.50	0.64-1.25	3rd
TD-305	Tertiary Drain	61.58	2.50-3.50	0.64-1.25	3rd
TD-306	Tertiary Drain	44.70	2.50-3.50	0.64-1.25	3rd
TD-307	Tertiary Drain	7.34	2.50-3.50	0.64-1.25	3rd
TD-307	Tertiary Drain	91.09	2.50-3.50	0.64-1.25	3rd
TD-308	Tertiary Drain	36.23	2.50-3.50	0.64-1.25	3rd
TD-309	Tertiary Drain	63.36	2.50-3.50	0.64-1.25	3rd
TD-310	Tertiary Drain	136.24	2.50-3.50	0.64-1.25	3rd
TD-310	Tertiary Drain	5.21	2.50-3.50	0.64-1.25	3rd
TD-311	Tertiary Drain	46.20	2.50-3.50	0.64-1.25	3rd
TD-312	Tertiary Drain	5.40	2.50-3.50	0.64-1.25	3rd
TD-312	Tertiary Drain	106.31	2.50-3.50	0.64-1.25	3rd
TD-313	Tertiary Drain	70.90	2.50-3.50	0.64-1.25	3rd
TD-314	Tertiary Drain	24.69	2.50-3.50	0.64-1.25	3rd
TD-315	Tertiary Drain	16.88	2.50-3.50	0.64-1.25	3rd
TD-316	Tertiary Drain	56.63	2.50-3.50	0.64-1.25	3rd
TD-317	Tertiary Drain	5.30	2.50-3.50	0.64-1.25	3rd
TD-317	Tertiary Drain	354.02	2.50-3.50	0.64-1.25	3rd
TD-317	Tertiary Drain	5.83	2.50-3.50	0.64-1.25	3rd
TD-318	Tertiary Drain	44.65	2.50-3.50	0.64-1.25	3rd
TD-318	Tertiary Drain	5.50	2.50-3.50	0.64-1.25	3rd
TD-319	Tertiary Drain	96.36	2.50-3.50	0.64-1.25	3rd
TD-321	Tertiary Drain	7.28	2.50-3.50	0.64-1.25	3rd
TD-321	Tertiary Drain	34.81	2.50-3.50	0.64-1.25	3rd
TD-322	Tertiary Drain	73.44	2.50-3.50	0.64-1.25	3rd
TD-323	Tertiary Drain	85.85	2.50-3.50	0.64-1.25	3rd
TD-324	Tertiary Drain	41.38	2.50-3.50	0.64-1.25	3rd
TD-325	Tertiary Drain	77.26	2.50-3.50	0.64-1.25	3rd
TD-326	Tertiary Drain	114.50	2.50-3.50	0.64-1.25	3rd
TD-327	Tertiary Drain	82.20	2.50-3.50	0.64-1.25	3rd
TD-328	Tertiary Drain	104.26	2.50-3.50	0.64-1.25	3rd
TD-329	Tertiary Drain	89.75	2.50-3.50	0.64-1.25	3rd
TD-330	Tertiary Drain	81.08	2.50-3.50	0.64-1.25	3rd
TD-331	Tertiary Drain	84.83	2.50-3.50	0.64-1.25	3rd
TD-332	Tertiary Drain	176.48	2.50-3.50	0.64-1.25	3rd
TD-333	Tertiary Drain	47.65	2.50-3.50	0.64-1.25	3rd
TD-334	Tertiary Drain	40.05	2.50-3.50	0.64-1.25	3rd
TD-335	Tertiary Drain	115.25	2.50-3.50	0.64-1.25	3rd
TD-336	Tertiary Drain	11.86	2.50-3.50	0.64-1.25	3rd
TD-337	Tertiary Drain	60.19	2.50-3.50	0.64-1.25	3rd
TD-339	Tertiary Drain	23.05	2.50-3.50	0.64-1.25	3rd
TD-340	Tertiary Drain	12.06	2.50-3.50	0.64-1.25	3rd
TD-341	Tertiary Drain	6.03	2.50-3.50	0.64-1.25	3rd
TD-342	Tertiary Drain	88.88	2.50-3.50	0.64-1.25	3rd
TD-343	Tertiary Drain	45.21	2.50-3.50	0.64-1.25	3rd
TD-344	Tertiary Drain	48.56	2.50-3.50	0.64-1.25	3rd
TD-345	Tertiary Drain	44.74	2.50-3.50	0.64-1.25	3rd
TD-346	Tertiary Drain	81.51	2.50-3.50	0.64-1.25	3rd
TD-347	Tertiary Drain	7.45	2.50-3.50	0.64-1.25	3rd
TD-348	Tertiary Drain	10.18	2.50-3.50	0.64-1.25	3rd
TD-349	Tertiary Drain	44.91	2.50-3.50	0.64-1.25	3rd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
TD-350	Tertiary Drain	138.11	2.50-3.50	0.64-1.25	3rd
TD-351	Tertiary Drain	29.57	2.50-3.50	0.64-1.25	3rd
TD-352	Tertiary Drain	11.86	2.50-3.50	0.64-1.25	3rd
TD-353	Tertiary Drain	207.81	2.50-3.50	0.64-1.25	3rd
TD-353	Tertiary Drain	25.99	2.50-3.50	0.64-1.25	3rd
TD-354	Tertiary Drain	111.37	2.50-3.50	0.64-1.25	3rd
TD-355	Tertiary Drain	26.34	2.50-3.50	0.64-1.25	3rd
TD-356	Tertiary Drain	74.26	2.50-3.50	0.64-1.25	3rd
TD-357	Tertiary Drain	66.13	2.50-3.50	0.64-1.25	3rd
TD-358	Tertiary Drain	137.80	2.50-3.50	0.64-1.25	3rd
TD-359	Tertiary Drain	23.49	2.50-3.50	0.64-1.25	3rd
TD-360	Tertiary Drain	51.28	2.50-3.50	0.64-1.25	3rd
TD-361	Tertiary Drain	145.96	2.50-3.50	0.64-1.25	3rd
TD-362	Tertiary Drain	44.00	2.50-3.50	0.64-1.25	3rd
TD-363	Tertiary Drain	39.93	2.50-3.50	0.64-1.25	3rd
TD-364	Tertiary Drain	148.74	2.50-3.50	0.64-1.25	3rd
TD-365	Tertiary Drain	332.25	2.50-3.50	0.64-1.25	3rd
TD-366	Tertiary Drain	162.61	2.50-3.50	0.64-1.25	3rd
TD-367	Tertiary Drain	401.32	2.50-3.50	0.64-1.25	3rd
TD-368	Tertiary Drain	182.46	2.50-3.50	0.64-1.25	3rd
TD-369	Tertiary Drain	158.39	2.50-3.50	0.64-1.25	3rd
TD-370	Tertiary Drain	26.30	2.50-3.50	0.64-1.25	3rd
TD-371	Tertiary Drain	157.42	2.50-3.50	0.64-1.25	3rd
TD-372	Tertiary Drain	100.01	2.50-3.50	0.64-1.25	3rd
TD-373	Tertiary Drain	97.19	2.50-3.50	0.64-1.25	3rd
TD-374	Tertiary Drain	177.05	2.50-3.50	0.64-1.25	3rd
TD-375	Tertiary Drain	161.98	2.50-3.50	0.64-1.25	3rd
TD-376	Tertiary Drain	105.32	2.50-3.50	0.64-1.25	3rd
TD-376	Tertiary Drain	7.20	2.50-3.50	0.64-1.25	3rd
TD-377	Tertiary Drain	5.76	2.50-3.50	0.64-1.25	3rd
TD-377	Tertiary Drain	38.42	2.50-3.50	0.64-1.25	3rd
TD-378	Tertiary Drain	99.84	2.50-3.50	0.64-1.25	3rd
TD-379	Tertiary Drain	62.24	2.50-3.50	0.64-1.25	3rd
TD-380	Tertiary Drain	86.60	2.50-3.50	0.64-1.25	3rd
TD-381	Tertiary Drain	126.19	2.50-3.50	0.64-1.25	3rd
TD-382	Tertiary Drain	89.55	2.50-3.50	0.64-1.25	3rd
TD-383	Tertiary Drain	55.03	2.50-3.50	0.64-1.25	3rd
TD-384	Tertiary Drain	33.26	2.50-3.50	0.64-1.25	3rd
TD-385	Tertiary Drain	22.92	2.50-3.50	0.64-1.25	3rd
TD-386	Tertiary Drain	132.21	2.50-3.50	0.64-1.25	3rd
TD-387	Tertiary Drain	13.27	2.50-3.50	0.64-1.25	3rd
TD-388	Tertiary Drain	113.51	2.50-3.50	0.64-1.25	3rd
TD-389	Tertiary Drain	20.07	2.50-3.50	0.64-1.25	3rd
TD-390	Tertiary Drain	156.71	2.50-3.50	0.64-1.25	3rd
TD-391	Tertiary Drain	3.28	2.50-3.50	0.64-1.25	3rd
TD-391	Tertiary Drain	88.97	2.50-3.50	0.64-1.25	3rd
TD-392	Tertiary Drain	83.03	2.50-3.50	0.64-1.25	3rd
TD-393	Tertiary Drain	93.81	2.50-3.50	0.64-1.25	3rd
TD-394	Tertiary Drain	132.76	2.50-3.50	0.64-1.25	3rd
TD-395	Tertiary Drain	179.99	2.50-3.50	0.64-1.25	3rd
TD-397	Tertiary Drain	44.33	2.50-3.50	0.64-1.25	3rd
TD-400	Tertiary Drain	26.38	2.50-3.50	0.64-1.25	3rd
TD-402	Tertiary Drain	26.34	2.50-3.50	0.64-1.25	3rd
TD-402	Tertiary Drain	215.45	2.50-3.50	0.64-1.25	3rd
TD-403	Tertiary Drain	147.48	2.50-3.50	0.64-1.25	3rd
TD-404	Tertiary Drain	0.23	2.50-3.50	0.64-1.25	3rd
TD-405	Tertiary Drain	85.33	2.50-3.50	0.64-1.25	3rd
TD-406	Tertiary Drain	398.51	2.50-3.50	0.64-1.25	3rd
TD-407	Tertiary Drain	166.88	2.50-3.50	0.64-1.25	3rd
TD-412	Tertiary Drain	40.86	2.50-3.50	0.64-1.25	3rd
TD-415	Tertiary Drain	173.61	2.50-3.50	0.64-1.25	3rd
TD-430	Tertiary Drain	71.71	2.50-3.50	0.64-1.25	3rd

Drain_ID	Drain Type	Length (in m)	Width (in ft)	Depth (in m)	Phase
TD-432	Tertiary Drain	31.83	2.50-3.50	0.64-1.25	3rd
TD-433	Tertiary Drain	69.71	2.50-3.50	0.64-1.25	3rd
TD-434	Tertiary Drain	41.85	2.50-3.50	0.64-1.25	3rd
TD-437	Tertiary Drain	79.16	2.50-3.50	0.64-1.25	3rd
TD-438	Tertiary Drain	49.14	2.50-3.50	0.64-1.25	3rd
TD-440	Tertiary Drain	87.72	2.50-3.50	0.64-1.25	3rd
TD-441	Tertiary Drain	92.84	2.50-3.50	0.64-1.25	3rd
TD-441	Tertiary Drain	2.27	2.50-3.50	0.64-1.25	3rd
TD-205	Tertiary Drain	26.75	2.50-3.50	0.64-1.25	3rd
TD-442	Tertiary Drain	78.01	2.50-3.50	0.64-1.25	3rd
TD-442	Tertiary Drain	105.49	2.50-3.50	0.64-1.25	3rd
TD-237	Tertiary Drain	0.00	2.50-3.50	0.64-1.25	3rd
TD-357	Tertiary Drain	0.00	2.50-3.50	0.64-1.25	3rd
TD-260	Tertiary Drain	0.27	2.50-3.50	0.64-1.25	3rd

13.3.3.2 List of Infrastructure measures for Drainage and Flood Control Network

Total 9 bridges, 24 box culverts and 2 pipe culverts will be established for drainage and flood control network of Banaripara Paurashava.

13.4 Implementation Strategies and Principles

13.4.1 Plan Implementation Strategies

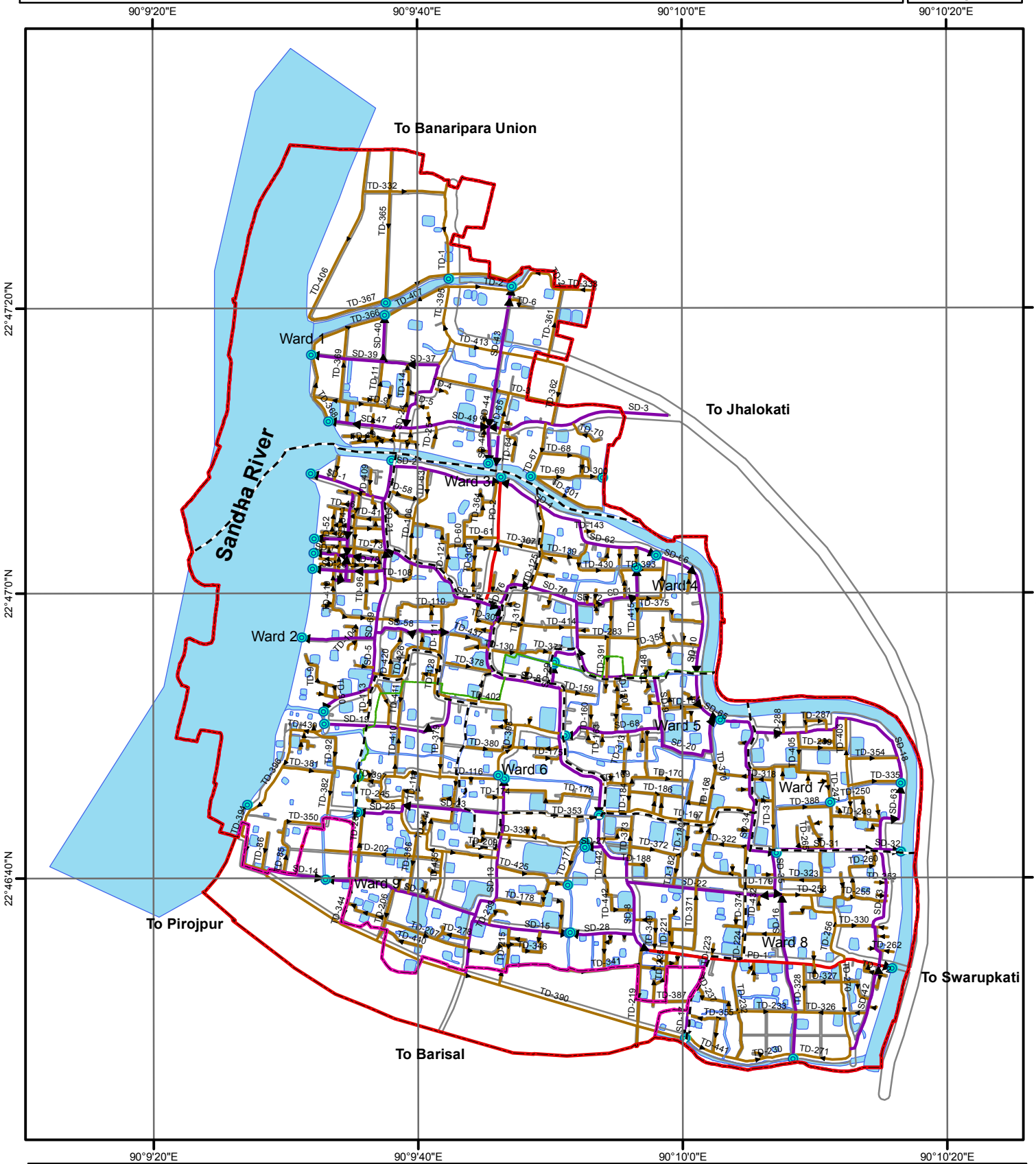
Management of a drainage system is more difficult than its construction. It requires not only an institutional set up but also huge resources for regular maintenance. The present engineering set up of the Paurashava is highly inadequate to manage the future drainage network. It must be equipped not only with adequate manpower but also sufficient number of logistics and equipment will be necessary for sound maintenance of the drainage system. For Banaripara Pourashava with its meager revenue earning it will be extremely difficult to go for regular maintenance of the drainage system without government assistance. So, the Paurashava must be provided with sufficient budget allocation to maintenance going on regularly. The next strategy will be to create awareness among the citizens not to dispose of solid waste in the drains and get them clogged. This can be done by regular publicity, engaging NGOs for motivation and the last imposing punitive measures like, fine on the waste disposer.

13.4.2 Regulations to implement the drainage and flood plan

Regulations in Bangladesh which are related to drainage and flood management:

1. **The Acquisition and Requisition of Immovable Property Ordinance, 1982,** for acquisition of land to construct drainage and flood control structures. The Bangladesh Water Development Board is main executing organization to implement drainage and flood control activities.
2. **National Water Policy (NWP)-1999,** regulatory policy to construct structures for flood control and drainage management. The Bangladesh Water Development Board is the executing and regulatory organization.
3. **National Water Management Plan (NWMP)-2004,** regulatory plan for management of flood, drainage and water resources of Bangladesh. The Bangladesh Water Development Board is the executing and regulatory organization. Local Government Engineering Department (LGED) is responsible for management of small scale water resources in Bangladesh.
4. **Canal and Drainage Act, 1872** has enacted for excavation of canal and removal of drainage congestion from agriculture land.
5. **Public Health (Emergency Provision) Ordinance, 1944** has enacted for the improvement of drainage and sanitation facilities. Department of Public Health Engineering (DPHE) is authorized to enforce the regulations.
6. **Water Body Reservoir Act 2000** has enacted for the provision to control the illegal development activities on natural water body of Metropolitan city, Divisional town, District town and all other Paurashava area. The act also enacts that Natural Streams (River, khal, Beel, Large pond/ Lake, Waterfall or water bodies which is identified in Master Plan or any place as flood flow area, rain water or other natural drainage water reservoir area proclaimed by Government, Local Government or any organization.

Map 13.2 :Proposed Drainage & Environment Management Plan of Banaripara Paurashava



Legend

- Planning Area Boundary
- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Waterbody
- Secondary Drain
- Tertiary Drain
- Primary Drain

0 50 100 200 300 400 Meters

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development and Cooperatives Local Government Division

CONSULTANT

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In Association with

13.5 Environmental Management Plan

13.5.1 Introduction

Environment is an important consideration during preparation of a Master Plan of an area. During the preparation of Master Plan of Banaripara Paurashava, different environmental issues have been analyzed and information has been collected accordingly. Information on drainage, sewerage (location/network, condition) and solid waste management system (existing and proposed plan), pollution sources and types also have been analyzed.

13.5.2 Goals and Objectives

The objectives of environmental study are as follows:

- to study the existing ecological system and environmental problems in the project area;
- to suggest the mitigation measures for all environmental problems;
- to provide the guidelines and assist the planners, engineers and consultants involved in this
- project in preparing environmentally sound Plan for Banaripara Town and
- to prepare an Environmental Management Plan (EMP) for future environmental management in the area.

13.5.3 Methodology and Approach to Planning

In environmental study, a multi-disciplinary approach is used for studying development project. The present environmental study is based on data collection and sharing with drainage and geology, transport engineering, socio-economic, economic and topographical survey components. A structured questionnaire prepared by LGED for environmental survey has been followed. Environmental study has been carried out through survey of biodiversity of flora and fauna, water pollution, local air pollution problem, drinking water sources, renewable energy, diseases, and major local environmental issues as well as secondary data has been considered.

13.5.4 Existing Environmental Condition

13.5.4.1 Geo-morphology Geology, Soil, Sub soil Condition

Banaripara Paurashava has five main types of soils with different qualities such as non-calcareous alluvium, peat, non-calcareous and calcareous grey floodplain and non-calcareous dark grey floodplain soils. Non-calcareous alluvium soils are raw sandy and silty alluvial deposits and generally neutral to alkaline in reaction. Peat soils are highly organic dark colored soils. Non-calcareous grey floodplain soils are prismatic and/or blocky structured whereas calcareous grey floodplain soils are structured grey silt loams to silty clays, calcareous from the surface or at shallow depths. Generally non-calcareous dark grey floodplain soils are structured dark grey loamy soils on old flood plain ridges and clay in basins. The basin clays have heavy consistence. However, soil condition of Banaripara Paurashava comprises diversified characteristics.

13.5.4.2 Climate

The Climate of an area is comprised of its Temperature, Average Humidity (%), Rainfall, Wind Speed and Hydrology. This zila bears a hot summer and a mild winter. But almost all the area of the zila is occasionally affected by cyclonic storm surges and tidal bores that originate over the Bay of Bengal during monsoon.

13.5.4.3 Temperature

Temperature rises steadily from January to April, remains fairly steady from April to October and then falls to reach the lowest in January. The maximum average monthly temperature is 29.5^{o}c in

August and minimum average monthly temperature is 7.4 ^{o} C in January. The monsoon starts from June and maximum rainfall is experienced from July to September.

13.5.4.4 Humidity

Weather of Banaripara Planning area is not more contradictory from the natural weather of Bangladesh. Due to coastal characteristics, weather of this area has few special characteristics. Humidity is comparatively high in the coastal region rather than other districts of Bangladesh.

13.5.4.5 Rainfall

The monsoon starts from June and maximum rainfall is experienced in 2004 and lowest in 2003. Annual rainfall as recorded from 2003 to 2010, maximum was 180.72 mm in 2004 and lowest 122.04 mm in 2003. It is recorded that during June to October there are high volume of rainfall.

13.5.4.6 Wind directions

Monthly Prevailing Wind speed in knots and direction of Banaripara Planning area for the years of 1977 to 2007 has been presented below in Figure 13.8. It shows that wind direction in is mainly towards south and most of the time wind is calm (61.5 %) which is followed by 1-2.5 m/s wind speed (21.9%) and 2.5-5 m/s wind speed (14.7%).

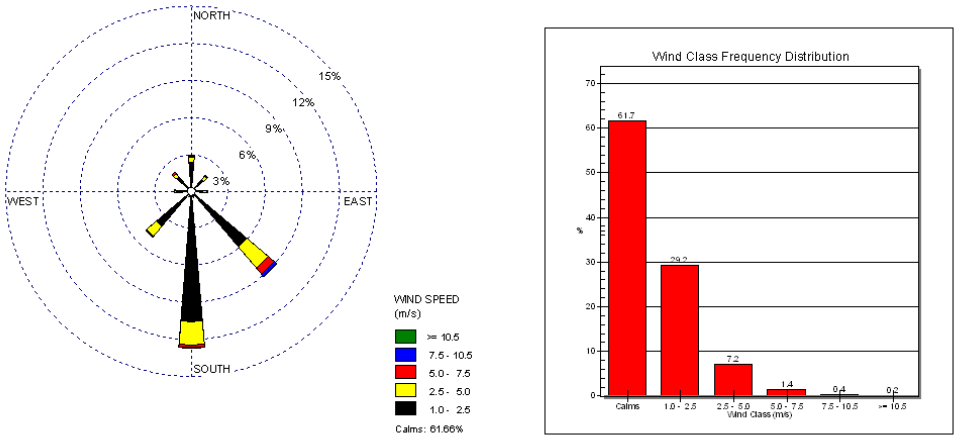
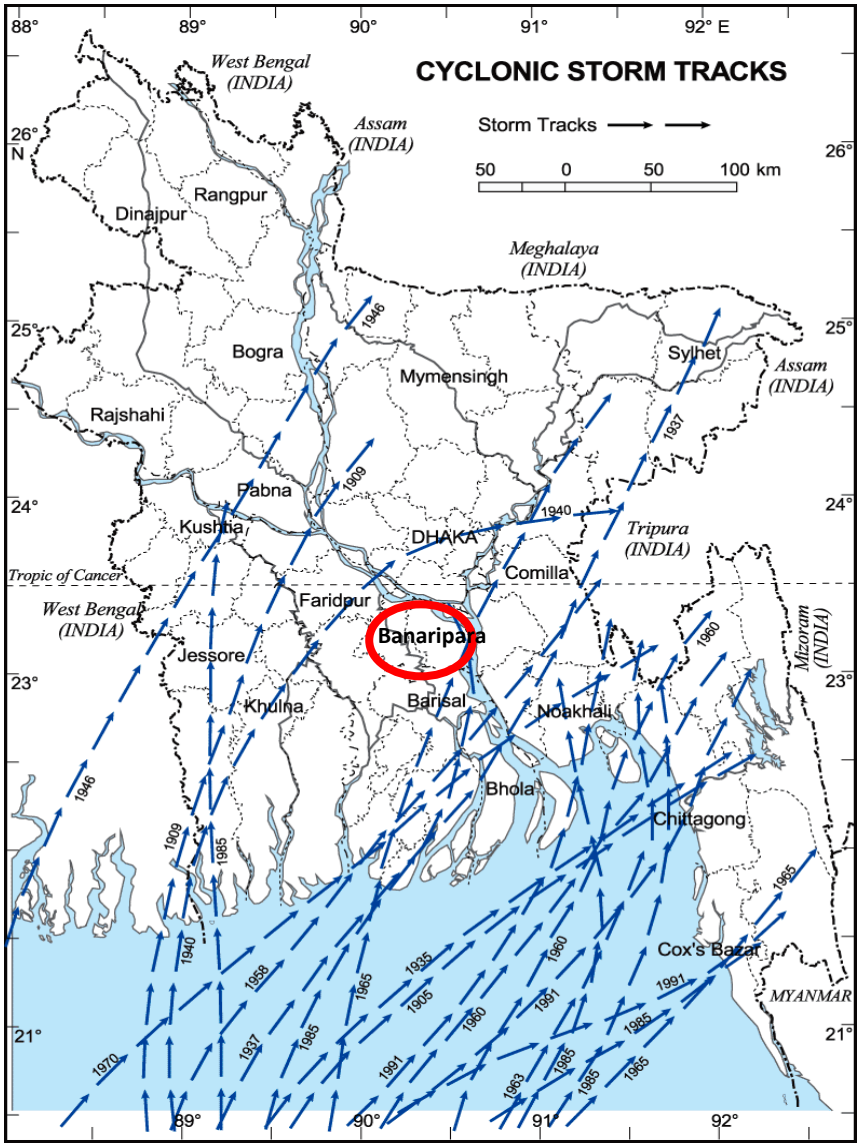
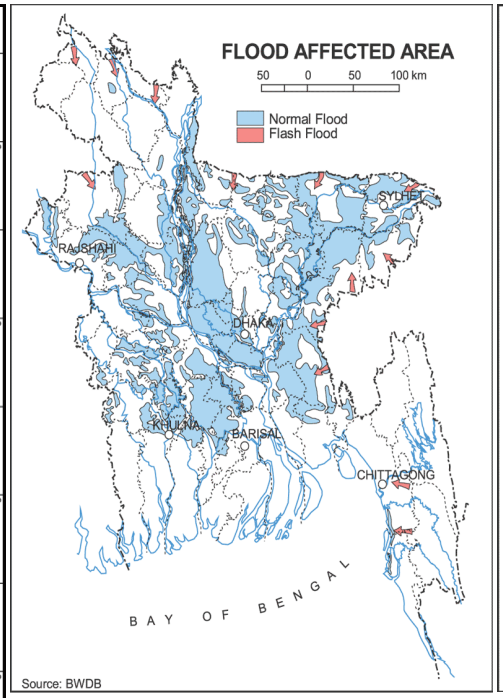


Fig 13.8: Wind Speed Data of Several Years in Barisal.
Source: Bangladesh Metrological Department, 2011.

13.5.4.7 Hydrology

Hydrology can be defined as the scientific study of the waters of the earth, especially with relation to the effects of precipitation and evaporation upon the occurrence and character of water in streams, lakes, and on or below the land surface. The hydrological condition of Banaripara Planning area is getting of inferior quality day by day.





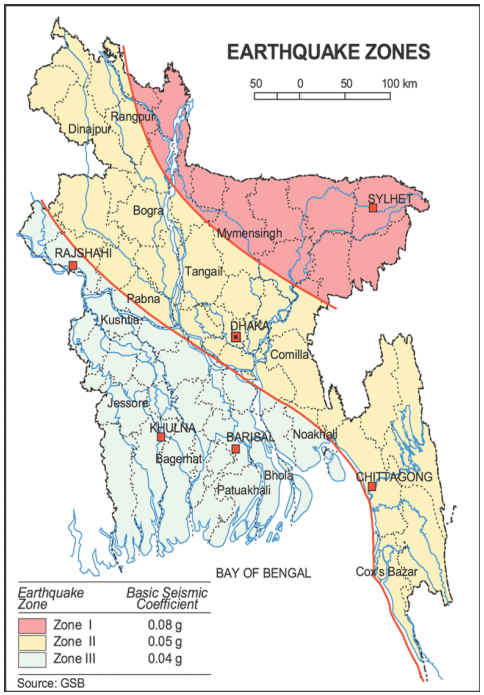


Fig 13.9: Cyclone, Flood and Earthquake condition in Banaripara Paurashava.

Banaripara Paurashanva is mainly affected by the cyclone storm and comparatively less vulnerable for flood and earthquake as it is geographically positioned in the coastal belt of Bangladesh.

13.5.5 Solid Waste and Garbage disposal

Condition of solid waste management at Banaripara Paurashava is very poor. According to the opinion of surveyed households, there is no solid waste management system at Banaripara Paurashava. Most of the people throw their garbage here and there and especially dump to the river, canal and khal which cause serious environmental pollution and also sometimes clogged the existing drainage network. From the field survey it is also found that there is no clinical waste management system. The standard demand rate of solid waste generation is 0.03 kg/ per capita/ per day which will be estimated in Interim phase.

House Hold Waste

According to the opinion of surveyed households, there is no dustbin at Banaripara Paurashava. Most of the people throw their garbage here and there and specially dump to the canal and khal which cause environmental pollution and also sometimes clogged the existing drainage network. From the field survey it is also found that there is no clinical waste management system.

Industrial Waste

There is no severe environmental pollution generating industrial unit situated within and/or nearby Banaripara Paurashava area. 7 saw mills, 6 rice mills, and 2 oil mills are situated in Banaripara Paurashava area.

Kitchen Market Waste

At present there is no dustbin at Banaripara Paurashava to collect kitchen market wastes. Generally people throw their garbage here and there which cause environmental pollution and also sometimes clogged the existing drainage network.

Existing Waste Management System

At present, there is no solid waste management system at Banaripara Paurashava. Most of the people threw garbage here and there, which causes serious environmental pollution and also sometimes clogged the existing drainage network.

13.5.6 Pollutions

Water Pollutions

Water pollution is one of the major phenomenons in Banaripara Paurashava. Many causes have been identified for surface water pollution. Maximum surface water are polluted by domestic source and chemical fertilizer used in agriculture field. However, as the area is in coastal region, saline and iron have been contaminated the water. Marine vehicles are also responsible for water pollution of rivers and khals.

Sound Pollution

Noise pollution is a minor phenomenon in Banaripara Paurashava. However such type of pollution problem is occurring by the road vehicles. But it has been identified that this is not a major problem for all over the area. It is a problem for some particular road side areas.

Land Pollution

Land pollution is a vital problem. Flood and river erosion is responsible for land erosion. During floods and river erosion, the loss of soil from farmland may be reflected in reduced crop production potential, lower surface water quality and damaged drainage networks.

Air Pollution

The households of Banaripara Paurashava face the problem of air pollution. There are industries inside the Banaripara Paurashava. These industries have been identified as main source of air pollution. No treatment plant is available in the Paurashava. A number of heavy vehicles

(Highway bus and truck) move through the road and extract some pollutant particle that also causes air pollution.

Arsenic

In Banaripara Paurashava arsenic contamination rate is as low as negligible.

13.5.7 Natural Calamities and Localized Hazards

Water Logging

Another undesirable phenomenon is water logging. It refers to as both manmade and natural. Ground may be regarded as waterlogged when the water table of the ground water is too high to conveniently permit an anticipated activity. Different causes are responsible for water logging. Poor drainage system is one of the most important causes of water logging in the study area. There is no fixed location where water logged frequently. Most of the areas suffer water logging during heavy rainfall.

Flood

A flood is not a common natural disaster at Banaripara Paurashava. The area hardly faces flash flood. In 1955, 1974, and 1988 year most of the area of Bangladesh affected by flood but Banaripara was not affected in that time. The Paurashava was affected only in the flood of 1998.

Cyclone

Cyclone is another common disaster at Banaripara Paurashava. Every year Banaripara Paurashava is affected by cyclone. Among them the identifiable disaster was cyclone SIDR in 2007 and Aila in 2009. The disaster SIDR and Aila were a big hazard for their natural climatic condition. It also damages many lives, forests, agricultures and infrastructures. For the help of cyclone affected peoples and livestock during and after cyclone there are cyclone centers at Banaripara Paurashava. Mainly primary schools are serving as cyclone centers.

Earthquake

Earthquake is a natural hazard and the southern area of Bangladesh is not so vulnerable. So, Banaripara Paurashava is not vulnerable for earthquake.

River Erosion

The Sandhya River sides are erosion prone caused by seepage of water from countryside towards the river along the banks during post-monsoon period and during high flood period. Water waves created during the storm surge, cyclone and heavy rainfall are causes of erosion. The seepage of water may create unbalanced pore pressure producing severe bank scouring in loose sandy riverbank resulting river erosion. Vulnerable river erosion is resulting in the eastern (Ward No. 2) part of the Paurashava.

Soil Erosion

Soil erosion is a naturally occurring process on all land. The agents of soil erosion are water and wind, each contributing a significant amount of soil loss each year at Banaripara Paurashava. The loss of soil from farmland may be reflected in reduced crop production potential, lower surface water quality and damaged drainage networks. The soil removed by runoff from the land, for example during a large storm, accumulates below the eroded areas, in severe cases blocking roadways or drainage channels and inundating buildings.

Fire Hazard

The residents of Banaripara Paurashava do not normally face the problem of fire.

Land Filling

Land filling creates problem in natural runoff and drainage system. The soil removed by runoff from the land accumulates below the eroded areas, in severe cases blocking roadways or drainage channels and inundating buildings.

Encroachment

Amount of land encroachment at Banaripara is very little but land encroachment beside river interrupts the natural flow of river and is responsible for river erosion. Encroachment by the side of the canals interrupts the natural drainage system. This may be responsible for the inundation of the Paurashava.

13.6 Plans for Environmental Management and Pollution Control

13.6.1 Proposals for Environmental Issues

13.6.1.1 Solid waste management Plan

No waste collection system is available in Banaripara Paurashava to handle / manage household/ kitchen market/clinical waste. Most of the people throw their garbage here and there and especially dump to canal and khal which environmental pollution and also sometimes clogged the existing drainage network. Although at present, environmental pollution due to solid waste not a serious problem on Banaripara Paurashava good solid waste management practice should be implemented for better environment at Banaripara Paurashava. To fulfill that aim some suggestions are recommended as Solid Waste Management Plan.

Criteria for Selection of Solid Waste Dumping Site

Usually the Paurashava does not have its own solid waste disposal site. For selection of solid waste dumping site, the following criteria should be considered.

- Site should not be situated just beside any river and canal
- Site should be located to minimum fuel distance
- Site should not create any nuisance to the residential areas as well as to the commercial and administrative areas.
- Site should be connected with main road and have sufficient width for truck movement.
- Infiltration of water into the dump should be prevented by covering the wastes with a layer of soil and sloping surface of the dump.

Table 13.9: Development Proposal for Environmental Management

Type of facility	Area (Acre)	Ward no	Plot no	Mouza Name	Phase-wise development		
					1st Phase (1st to 5th year)	2nd Phase (6th to 10th year)	3rd Phase 11th to last 10 year)
Waste Dumping Site	6.01	Extension Area	-	-		Land acquisition and development all facilities	
Waste transfer station	1.42	1	82,93	Banaripara		Land acquisition and development all facilities	
		2	653,854	Banaripara			
		3	519,521-23	Banaripara			
		4	614-17,891	Banaripara			
		5	221	Kundohar			
		6	20-22,37	Kundohar			
		7	306,313	Kundohar			
		8	324-25,327	Kundohar			
		9	10-11	Kundohar			

13.6.1.2 Open space, wet-land and relevant features protection Plan

The river Sandhya is a great asset of Banaripara that plays multifaceted role for the town. It could be a navigation route to some extent, a source of water and also a source of recreation. Detail land use information of Open spaces is given in Table 11.9, Chapter 11, and Part B of this report.

Mitigation Measures:

- The river should be preserved for future sustainable source of surface water supply for the City when the city's ground water would be depleted.
- Its banks can serve as breathing space and recreation for the town dwellers.
- The river should be kept pollution free applying regulatory measures based on environmental regulations
- No industry should be allowed within 100 m of the river bank.

Loss of Wetlands

Wetlands are mainly affected first by the urbanization process. Earth filling fills up the ponds and ditches. Waste water affects the aquatic ecosystem and makes the ponds and ditches unproductive and as a result the aquatic plants, fishes and animals have to die or migrate to other places. There is no strict regulation on earth filling of ponds. The Paurashava can fine only Tk.500 if someone fills the ponds. However, Wetlands Conversation Act exists in Bangladesh, which is applicable only to natural beels and khals. Wetlands play an important role as a reservoir of rain and flood water. They are also important to maintain the balance of ecosystems and for replenishing the ground water level through seepage.

Mitigation Measures:

- Designate all ponds in Master Plan Map and protect the large ones according to the ecological importance and public interest.
- Protect the ponds as per regulatory framework of Master Plan.
- Avoiding wetlands during road alignment fixation.
- Stopping housing, industries and other development works in wetlands through earth filling.
- Stopping earth filling of ponds in the area through creation of public awareness.
- Strict implementation of Wetland Conversation Act, 2000.
- Strict implementation of Environment Conversation Act(ECA), 1885
- Create new laws if existing one fails to stop land filling of ponds.

13.6.1.3 Ground Water Pollution

Though ground water is not a major source of drinking water supply in the study area, yet ground water pollution by salinity and arsenic is a serious problem for future water supply. Arsenic is geological problem. But experts view that it arises due excessive extraction of ground water. So in future, when population rises further excessive ground water extraction will aggravate contamination situation.

Mitigation Measures:

- Expand use of surface water by protecting existing ponds and excavating new ponds.
- Introduce and popularize rain water harvesting system.
- Reduce dependency on ground water.

13.6.1.4 Surface Water Pollution

Various surface water sources of the town are regularly polluted by deliberate drainage of waste water in respect of pH, turbidity and coli form bacteria when compared with national standard. But present pollution level is low due to low density of population and no industrial agglomeration. The main sources of surface water pollution are urban waste water, sanitary sewage and solid waste dumping. With the implementation of this plan the pollution level may further increase as population and activity will increase leading to increase in waste water, sanitary sewage and solid waste dumping.

Mitigation Measures:

- Abolish katcha and hanging latrines.
- Encourage practice of sanitary latrines.
- Take measures against indiscriminate dumping of solid waste.
- Improve sanitation conditions of slaughter house, fish market and katcha bazar.
- Propaganda for public awareness.
- In future set up sewerage treatment plant to treat waste water.

13.6.2 Natural calamities and regular hazard mitigation proposals

13.6.2.1 Cyclone

Cyclone is a regular natural calamity in the study area. It affects the poor people mostly who cannot build houses with permanent materials. Cyclones also destroy trees and other establishments causing economic losses. It is not possible to prevent cyclones, but it is possible to reduce the losses by cyclones.

Mitigation Measures:

- Construction of cyclone shelter in coastal area.
- Provide housing loan to build houses with permanent materials.
- Take measures to promote employment and reduce poverty.
- Take appropriate measures for post disaster loss mitigation.

13.6.2.2 Flood Protection

The Sandhya River is subject to bank erosion, but it is not continuous. The road along the river has eroded to some extent. With implementation of Master Plan (MP) Project, the whole project area will be protected from flooding.

Enhancement Activities:

- Arrangement of pump drainage to Sandhya River during high flood when gravitational drainage fails.
- Pump of excess water will save the area from internal flooding.

Responsible Organizations: BWDB and Paurashava.

13.6.2.3 Earthquake

Although Banaripara is not Earthquake prone area, however unplanned and unregulated urbanization and disregard to BNBC rules in building construction may cause it vulnerable in future. With the implementation of SMP the planned urbanization will strictly follow the actual

zoning plan and following of BNBC rule will minimize the earthquake damage. In DMDP Urban Area Plan Volume-II, (Part-3, Interim Planning Rules) development restriction considering the geological fault line areas states **"**Structures above 2 storeys situated within 500 meters of a geological fault is not allowed unless built to the BNBC standards for Seismic Zone 3 (BNBC Section 6 Chapter 2.25)"**.**

Enhancement Activities:

- Ensure all new buildings are designed and constructed following the guideline of BNBC.
- Development of a comprehensive plan for managing post-earthquake situation.
- Train community workers who would carry out the initial search and rescue efforts.
- Launch a massive public awareness campaign.

Responsible Organizations: Paurashava, MOFDM, Civil Defense, Fire Service and DO.

13.6.2.4 Fire Hazard

Though fire hazard is low in the town it might increase in future with increased urbanization. Fire hazard will be severe when katcha housing will be built by low income poor people of the town. To avoid fire hazard following mitigation measures are recommended.

Mitigation Measures:

- Set up modern fire extinguishing devises.
- Discourage people from using low quality electrical wire in building and industries.
- Ensure periodical checking of electrical lines.
- Advise low income dwellers about cooking safety.
- Create awareness among people about the dangers of fire hazard.

13.6.2.5 Protection Plan addressing encroachment and other relevant issues

Implementation of SMP activities like roads, drainage, bridge/culvert, housing and industrial estates and bazars will radically change the natural topography and land use pattern of the area. The agricultural area will be converted into urban and semi-urban area. The present green scenic beauty will disappear; water bodies will be lost due to rapid urbanization.

Mitigation Measures:

- Careful planning to minimize the change of the area.
- Avoid water bodies during construction of roads, housing and industrial estates.
- Practice good architectural/engineering design during planning of housing estates, buildings and the intersections of main roads.
- Enhancement of plantation and gardening to increase the scenic beauty of the town.
- Preserve the ponds, canal and large water bodies.
- Strict implementation of Environment Conversation Act(ECA), 1885
- Propaganda for public awareness

Responsible Organizations: Paurashava, DOE and Forest Department.

13.7 Plan Implementation Strategies

13.7.1 Regulations to Implement the Environment Management Plan

Related rules and regulations for urban environment management to protect environment for sustainable urban development:

1. **Local Government (Paurashava) Act 2009**, Paurashava's responsibility to concern solid wastes and sustainable development.

2. **Environmental Conservation Act 1995**, to concern water quality, air quality, noise abatement and solid wastes etc. The Department of Environment is the law enforcing organization.

3. **Environmental Conservation Rules 1997,** to concern water quality, air quality, noise abatement and solid wastes etc. The Department of Environment is the law enforcing organization.

4. **Acquisition and Requisition of Immovable Property Ordinance, 1982** is needed for acquisition of land in view to construct environmental components. The authority, according to the demand, will apply to the Deputy Commissioner for such acquisition.

5. **Conservation of Environment Act, 1995** have prescribed duties and responsibilities of the Director. Most of those responsibilities are on the control of pollution.

6. **Playfield, Open Space, Park and Natural Water Reservoir Conservation Act, 2000** will be needed for the preservation of playfield, garden, open space and natural tank of the Paurashava.

7. **Water Hyacinth Act, 1936** was enacted for preventing the spread of water hyacinth in Bangladesh and for its destruction. It is said in the section 5 that, no person shall grow or cultivate water hyacinth in any garden or in any ornamental water or receptacle. Again, according to the section 8(1) said, with a view to facilitating the discovery or destruction of water hyacinth, an Authorized Officer may, subject to any rules made under this Act, by a notice served in the prescribed manner, direct an occupier of any land, premises or water within a notified area to cause-

    (a) any branches of trees or shrubs on any such land or premises which overhang the edge of any river, stream, waterway, ditch, marsh, bil, lake, tank, pond, pool or pit to be cut back and any undergrowth or jungle thereon to be removed from such edge, within a distance specified in the notice, or

    (b) any vegetation appearing above the surface of any such water to be removed from the water, within such period as may be specified in the notice.

13.7.2 Plan Implementation Strategy

Implementation through Multi-Sectoral Investment Programme: Major infrastructure development works such as primary roads, water supply, drainage, etc., will largely be controlled by Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Programme (MSIP).

Objective of a Multi-Sectoral Investment Programme (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that

would determine the contents of MSIP. Firstly, activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Urban Area Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects: Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control: Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, landuse control may be applied; careful consideration requires the following ideologies:

Development control as an instrument of plan implementation may be selectively applied within the Urban Area Plans. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.
Implementation by Facilitating Private Investment: Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient layout of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Urban Area Plan would simply be tools for guiding and encouraging the growth and development of an urban area in a preferred manner. In a rapidly changing urban environment, the Urban Area Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Urban Area Plan be made a legal requirement.

For implementation of the various program components of the Urban Area Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time.
Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by Paurashava Mayor, LGED representative and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works

Co-ordination

A Planning Section of Paurashava should have close interaction with the citizen of Paurashava at large in order to make people aware of the benefits of a good plan and, therefore, their social responsibility to promote plan implementation in one hand and also resist contraventions on the other. In this way it will be possible to ensure governance at Paurashava level. A specific interactive cell is recommended to operate in this regard with following responsibilities:

- Provide pre-application advice to residents, consultants and developers about landuse management issues and application procedures for the submission of development applications.
- Enforce planning and landuse management related legislation and zoning scheme regulations.
- Issue of property zoning certificates.
- Investigate and resolve landuse management complaints, illegal landuse and prosecuting contraventions.

Such interactive windows may be opened in various convenient locations to ensure ease of the answers to commonly asked questions may be shown in the internet. Besides, those may be shown in the print and electronic media time to time.

In spontaneous areas, while all out people's co-operation is needed for project implementation; there will also be some elements of negotiation. Negotiation will be particularly needed in case of road widening projects. It will be a crucial task for Paurashava to convince the affected people to give up their land for road use. Efforts should be made to convince the land owners on the ground of enhancement of property value due to road widening. In case people refuse to offer land free of cost necessary arrangements may have to be made for payment of compensation. This process of negotiation will be very critical, cumbersome and time consuming, and therefore, has to be handled with utmost care and patience. The best results can be accrued only by wining people's confidence. In case the authority fails to get peoples co-operation they should exercise power of compulsory acquisition of land. Attempts may be made to engage NGOs / CBOs to work as catalysts in negotiation.

Chapter-14

PLAN FOR URBAN SERVICES

14.1 Introduction

Urban planning is critical to the healthy growth of cities. Unplanned growth leads a number of problems, creating misery for urban dwellers and making remedying of those difficulties. Yet flawed urban planning is little better, or perhaps worse, than no urban planning at all. It is thus important, when taking on such an enormous task as the drafting of an Urban Area Plan for a Paurashava, to ensure that the plan is well considered and likely to be conducive to good health and well-being of the urban dwellers.

14.2 Consideration for the Preparation of Urban Service

- Specify whether the urban service will be provided in the future by a city, county, district, authority or a combination of one or more cities, counties, districts or authorities.
- Set forth the functional role of each service provider in the future provision of the urban service.
- Determine the future service area for each provider of the urban service.
- Assign responsibilities for:
    - Planning and coordinating provision of the urban service with other urban services;
    - Planning, constructing and maintaining service facilities; and
    - Managing and administering provision of services to urban users.

14.3 Range and Content of the Urban Service

The Plan for Urban Services covers planning area of Banaripara Paurashava for ten years' time-frame (from 2011 to 2021). It also comprises with report and maps.

The Plan in concerned where services will be located (expected development). It also indicates how the Structure Plan policies will govern the areas and the standard for services calculated based on the population projection.

Outline of the Plan gives guidance to the Paurashava how the urban services will be developed and be promoted, maintained with a coordinated manner.

This chapter describes the urban basic services development proposals for future development of the Paurashava. The proposals have been made at the town level, under the urban area plan. The local level development proposals will be addressed in the Ward Action Plan. The development proposals deal with the basic urban services, like, water supply, drainage, sanitation, solid waste, telecommunication, electricity and community facilities, education and health.

14.3.1 Water Supply

According to BBS, it has been observed that about 0.8% households of Banaripara Paurashava is connected to Paurashava supplied water supply system whereas about 79.4% households use well as a source of drinking water. Additionally, about 19.2% households have tube-well and the rest of the households use pond water for their drinking purpose.

Quality of the supply system is not so satisfactory. All the surveyed households affirmed that there is no water supply facility available for them.

Considering the above issues establishment of deep tube-well in whole Paurashava area has been proposed and also it is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines will be established along all categories of roads as per the growth of the settlement.

14.3.2 Solid Waste

There will be waste transfer stations in every ward with an area of 1.41 acres for collection of solid waste located at suitable locations. A waste disposal site will be developed over an area of 6.01 acres for final disposal of the solid waste. The waste dumping site is located in extension area of the Paurashava. Details have been given in table 11.14, chapter 11, Landuse Plan, Part B.

14.3.3 Telecommunication

The town enjoys the networks of all mobile companies operating in the country. Due to easy and cheaper access to mobile, there is actually no demand for BTCL network.

14.3.4 Sanitation

The BBS data shows that about 96.01% of the households have sanitary toilet whereas about 1.3% households have no toilet facilities. Furthermore, about 2.6% of the households have other type of toilet facilities such as kutcha toilet, hanging toilet, etc.

The socio-economic survey results indicate that about 85.6% of the toilets are Pucca, and 10% Katcha and the rest 4.4% do not have toilet facility. However, the condition of toilet facilities is good at Banaripara Paurashava

Due to prohibitive expenditure one should not expect establishing network and treatment plant based sewerage system in the town by the Paurashava. So, for long the sanitary system of the Paurashava will remain on site. To promote healthy sanitation, Paurashava should promote low cost sanitary latrines in the town together with awareness building for healthy sanitation. It is proposed to set up public toilets in public gathering areas, like, existing and proposed bus stand, bazar and the main town center.

14.4 Regulations to Address the Proposals

Local Government (Paurashava) Act, 2009 (Act No. XLXVIII of 2009)

According to the 2nd Schedule, Sl. No. 10, the Paurashava may provide supply of 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. In case of private sources of water supply, it is said that, 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 will be dug, constructed or provided except with the sanction of the Paurashava.

The regulations, as discussed above, will be needed for provision of drinking water supplies both Paurashava and private sources in the Paurashava.

The sewerage facilities may be provided by the Paurashava and Department of Public Health Engineering (DPHE). According to the 2nd Schedule, Sl. No. 12, of the Local Government (Paurashava) Ordinance, 2009, Paurashava provide an adequate system of public drains 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.

Public Health (Emergency Provisions) Ordinance, 1944 (Ordinance No. XXI of 1944)

According to the **s**ection 2(e) “public health services” and “public health establishment” include respectively sanitary, water-supply, vaccination, sewage disposal, drainage and conservancy services and establishment maintained for the purposes of such services, and any other service or establishment of a local authority which the Government may by notification in the Official Gazette declare to be a public health service or public health establishment for any purpose of this Ordinance.

The Department of Public Health Engineering (DPHE) is performing activities for drinking water supply. At Paurashava level If DPHE likes to render their service according to the water supply network as presented in this plan, the regulation will be the safeguard for them.

East Pakistan Water and Power Development Authority Rules, 1965 (No. 4-1(E)

The Power Development Board (PDB) is empowered for power generation under the guidance of Electricity Act, 1910. At present, PDB and Rural Electrification Board (under the Rural Electrification Board Ordinance, 1977) is performing the role relevant with the electrification of the Paurashava. The existing authorities will be needed for electrification of the Paurashava according to the guidelines presented in the plan.

Telegraph and Telephone Board Ordinance, 1975 (Ordinance No. XLVII of 1975)

A Telegraph and Telephone Board (T&T Board) was composed through this Ordinance. Section 6(1) of the Ordinance has prescribed the functions of the Board and said, it shall be the function of the Board to provide efficient telegraph and telephone services and to do all acts and things necessary for the development of telegraphs and telephones. In the Paurashava, at present, a T & T Board is performing the functions prescribed in the section 6(1). T & T Board is the sole authority for performing the same and it will be continued in future also. But, the Mobile telephone system generates a revolution in the society. Most of the people are depended on the Mobile phone system. The plan does not consider this system.

East Pakistan Water and Power Development Authority Rules, 1965 (No. 4-1(E)

The Power Development Board (PDB) is empowered for power generation under the guidance of Electricity Act, 1910. At present, PDB and Rural Electrification Board (under the Rural Electrification Board Ordinance, 1977) is performing the role relevant with the electrification of the Paurashava. The existing authorities will be needed for electrification of the Paurashava according to the guidelines presented in the plan.

14.5 Implementation, Monitoring and Evaluation

Implementation, Monitoring and Evaluation of the Urban Services Plan

Implementation through Multi-Sectoral Investment Program: Major infrastructure development works such as primary roads, water supply, drainage, etc., will largely be controlled by Government. Public works requires efficient co-ordination through the Multi-Sectoral Investment Program (MSIP).

Objective of a Multi-Sectoral Investment Program (MSIP) will match a list of the development projects with the funding stream necessary to implement them. There are two basic activities that would determine the contents of MSIP. One activity would be to prioritize and schedule the investment projects of all public agencies so they will collectively help to achieve the development goals and objectives of the Urban Services Plan. Second activity would be to analyze the source and availability of fund for the prioritized list of development projects.

Implementation through Action Plans and Projects: Action Plans and Projects will be the implementation plans to solve problems at the local level. Action plans will take a direct approach toward plan implementation with a minimum of research, reports or elaborate planning methods. These projects will be easily identifiable and will require minimum resource.

Implementation through Development Control: Landuse zoning is one of several methods of plan implementation to be considered. In all cases where some form of development, landuse control may be applied; careful consideration requires the following ideologies:

- the purpose to be achieved by the development controls;
- where controls should be applied;

- what aspect of development needs to be controlled;
- what type of development controls are required;
- what degree or level of development control is required;
- who will be affected by the required control;
- who will be affected by the controls and in what manner;
- when the controls should be applied;
- what will be the likely impact of the controls;
- how and by whom will the controls be administered and enforced.

Development control as an instrument of plan implementation may be selectively applied within the Urban Services Plans. Development controls would also be varied in intensity and detail to suit the particular circumstances. It is important that they should be clear and easily understood by all parties concerned. Since the entire Paurashava Master Plan 'package' has become statutory, development controls associated with its component plans would also be statutory.

Implementation by Facilitating Private Investment: Another approach that would be taken by government toward plan implementation will be to guide and facilitate investments made by the private sector. Government can achieve this with relative ease and at very low cost by setting up a legal and operational framework, coupled with suitable incentives, to facilitate land consolidation, plot boundary readjustment, efficient lay out of plots and provision of local infrastructure by the private sector. The benefits of this approach would be:

- increased efficiently of the urban land market would make, more private land available to urban households;
- would pass much of the development costs for local infrastructure to the private sector and land market mechanisms;
- would increase in land for development without large cash outlays by government to purchase land for development schemes; and
- would keep provision of land for community facilities virtually no cost to government.

Plan Monitoring

The Urban Services Plan would simply be tools for guiding and encouraging the growth and development of an urban area in a preferred manner. In a rapidly changing urban environment, the Urban Services Plan would require to keep up to date. If this is not done, within a few years it will be obsolete. Therefore, it is imperative that the requirement for regular updating of the Urban Services Plan be made a legal requirement.

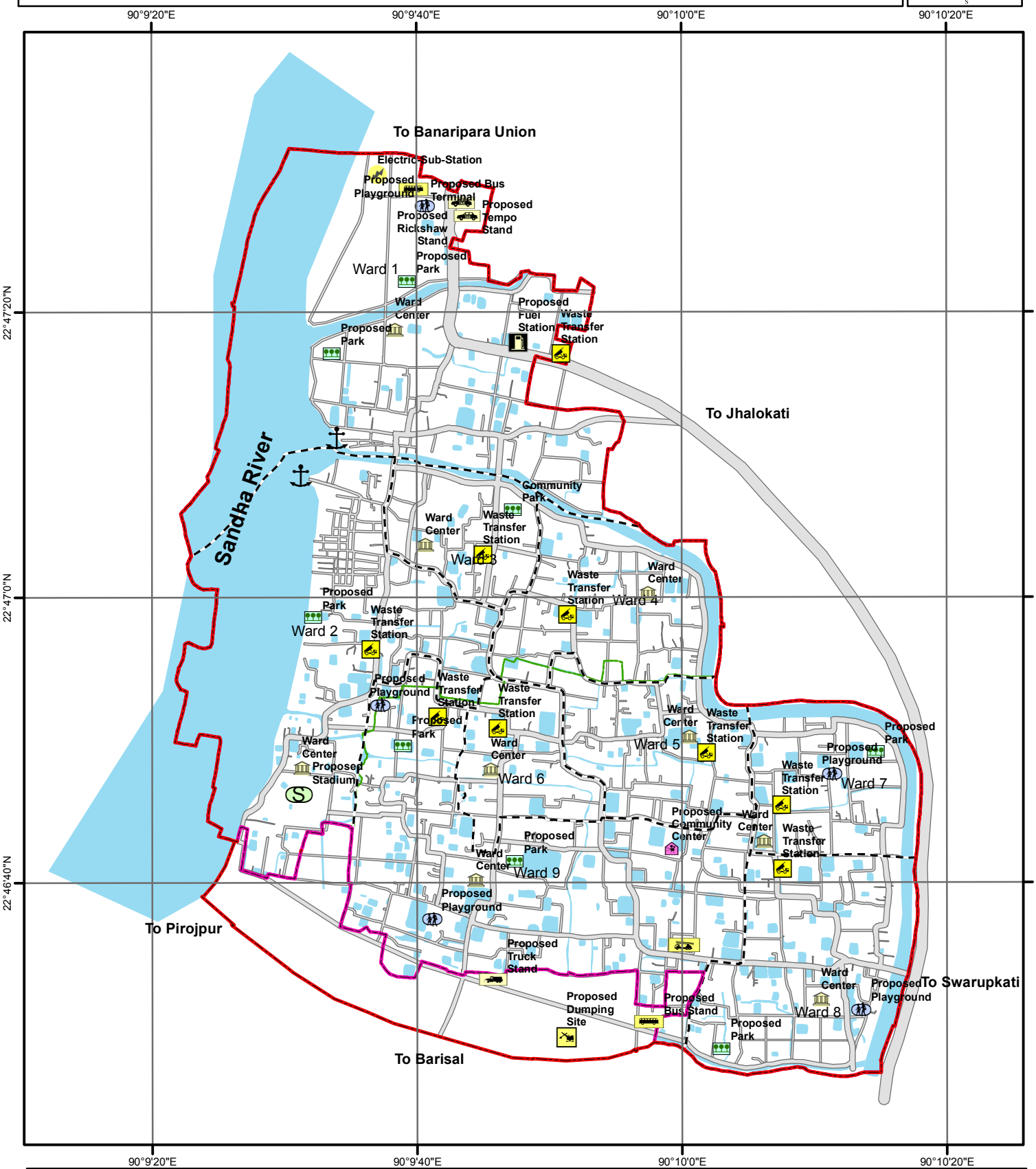
For implementation of the various program components of the Urban Services Plan appropriate administrative measures will have to be undertaken. This will essentially include project preparation and monitoring of their execution and evaluation. For carrying out all these activities appropriate institutional measures are also be needed.

Evaluation

Monitoring and evaluation of ongoing and implemented projects is essential to keep the future course of action on the right track. An ongoing project should be regularly monitored and handicaps identified to enable taking appropriate measures at the right time.
Post implementation evaluation is also needed to take appropriate measures correcting past errors-from project preparation to implementation.

The top level supervision has to be done by a high level supervisory committee headed by the Paurashava Mayor, representatives of the service giving agencies and Local Government Ministry. Other members of the committee will be local Ward Councilors, local community leader/social workers and the Town Planner of the Paurashava. The committee will supervise implementation works regularly and issue necessary instructions to expedite the works of implementation.

Map 14.1 : Proposed Urban Services of Banaripara Paurashava



Legend

- Planning Area Boundary
- Pourashava Boundary
- Mouza Boundary
- Ward Boundary

- Ward Center
- Bus Stand/Terminal
- Community Center
- Dumping Site
- Electric-Sub-Station
- Ferry ghat/Lanch ghat
- Fire Service
- Fuel Station
- Park
- Playground
- Rickshaw Stand
- Stadium
- Tempo Stand
- Truck Stand/Termianal
- Waste Transfer Station

0 50 100 200 300 400 Meters

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Government of the People's Republic of Bangladesh
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Part C. Ward Action Plan

Chapter-15

WARD ACTION PLAN

15.1 Introduction

This chapter contains Ward Action Plan of each individual Ward. First, the issues prevailing in different Wards have been briefly described followed by description of Development Proposals in first ward action plan (1st to 5th year of planning period) for each Ward.

15.1.1 Background

The Ward Action Plans are prepared under the framework of Structure Plan and Urban Area Plan. The Ward Action Plans contain details of development proposals at Ward level including the problems and opportunities existing therein and also include the proposals made in the upper level plan that is in the Urban Area Plan. The Ward Action Plans have been formulated for execution within a period of 5 years.

Ward Action Plan is a vital part of the current plan package as far as spatial development and development control is concerned. Absence of Ward Action Plan not only hampers undertaking of development projects by planning authority, but also leads to uncontrolled and unwanted spatial development in the private sector. Land use zoning is also provided in the Ward Action Plan to enable detailed view of proposed land use and development.

15.1.2 Content and Form of Ward Action Plan

The Ward Action Plan is detailed area plan based on the policy framework, guideline indication of Structure Plan and more detailed guideline of Urban Area Plan. The provision of Ward Action Plan is inherent in the Structure Plan with some specific purposes. The Ward Action Plan is to:

a. Provide basic micro level infrastructure and services in the study area through systematic planning, under the framework of Structure Plan and proposals of the Urban Area Plan;
b. Create congenial environment to promote economic activities;
c. Improve drainage system and protect natural water channels from encroachment; and
d. Create service centers to promote urban growth.

15.1.3 Linkage with 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.

15.2 Derivation of Ward Action Plan

The Ward Action Plan is derived from the conceptual framework, and guidelines and strategies for development under Structure Plan and detailed proposals of Urban Area Plan. Ward Action Plan is aimed to provide detailed infrastructure plan to guide the physical development of Banaripara upazila including its all economic and social activities. This plan adheres to the policy directives spelled out in the Structure Plan.

15.2.1 Revisiting Structure Plan and Urban Area Plan

To guide long term growth of the Paurashava, potential locations of major development areas are identified and the Structure Plan Area is broadly classified into nine categories, namely Established Urban Area, Sub Urban Area, New Urban Area, Recreational Facility, Circulation Network, Restricted Area, Urban Peripheral Area, Agriculture Area and Water Retention Area. The Urban Area Plan is prepared under the framework of Structure Plan and the infrastructure

identified for improvement and development are listed as proposals in the Urban Area Plan. The broad classification of lands in the Structure Plan and detailed proposals in the Urban Area Plan form the basis for Ward Action Plan.

15.2.2 Prioritization

The prioritization of project proposals in Ward wise Action Plan are made on the basis of urgency for development depending on the needs of people and the town's requirement for infrastructure development.

15.2.3 Ward Wise Action Plan

The Ward Action Plan is prepared for each of the nine Wards and is presented in order of their serial number. The Ward Action Plans are a series of detailed spatial development plans of different use and facilities. The plans comprise maps of appropriate scale supported by explanatory report. The Ward Action Plans have been formulated for execution within a period of 5 years. They do not initially cover the entire Structure Plan area. While all sub-areas will eventually require Ward Action Plan, only priority areas are to be dealt with initially. The aim of a Ward Action Plan is to prevent haphazard urban development and ensure livable environment in areas that are likely to be urbanized soon. Initially Detailed Area Plan should be covered for only those areas where action is needed immediately or where development pressure is high.

15.3 Ward Action Plan for Ward No. 01

15.3.1 Demography

Ward No.1 is located on the Northern part of the Paurashava. Population projection shows 2106 populations for the year 2031. For the same year, it will be 19 persons per acre in 2031. Table 15.1 shows the detail.

Table 15.1: Population Statistics of Ward No. 01

Item	Year			
	2016	**2021**	**2026**	**2031**
Area (acre)	112.34	112.34	112.34	112.34
Population	1719	1839	1968	2106
Density of Population (acre)	15	16	18	19

15.3.2 Ward Action Plan Proposals

15.3.2.1 Review of Existing Land Use

Out of total 112.34 acres of land of this ward, more than 45 acres of land i.e. 40.86% is used in waterbody. The agricultural use with 38.28 acres, occupies 34.07% of total land, residential use 19.94%, commercial use 1.95%, and circulation network 2.18%. There is no land for recreational facility.

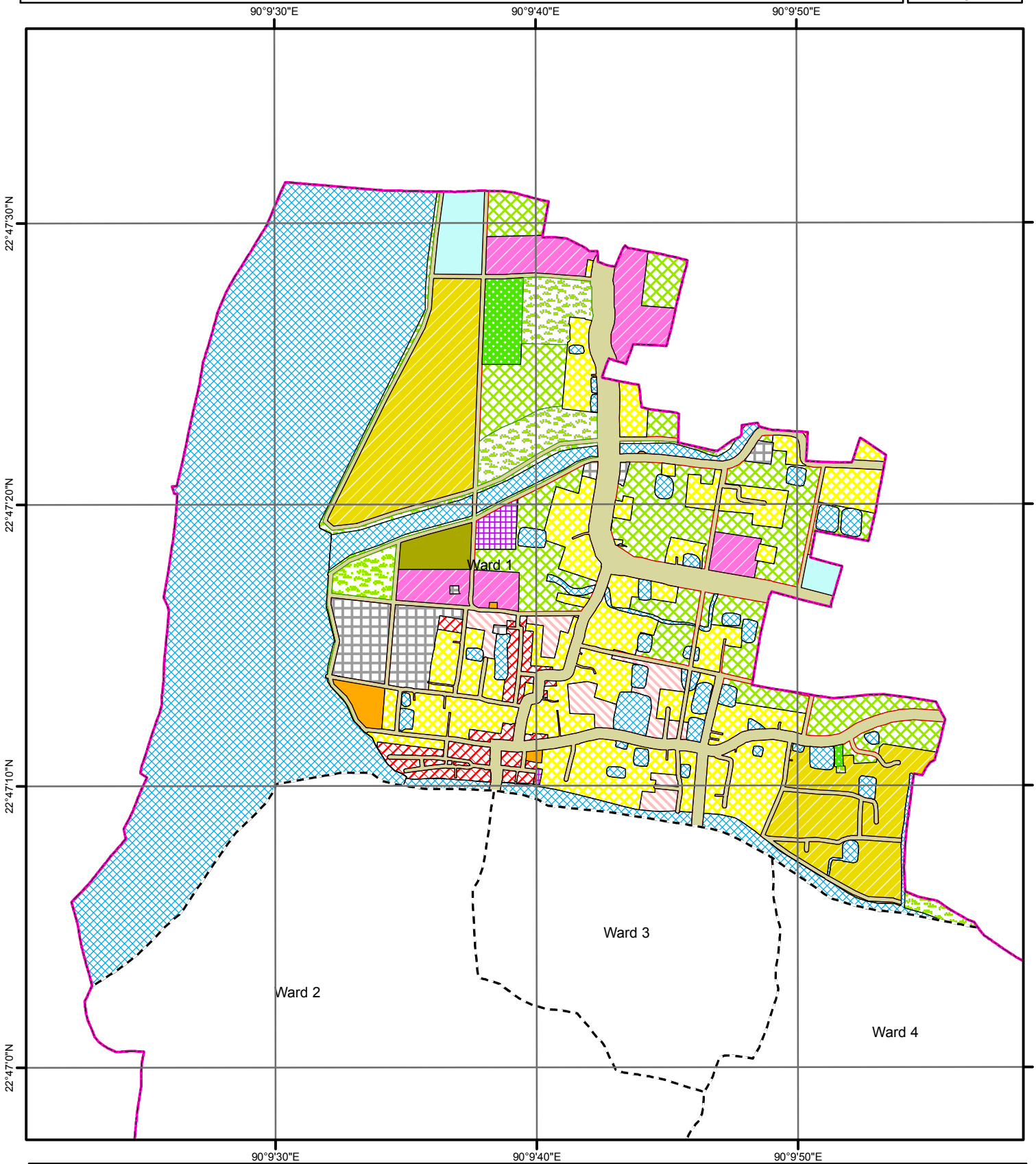
15.3.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.2 shows the amount of land existing and proposed uses in Ward no. 1. **Map 15.1** shows proposed land use of Ward 01. Table 15.2 shows the detail.

Table 15.2: Comparative Scenario of Existing and Proposed Land Uses of Ward No. 01

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agricultural	38.28	34.07	1	Administrative	0.50	0.45
2	Circulation Network	2.45	2.18	2	Agricultural	12.54	11.16
3	Commercial Activities	2.19	1.95	3	Circulation Network	12.24	10.90
4	Community Facilities	0.10	0.09	4	Commercial Activities	1.77	1.58
5	Education and Research	0.07	0.06	5	Community Facilities	0.49	0.44
6	Governmental Service	0.03	0.02	6	Education & Research	1.03	0.91
7	Industrial Facilities	0.48	0.43	7	Health Facilities	0.78	0.70
8	Miscellaneous	0.07	0.06	8	Industrial Facilities	2.62	2.33
9	Mixed Use	0.35	0.31	9	Mixed Use	1.89	1.68
10	Open Space	0.02	0.02	10	Open Space	4.39	3.91
11	Residential Area	22.40	19.94	11	Rural Settlement	10.03	8.93
12	Waterbody	45.90	40.86	12	Transportation & Communication	4.05	3.60
				13	Urban Settlement	14.40	12.82
				14	Utility Service	1.41	1.25
				15	Waterbody	44.19	39.34
	Total	**112.34**	**100**		**Total**	**112.34**	**100**

Map 15.1:Proposed Landuse Map of ward no. 1



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

0 25 50 100 150 200 Meters

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15.3.2.3 Proposed Road Infrastructure Development

A total of 7.27 km of road development has been proposed in first ward action plan for Ward no. 01 of Banaripara Paurashava. Total length of secondary road will be 1.47 km and width will be 30 to 40 ft for this ward. Total length of tertiary road of this ward will be 5.56 km. The rest 0.24 km primary road will be developed and its width will be 80 ft. The detailed scenario of road network development proposal is given in Table 15.3.

Table 15.3: Road Network Proposal at Ward no. 01

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Primary Road	PR-1	80	308.90	Widening	1st
Primary Road	PR-2	80	232.37	Widening	1st
Primary Road	PR-4	80	3.97	Widening	1st
Secondary Road	SR-2	40	299.60	Widening	1st
Secondary Road	SR-3	40	24.79	Widening	1st
Secondary Road	SR-8	40	302.13	Widening	1st
Secondary Road	SR-50	40	25.16	Widening	1st
Secondary Road	SR-54	40	252.60	Widening	1st
Secondary Road	SR-1	30	290.95	Widening	1st
Secondary Road	SR-9	30	74.52	Widening	1st
Secondary Road	SR-10	30	48.22	Widening	1st
Secondary Road	SR-43	30	21.20	Widening	1st
Secondary Road	SR-42	40	84.84	New	2nd
Secondary Road	SR-48	30	48.81	New	2nd
Tertiary Road	TR-1	20	10.24	Widening	2nd
Tertiary Road	TR-2	20	12.43	Widening	2nd
Tertiary Road	TR-3	20	31.87	Widening	2nd
Tertiary Road	TR-4	20	53.75	Widening	2nd
Tertiary Road	TR-5	20	27.86	Widening	2nd
Tertiary Road	TR-6	20	9.15	Widening	2nd
Tertiary Road	TR-7	20	30.71	Widening	2nd
Tertiary Road	TR-8	20	24.42	Widening	2nd
Tertiary Road	TR-9	20	31.94	Widening	2nd
Tertiary Road	TR-10	20	22.26	Widening	2nd
Tertiary Road	TR-11	20	59.23	Widening	2nd
Tertiary Road	TR-12	20	61.74	Widening	2nd
Tertiary Road	TR-13	20	50.10	Widening	2nd
Tertiary Road	TR-14	20	71.71	Widening	2nd
Tertiary Road	TR-15	20	25.85	Widening	2nd
Tertiary Road	TR-16	20	97.90	Widening	2nd
Tertiary Road	TR-17	20	31.24	Widening	2nd
Tertiary Road	TR-18	20	96.22	Widening	2nd
Tertiary Road	TR-19	20	43.06	Widening	2nd
Tertiary Road	TR-20	20	24.76	Widening	2nd
Tertiary Road	TR-21	20	21.10	Widening	2nd
Tertiary Road	TR-22	20	61.74	Widening	2nd
Tertiary Road	TR-23	20	14.27	Widening	2nd
Tertiary Road	TR-24	20	24.53	Widening	2nd
Tertiary Road	TR-25	20	82.14	Widening	2nd
Tertiary Road	TR-26	20	43.81	Widening	2nd
Tertiary Road	TR-27	20	19.50	Widening	2nd
Tertiary Road	TR-28	20	29.57	Widening	2nd
Tertiary Road	TR-29	20	54.50	Widening	2nd
Tertiary Road	TR-30	20	19.39	Widening	2nd
Tertiary Road	TR-31	20	24.62	Widening	2nd
Tertiary Road	TR-32	20	40.58	Widening	2nd
Tertiary Road	TR-33	20	16.05	Widening	2nd
Tertiary Road	TR-34	20	28.32	Widening	2nd
Tertiary Road	TR-35	20	34.61	Widening	2nd
Tertiary Road	TR-36	20	44.67	Widening	2nd
Tertiary Road	TR-37	20	12.20	Widening	2nd
Tertiary Road	TR-38	20	25.91	Widening	2nd
Tertiary Road	TR-39	20	13.94	Widening	2nd

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Tertiary Road	TR-40	20	13.28	Widening	2nd
Tertiary Road	TR-41	20	7.61	Widening	2nd
Tertiary Road	TR-42	20	6.80	Widening	2nd
Tertiary Road	TR-43	20	22.74	Widening	2nd
Tertiary Road	TR-44	20	11.98	Widening	2nd
Tertiary Road	TR-45	20	38.87	Widening	2nd
Tertiary Road	TR-46	20	17.14	Widening	2nd
Tertiary Road	TR-47	20	26.69	Widening	2nd
Tertiary Road	TR-88	20	72.78	Widening	2nd
Tertiary Road	TR-89	20	11.70	Widening	2nd
Tertiary Road	TR-90	20	17.61	Widening	2nd
Tertiary Road	TR-91	20	14.65	Widening	2nd
Tertiary Road	TR-92	20	5.03	Widening	2nd
Tertiary Road	TR-93	20	4.63	Widening	2nd
Tertiary Road	TR-94	20	14.87	Widening	2nd
Tertiary Road	TR-95	20	114.61	Widening	2nd
Tertiary Road	TR-96	20	11.12	Widening	2nd
Tertiary Road	TR-97	20	5.94	Widening	2nd
Tertiary Road	TR-98	20	124.08	Widening	2nd
Tertiary Road	TR-99	20	16.74	Widening	2nd
Tertiary Road	TR-100	20	112.54	Widening	2nd
Tertiary Road	TR-101	20	72.05	Widening	2nd
Tertiary Road	TR-305	20	11.10	Widening	2nd
Tertiary Road	TR-306	20	10.21	Widening	2nd
Tertiary Road	TR-451	20	169.28	New	3rd
Tertiary Road	TR-452	20	0.79	Widening	3rd
Tertiary Road	TR-453	20	26.34	New	3rd
Tertiary Road	TR-454	20	41.26	New	3rd
Tertiary Road	TR-455	20	167.90	New	3rd
Tertiary Road	TR-496	20	10.82	Widening	3rd
Tertiary Road	TR-497	20	187.75	Widening	3rd
Tertiary Road	TR-507	20	83.52	New	3rd
Tertiary Road	TR-533	20	151.36	New	3rd
Tertiary Road	TR-534	20	50.50	New	3rd
Tertiary Road	TR-535	20	287.87	New	3rd
Tertiary Road	TR-538	20	441.24	New	3rd
Tertiary Road	TR-539	20	334.15	New	3rd
Tertiary Road	TR-540	20	804.52	New	3rd
Tertiary Road	TR-541	20	186.83	New	3rd
Tertiary Road	TR-542	20	75.55	New	3rd
Tertiary Road	TR-543	20	158.11	New	3rd
Tertiary Road	TR-544	20	158.39	New	3rd
Tertiary Road	TR-419	20	9.90	Widening	3rd
Tertiary Road	TR-576	20	19.26	Widening	3rd

- "TR" for tertiary road, "SR" for secondary road, and "PR" for primary road.

15.3.2.4 Drainage Development Plan

There is both natural and man-made drainage system at Ward no. 01. The existing drainage of the ward mainly depends on the natural drainage facilities. There is proposal for manmade drainage facilities in Ward Action Plan. The proposed drainage facilities will be developed based on these natural channels. Table 15.4 shows the details. **Map 15.2** represents the proposed road and drainage network for Banaripara Paurashava.

Table15.4: Drainage Development Plan Proposals for ward 01

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
SD-3	Secondary Drain	299.18	3.50-4.50	1.25-2.25	New	1st
SD-36	Secondary Drain	0.12	3.50-4.50	1.25-2.25	New	1st
SD-37	Secondary Drain	67.99	3.50-4.50	1.25-2.25	New	1st
SD-38	Secondary Drain	65.95	3.50-4.50	1.25-2.25	New	1st
SD-39	Secondary Drain	159.77	3.50-4.50	1.25-2.25	New	1st
SD-40	Secondary Drain	84.34	3.50-4.50	1.25-2.25	New	1st
SD-47	Secondary Drain	118.02	3.50-4.50	1.25-2.25	New	1st
SD-48	Secondary Drain	52.19	3.50-4.50	1.25-2.25	New	1st
SD-49	Secondary Drain	181.49	3.50-4.50	1.25-2.25	New	1st
SD-24	Secondary Drain	174.82	3.50-4.50	1.25-2.25	New	2nd
SD-43	Secondary Drain	202.64	3.50-4.50	1.25-2.25	New	2nd
SD-44	Secondary Drain	80.71	3.50-4.50	1.25-2.25	New	2nd
SD-45	Secondary Drain	24.20	3.50-4.50	1.25-2.25	New	2nd
SD-46	Secondary Drain	78.56	3.50-4.50	1.25-2.25	New	2nd
SD-74	Secondary Drain	64.77	3.50-4.50	1.25-2.25	New	2nd
TD-1	Tertiary Drain	215.31	2.50-3.50	0.64-1.25	New	2nd
TD-2	Tertiary Drain	149.54	2.50-3.50	0.64-1.25	New	2nd
TD-3	Tertiary Drain	202.87	2.50-3.50	0.64-1.25	New	2nd
TD-4	Tertiary Drain	30.71	2.50-3.50	0.64-1.25	New	2nd
TD-5	Tertiary Drain	30.42	2.50-3.50	0.64-1.25	New	2nd
TD-6	Tertiary Drain	60.23	2.50-3.50	0.64-1.25	New	2nd
TD-7	Tertiary Drain	45.89	2.50-3.50	0.64-1.25	New	2nd
TD-8	Tertiary Drain	25.85	2.50-3.50	0.64-1.25	New	2nd
TD-9	Tertiary Drain	91.24	2.50-3.50	0.64-1.25	New	2nd
TD-10	Tertiary Drain	33.83	2.50-3.50	0.64-1.25	New	2nd
TD-11	Tertiary Drain	96.22	2.50-3.50	0.64-1.25	New	2nd
TD-12	Tertiary Drain	44.76	2.50-3.50	0.64-1.25	New	2nd
TD-13	Tertiary Drain	27.07	2.50-3.50	0.64-1.25	New	2nd
TD-14	Tertiary Drain	63.72	2.50-3.50	0.64-1.25	New	2nd
TD-15	Tertiary Drain	20.11	2.50-3.50	0.64-1.25	New	2nd
TD-16	Tertiary Drain	43.81	2.50-3.50	0.64-1.25	New	2nd
TD-17	Tertiary Drain	19.50	2.50-3.50	0.64-1.25	New	2nd
TD-18	Tertiary Drain	29.57	2.50-3.50	0.64-1.25	New	2nd
TD-19	Tertiary Drain	54.50	2.50-3.50	0.64-1.25	New	2nd
TD-20	Tertiary Drain	19.39	2.50-3.50	0.64-1.25	New	2nd
TD-21	Tertiary Drain	24.62	2.50-3.50	0.64-1.25	New	2nd
TD-22	Tertiary Drain	45.10	2.50-3.50	0.64-1.25	New	2nd
TD-23	Tertiary Drain	28.32	2.50-3.50	0.64-1.25	New	2nd
TD-24	Tertiary Drain	28.87	2.50-3.50	0.64-1.25	New	2nd
TD-25	Tertiary Drain	50.30	2.50-3.50	0.64-1.25	New	2nd
TD-26	Tertiary Drain	12.20	2.50-3.50	0.64-1.25	New	2nd
TD-27	Tertiary Drain	29.19	2.50-3.50	0.64-1.25	New	2nd
TD-28	Tertiary Drain	24.79	2.50-3.50	0.64-1.25	New	2nd
TD-29	Tertiary Drain	15.82	2.50-3.50	0.64-1.25	New	2nd
TD-30	Tertiary Drain	13.28	2.50-3.50	0.64-1.25	New	2nd
TD-31	Tertiary Drain	7.61	2.50-3.50	0.64-1.25	New	2nd
TD-32	Tertiary Drain	6.80	2.50-3.50	0.64-1.25	New	2nd
TD-33	Tertiary Drain	22.74	2.50-3.50	0.64-1.25	New	2nd
TD-34	Tertiary Drain	11.98	2.50-3.50	0.64-1.25	New	2nd
TD-35	Tertiary Drain	30.82	2.50-3.50	0.64-1.25	New	2nd
TD-36	Tertiary Drain	23.06	2.50-3.50	0.64-1.25	New	2nd
TD-37	Tertiary Drain	26.69	2.50-3.50	0.64-1.25	New	2nd
TD-64	Tertiary Drain	80.82	2.50-3.50	0.64-1.25	New	2nd
TD-65	Tertiary Drain	91.27	2.50-3.50	0.64-1.25	New	2nd
TD-66	Tertiary Drain	21.88	2.50-3.50	0.64-1.25	New	2nd
TD-67	Tertiary Drain	119.89	2.50-3.50	0.64-1.25	New	2nd
TD-68	Tertiary Drain	125.00	2.50-3.50	0.64-1.25	New	2nd
TD-69	Tertiary Drain	105.94	2.50-3.50	0.64-1.25	New	2nd
TD-70	Tertiary Drain	78.69	2.50-3.50	0.64-1.25	New	2nd

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
TD-408	Tertiary Drain	12.46	2.50-3.50	0.64-1.25	New	2nd
TD-413	Tertiary Drain	188.59	2.50-3.50	0.64-1.25	New	2nd
TD-2	Tertiary Drain	143.77	2.50-3.50	0.64-1.25	New	2nd
TD-298	Tertiary Drain	0.79	2.50-3.50	0.64-1.25	New	3rd
TD-299	Tertiary Drain	38.59	2.50-3.50	0.64-1.25	New	3rd
TD-300	Tertiary Drain	41.26	2.50-3.50	0.64-1.25	New	3rd
TD-301	Tertiary Drain	173.46	2.50-3.50	0.64-1.25	New	3rd
TD-332	Tertiary Drain	176.48	2.50-3.50	0.64-1.25	New	3rd
TD-333	Tertiary Drain	47.65	2.50-3.50	0.64-1.25	New	3rd
TD-342	Tertiary Drain	88.88	2.50-3.50	0.64-1.25	New	3rd
TD-361	Tertiary Drain	145.96	2.50-3.50	0.64-1.25	New	3rd
TD-362	Tertiary Drain	44.00	2.50-3.50	0.64-1.25	New	3rd
TD-365	Tertiary Drain	332.25	2.50-3.50	0.64-1.25	New	3rd
TD-366	Tertiary Drain	162.61	2.50-3.50	0.64-1.25	New	3rd
TD-367	Tertiary Drain	401.32	2.50-3.50	0.64-1.25	New	3rd
TD-368	Tertiary Drain	182.46	2.50-3.50	0.64-1.25	New	3rd
TD-369	Tertiary Drain	158.39	2.50-3.50	0.64-1.25	New	3rd
TD-395	Tertiary Drain	179.99	2.50-3.50	0.64-1.25	New	3rd
TD-406	Tertiary Drain	398.51	2.50-3.50	0.64-1.25	New	3rd
TD-407	Tertiary Drain	166.88	2.50-3.50	0.64-1.25	New	3rd

15.3.2.5 Urban Services

a. Solid Waste Management

Solid waste management is an important urban service. As density of population increases the volume of solid waste also increases proportionately. This ward will be developed as an industrial area. 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 proposes one solid waste transfer stations in this ward at on an area of 0.32 acre. 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.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. 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. **Map 15.3** represents proposed urban services for ward 01.

Table15.5: Urban Service Development Proposals for ward 01

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.48
Community Facilities	Graveyard	1	0.42
Education & Research	Primary school	1	0.97
Health Facility	Clinic	1	0.78
Industrial	General Industry	1	2.32
Open Space	Park	2	2.09
	Playground	1	1.17
Rural Settlement	Cluster Village	1	5.94
Transportation & Communication	Bus Terminal	1	1.10
	fuel Station	1	0.53
	Rickshaw Stand	1	0.49
	Tempo Stand	1	0.74
	Truck Terminal	1	1.18
Utility Services	Electric-Sub-Station	1	1.08
	Electricity Line	As per existing program of PDB	-
	Waste Transfer Station	1	0.32

Map 15.2: Proposed Road & Drainage Network of Ward No. 1

Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Bridge
- Culvert
- Pipe Culvert
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Primary Road
- Secondary Road
- Tertiary Road
- Waterbody

0 25 50 100 150 200 Meters

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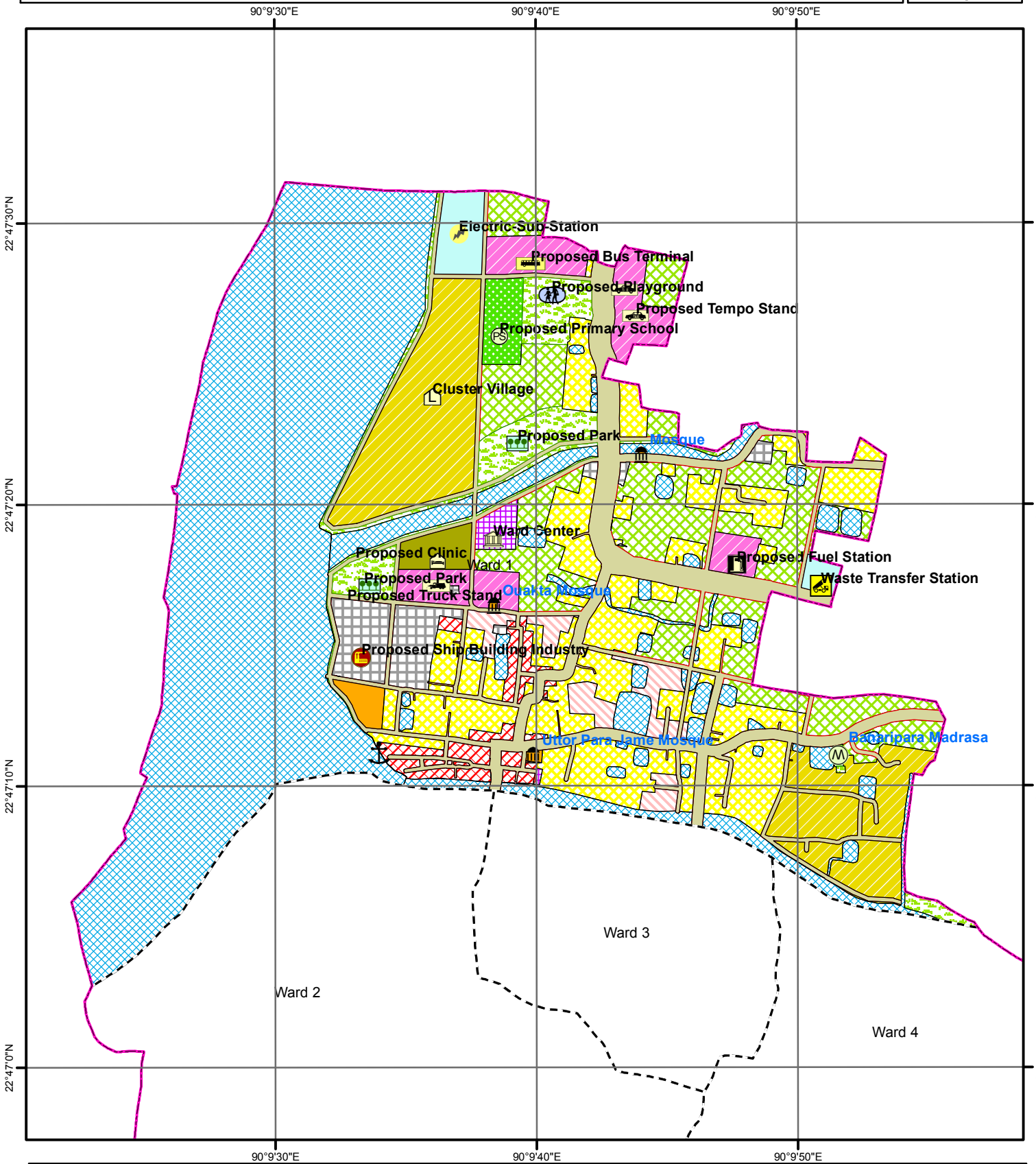
Map 15.3 : Development Proposal for Ward No. 1



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary

- Ward Center
- Stadium
- Bus Stand/Terminal
- Cinema Hall
- Clinic/Hospital
- Cluster Village
- College
- Community Center
- Dumping Site
- Eidgah
- Ferry ghat/Lanch ghat
- Fuel Station
- Graveyard
- High School
- Industry
- Low Income Housing
- Madrasha
- Market
- Mosque
- Park
- Primary School
- Resettelement Zone
- Rickshaw Stand
- Roundabout
- Shamshan Ghat
- Electric-Sub-Station
- Tempo Stand
- Tourist Spot
- Truck Stand/Termianal
- Playground
- Waste Transfer Station

0 25 50 100 150 200 Meters

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15.4 Ward Action Plan for Ward No. 02

15.4.1 Demography

Ward no. 02 is located on the Western part of the town. It has the low density of population within the Paurashava Area. Table 15.6 shows the detail.

Table 15.6: Population Statistics of Ward No. 02

Item	Year			
	2016	2021	2026	2031
Area (acre)	87.14	87.14	87.14	87.14
Population	931	996	1066	1141
Density of Population (acre)	11	11	12	13

15.4.2 Ward Action Plan Proposals

15.4.2.1 Review of Existing Land Use

The maximum land of this ward at present is used for waterbody. It occupies 42.88 acres of land covering more than 49.21% of the total land. Residential land occupies about 17.54% of the land of the ward. About 15.25 acres of land is under agriculture, 1.13% is used for education, 4.37% for circulation network, and only 0.08% of land is used as open spaces. Table 15.8 shows the existing land use pattern of Banaripara Paurashava.

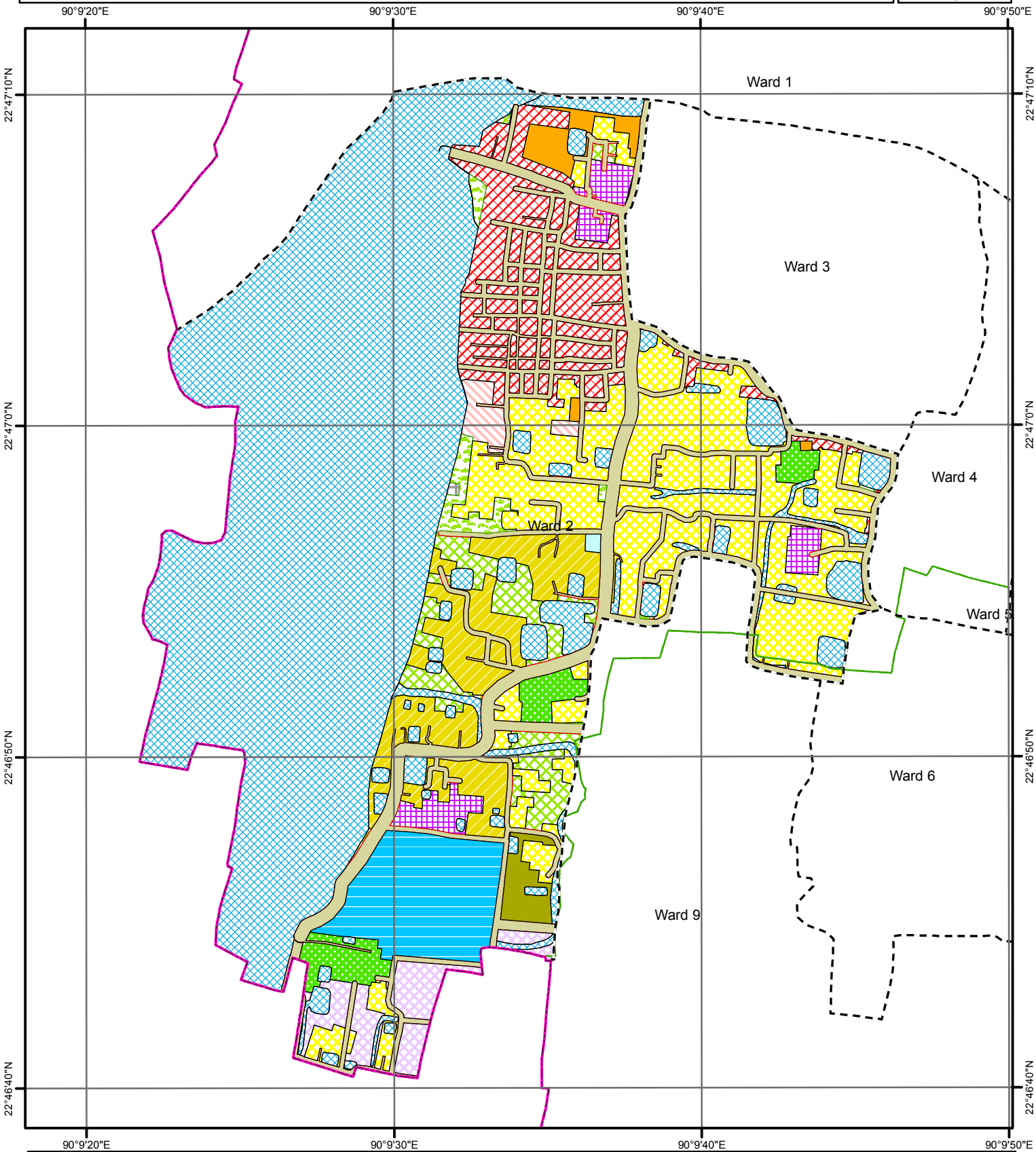
15.4.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.7 shows the amount of land existing and proposed uses in Ward no. 02. **Map 15.4** shows proposed land use of Ward 02.

Table 15.7: Comparative Scenario of Existing and Proposed Land Uses of Ward No. 02

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agricultural	15.25	17.50	1	Administrative	1.39	1.60
2	Circulation Network	3.81	4.37	2	Agriculture	2.35	2.69
3	Commercial Activity	7.08	8.13	3	Circulation Network	9.73	11.17
4	Community Facilities	0.07	0.09	4	Commercial Activities	5.65	6.48
5	Educational and Research	0.98	1.13	5	Community Facilities	0.75	0.86
6	Government Service	0.97	1.11	6	Educational & Research	1.48	1.70
7	Industrial Facilities	0.03	0.03	7	Health Facilities	0.60	0.69
8	Miscellaneous	0.11	0.12	8	Industrial Facilities	0.03	0.03
9	Mixed Use	0.59	0.67	9	Mixed Use	0.56	0.64
10	Open Space	0.07	0.08	10	Open Space	0.67	0.76
11	Residential Area	15.29	17.54	11	Recreational Facilities	3.65	4.19
12	Service Activity	-	-	12	Rural Settlement	4.36	5.00
13	Waterbody	42.88	49.21	13	Urban Deferred	1.74	1.99
				14	Urban Settlement	12.47	14.31
				15	Utility Service	0.06	0.07
				16	Waterbody	41.66	47.81
	Total	**87.14**	**100**		**Total**	**87.14**	**100**

Map 15.4:Proposed Landuse Map of ward no. 2



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

0 20 40 80 120 160 Meters

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15.4.2.3 Proposed Road Infrastructure Development

A total of 7.58 km of road development proposal have been made for Ward no. 02 of Banaripara Paurashava. The total length of tertiary road will be 5.49 km and width of these roads will be 20 ft for this Ward. The total length of secondary road will be 2.09 km and width of these roads will be 30 to 40 ft. The detailed scenario of road network development proposal is given in Table 15.8.

Table 15.8: Road Network Proposal at Ward no. 02

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Secondary Road	SR-6	40	0.12	Widening	1st
Secondary Road	SR-12	40	456.29	Widening	1st
Secondary Road	SR-13	40	66.33	Widening	1st
Secondary Road	SR-14	40	135.54	Widening	1st
Secondary Road	SR-16	40	187.98	Widening	1st
Secondary Road	SR-21	40	148.07	Widening	1st
Secondary Road	SR-50	40	375.87	Widening	1st
Secondary Road	SR-4	30	25.68	Widening	1st
Secondary Road	SR-5	30	155.61	Widening	1st
Secondary Road	SR-15	30	0.01	Widening	1st
Secondary Road	SR-55	30	20.76	Widening	1st
Secondary Road	SR-42	40	22.53	New	2nd
Secondary Road	SR-46	30	88.45	New	2nd
Secondary Road	SR-66	30	406.19	New	2nd
Tertiary Road	TR-48	20	53.61	Widening	2nd
Tertiary Road	TR-49	20	24.90	Widening	2nd
Tertiary Road	TR-50	20	68.81	Widening	2nd
Tertiary Road	TR-51	20	57.24	Widening	2nd
Tertiary Road	TR-52	20	10.77	Widening	2nd
Tertiary Road	TR-53	20	12.71	Widening	2nd
Tertiary Road	TR-54	20	56.93	Widening	2nd
Tertiary Road	TR-55	20	25.17	Widening	2nd
Tertiary Road	TR-56	20	64.49	Widening	2nd
Tertiary Road	TR-57	20	67.50	Widening	2nd
Tertiary Road	TR-58	20	20.01	Widening	2nd
Tertiary Road	TR-59	20	43.21	Widening	2nd
Tertiary Road	TR-60	20	70.99	Widening	2nd
Tertiary Road	TR-61	20	63.03	Widening	2nd
Tertiary Road	TR-62	20	34.64	Widening	2nd
Tertiary Road	TR-63	20	24.12	Widening	2nd
Tertiary Road	TR-64	20	20.79	Widening	2nd
Tertiary Road	TR-65	20	11.74	Widening	2nd
Tertiary Road	TR-66	20	46.77	Widening	2nd
Tertiary Road	TR-67	20	11.61	Widening	2nd
Tertiary Road	TR-68	20	12.37	Widening	2nd
Tertiary Road	TR-69	20	14.83	Widening	2nd
Tertiary Road	TR-70	20	36.06	Widening	2nd
Tertiary Road	TR-71	20	18.30	Widening	2nd
Tertiary Road	TR-72	20	19.62	Widening	2nd
Tertiary Road	TR-73	20	58.71	Widening	2nd
Tertiary Road	TR-74	20	18.58	Widening	2nd
Tertiary Road	TR-75	20	33.58	Widening	2nd
Tertiary Road	TR-76	20	28.71	Widening	2nd
Tertiary Road	TR-77	20	30.95	Widening	2nd
Tertiary Road	TR-78	20	29.49	Widening	2nd
Tertiary Road	TR-79	20	52.16	Widening	2nd
Tertiary Road	TR-80	20	0.12	Widening	2nd
Tertiary Road	TR-102	20	35.05	Widening	2nd
Tertiary Road	TR-103	20	76.72	Widening	2nd
Tertiary Road	TR-104	20	72.63	Widening	2nd
Tertiary Road	TR-105	20	163.83	Widening	2nd
Tertiary Road	TR-106	20	40.22	Widening	2nd
Tertiary Road	TR-107	20	18.08	Widening	2nd
Tertiary Road	TR-108	20	32.04	Widening	2nd

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Tertiary Road	TR-109	20	41.99	Widening	2nd
Tertiary Road	TR-110	20	14.11	Widening	2nd
Tertiary Road	TR-111	20	29.41	Widening	2nd
Tertiary Road	TR-112	20	51.03	Widening	2nd
Tertiary Road	TR-113	20	51.16	Widening	2nd
Tertiary Road	TR-114	20	35.13	Widening	2nd
Tertiary Road	TR-115	20	33.07	Widening	2nd
Tertiary Road	TR-116	20	57.85	Widening	2nd
Tertiary Road	TR-117	20	35.64	Widening	2nd
Tertiary Road	TR-118	20	32.94	Widening	2nd
Tertiary Road	TR-119	20	40.70	Widening	2nd
Tertiary Road	TR-120	20	14.64	Widening	2nd
Tertiary Road	TR-121	20	68.91	Widening	2nd
Tertiary Road	TR-122	20	83.58	Widening	2nd
Tertiary Road	TR-123	20	13.55	Widening	2nd
Tertiary Road	TR-124	20	53.22	Widening	2nd
Tertiary Road	TR-125	20	23.88	Widening	2nd
Tertiary Road	TR-126	20	19.33	Widening	2nd
Tertiary Road	TR-127	20	40.69	Widening	2nd
Tertiary Road	TR-128	20	153.94	Widening	2nd
Tertiary Road	TR-129	20	159.25	Widening	2nd
Tertiary Road	TR-130	20	22.20	Widening	2nd
Tertiary Road	TR-131	20	8.33	Widening	2nd
Tertiary Road	TR-132	20	19.00	Widening	2nd
Tertiary Road	TR-133	20	22.92	Widening	2nd
Tertiary Road	TR-134	20	28.81	Widening	2nd
Tertiary Road	TR-135	20	23.88	Widening	2nd
Tertiary Road	TR-136	20	27.04	Widening	2nd
Tertiary Road	TR-137	20	34.95	Widening	2nd
Tertiary Road	TR-138	20	48.73	Widening	2nd
Tertiary Road	TR-139	20	16.15	Widening	2nd
Tertiary Road	TR-140	20	65.85	Widening	2nd
Tertiary Road	TR-141	20	109.77	Widening	2nd
Tertiary Road	TR-142	20	15.73	Widening	2nd
Tertiary Road	TR-143	20	25.15	Widening	2nd
Tertiary Road	TR-144	20	15.95	Widening	2nd
Tertiary Road	TR-145	20	27.87	Widening	2nd
Tertiary Road	TR-146	20	24.92	Widening	2nd
Tertiary Road	TR-147	20	37.86	Widening	2nd
Tertiary Road	TR-148	20	23.12	Widening	2nd
Tertiary Road	TR-149	20	22.74	Widening	2nd
Tertiary Road	TR-150	20	106.94	Widening	2nd
Tertiary Road	TR-151	20	48.33	Widening	2nd
Tertiary Road	TR-152	20	51.24	Widening	2nd
Tertiary Road	TR-153	20	50.24	Widening	2nd
Tertiary Road	TR-154	20	0.01	Widening	2nd
Tertiary Road	TR-155	20	86.78	Widening	2nd
Tertiary Road	TR-156	20	7.90	Widening	2nd
Tertiary Road	TR-157	20	79.83	Widening	2nd
Tertiary Road	TR-158	20	6.80	Widening	2nd
Tertiary Road	TR-159	20	139.42	Widening	2nd
Tertiary Road	TR-160	20	109.04	Widening	2nd
Tertiary Road	TR-161	20	31.04	Widening	2nd
Tertiary Road	TR-162	20	90.33	Widening	2nd
Tertiary Road	TR-163	20	33.16	Widening	2nd
Tertiary Road	TR-165	20	60.16	Widening	2nd
Tertiary Road	TR-166	20	18.08	Widening	2nd
Tertiary Road	TR-167	20	21.11	Widening	2nd
Tertiary Road	TR-168	20	18.53	Widening	2nd
Tertiary Road	TR-170	20	0.09	Widening	2nd
Tertiary Road	TR-171	20	68.11	Widening	2nd
Tertiary Road	TR-172	20	58.19	Widening	2nd

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Tertiary Road	TR-175	20	13.53	Widening	2nd
Tertiary Road	TR-176	20	11.00	Widening	2nd
Tertiary Road	TR-185	20	5.41	Widening	2nd
Tertiary Road	TR-186	20	13.25	Widening	2nd
Tertiary Road	TR-203	20	0.28	Widening	2nd
Tertiary Road	TR-307	20	20.16	Widening	2nd
Tertiary Road	TR-308	20	55.93	Widening	2nd
Tertiary Road	TR-309	20	37.41	Widening	2nd
Tertiary Road	TR-319	20	50.99	Widening	2nd
Tertiary Road	TR-457	20	0.14	New	3rd
Tertiary Road	TR-463	20	68.44	New	3rd
Tertiary Road	TR-465	20	44.08	New	3rd
Tertiary Road	TR-468	20	0.15	Widening	3rd
Tertiary Road	TR-500	20	14.14	New	3rd
Tertiary Road	TR-501	20	14.49	New	3rd
Tertiary Road	TR-516	20	38.37	New	3rd
Tertiary Road	TR-555	20	140.32	New	3rd
Tertiary Road	TR-556	20	118.51	New	3rd
Tertiary Road	TR-560	20	127.91	Widening	3rd
Tertiary Road	TR-561	20	78.32	New	3rd
Tertiary Road	TR-567	20	26.56	New	3rd
Tertiary Road	TR-369	20	27.87	Widening	3rd
Tertiary Road	TR-420	20	13.90	Widening	3rd

- "TR" for tertiary road, and "SR" for secondary road.

15.4.2.4 Drainage Development Plan

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. Primary drain will be connected by 2.3 km secondary drain and 4.73 km tertiary drain. Table 15.9 shows the details. **Map 15.5** represents proposed Road and Drainage Network of Ward 2.

Table15.9: Drainage Development Plan Proposals for ward 02

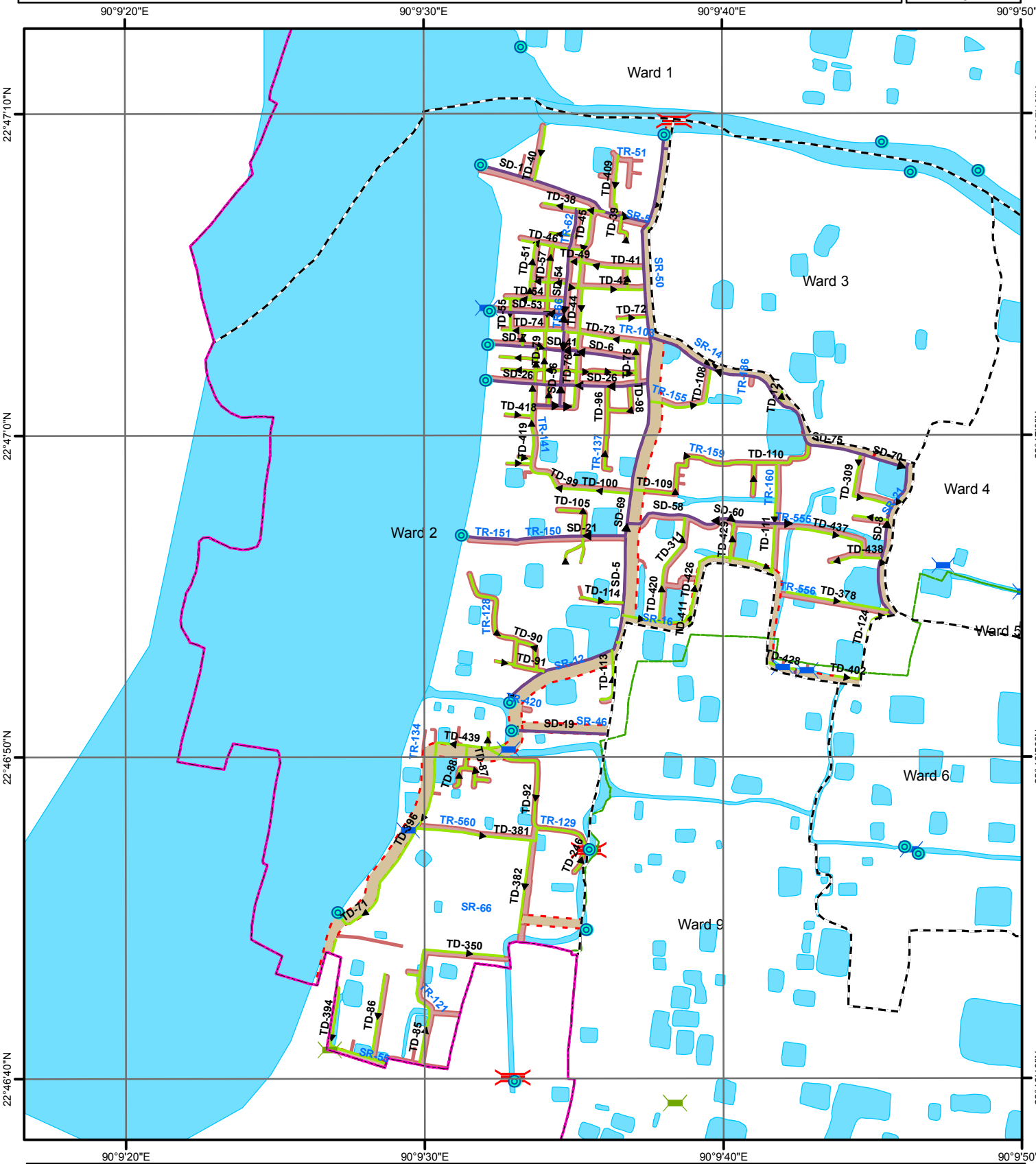
Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
PD-2	Primary Drain	6.01	4.50-5.50	2.25-3.50	New	1st
SD-1	Secondary Drain	171.27	3.50-4.50	1.25-2.25	New	1st
SD-2	Secondary Drain	6.17	3.50-4.50	1.25-2.25	New	1st
SD-5	Secondary Drain	223.23	3.50-4.50	1.25-2.25	New	1st
SD-6	Secondary Drain	57.34	3.50-4.50	1.25-2.25	New	1st
SD-7	Secondary Drain	56.03	3.50-4.50	1.25-2.25	New	1st
SD-41	Secondary Drain	29.76	3.50-4.50	1.25-2.25	New	1st
SD-50	Secondary Drain	11.43	3.50-4.50	1.25-2.25	New	1st
SD-51	Secondary Drain	26.43	3.50-4.50	1.25-2.25	New	1st
SD-52	Secondary Drain	0.20	3.50-4.50	1.25-2.25	New	1st
SD-53	Secondary Drain	71.14	3.50-4.50	1.25-2.25	New	1st
SD-54	Secondary Drain	102.50	3.50-4.50	1.25-2.25	New	1st
SD-55	Secondary Drain	15.78	3.50-4.50	1.25-2.25	New	1st
SD-56	Secondary Drain	52.61	3.50-4.50	1.25-2.25	New	1st
SD-57	Secondary Drain	19.17	3.50-4.50	1.25-2.25	New	1st
SD-58	Secondary Drain	96.90	3.50-4.50	1.25-2.25	New	1st
SD-59	Secondary Drain	55.46	3.50-4.50	1.25-2.25	New	1st
SD-8	Secondary Drain	151.02	3.50-4.50	1.25-2.25	New	2nd
SD-19	Secondary Drain	98.70	3.50-4.50	1.25-2.25	New	2nd
SD-21	Secondary Drain	354.80	3.50-4.50	1.25-2.25	New	2nd
SD-69	Secondary Drain	195.25	3.50-4.50	1.25-2.25	New	2nd
SD-70	Secondary Drain	41.42	3.50-4.50	1.25-2.25	New	2nd
SD-71	Secondary Drain	0.72	3.50-4.50	1.25-2.25	New	2nd
SD-72	Secondary Drain	0.85	3.50-4.50	1.25-2.25	New	2nd

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
SD-73	Secondary Drain	2.31	3.50-4.50	1.25-2.25	New	2nd
SD-75	Secondary Drain	251.51	3.50-4.50	1.25-2.25	New	2nd
SD-76	Secondary Drain	6.08	3.50-4.50	1.25-2.25	New	2nd
SD-26	Secondary Drain	91.83	3.50-4.50	1.25-2.25	New	2nd
SD-26	Secondary Drain	63.55	3.50-4.50	1.25-2.25	New	2nd
SD-14	Secondary Drain	0.12	3.50-4.50	1.25-2.25	New	2nd
SD-60	Secondary Drain	15.94	3.50-4.50	1.25-2.25	New	3rd
SD-61	Secondary Drain	0.43	3.50-4.50	1.25-2.25	New	3rd
TD-411	Tertiary Drain	13.43	2.50-3.50	0.64-1.25	New	1st
TD-38	Tertiary Drain	32.85	2.50-3.50	0.64-1.25	New	2nd
TD-39	Tertiary Drain	29.26	2.50-3.50	0.64-1.25	New	2nd
TD-40	Tertiary Drain	54.29	2.50-3.50	0.64-1.25	New	2nd
TD-41	Tertiary Drain	61.01	2.50-3.50	0.64-1.25	New	2nd
TD-42	Tertiary Drain	59.27	2.50-3.50	0.64-1.25	New	2nd
TD-43	Tertiary Drain	20.01	2.50-3.50	0.64-1.25	New	2nd
TD-44	Tertiary Drain	47.42	2.50-3.50	0.64-1.25	New	2nd
TD-45	Tertiary Drain	76.20	2.50-3.50	0.64-1.25	New	2nd
TD-46	Tertiary Drain	59.88	2.50-3.50	0.64-1.25	New	2nd
TD-47	Tertiary Drain	24.12	2.50-3.50	0.64-1.25	New	2nd
TD-48	Tertiary Drain	11.61	2.50-3.50	0.64-1.25	New	2nd
TD-49	Tertiary Drain	12.37	2.50-3.50	0.64-1.25	New	2nd
TD-50	Tertiary Drain	14.83	2.50-3.50	0.64-1.25	New	2nd
TD-51	Tertiary Drain	36.06	2.50-3.50	0.64-1.25	New	2nd
TD-52	Tertiary Drain	18.30	2.50-3.50	0.64-1.25	New	2nd
TD-53	Tertiary Drain	19.67	2.50-3.50	0.64-1.25	New	2nd
TD-54	Tertiary Drain	58.71	2.50-3.50	0.64-1.25	New	2nd
TD-55	Tertiary Drain	30.95	2.50-3.50	0.64-1.25	New	2nd
TD-56	Tertiary Drain	31.15	2.50-3.50	0.64-1.25	New	2nd
TD-57	Tertiary Drain	52.16	2.50-3.50	0.64-1.25	New	2nd
TD-58	Tertiary Drain	6.38	2.50-3.50	0.64-1.25	New	2nd
TD-71	Tertiary Drain	72.50	2.50-3.50	0.64-1.25	New	2nd
TD-72	Tertiary Drain	29.07	2.50-3.50	0.64-1.25	New	2nd
TD-73	Tertiary Drain	70.90	2.50-3.50	0.64-1.25	New	2nd
TD-74	Tertiary Drain	72.76	2.50-3.50	0.64-1.25	New	2nd
TD-75	Tertiary Drain	40.22	2.50-3.50	0.64-1.25	New	2nd
TD-76	Tertiary Drain	72.29	2.50-3.50	0.64-1.25	New	2nd
TD-77	Tertiary Drain	14.11	2.50-3.50	0.64-1.25	New	2nd
TD-78	Tertiary Drain	29.41	2.50-3.50	0.64-1.25	New	2nd
TD-79	Tertiary Drain	51.54	2.50-3.50	0.64-1.25	New	2nd
TD-80	Tertiary Drain	35.13	2.50-3.50	0.64-1.25	New	2nd
TD-81	Tertiary Drain	35.59	2.50-3.50	0.64-1.25	New	2nd
TD-82	Tertiary Drain	32.94	2.50-3.50	0.64-1.25	New	2nd
TD-83	Tertiary Drain	40.70	2.50-3.50	0.64-1.25	New	2nd
TD-84	Tertiary Drain	14.64	2.50-3.50	0.64-1.25	New	2nd
TD-85	Tertiary Drain	67.81	2.50-3.50	0.64-1.25	New	2nd
TD-86	Tertiary Drain	83.58	2.50-3.50	0.64-1.25	New	2nd
TD-87	Tertiary Drain	59.52	2.50-3.50	0.64-1.25	New	2nd
TD-88	Tertiary Drain	23.88	2.50-3.50	0.64-1.25	New	2nd
TD-89	Tertiary Drain	19.33	2.50-3.50	0.64-1.25	New	2nd
TD-90	Tertiary Drain	40.69	2.50-3.50	0.64-1.25	New	2nd
TD-91	Tertiary Drain	145.96	2.50-3.50	0.64-1.25	New	2nd
TD-92	Tertiary Drain	170.89	2.50-3.50	0.64-1.25	New	2nd
TD-93	Tertiary Drain	15.66	2.50-3.50	0.64-1.25	New	2nd
TD-96	Tertiary Drain	83.93	2.50-3.50	0.64-1.25	New	2nd
TD-98	Tertiary Drain	46.48	2.50-3.50	0.64-1.25	New	2nd
TD-99	Tertiary Drain	17.31	2.50-3.50	0.64-1.25	New	2nd
TD-100	Tertiary Drain	60.64	2.50-3.50	0.64-1.25	New	2nd
TD-101	Tertiary Drain	13.21	2.50-3.50	0.64-1.25	New	2nd
TD-102	Tertiary Drain	23.31	2.50-3.50	0.64-1.25	New	2nd
TD-103	Tertiary Drain	20.58	2.50-3.50	0.64-1.25	New	2nd
TD-104	Tertiary Drain	51.24	2.50-3.50	0.64-1.25	New	2nd
TD-105	Tertiary Drain	50.24	2.50-3.50	0.64-1.25	New	2nd

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
TD-106	Tertiary Drain	7.34	2.50-3.50	0.64-1.25	New	2nd
TD-107	Tertiary Drain	7.47	2.50-3.50	0.64-1.25	New	2nd
TD-108	Tertiary Drain	88.39	2.50-3.50	0.64-1.25	New	2nd
TD-109	Tertiary Drain	85.81	2.50-3.50	0.64-1.25	New	2nd
TD-110	Tertiary Drain	130.50	2.50-3.50	0.64-1.25	New	2nd
TD-111	Tertiary Drain	105.12	2.50-3.50	0.64-1.25	New	2nd
TD-112	Tertiary Drain	31.04	2.50-3.50	0.64-1.25	New	2nd
TD-113	Tertiary Drain	56.55	2.50-3.50	0.64-1.25	New	2nd
TD-114	Tertiary Drain	42.05	2.50-3.50	0.64-1.25	New	2nd
TD-121	Tertiary Drain	12.98	2.50-3.50	0.64-1.25	New	2nd
TD-124	Tertiary Drain	57.82	2.50-3.50	0.64-1.25	New	2nd
TD-130	Tertiary Drain	5.95	2.50-3.50	0.64-1.25	New	2nd
TD-396	Tertiary Drain	148.26	2.50-3.50	0.64-1.25	New	2nd
TD-409	Tertiary Drain	59.74	2.50-3.50	0.64-1.25	New	2nd
TD-416	Tertiary Drain	26.81	2.50-3.50	0.64-1.25	New	2nd
TD-417	Tertiary Drain	31.98	2.50-3.50	0.64-1.25	New	2nd
TD-418	Tertiary Drain	25.77	2.50-3.50	0.64-1.25	New	2nd
TD-419	Tertiary Drain	77.55	2.50-3.50	0.64-1.25	New	2nd
TD-420	Tertiary Drain	61.79	2.50-3.50	0.64-1.25	New	2nd
TD-421	Tertiary Drain	37.54	2.50-3.50	0.64-1.25	New	2nd
TD-426	Tertiary Drain	113.12	2.50-3.50	0.64-1.25	New	2nd
TD-427	Tertiary Drain	3.88	2.50-3.50	0.64-1.25	New	2nd
TD-428	Tertiary Drain	73.30	2.50-3.50	0.64-1.25	New	2nd
TD-429	Tertiary Drain	36.73	2.50-3.50	0.64-1.25	New	2nd
TD-439	Tertiary Drain	66.30	2.50-3.50	0.64-1.25	New	2nd
TD-198	Tertiary Drain	17.23	2.50-3.50	0.64-1.25	New	3rd
TD-199	Tertiary Drain	33.61	2.50-3.50	0.64-1.25	New	3rd
TD-246	Tertiary Drain	27.87	2.50-3.50	0.64-1.25	New	3rd
TD-303	Tertiary Drain	5.30	2.50-3.50	0.64-1.25	New	3rd
TD-309	Tertiary Drain	63.36	2.50-3.50	0.64-1.25	New	3rd
TD-311	Tertiary Drain	46.20	2.50-3.50	0.64-1.25	New	3rd
TD-312	Tertiary Drain	5.40	2.50-3.50	0.64-1.25	New	3rd
TD-336	Tertiary Drain	11.86	2.50-3.50	0.64-1.25	New	3rd
TD-350	Tertiary Drain	138.11	2.50-3.50	0.64-1.25	New	3rd
TD-376	Tertiary Drain	7.20	2.50-3.50	0.64-1.25	New	3rd
TD-378	Tertiary Drain	99.84	2.50-3.50	0.64-1.25	New	3rd
TD-381	Tertiary Drain	126.19	2.50-3.50	0.64-1.25	New	3rd
TD-382	Tertiary Drain	89.55	2.50-3.50	0.64-1.25	New	3rd
TD-394	Tertiary Drain	132.76	2.50-3.50	0.64-1.25	New	3rd
TD-402	Tertiary Drain	26.34	2.50-3.50	0.64-1.25	New	3rd
TD-437	Tertiary Drain	79.16	2.50-3.50	0.64-1.25	New	3rd
TD-438	Tertiary Drain	49.14	2.50-3.50	0.64-1.25	New	3rd

Besides, it will be necessary to re-excavate all the encroached khals that serve as primary drains. The consultants have identified all existing khals that need to be re-excavated to allow smooth flow of water through them.

Map 15.5: Proposed Road & Drainage Network of Ward No. 2



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Bridge
- Culvert
- Pipe Culvert
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Primary Road
- Secondary Road
- Tertiary Road
- Waterbody

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15.4.2.5 Urban Services

a. Solid Waste Management

The present management system as in the other wards is not satisfactory and it might lead to problem in future. 0.06 acre land is proposed as waste transfer station. 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.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

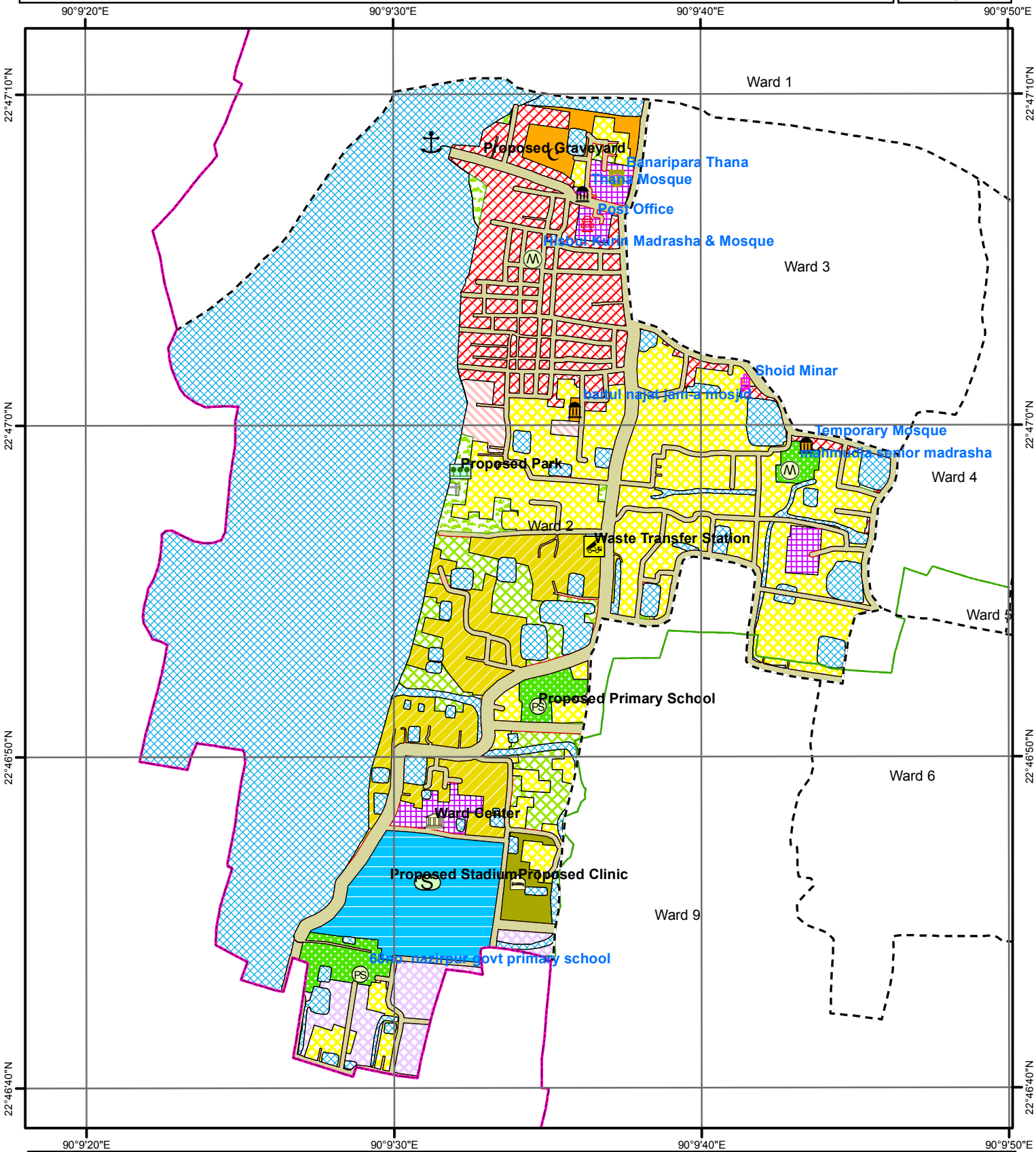
The Paurashava must try to promote hygienic sanitation for the whole Paurashavsa to ensure better public health.

Table15.10: Urban Service Development Proposals for ward 02

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.52
Commercial Activity	Retailsale Market	1	1.40
Community Facilities	Graveyard	1	0.68
Education & Research	Primary School	1	0.49
Health Facility	Clinic	1	0.60
Open Space	park	1	0.51
	Playground	1	0.46
Recreational facility	Stadium	1	3.68
Utility Services	Electricity Line	As per existing program of PDB	-
	Waste Transfer Station	1	0.06

Map 15.6 represents proposed urban services for ward 2.

Map 15.6 : Development Proposal for Ward No. 2



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary

- Ward Center
- Stadium
- Bus Stand/Terminal
- Cinema Hall
- Clinic/Hospital
- Cluster Village
- College
- Community Center
- Dumping Site
- Eidgah
- Ferry ghat/Lanch ghat
- Fuel Station
- Graveyard
- High School
- Industry
- Low Income Housing
- Madrasha
- Market
- Mosque
- Park
- Primary School
- Resettelement Zone
- Rickshaw Stand
- Roundabout
- Shamshan Ghat
- Electric-Sub-Station
- Tempo Stand
- Tourist Spot
- Truck Stand/Termianal
- Playground
- Waste Transfer Station

0 20 40 80 120 160 Meters

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15.5 Ward Action Plan for Ward No. 03

15.5.1 Demography

Ward No. 03 is located on the middle part of the town. Estimated population for the year 2031 will be 1354 in the ward with a density of 69 persons per acre. It has the highest density of population. Table 15.11 shows the detail.

Table 15.11: Population Statistics of Ward No. 03

Item	Year			
	2016	2021	2026	2031
Area (acre)	19.56	19.56	19.56	19.56
Population	1104	1182	1265	1354
Density of Population (acre)	56	60	65	69

15.5.2 Ward Action Plan Proposals

15.5.2.1 Review of Existing Land Use

The maximum land of this ward at present is used for residential purpose. It occupies 7.99 acres of land covering more than 40.87% of the total land. Agricultural lands occupy about 29.71% of the land of the ward. About 1.60 acre of land is under Water bodies, 5.21% is used for commercial facilities, 6.20% circulation network. 3.87% land is utilized for educational purpose. Only 0.34 acres of land is used as community facilities with negligible percentage of recreational facilities (0.63%).

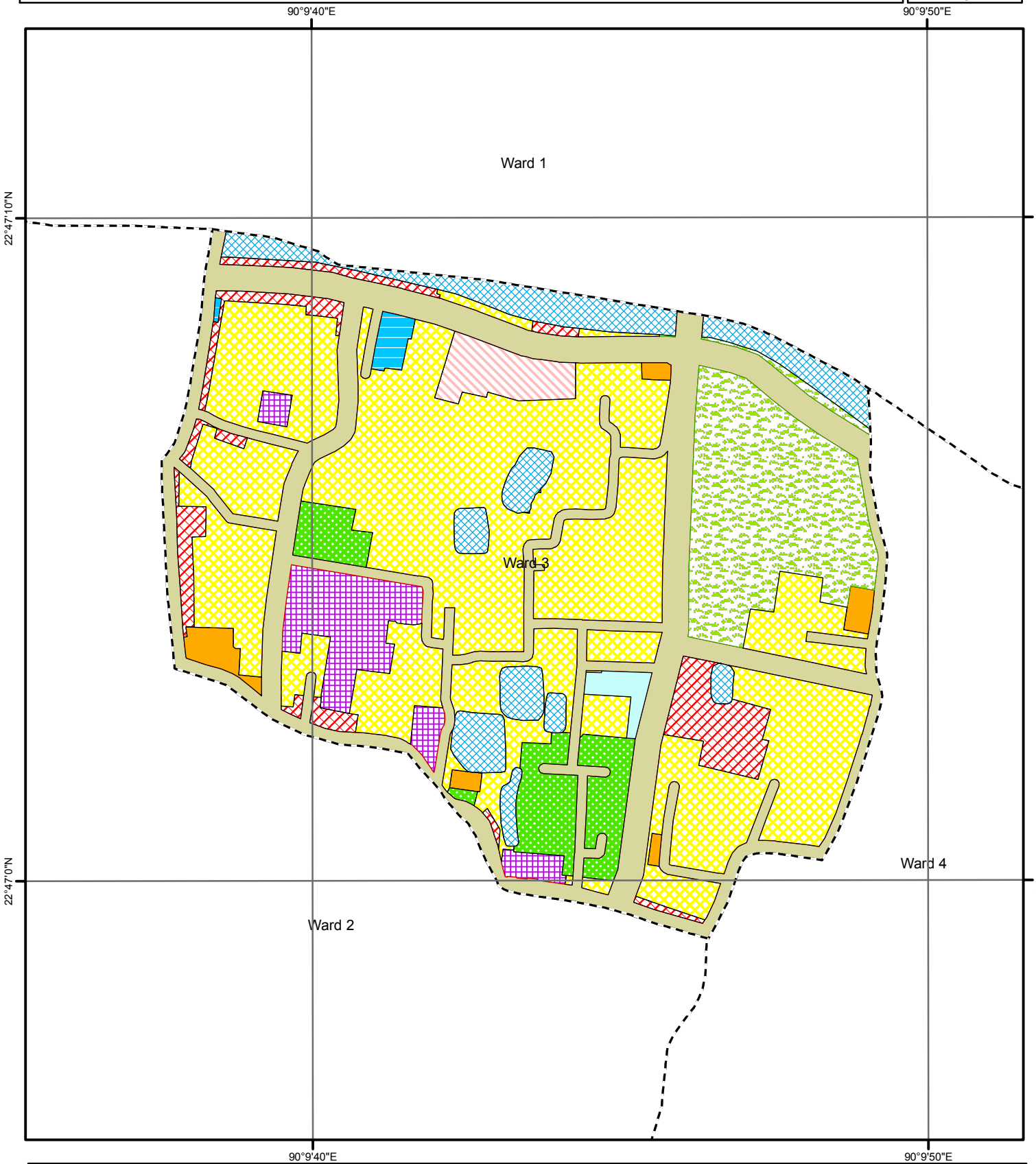
15.5.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.12 shows the amount of land existing and proposed uses in Ward no. 03. **Map 15.7** shows proposed land use of Ward 03.

Table15.12: Comparative Scenario of Existing and Proposed Land Use of Ward No. 03

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agricultural	5.81	29.71	1	Administrative	0.83	4.24
2	Circulation Network	1.21	6.20	2	Agriculture	0.00	0.00
3	Commercial Activities	1.02	5.21	3	Circulation Network	4.53	23.14
4	Community Facilities	0.34	1.73	4	Commercial Activities	0.88	4.49
5	Education and Research	0.76	3.87	5	Community Facilities	0.25	1.28
6	Government Service	0.16	0.80	6	Education & Research	0.84	4.28
7	Mixed Use	0.41	2.08	7	Mixed use	0.34	1.75
8	Recreational Facilities	0.12	0.63	8	Open Space	1.94	9.92
9	Residential Area	7.99	40.87	9	Recreational Facilities	0.10	0.52
10	Service Activity	0.14	0.71	10	Residential Area	8.37	42.79
11	Waterbody	1.60	8.18	11	Utility Service	0.11	0.55
				12	Waterbody	1.38	7.05
	Total	**19.56**	**100**		**Total**	**19.56**	**100**

Map 15.7:Proposed Landuse Map of ward no. 3



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

0 10 20 40 60 80 Meters

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15.5.2.3 Proposed Road Infrastructure Development

Total 2.31 km road development proposal have been proposed for Ward no. 03. Total length of tertiary road will be 1.15 km and width of these roads will be 20 ft Total length of secondary road will be 1.16 km and width of these roads will be 30 to 40 ft. Detail scenario of road network development proposal is given in table 15.13.

Table 15.13: Road Network Proposal at Ward no. 03

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Secondary Road	SR-6	40	223.43	Widening	1st
Secondary Road	SR-11	40	104.88	Widening	1st
Secondary Road	SR-14	40	115.51	Widening	1st
Secondary Road	SR-21	40	0.01	Widening	1st
Secondary Road	SR-50	40	32.74	Widening	1st
Secondary Road	SR-51	40	2.83	Widening	1st
Secondary Road	SR-7	30	99.38	Widening	1st
Secondary Road	SR-15	30	110.95	Widening	1st
Secondary Road	SR-20	30	73.09	Widening	1st
Secondary Road	SR-42	40	302.55	New	2nd
Secondary Road	SR-44	30	98.40	New	2nd
Tertiary Road	TR-80	20	42.48	Widening	2nd
Tertiary Road	TR-81	20	27.51	Widening	2nd
Tertiary Road	TR-82	20	6.86	Widening	2nd
Tertiary Road	TR-83	20	77.44	Widening	2nd
Tertiary Road	TR-84	20	39.42	Widening	2nd
Tertiary Road	TR-85	20	19.00	Widening	2nd
Tertiary Road	TR-86	20	11.73	Widening	2nd
Tertiary Road	TR-87	20	24.41	Widening	2nd
Tertiary Road	TR-154	20	26.82	Widening	2nd
Tertiary Road	TR-185	20	84.15	Widening	2nd
Tertiary Road	TR-187	20	9.26	Widening	2nd
Tertiary Road	TR-188	20	9.50	Widening	2nd
Tertiary Road	TR-189	20	59.94	Widening	2nd
Tertiary Road	TR-190	20	28.63	Widening	2nd
Tertiary Road	TR-191	20	16.23	Widening	2nd
Tertiary Road	TR-193	20	32.72	Widening	2nd
Tertiary Road	TR-194	20	53.68	Widening	2nd
Tertiary Road	TR-195	20	0.02	Widening	2nd
Tertiary Road	TR-196	20	0.03	Widening	2nd
Tertiary Road	TR-205	20	71.23	Widening	2nd
Tertiary Road	TR-456	20	20.56	New	3rd
Tertiary Road	TR-457	20	68.50	New	3rd
Tertiary Road	TR-458	20	28.60	New	3rd
Tertiary Road	TR-459	20	48.71	New	3rd
Tertiary Road	TR-460	20	69.99	New	3rd
Tertiary Road	TR-461	20	39.39	New	3rd
Tertiary Road	TR-462	20	35.95	New	3rd
Tertiary Road	TR-536	20	39.93	Widening	3rd
Tertiary Road	TR-537	20	153.58	Widening	3rd

- “TR” for tertiary road, and “SR” for secondary road.

15.5.2.4 Drainage Development Plan

Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on these natural channels. These will serve as primary drain for the ward which will be connected by 0.47 km secondary drain and 1.3 km tertiary drain. Table 15.14 shows the detail.

Table 15.14: Drainage Development Plan Proposals for ward 03

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
PD-2	Primary Drain	270.28	4.50-5.50	2.25-3.50	New	1st
SD-2	Secondary Drain	234.14	3.50-4.50	1.25-2.25	New	1st
SD-4	Secondary Drain	93.59	3.50-4.50	1.25-2.25	New	1st
SD-76	Secondary Drain	88.67	3.50-4.50	1.25-2.25	New	2nd
TD-58	Tertiary Drain	43.37	2.50-3.50	0.64-1.25	New	2nd
TD-59	Tertiary Drain	27.51	2.50-3.50	0.64-1.25	New	2nd
TD-60	Tertiary Drain	77.44	2.50-3.50	0.64-1.25	New	2nd
TD-61	Tertiary Drain	73.36	2.50-3.50	0.64-1.25	New	2nd
TD-62	Tertiary Drain	19.00	2.50-3.50	0.64-1.25	New	2nd
TD-63	Tertiary Drain	94.46	2.50-3.50	0.64-1.25	New	2nd
TD-106	Tertiary Drain	111.21	2.50-3.50	0.64-1.25	New	2nd
TD-107	Tertiary Drain	26.07	2.50-3.50	0.64-1.25	New	2nd
TD-121	Tertiary Drain	84.09	2.50-3.50	0.64-1.25	New	2nd
TD-122	Tertiary Drain	59.94	2.50-3.50	0.64-1.25	New	2nd
TD-123	Tertiary Drain	28.63	2.50-3.50	0.64-1.25	New	2nd
TD-129	Tertiary Drain	6.37	2.50-3.50	0.64-1.25	New	2nd
TD-132	Tertiary Drain	66.31	2.50-3.50	0.64-1.25	New	2nd
TD-302	Tertiary Drain	28.59	2.50-3.50	0.64-1.25	New	3rd
TD-303	Tertiary Drain	74.53	2.50-3.50	0.64-1.25	New	3rd
TD-304	Tertiary Drain	48.71	2.50-3.50	0.64-1.25	New	3rd
TD-305	Tertiary Drain	61.58	2.50-3.50	0.64-1.25	New	3rd
TD-306	Tertiary Drain	44.70	2.50-3.50	0.64-1.25	New	3rd
TD-307	Tertiary Drain	91.09	2.50-3.50	0.64-1.25	New	3rd
TD-308	Tertiary Drain	36.23	2.50-3.50	0.64-1.25	New	3rd
TD-310	Tertiary Drain	5.21	2.50-3.50	0.64-1.25	New	3rd
TD-363	Tertiary Drain	39.93	2.50-3.50	0.64-1.25	New	3rd
TD-364	Tertiary Drain	148.74	2.50-3.50	0.64-1.25	New	3rd

Map 15.8 represents Road and Drainage Network for ward 3.

15.5.2.5 Urban Services

a. Solid Waste Management

The consultant proposes a waste transfer station with 0.11 acre. It is recommended that home collection system is introduced in the ward by creation of local CBOs. This will create organized collection of waste and prevent indiscriminate littering.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

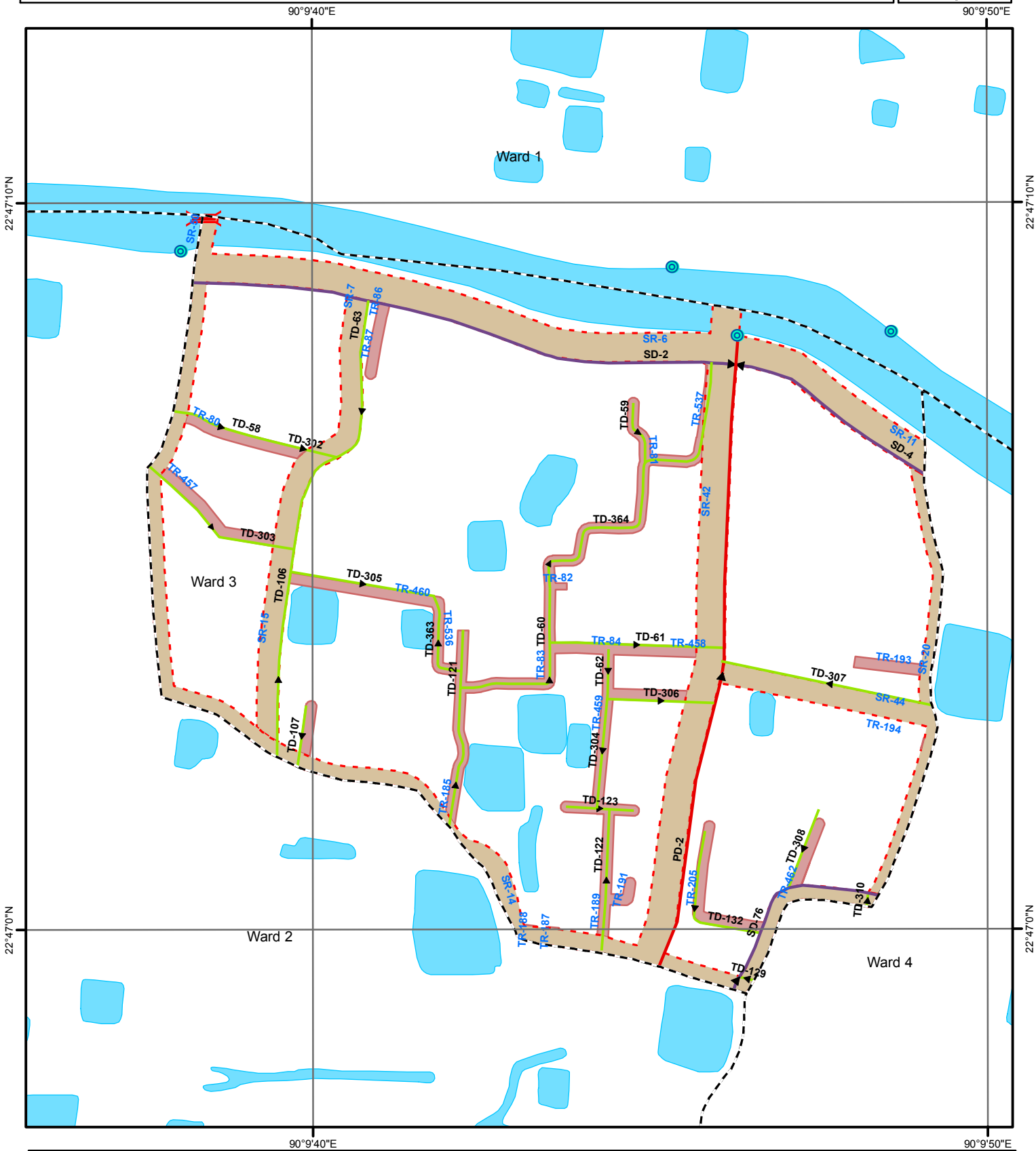
c. Sanitation

The Paurashava must try to promote hygienic sanitation for the whole Paurashavsa to ensure better public health. **Map 15.9** represents proposed urban services for ward 3.

Table 15.15: Urban Service Development Proposals for ward 03

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.61
Commercial Activity	Pauro Market	1	0.38
Education & Research	Kindergarten	1	0.20
Open Space	Community Park	1	1.88
Utility Services	Electricity Line	As per existing program of PDB	-
	Waste Transfer Station	1	0.11

Map 15.8: Proposed Road & Drainage Network of Ward No. 3



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Bridge
- Culvert
- Pipe Culvert
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Primary Road
- Secondary Road
- Tertiary Road
- Waterbody

Meters
0 5 10 20 30 40

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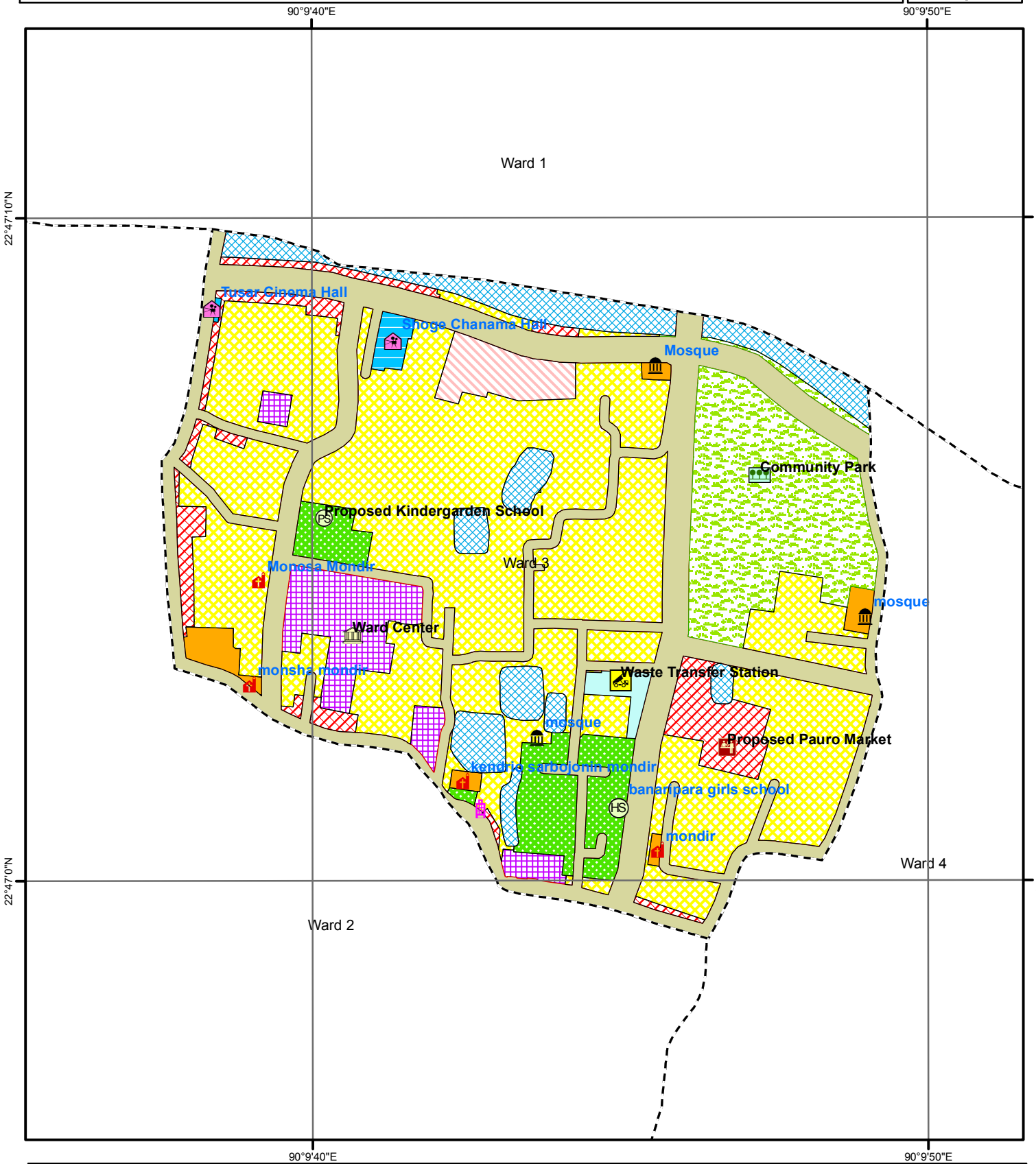
Map 15.9 : Development Proposal for Ward No. 3



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Ward Center
- Stadium
- Bus Stand/Terminal
- Cinema Hall
- Clinic/Hospital
- Cluster Village
- College
- Community Center
- Dumping Site
- Eidgah
- Ferry ghat/Lanch ghat
- Fuel Station
- Graveyard
- High School
- Industry
- Low Income Housing
- Madrasha
- Market
- Mosque
- Park
- Primary School
- Resettelement Zone
- Rickshaw Stand
- Roundabout
- Shamshan Ghat
- Electric-Sub-Station
- Tempo Stand
- Tourist Spot
- Truck Stand/Termianal
- Playground
- Waste Transfer Station

0 10 20 40 60 80 Meters

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15.6 Ward Action Plan for Ward No. 04

15.6.1 Demography

Ward no. 4 is located on the East-Northern part of the town. Population projection shows that 1600 people would be living in the ward in the year 2031 with a very density of 45 persons per acre. Table 15.16 shows the detail.

Table 15.16: Population Statistics of Ward No. 04

Item	Year			
	2016	**2021**	**2026**	**2031**
Area (acre)	35.33	35.33	35.33	35.33
Population	1306	1397	1495	1600
Density of Population (acre)	37	40	42	45

15.6.2 Ward Action Plan Proposals

15.6.2.1 Review of Existing Land Use

Out of total 35.33 acre; 13.85 acre of land i.e. 39.20% is used as residential use. The next use is agriculture; 11.61 acres are used in this purpose. It occupies more than 32% of total land. Water bodies occupy 17.66% land of the ward. Almost 0.99 acre of land is used for educational purpose. At present 0.08 acres of land are used in commercial purpose. About 5.27% is used as circulation network.

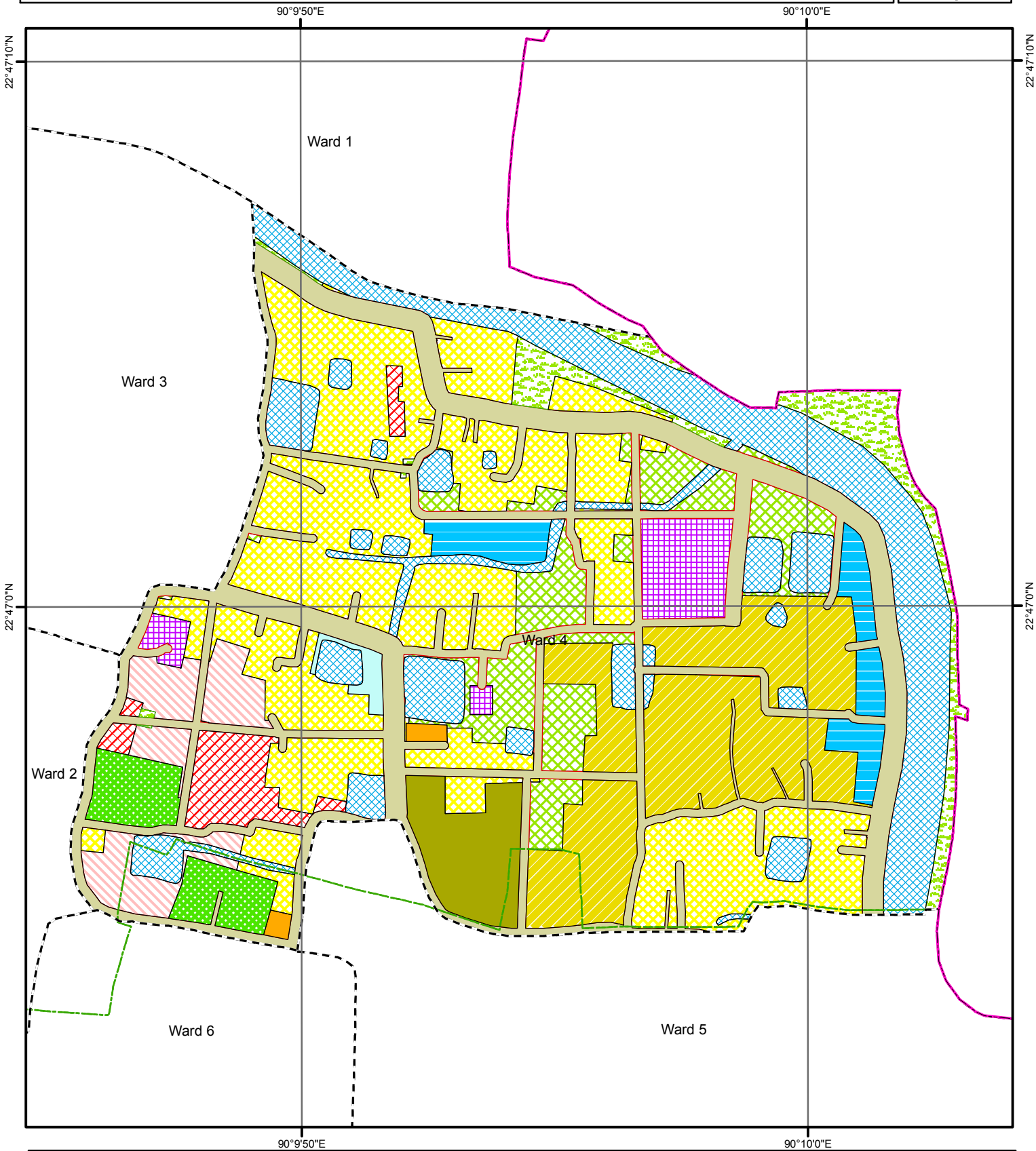
15.6.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.17 shows the amount of land existing and proposed uses in Ward no. 04. **Map 15.10** shows proposed land use of Ward 04.

Table 15.17: Comparative Scenario of Existing and Proposed Land Uses of Ward No. 04

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Administrative	0.21	0.59	1	Administrative	0.86	2.44
2	Agricultural	11.61	32.87	2	Agricultural	2.35	6.66
3	Circulation Network	1.86	5.27	3	Circulation Network	6.45	18.24
4	Commercial Activity	0.08	0.24	4	Commercial Activity	0.82	2.31
5	Community Facilities	0.14	0.40	5	Community Facilities	0.10	0.29
6	Educational and Research	0.99	2.82	6	Educational Facility	0.89	2.52
7	Mixed Use	0.17	0.49	7	Health Facility	0.99	2.81
8	Open Space	0.03	0.08	8	Mixed Use	1.25	3.54
9	Residential Area	13.85	39.20	9	Open Space	1.27	3.60
10	Service Activity	0.14	0.39	10	Recreational facility	0.96	2.72
11	Waterbody	6.24	17.66	11	Rural Settlement	4.26	12.07
				12	Urban Settlement	9.13	25.83
				13	Utility Services	0.13	0.38
				14	Waterbody	5.86	16.59
	Total	**35.33**	**100**		**Total**	**35.33**	**100**

Map 15.10:Proposed Landuse Map of ward no. 4



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

0 12.5 25 50 75 100 Meters

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15.6.2.3 Proposed Road Infrastructure Development

Total 4.11 km road development proposal have been proposed for Ward no. 04. Total length of tertiary road will be 2.82 km and width of these roads will be 20 ft. Total length of secondary road will be 1.28 km and width of these roads will be 30 to 40 ft for this ward. Detail scenario of road network development proposal was given in Table 15.18.

Table 15.18: Road Network Proposal at Ward no. 04

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Secondary Road	SR-11	40	106.98	Widening	1st
Secondary Road	SR-21	40	5.91	Widening	1st
Secondary Road	SR-24	40	518.92	Widening	1st
Secondary Road	SR-25	40	276.85	Widening	1st
Secondary Road	SR-51	40	74.82	Widening	1st
Secondary Road	SR-20	30	125.57	Widening	1st
Secondary Road	SR-22	30	5.63	Widening	1st
Secondary Road	SR-23	30	16.92	Widening	1st
Secondary Road	SR-26	30	87.85	Widening	1st
Secondary Road	SR-27	30	58.79	Widening	1st
Secondary Road	SR-44	30	0.03	New	2nd
Secondary Road	SR-45	30	5.75	New	2nd
Tertiary Road	TR-195	20	36.37	Widening	2nd
Tertiary Road	TR-196	20	40.40	Widening	2nd
Tertiary Road	TR-197	20	40.12	Widening	2nd
Tertiary Road	TR-198	20	20.20	Widening	2nd
Tertiary Road	TR-199	20	15.34	Widening	2nd
Tertiary Road	TR-200	20	15.32	Widening	2nd
Tertiary Road	TR-201	20	84.18	Widening	2nd
Tertiary Road	TR-202	20	29.08	Widening	2nd
Tertiary Road	TR-203	20	102.32	Widening	2nd
Tertiary Road	TR-205	20	0.23	Widening	2nd
Tertiary Road	TR-206	20	28.47	Widening	2nd
Tertiary Road	TR-207	20	136.87	Widening	2nd
Tertiary Road	TR-208	20	66.17	Widening	2nd
Tertiary Road	TR-209	20	22.87	Widening	2nd
Tertiary Road	TR-210	20	33.98	Widening	2nd
Tertiary Road	TR-211	20	17.38	Widening	2nd
Tertiary Road	TR-212	20	37.92	Widening	2nd
Tertiary Road	TR-213	20	22.27	Widening	2nd
Tertiary Road	TR-214	20	17.86	Widening	2nd
Tertiary Road	TR-215	20	24.73	Widening	2nd
Tertiary Road	TR-216	20	130.22	Widening	2nd
Tertiary Road	TR-217	20	10.45	Widening	2nd
Tertiary Road	TR-218	20	29.89	Widening	2nd
Tertiary Road	TR-219	20	20.00	Widening	2nd
Tertiary Road	TR-220	20	19.20	Widening	2nd
Tertiary Road	TR-221	20	44.47	Widening	2nd
Tertiary Road	TR-222	20	66.87	Widening	2nd
Tertiary Road	TR-223	20	19.31	Widening	2nd
Tertiary Road	TR-224	20	22.41	Widening	2nd
Tertiary Road	TR-225	20	15.60	Widening	2nd
Tertiary Road	TR-227	20	19.31	Widening	2nd
Tertiary Road	TR-228	20	19.43	Widening	2nd
Tertiary Road	TR-229	20	13.65	Widening	2nd
Tertiary Road	TR-230	20	12.15	Widening	2nd
Tertiary Road	TR-231	20	23.53	Widening	2nd
Tertiary Road	TR-232	20	37.77	Widening	2nd
Tertiary Road	TR-462	20	0.29	New	3rd
Tertiary Road	TR-464	20	136.36	New	3rd
Tertiary Road	TR-525	20	199.95	Widening	3rd
Tertiary Road	TR-526	20	11.33	Widening	3rd
Tertiary Road	TR-527	20	22.17	Widening	3rd

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Tertiary Road	TR-528	20	26.49	Widening	3rd
Tertiary Road	TR-529	20	23.49	Widening	3rd
Tertiary Road	TR-530	20	28.00	Widening	3rd
Tertiary Road	TR-531	20	22.73	Widening	3rd
Tertiary Road	TR-532	20	56.68	Widening	3rd
Tertiary Road	TR-551	20	227.57	New	3rd
Tertiary Road	TR-552	20	139.31	New	3rd
Tertiary Road	TR-553	20	99.36	New	3rd
Tertiary Road	TR-554	20	40.16	New	3rd
Tertiary Road	TR-573	20	91.30	New	3rd
Tertiary Road	TR-574	20	77.12	New	3rd
Tertiary Road	TR-575	20	178.52	New	3rd
Tertiary Road	TR-418	20	7.19	Widening	3rd
Tertiary Road	TR-429	20	138.73	Widening	3rd

- "TR" for tertiary road, and "SR" for secondary road.

15.6.2.4 Drainage Development Plan

There is manmade drainage facility at Ward no. 04 of Banaripara Paurashava. Existing drainage is mostly depending on natural drainage facilities. Table 15.19 shows the detail.

Table 15.19: Drainage Development Plan Proposals for ward 04

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
SD-4	Secondary Drain	103.06	3.50-4.50	1.25-2.25	New	1st
SD-9	Secondary Drain	204.90	3.50-4.50	1.25-2.25	New	2nd
SD-10	Secondary Drain	216.93	3.50-4.50	1.25-2.25	New	2nd
SD-11	Secondary Drain	82.64	3.50-4.50	1.25-2.25	New	2nd
SD-12	Secondary Drain	55.31	3.50-4.50	1.25-2.25	New	2nd
SD-62	Secondary Drain	201.49	3.50-4.50	1.25-2.25	New	2nd
SD-64	Secondary Drain	62.76	3.50-4.50	1.25-2.25	New	2nd
SD-66	Secondary Drain	87.10	3.50-4.50	1.25-2.25	New	2nd
SD-70	Secondary Drain	209.88	3.50-4.50	1.25-2.25	New	2nd
SD-76	Secondary Drain	5.15	3.50-4.50	1.25-2.25	New	2nd
TD-431	Tertiary Drain	39.37	2.50-3.50	0.64-1.25	New	1st
TD-125	Tertiary Drain	182.50	2.50-3.50	0.64-1.25	New	2nd
TD-126	Tertiary Drain	35.56	2.50-3.50	0.64-1.25	New	2nd
TD-127	Tertiary Drain	40.43	2.50-3.50	0.64-1.25	New	2nd
TD-128	Tertiary Drain	44.01	2.50-3.50	0.64-1.25	New	2nd
TD-129	Tertiary Drain	28.12	2.50-3.50	0.64-1.25	New	2nd
TD-130	Tertiary Drain	102.81	2.50-3.50	0.64-1.25	New	2nd
TD-133	Tertiary Drain	28.47	2.50-3.50	0.64-1.25	New	2nd
TD-134	Tertiary Drain	22.87	2.50-3.50	0.64-1.25	New	2nd
TD-135	Tertiary Drain	33.98	2.50-3.50	0.64-1.25	New	2nd
TD-136	Tertiary Drain	61.88	2.50-3.50	0.64-1.25	New	2nd
TD-137	Tertiary Drain	19.40	2.50-3.50	0.64-1.25	New	2nd
TD-138	Tertiary Drain	24.09	2.50-3.50	0.64-1.25	New	2nd
TD-139	Tertiary Drain	122.19	2.50-3.50	0.64-1.25	New	2nd
TD-140	Tertiary Drain	30.54	2.50-3.50	0.64-1.25	New	2nd
TD-141	Tertiary Drain	40.47	2.50-3.50	0.64-1.25	New	2nd
TD-142	Tertiary Drain	38.52	2.50-3.50	0.64-1.25	New	2nd
TD-143	Tertiary Drain	22.41	2.50-3.50	0.64-1.25	New	2nd
TD-144	Tertiary Drain	85.56	2.50-3.50	0.64-1.25	New	2nd
TD-145	Tertiary Drain	57.82	2.50-3.50	0.64-1.25	New	2nd
TD-146	Tertiary Drain	25.79	2.50-3.50	0.64-1.25	New	2nd
TD-147	Tertiary Drain	21.49	2.50-3.50	0.64-1.25	New	2nd
TD-148	Tertiary Drain	35.44	2.50-3.50	0.64-1.25	New	2nd
TD-149	Tertiary Drain	2.14	2.50-3.50	0.64-1.25	New	2nd
TD-414	Tertiary Drain	65.21	2.50-3.50	0.64-1.25	New	2nd
TD-436	Tertiary Drain	51.55	2.50-3.50	0.64-1.25	New	2nd
TD-150	Tertiary Drain	4.47	2.50-3.50	0.64-1.25	New	3rd

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
TD-283	Tertiary Drain	130.24	2.50-3.50	0.64-1.25	New	3rd
TD-307	Tertiary Drain	7.34	2.50-3.50	0.64-1.25	New	3rd
TD-310	Tertiary Drain	136.24	2.50-3.50	0.64-1.25	New	3rd
TD-358	Tertiary Drain	137.80	2.50-3.50	0.64-1.25	New	3rd
TD-359	Tertiary Drain	23.49	2.50-3.50	0.64-1.25	New	3rd
TD-360	Tertiary Drain	51.28	2.50-3.50	0.64-1.25	New	3rd
TD-375	Tertiary Drain	161.98	2.50-3.50	0.64-1.25	New	3rd
TD-376	Tertiary Drain	105.32	2.50-3.50	0.64-1.25	New	3rd
TD-377	Tertiary Drain	38.42	2.50-3.50	0.64-1.25	New	3rd
TD-391	Tertiary Drain	88.97	2.50-3.50	0.64-1.25	New	3rd
TD-392	Tertiary Drain	83.03	2.50-3.50	0.64-1.25	New	3rd
TD-393	Tertiary Drain	93.81	2.50-3.50	0.64-1.25	New	3rd
TD-415	Tertiary Drain	173.61	2.50-3.50	0.64-1.25	New	3rd
TD-430	Tertiary Drain	71.71	2.50-3.50	0.64-1.25	New	3rd

Besides, it will be necessary to re-excavate the khals that serve as primary drains.

Map 15.11 represents proposed Road and Drainage Network for Ward 4.

15.6.2.5 Urban Services

a. Solid Waste Management

The consultant proposes one solid waste transfer station at ward 4 consisting of 0.13 acre land.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the nearest River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

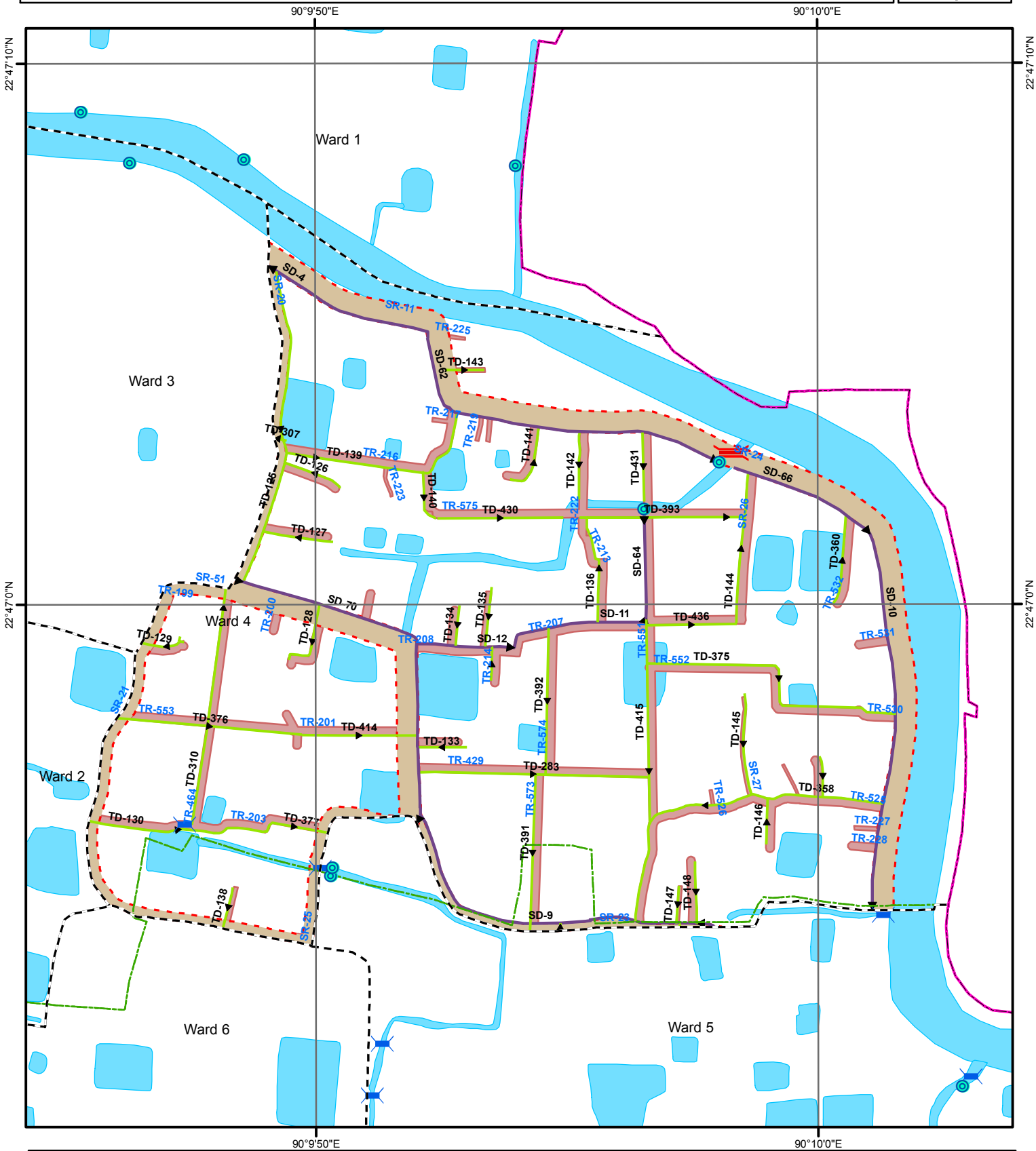
The Paurashava must try to promote hygienic sanitation for the whole Paurashavsa to ensure better public health.

Table 15.20: Urban Service Development Proposals for ward 04

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.68
Commercial Activity	Neighborhood Market	1	0.64
Health Facility	Hospital	1	0.99
Open Space	Linear Park	1	1.07
Recreational facility	Tourist Spot	1	0.59
	Cinema Hall	1	0.37
Utility Services	Electricity Line	As per existing program of PDB	-
	Waste Transfer Station	1	0.13

Map 15.12 represents proposed urban services for ward 4.

Map 15.11: Proposed Road & Drainage Network of Ward No. 4



Legend

- Pourashava Boundary
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- Ward Boundary
- Proposed Outfall
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- Primary Drain
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- Primary Road
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- Waterbody

Meters
0 5 10 20 30 40

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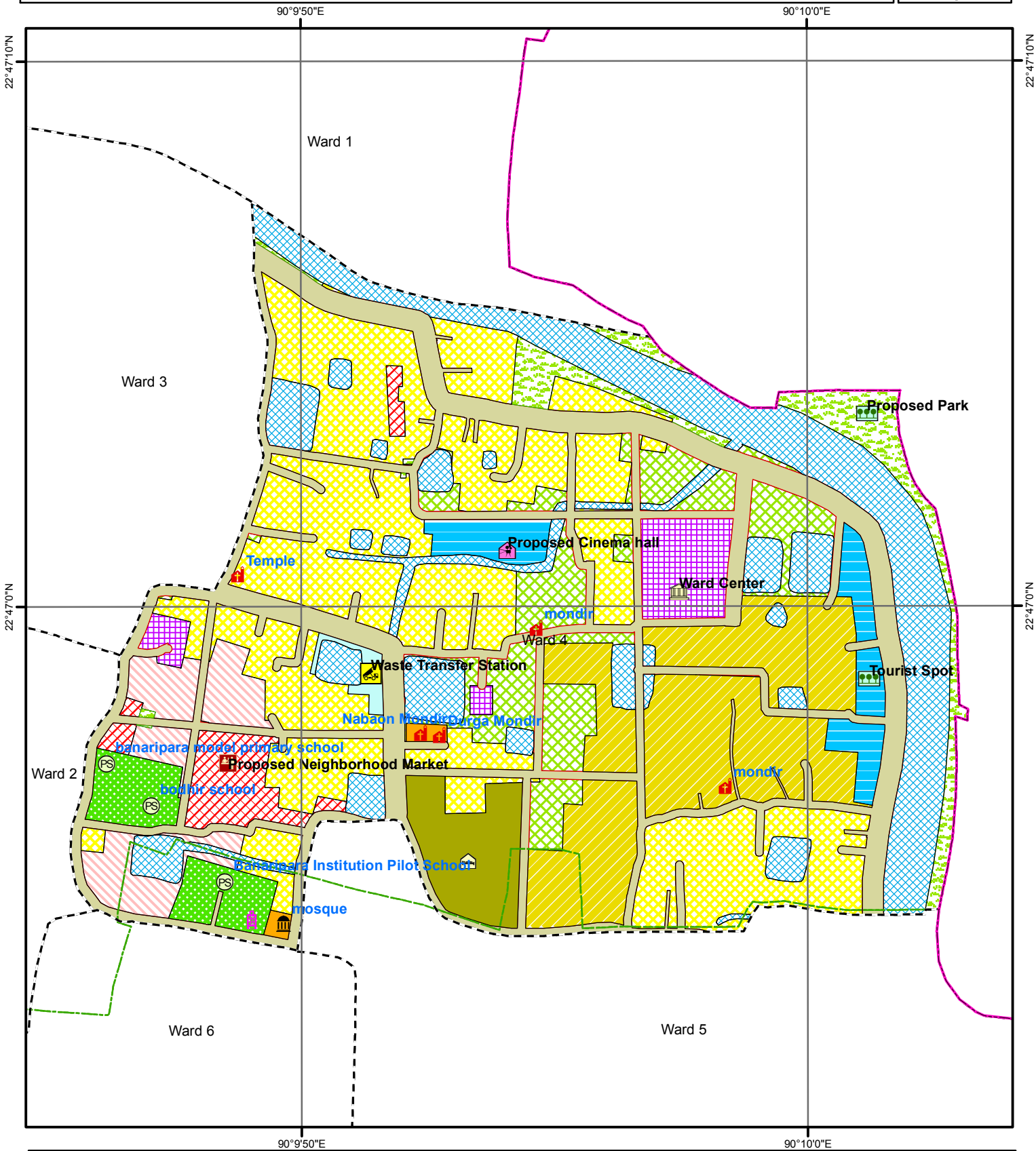
Map 15.12 : Development Proposal for Ward No. 4



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary

- Ward Center
- Stadium
- Bus Stand/Terminal
- Cinema Hall
- Clinic/Hospital
- Cluster Village
- College
- Community Center
- Dumping Site
- Eidgah
- Ferry ghat/Lanch ghat
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- Graveyard
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- Industry
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- Market
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- Rickshaw Stand
- Roundabout
- Shamshan Ghat
- Electric-Sub-Station
- Tempo Stand
- Tourist Spot
- Truck Stand/Termianal
- Playground
- Waste Transfer Station

0 12.5 25 50 75 100 Meters

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15.7 Ward Action Plan for Ward No. 05

15.7.1 Demography

Ward No. 5 is located on the middle part of the town. It has the density of 46 persons per acre in the year 2031 with a total population of 1300. Table 15.21 shows the detail.

Table 15.21: Population Statistics of Ward No. 05

Item	Year			
	2016	**2021**	**2026**	**2031**
Area (acre)	28.36	28.36	28.36	28.36
Population	1061	1135	1215	1300
Density of Population (acre)	37	40	43	46

15.7.2 Ward Action Plan Proposals

15.7.2.1 Review of Existing Land Use

Out of total 28.36 acres of land i.e. 55.55% is used as residential land and 15.24% is for waterbody. Agricultural land occupies 8.90% land of the ward. At present only 0.13 acre of land are used in commercial purpose whereas 6.69% is used as circulation network. Only 0.09 acre of land is used as community facilities.

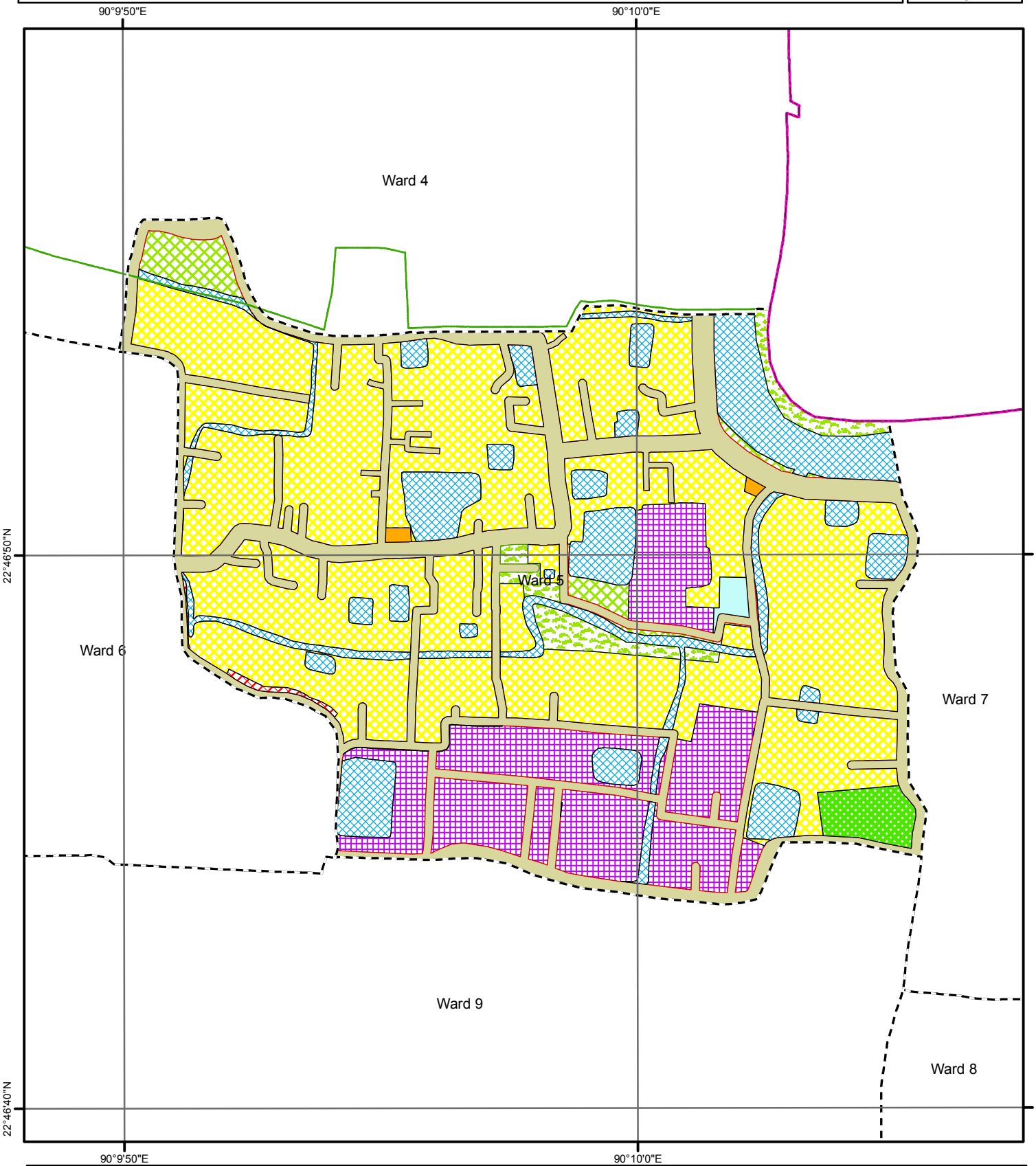
15.7.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.22 shows the amount of land existing and proposed uses in Ward no. 5. **Map 15.13** shows proposed land use of Ward 05.

Table 15.22: Comparative Scenario of Existing and Proposed Land Use of Ward No. 05

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agricultural	2.52	8.90	1	Administrative	3.88	13.67
2	Circulation Network	1.90	6.69	2	Agriculture	0.53	1.88
3	Commercial Activities	0.13	0.46	3	Circulation Network	5.44	19.18
4	Community Facilities	0.09	0.31	4	Commercial Activities	0.05	0.18
5	Governmental Service	3.65	12.85	5	Community Facilities	0.04	0.16
6	Residential Area	15.75	55.55	6	Education & Research	0.36	1.27
7	Waterbody	4.32	15.24	7	Open Space	0.63	2.21
				8	Urban Settlement	13.56	47.83
				9	Utility Service	0.09	0.31
				10	Waterbody	3.77	13.31
	Total	**28.36**	**100**		**Total**	**28.36**	**100**

Map 15.13:Proposed Landuse Map of ward no. 5



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

0 12.5 25 50 75 100 Meters

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15.7.2.3 Proposed Road Infrastructure Development

Total 3.43 km road development proposal have been proposed in first Ward Action Plan for Ward no. 05. Tertiary road covers 2.32 km having width of 20 ft. Secondary road covers 1.11 km having width of 30 to 40 ft. Detail scenario of road network development proposal was given in table 15.23.

Table 15.23: Road Network Proposal at Ward no. 05

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Secondary Road	SR-24	40	232.36	Widening	1st
Secondary Road	SR-25	40	47.20	Widening	1st
Secondary Road	SR-22	30	138.17	Widening	1st
Secondary Road	SR-23	30	391.84	Widening	1st
Secondary Road	SR-28	30	90.82	Widening	1st
Secondary Road	SR-30	30	214.34	Widening	1st
Tertiary Road	TR-231	20	2.59	Widening	2nd
Tertiary Road	TR-232	20	2.69	Widening	2nd
Tertiary Road	TR-233	20	16.27	Widening	2nd
Tertiary Road	TR-234	20	33.33	Widening	2nd
Tertiary Road	TR-235	20	50.90	Widening	2nd
Tertiary Road	TR-236	20	72.71	Widening	2nd
Tertiary Road	TR-237	20	19.34	Widening	2nd
Tertiary Road	TR-238	20	11.20	Widening	2nd
Tertiary Road	TR-239	20	47.25	Widening	2nd
Tertiary Road	TR-240	20	36.25	Widening	2nd
Tertiary Road	TR-241	20	44.27	Widening	2nd
Tertiary Road	TR-242	20	50.70	Widening	2nd
Tertiary Road	TR-243	20	13.02	Widening	2nd
Tertiary Road	TR-244	20	6.87	Widening	2nd
Tertiary Road	TR-245	20	9.80	Widening	2nd
Tertiary Road	TR-246	20	21.39	Widening	2nd
Tertiary Road	TR-247	20	59.66	Widening	2nd
Tertiary Road	TR-248	20	74.31	Widening	2nd
Tertiary Road	TR-249	20	53.59	Widening	2nd
Tertiary Road	TR-251	20	20.56	Widening	2nd
Tertiary Road	TR-252	20	39.39	Widening	2nd
Tertiary Road	TR-253	20	24.26	Widening	2nd
Tertiary Road	TR-254	20	43.49	Widening	2nd
Tertiary Road	TR-255	20	39.82	Widening	2nd
Tertiary Road	TR-256	20	11.16	Widening	2nd
Tertiary Road	TR-259	20	31.26	Widening	2nd
Tertiary Road	TR-260	20	162.99	Widening	2nd
Tertiary Road	TR-261	20	14.97	Widening	2nd
Tertiary Road	TR-262	20	105.83	Widening	2nd
Tertiary Road	TR-263	20	95.66	Widening	2nd
Tertiary Road	TR-264	20	20.23	Widening	2nd
Tertiary Road	TR-265	20	21.71	Widening	2nd
Tertiary Road	TR-280	20	2.28	Widening	2nd
Tertiary Road	TR-284	20	62.97	Widening	2nd
Tertiary Road	TR-285	20	90.69	Widening	2nd
Tertiary Road	TR-286	20	129.33	Widening	2nd
Tertiary Road	TR-287	20	47.09	Widening	2nd
Tertiary Road	TR-291	20	1.84	Widening	2nd
Tertiary Road	TR-292	20	17.70	Widening	2nd
Tertiary Road	TR-293	20	50.44	Widening	2nd
Tertiary Road	TR-294	20	15.59	Widening	2nd
Tertiary Road	TR-295	20	7.50	Widening	2nd
Tertiary Road	TR-296	20	6.02	Widening	2nd
Tertiary Road	TR-469	20	55.23	New	3rd
Tertiary Road	TR-470	20	97.93	New	3rd
Tertiary Road	TR-471	20	21.80	New	3rd
Tertiary Road	TR-472	20	42.99	New	3rd
Tertiary Road	TR-473	20	204.26	New	3rd

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Tertiary Road	TR-474	20	30.20	New	3rd
Tertiary Road	TR-475	20	24.73	New	3rd
Tertiary Road	TR-484	20	1.54	New	3rd
Tertiary Road	TR-525	20	1.76	Widening	3rd
Tertiary Road	TR-545	20	45.28	New	3rd
Tertiary Road	TR-549	20	3.01	New	3rd
Tertiary Road	TR-554	20	0.02	New	3rd
Tertiary Road	TR-573	20	0.95	New	3rd
Tertiary Road	TR-425	20	22.34	Widening	3rd
Tertiary Road	TR-426	20	14.24	Widening	3rd
Tertiary Road	TR-427	20	15.62	Widening	3rd
Tertiary Road	TR-428	20	20.77	Widening	3rd
Tertiary Road	TR-430	20	27.62	Widening	3rd

- "TR" for tertiary road, and "SR" for secondary road.

15.7.2.4 Drainage Development Plan

There are both natural and manmade drainage facilities at ward no. 05. Existing drainage is mostly depending on natural drainage facilities; the proposed drainage facilities will be developed based on this natural channel. These will be served as primary drain which will be connected with 1.06 km secondary drain and 2.20 km tertiary drain in first Ward Action Plan. Table 15.24 shows the detail.

Table 15.24: Drainage Development Plan Proposals for ward 05

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth(m)	Remark	Phasing
SD-9	Secondary Drain	151.80	3.50-4.50	1.25-2.25	New	2nd
SD-10	Secondary Drain	1.05	3.50-4.50	1.25-2.25	New	2nd
SD-18	Secondary Drain	5.14	3.50-4.50	1.25-2.25	New	2nd
SD-20	Secondary Drain	193.94	3.50-4.50	1.25-2.25	New	2nd
SD-29	Secondary Drain	40.51	3.50-4.50	1.25-2.25	New	2nd
SD-65	Secondary Drain	42.68	3.50-4.50	1.25-2.25	New	2nd
SD-67	Secondary Drain	73.20	3.50-4.50	1.25-2.25	New	2nd
SD-68	Secondary Drain	218.16	3.50-4.50	1.25-2.25	New	2nd
SD-70	Secondary Drain	68.85	3.50-4.50	1.25-2.25	New	2nd
SD-34	Secondary Drain	267.78	3.50-4.50	1.25-2.25	New	3rd
TD-401	Tertiary Drain	66.90	2.50-3.50	0.64-1.25	New	1st
TD-149	Tertiary Drain	35.16	2.50-3.50	0.64-1.25	New	2nd
TD-150	Tertiary Drain	52.87	2.50-3.50	0.64-1.25	New	3rd
TD-151	Tertiary Drain	67.71	2.50-3.50	0.64-1.25	New	3rd
TD-152	Tertiary Drain	19.34	2.50-3.50	0.64-1.25	New	3rd
TD-153	Tertiary Drain	47.25	2.50-3.50	0.64-1.25	New	3rd
TD-154	Tertiary Drain	90.82	2.50-3.50	0.64-1.25	New	3rd
TD-155	Tertiary Drain	36.25	2.50-3.50	0.64-1.25	New	3rd
TD-156	Tertiary Drain	44.27	2.50-3.50	0.64-1.25	New	3rd
TD-157	Tertiary Drain	50.70	2.50-3.50	0.64-1.25	New	3rd
TD-158	Tertiary Drain	59.66	2.50-3.50	0.64-1.25	New	3rd
TD-159	Tertiary Drain	68.20	2.50-3.50	0.64-1.25	New	3rd
TD-160	Tertiary Drain	49.18	2.50-3.50	0.64-1.25	New	3rd
TD-162	Tertiary Drain	41.92	2.50-3.50	0.64-1.25	New	3rd
TD-163	Tertiary Drain	27.49	2.50-3.50	0.64-1.25	New	3rd
TD-164	Tertiary Drain	45.99	2.50-3.50	0.64-1.25	New	3rd
TD-165	Tertiary Drain	6.01	2.50-3.50	0.64-1.25	New	3rd
TD-166	Tertiary Drain	25.62	2.50-3.50	0.64-1.25	New	3rd
TD-167	Tertiary Drain	344.12	2.50-3.50	0.64-1.25	New	3rd
TD-168	Tertiary Drain	157.77	2.50-3.50	0.64-1.25	New	3rd
TD-169	Tertiary Drain	136.82	2.50-3.50	0.64-1.25	New	3rd
TD-170	Tertiary Drain	90.51	2.50-3.50	0.64-1.25	New	3rd
TD-171	Tertiary Drain	20.23	2.50-3.50	0.64-1.25	New	3rd

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth(m)	Remark	Phasing
TD-172	Tertiary Drain	45.85	2.50-3.50	0.64-1.25	New	3rd
TD-180	Tertiary Drain	7.44	2.50-3.50	0.64-1.25	New	3rd
TD-184	Tertiary Drain	60.67	2.50-3.50	0.64-1.25	New	3rd
TD-185	Tertiary Drain	90.69	2.50-3.50	0.64-1.25	New	3rd
TD-186	Tertiary Drain	122.01	2.50-3.50	0.64-1.25	New	3rd
TD-187	Tertiary Drain	42.12	2.50-3.50	0.64-1.25	New	3rd
TD-190	Tertiary Drain	7.05	2.50-3.50	0.64-1.25	New	3rd
TD-191	Tertiary Drain	45.51	2.50-3.50	0.64-1.25	New	3rd
TD-284	Tertiary Drain	27.62	2.50-3.50	0.64-1.25	New	3rd
TD-313	Tertiary Drain	70.90	2.50-3.50	0.64-1.25	New	3rd
TD-314	Tertiary Drain	24.69	2.50-3.50	0.64-1.25	New	3rd
TD-315	Tertiary Drain	16.88	2.50-3.50	0.64-1.25	New	3rd
TD-317	Tertiary Drain	5.83	2.50-3.50	0.64-1.25	New	3rd
TD-318	Tertiary Drain	5.50	2.50-3.50	0.64-1.25	New	3rd
TD-321	Tertiary Drain	7.28	2.50-3.50	0.64-1.25	New	3rd
TD-370	Tertiary Drain	26.30	2.50-3.50	0.64-1.25	New	3rd
TD-377	Tertiary Drain	5.76	2.50-3.50	0.64-1.25	New	3rd
TD-391	Tertiary Drain	3.28	2.50-3.50	0.64-1.25	New	3rd

Besides, it will be necessary to re-excavate the khals that serve as primary drains.

Map 15.14 represents proposed Road and Drainage Network for ward 5.

15.7.2.5 Urban Services

a. Solid Waste Management

The plan proposes one solid waste transfer station at ward 05 with an area 0.09 acre. It also is recommended that home collection system is introduced in the ward by creation of local CBOs.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

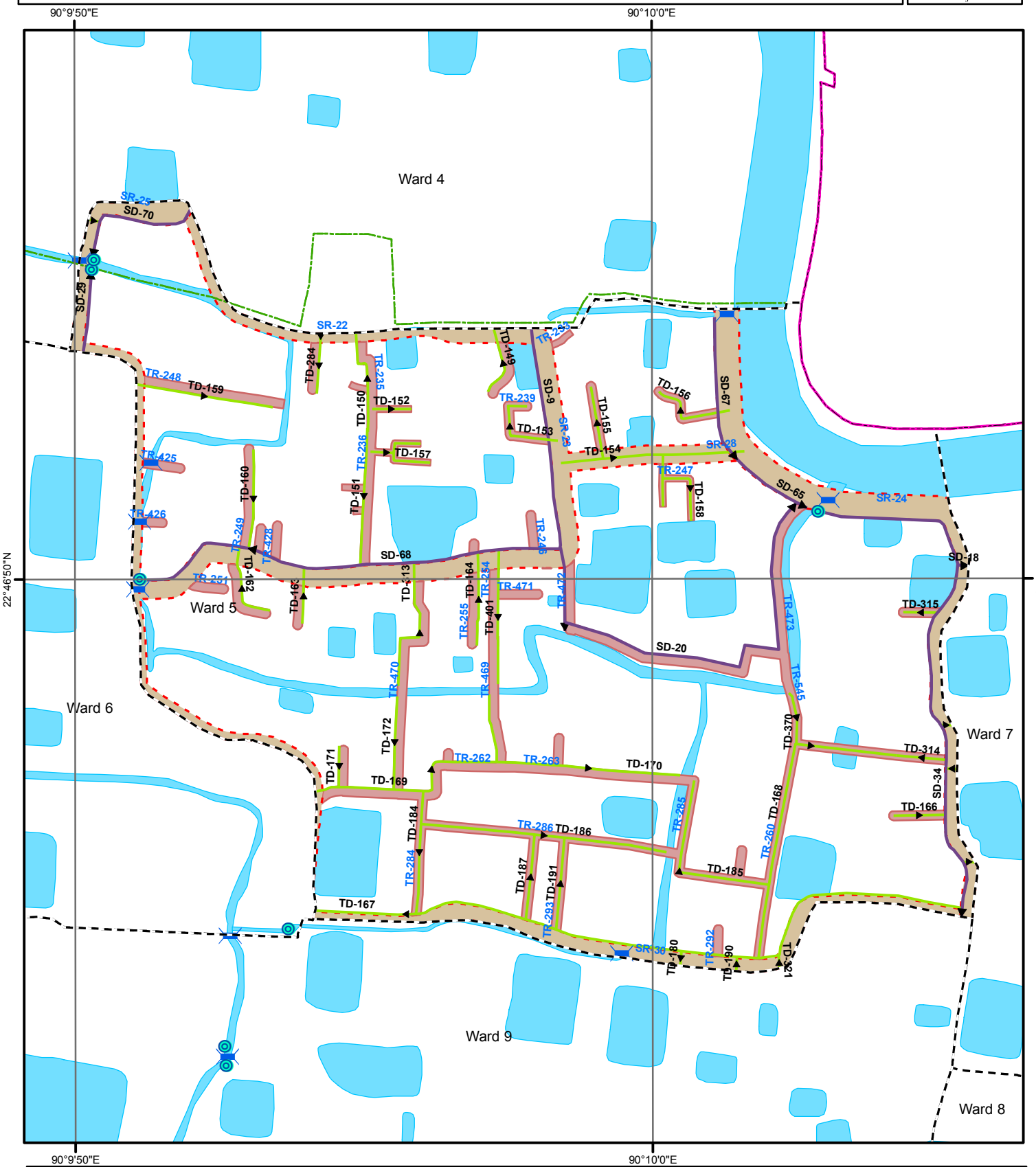
The Paurashava must try to promote hygienic sanitation for the whole Paurashava to ensure better public health.

Table 15.25: Utility Services Development Proposals for ward 05

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.67
Educational Facility	Kindergarten	1	0.36
Open Space	Linear Park	1	1.07
	Park	1	0.40
Utility Services	Electricity Line	As per existing program of PDB	-
	Waste Transfer Station	1	0.09

Map 15.15 represents proposed urban services for ward 5

Map 15.14: Proposed Road & Drainage Network of Ward No. 5



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Bridge
- Culvert
- Pipe Culvert
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Primary Road
- Secondary Road
- Tertiary Road
- Waterbody

Meters
0 4.5 9 18 27 36

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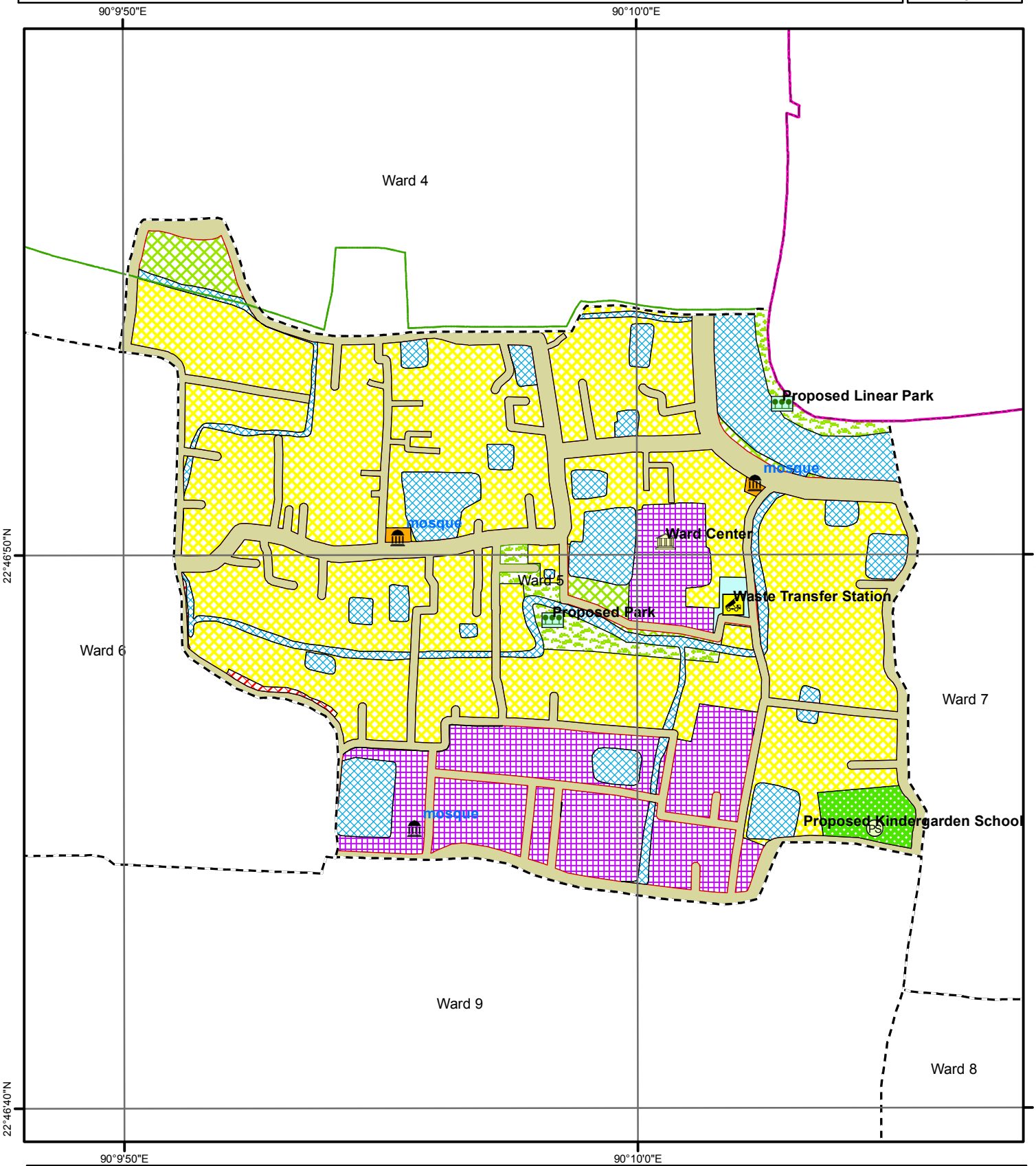
Map 15.15 : Development Proposal for Ward No. 5



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary

- Ward Center
- Stadium
- Bus Stand/Terminal
- Cinema Hall
- Clinic/Hospital
- Cluster Village
- College
- Community Center
- Dumping Site
- Eidgah
- Ferry ghat/Lanch ghat
- Fuel Station
- Graveyard
- High School
- Industry
- Low Income Housing
- Madrasha
- Market
- Mosque
- Park
- Primary School
- Resettelement Zone
- Rickshaw Stand
- Roundabout
- Shamshan Ghat
- Electric-Sub-Station
- Tempo Stand
- Tourist Spot
- Truck Stand/Termianal
- Playground
- Waste Transfer Station

0 12.5 25 50 75 100 Meters

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15.8 Ward Action Plan for Ward No. 06

15.8.1 Demography

Ward No. 6 is located on the middle part of the town. It has the high density of population within the Paurashava. Table 15.26 shows detail.

Table 15.26: Population Statistics of Ward No. 06

Item	Year			
	2016	**2021**	**2026**	**2031**
Area (acre)	18.37	18.37	18.37	18.37
Population	944	1010	1081	1157
Density of Population (acre)	51	55	59	63

15.8.2 Ward Action Plan Proposals

15.8.2.1 Review of Existing Land Use

Out of total 18.37 acres of land i.e. about 39.30% is used as residential land and 18.70% land is used as agricultural use. Water bodies occupy more than 12% land of the ward. At present 0.57 acre of land are used in commercial purpose. About 8.35% is used as circulation network. Only 2.47 acre of land is used as community facilities.

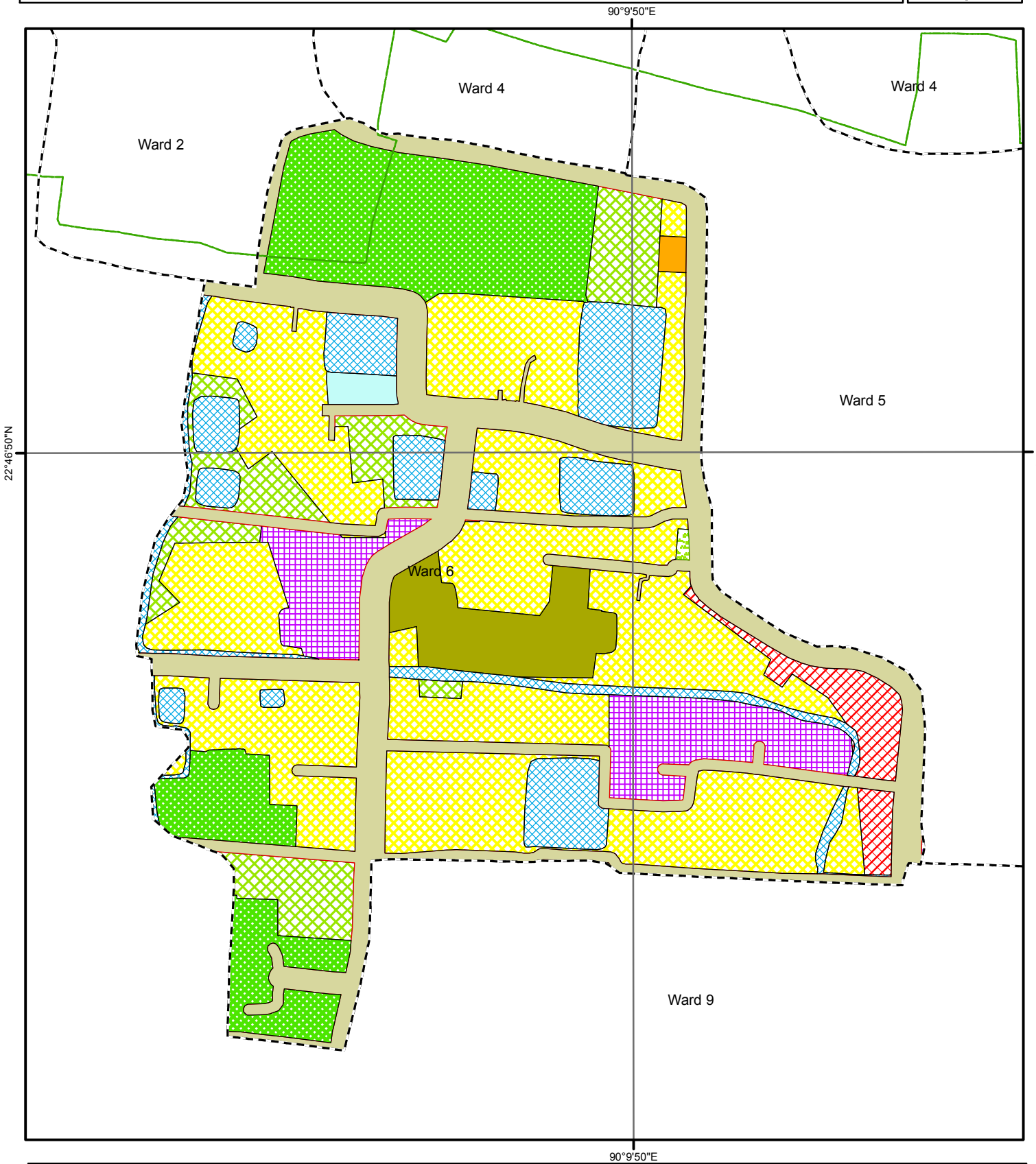
15.8.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.26 shows the amount of land existing and proposed uses in Ward no. 06. **Map 15.16** shows proposed land use of Ward 06.

Table 15.27: Comparative Scenario of Existing and Proposed Land Uses of Ward no. 06

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agriculture	3.43	18.70	1	Administrative	1.14	6.22
2	Circulation Network	1.53	8.35	2	Agriculture	1.53	8.36
3	Commercial Activities	0.57	3.12	3	Circulation Network	3.81	20.74
4	Community Facilities	2.47	13.44	4	Commercial Activities	0.43	2.32
5	Education & Research	0.77	4.17	5	Community Facilities	0.04	0.22
6	Government Office	3.43	18.70	6	Education & Research	2.59	14.10
7	Open space	0.03	0.15	7	Health Facilities	0.70	3.81
8	Residential area	7.22	39.30	8	Open Space	0.02	0.08
9	Service Activity	0.06	0.30	9	Urban Settlement	6.22	33.84
10	Waterbody	2.29	12.45	10	Utility Service	0.09	0.47
				11	Waterbody	1.80	9.81
	Total	**18.37**	**100**		**Total**	**18.37**	**100**

Map 15.16:Proposed Landuse Map of ward no. 6



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

Meters
04.59 18 27 36

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15.8.2.3 Proposed Road Infrastructure Development

Total 2.32 km road development proposal have been proposed for Ward no. 06 Length of tertiary road is 1.21 km and width is 20 ft. The total length of Secondary road is 1.11 km and width is 30 to 40 ft. Detail scenario of road network development proposal was given in table 15.28.

Table 15.28: Road Network Proposal at Ward no. 06

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Secondary Road	SR-16	40	232.07	Widening	1st
Secondary Road	SR-21	40	479.55	Widening	1st
Secondary Road	SR-25	40	0.76	Widening	1st
Secondary Road	SR-31	40	273.74	Widening	1st
Secondary Road	SR-19	30	90.92	Widening	1st
Secondary Road	SR-23	30	2.64	Widening	1st
Secondary Road	SR-30	30	0.81	Widening	1st
Secondary Road	SR-52	30	33.06	Widening	1st
Tertiary Road	TR-192	20	88.50	Widening	2nd
Tertiary Road	TR-204	20	40.15	Widening	2nd
Tertiary Road	TR-215	20	1.04	Widening	2nd
Tertiary Road	TR-226	20	15.70	Widening	2nd
Tertiary Road	TR-248	20	2.18	Widening	2nd
Tertiary Road	TR-250	20	63.03	Widening	2nd
Tertiary Road	TR-262	20	4.72	Widening	2nd
Tertiary Road	TR-266	20	220.43	Widening	2nd
Tertiary Road	TR-269	20	30.11	Widening	2nd
Tertiary Road	TR-270	20	65.14	Widening	2nd
Tertiary Road	TR-271	20	15.22	Widening	2nd
Tertiary Road	TR-272	20	254.67	Widening	2nd
Tertiary Road	TR-273	20	9.06	Widening	2nd
Tertiary Road	TR-274	20	12.06	Widening	2nd
Tertiary Road	TR-297	20	29.43	Widening	2nd
Tertiary Road	TR-298	20	26.07	Widening	2nd
Tertiary Road	TR-299	20	10.05	Widening	2nd
Tertiary Road	TR-300	20	12.34	Widening	2nd
Tertiary Road	TR-310	20	15.01	Widening	2nd
Tertiary Road	TR-325	20	45.24	Widening	2nd
Tertiary Road	TR-498	20	40.05	New	3rd
Tertiary Road	TR-504	20	23.05	Widening	3rd
Tertiary Road	TR-505	20	12.06	Widening	3rd
Tertiary Road	TR-519	20	0.77	New	3rd
Tertiary Road	TR-556	20	3.04	New	3rd
Tertiary Road	TR-558	20	91.10	New	3rd
Tertiary Road	TR-563	20	72.42	New	3rd
Tertiary Road	TR-418	20	1.28	Widening	3rd
Tertiary Road	TR-425	20	2.29	Widening	3rd
Tertiary Road	TR-426	20	1.68	Widening	3rd

- "TR" for tertiary road, and "SR" for secondary road.

15.8.2.4 Drainage Development Plan

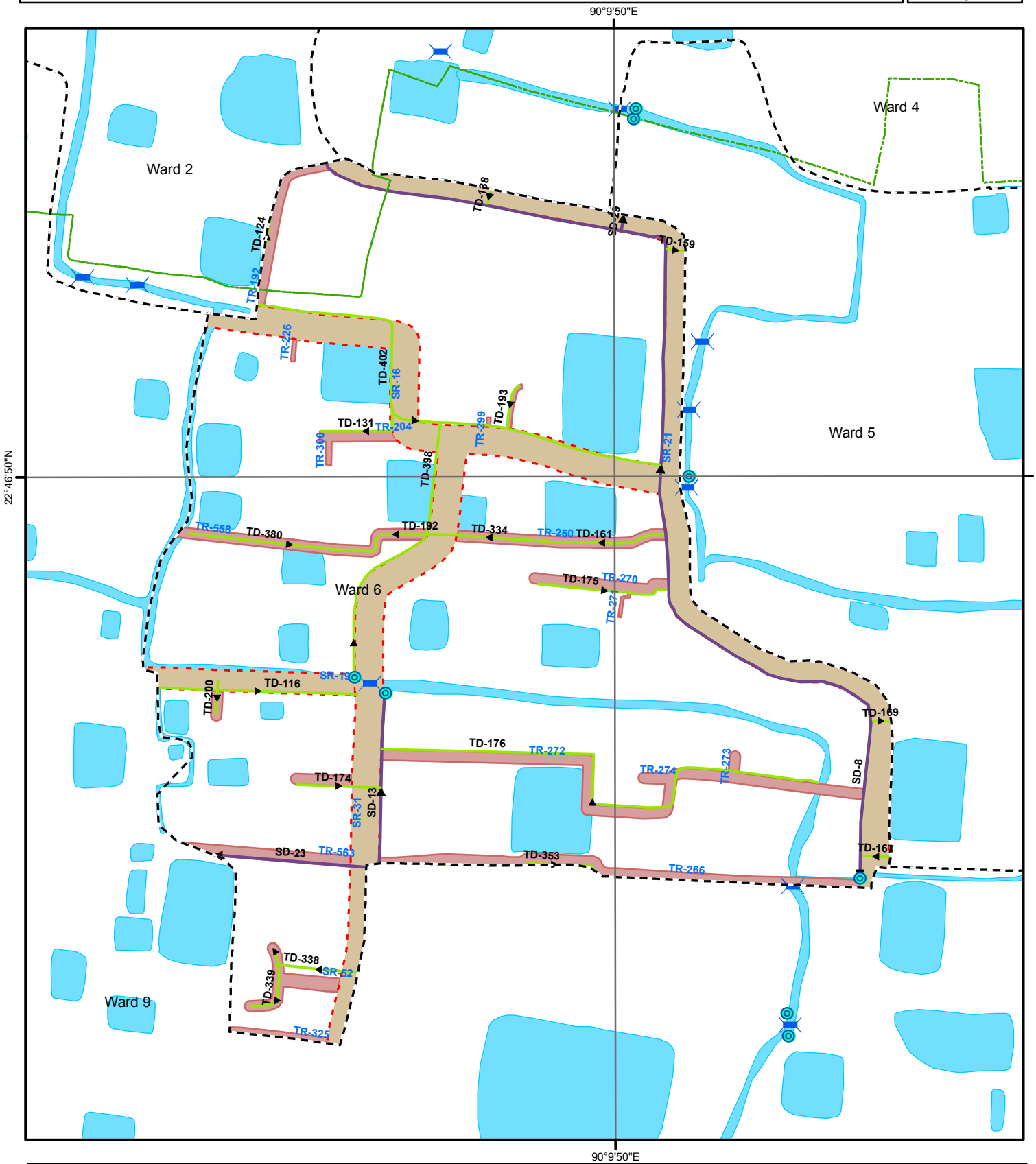
The proposed drainage facilities will be 1.81 km, served as 0.63 km secondary drain and 1.18 km tertiary drain in first Ward Action Plan. Table 15.29 shows the detail.

Table 15.29: Drainage Development Plan Proposals for ward 06

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
SD-8	Secondary Drain	259.95	3.50-4.50	1.25-2.25	New	2nd
SD-13	Secondary Drain	75.30	3.50-4.50	1.25-2.25	New	2nd
SD-23	Secondary Drain	65.58	3.50-4.50	1.25-2.25	New	2nd
SD-29	Secondary Drain	6.81	3.50-4.50	1.25-2.25	New	2nd
SD-8	Secondary Drain	221.53	3.50-4.50	1.25-2.25	New	2nd
TD-116	Tertiary Drain	86.24	2.50-3.50	0.64-1.25	New	2nd
TD-124	Tertiary Drain	19.04	2.50-3.50	0.64-1.25	New	2nd
TD-131	Tertiary Drain	38.96	2.50-3.50	0.64-1.25	New	2nd
TD-138	Tertiary Drain	6.84	2.50-3.50	0.64-1.25	New	2nd
TD-338	Tertiary Drain	35.27	2.50-3.50	0.64-1.25	New	2nd
TD-398	Tertiary Drain	123.61	2.50-3.50	0.64-1.25	New	2nd
TD-159	Tertiary Drain	8.29	2.50-3.50	0.64-1.25	New	3rd
TD-161	Tertiary Drain	56.71	2.50-3.50	0.64-1.25	New	3rd
TD-167	Tertiary Drain	13.39	2.50-3.50	0.64-1.25	New	3rd
TD-169	Tertiary Drain	8.71	2.50-3.50	0.64-1.25	New	3rd
TD-174	Tertiary Drain	36.48	2.50-3.50	0.64-1.25	New	3rd
TD-175	Tertiary Drain	58.00	2.50-3.50	0.64-1.25	New	3rd
TD-176	Tertiary Drain	223.17	2.50-3.50	0.64-1.25	New	3rd
TD-192	Tertiary Drain	26.99	2.50-3.50	0.64-1.25	New	3rd
TD-193	Tertiary Drain	19.79	2.50-3.50	0.64-1.25	New	3rd
TD-200	Tertiary Drain	15.01	2.50-3.50	0.64-1.25	New	3rd
TD-334	Tertiary Drain	40.05	2.50-3.50	0.64-1.25	New	3rd
TD-339	Tertiary Drain	23.05	2.50-3.50	0.64-1.25	New	3rd
TD-340	Tertiary Drain	12.06	2.50-3.50	0.64-1.25	New	3rd
TD-353	Tertiary Drain	25.99	2.50-3.50	0.64-1.25	New	3rd
TD-380	Tertiary Drain	86.60	2.50-3.50	0.64-1.25	New	3rd
TD-402	Tertiary Drain	215.45	2.50-3.50	0.64-1.25	New	3rd

Map 15.17 represents proposed Road and Drainage Network Map of Ward 6.

Map 15.17: Proposed Road & Drainage Network of Ward No. 6



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Bridge
- Culvert
- Pipe Culvert
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Primary Road
- Secondary Road
- Tertiary Road
- Waterbody

Meters
0 4 8 16 24 32

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15.8.2.5 Urban Services

a. Solid Waste Management

The consultant proposes solid waste transfer stations at ward no. 06. It is recommended that home collection system is introduced in the ward by creation of local CBOs. Table 15.30 shows the detail.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

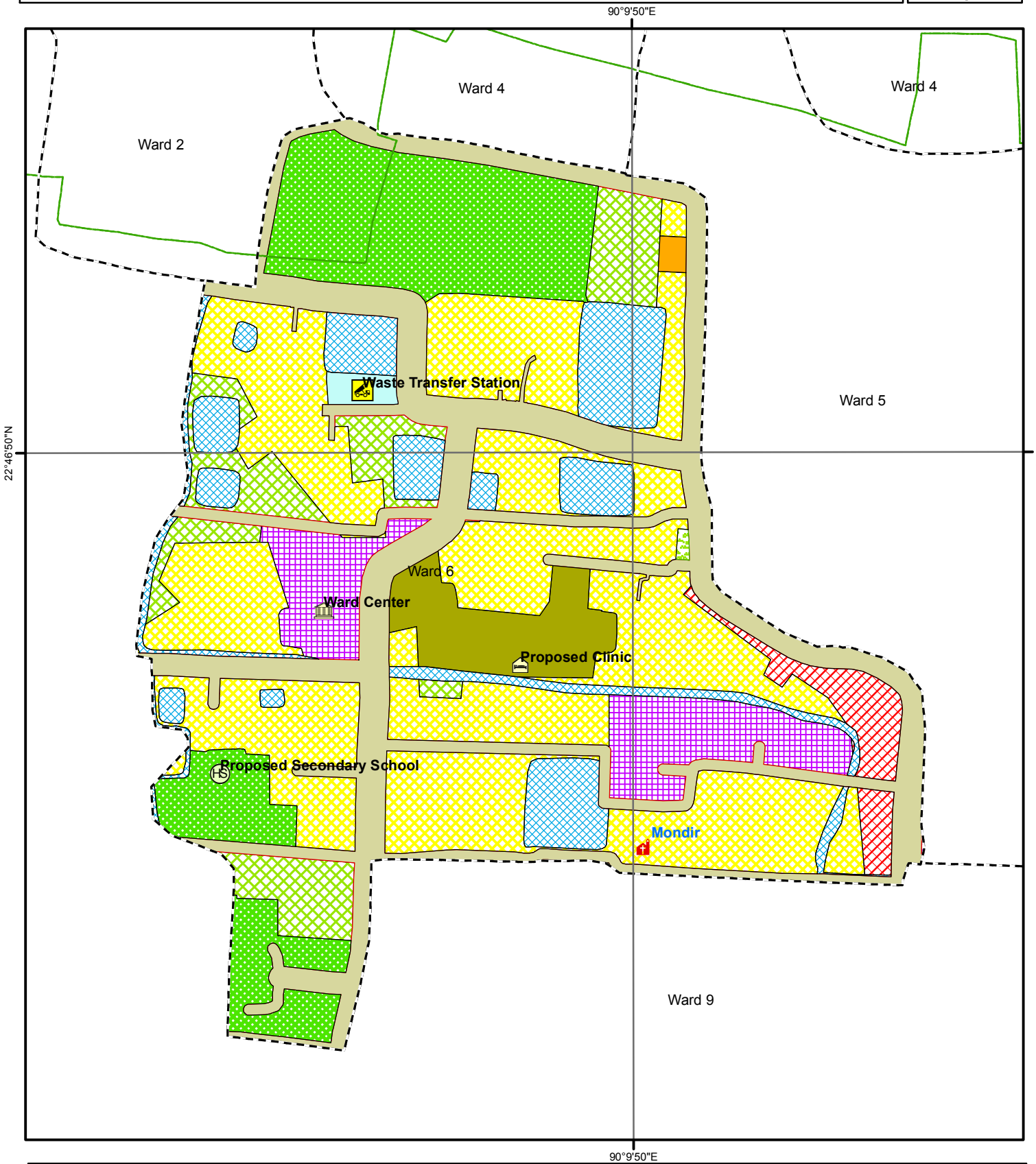
The Paurashava must try to promote hygienic sanitation for the whole Paurashava to ensure better public health.

Table 15.30: Utility Services Development Proposals for ward 06

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.47
Educational Facility	Secondary School	1	0.42
Health Facility	clinic	1	0.70
Utility Services	Electricity Line	As per existing program of PDB	-
	Waste Transfer Station	1	0.09

Map 15.18 represents proposed urban services for ward 6

Map 15.18 : Development Proposal for Ward No. 6



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary

- Ward Center
- Stadium
- Bus Stand/Terminal
- Cinema Hall
- Clinic/Hospital
- Cluster Village
- College
- Community Center
- Dumping Site
- Eidgah
- Ferry ghat/Lanch ghat
- Fuel Station
- Graveyard
- High School
- Industry
- Low Income Housing
- Madrasha
- Market
- Mosque
- Park
- Primary School
- Resettelement Zone
- Rickshaw Stand
- Roundabout
- Shamshan Ghat
- Electric-Sub-Station
- Tempo Stand
- Tourist Spot
- Truck Stand/Termianal
- Playground
- Waste Transfer Station

Meters
04.59 18 27 36

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15.9 Ward Action Plan for Ward No. 07

15.9.1 Demography

Ward no.7 is located on the Eastern of the town. It has the second highest density of population of 68 persons per acre with population of 1914 persons. Table 15.31 shows the details.

Table 15.31: Population Statistics of Ward No. 07

Item	Year			
	2016	2021	2026	2031
Area (acre)	28.01	28.01	28.01	28.01
Population	1561	1671	1788	1914
Density of Population (acre)	56	60	64	68

15.9.2 Ward Action Plan Proposals

15.9.2.1 Review of Existing Land Use

Out of total 28.01 acres of land about 38.55% is used as residential use. The next use is agricultural use, more than 9 acres of land are used in this purpose. Waterbody occupies about 22.46% land of the ward. More than 4% is used as circulation network.

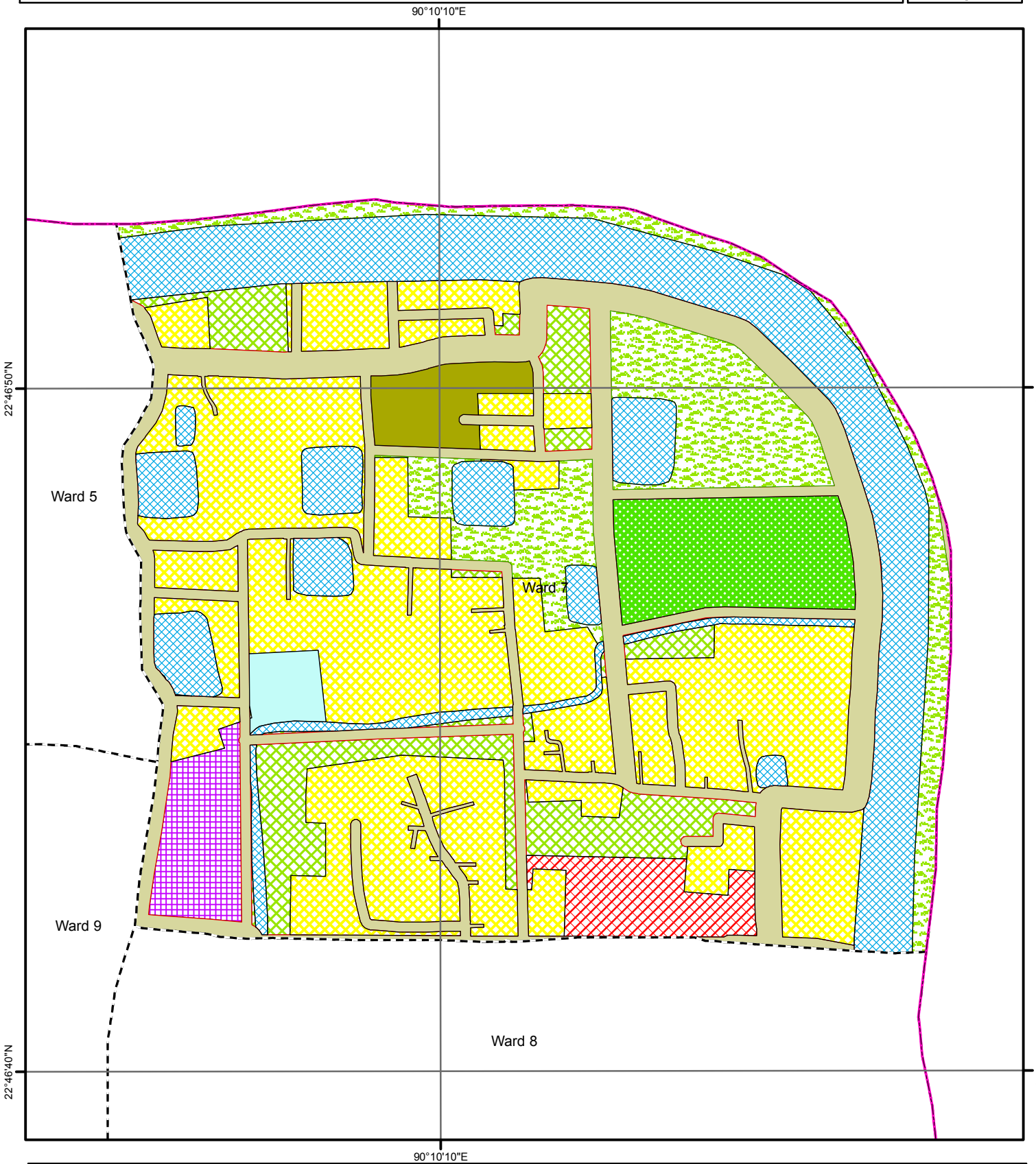
15.9.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.32 shows the amount of land existing and proposed uses in Ward no. 7. **Map 15.19** shows proposed land use of Ward 07

Table 15.32: Comparative Existing Land Use and Proposed Land Use of Ward No. 07

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agricultural	9.72	34.70	1	Administrative	0.68	2.44
2	Circulation Network	1.20	4.29	2	Agriculture	1.98	7.06
3	Residential Area	10.80	38.55	3	Circulation Network	5.18	18.48
4	Waterbody	6.29	22.46	4	Commercial	0.69	2.46
				5	Educational Facilities	1.33	4.74
				6	Health Facilities	0.49	1.76
				7	Open Space	2.87	10.26
				8	Urban Settlement	8.93	31.89
				9	Utility Service	0.26	0.92
				10	Waterbody	5.60	19.99
	Total	**28.01**	**100**		**Total**	**28.01**	**100**

Map 15.19:Proposed Landuse Map of ward no. 7



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

Meters
0 5 10 20 30 40

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15.9.2.3 Proposed Road Infrastructure Development

Total 3.23 km road development proposal have been proposed in ward action plan for ward no. 07. Total length of tertiary road will be 2.13 km and width of these roads will be 20ft for this ward. Total length of secondary road will be 1.10 km and width of these roads will be 30 to 40ft for this ward. Detail scenario of road network development proposal was given in table 15.33.

Table 15.33: Road Network Proposal at Ward no. 07

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Secondary Road	SR-24	40	256.58	Widening	1st
Secondary Road	SR-29	40	59.67	Widening	1st
Secondary Road	SR-35	40	138.13	Widening	1st
Secondary Road	SR-36	40	428.50	Widening	1st
Secondary Road	SR-30	30	0.12	Widening	1st
Secondary Road	SR-47	30	220.76	New	2nd
Tertiary Road	TR-257	20	25.15	Widening	2nd
Tertiary Road	TR-258	20	36.90	Widening	2nd
Tertiary Road	TR-301	20	0.12	Widening	2nd
Tertiary Road	TR-302	20	0.13	Widening	2nd
Tertiary Road	TR-474	20	0.14	New	3rd
Tertiary Road	TR-475	20	0.06	New	3rd
Tertiary Road	TR-476	20	77.02	New	3rd
Tertiary Road	TR-477	20	20.38	New	3rd
Tertiary Road	TR-478	20	30.51	New	3rd
Tertiary Road	TR-479	20	27.69	New	3rd
Tertiary Road	TR-480	20	180.59	New	3rd
Tertiary Road	TR-481	20	46.11	New	3rd
Tertiary Road	TR-482	20	105.56	New	3rd
Tertiary Road	TR-487	20	47.60	New	3rd
Tertiary Road	TR-499	20	116.16	New	3rd
Tertiary Road	TR-521	20	111.37	New	3rd
Tertiary Road	TR-570	20	124.10	New	3rd
Tertiary Road	TR-371	20	68.61	Widening	3rd
Tertiary Road	TR-372	20	63.10	Widening	3rd
Tertiary Road	TR-373	20	16.49	Widening	3rd
Tertiary Road	TR-374	20	9.26	Widening	3rd
Tertiary Road	TR-375	20	115.68	Widening	3rd
Tertiary Road	TR-376	20	71.36	Widening	3rd
Tertiary Road	TR-377	20	35.10	Widening	3rd
Tertiary Road	TR-378	20	25.23	Widening	3rd
Tertiary Road	TR-379	20	7.69	Widening	3rd
Tertiary Road	TR-387	20	80.34	Widening	3rd
Tertiary Road	TR-390	20	56.68	Widening	3rd
Tertiary Road	TR-393	20	176.83	Widening	3rd
Tertiary Road	TR-394	20	29.70	Widening	3rd
Tertiary Road	TR-395	20	23.77	Widening	3rd
Tertiary Road	TR-396	20	89.42	Widening	3rd
Tertiary Road	TR-397	20	22.28	Widening	3rd
Tertiary Road	TR-398	20	10.42	Widening	3rd
Tertiary Road	TR-399	20	18.91	Widening	3rd
Tertiary Road	TR-400	20	7.36	Widening	3rd
Tertiary Road	TR-401	20	11.42	Widening	3rd
Tertiary Road	TR-402	20	6.71	Widening	3rd
Tertiary Road	TR-403	20	8.44	Widening	3rd
Tertiary Road	TR-432	20	7.71	Widening	3rd
Tertiary Road	TR-433	20	36.52	Widening	3rd
Tertiary Road	TR-434	20	58.74	Widening	3rd
Tertiary Road	TR-435	20	36.44	Widening	3rd
Tertiary Road	TR-436	20	50.28	Widening	3rd
Tertiary Road	TR-437	20	33.55	Widening	3rd

- "TR" for tertiary road, and "SR" for secondary road.

15.9.2.4 Drainage Development Plan

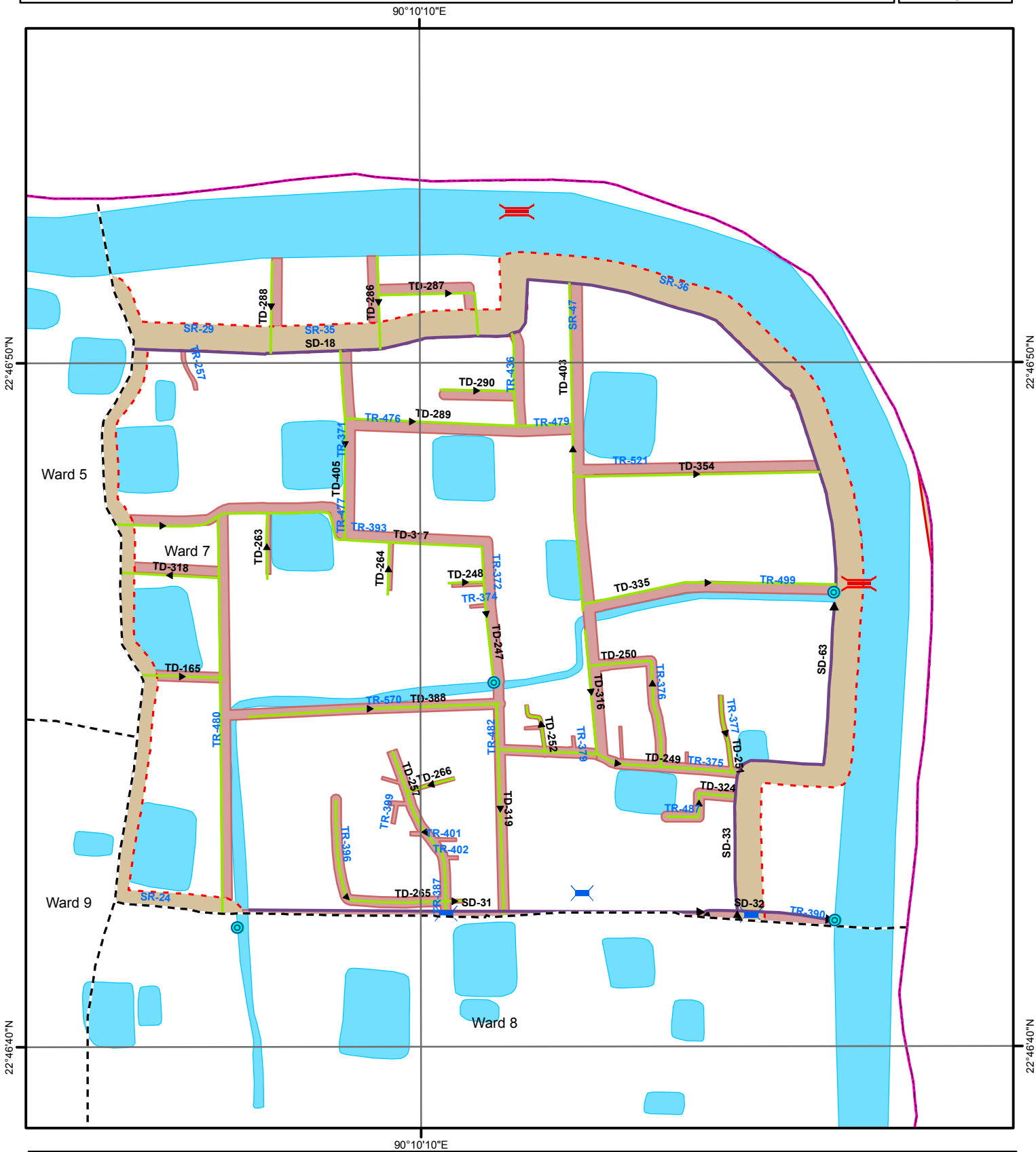
There are both manmade and natural drainage facilities at ward no. 07. Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on this natural channel and served as primary drain for the ward and will be connected with 0.87 km secondary drain. Table 15.34 shows the detail.

Table 15.34: Drainage Development Plan Proposals for ward 07

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
SD-18	Secondary Drain	427.39	3.50-4.50	1.25-2.25	New	2nd
SD-33	Secondary Drain	108.48	3.50-4.50	1.25-2.25	New	2nd
SD-63	Secondary Drain	72.29	3.50-4.50	1.25-2.25	New	2nd
SD-30	Secondary Drain	0.09	3.50-4.50	1.25-2.25	New	3rd
SD-31	Secondary Drain	205.10	3.50-4.50	1.25-2.25	New	3rd
SD-32	Secondary Drain	58.30	3.50-4.50	1.25-2.25	New	3rd
TD-165	Tertiary Drain	37.94	2.50-3.50	0.64-1.25	New	3rd
TD-247	Tertiary Drain	61.14	2.50-3.50	0.64-1.25	New	3rd
TD-248	Tertiary Drain	16.49	2.50-3.50	0.64-1.25	New	3rd
TD-249	Tertiary Drain	108.45	2.50-3.50	0.64-1.25	New	3rd
TD-250	Tertiary Drain	75.93	2.50-3.50	0.64-1.25	New	3rd
TD-251	Tertiary Drain	35.10	2.50-3.50	0.64-1.25	New	3rd
TD-252	Tertiary Drain	25.23	2.50-3.50	0.64-1.25	New	3rd
TD-257	Tertiary Drain	80.34	2.50-3.50	0.64-1.25	New	3rd
TD-260	Tertiary Drain	3.25	2.50-3.50	0.64-1.25	New	3rd
TD-263	Tertiary Drain	29.70	2.50-3.50	0.64-1.25	New	3rd
TD-264	Tertiary Drain	23.77	2.50-3.50	0.64-1.25	New	3rd
TD-265	Tertiary Drain	89.42	2.50-3.50	0.64-1.25	New	3rd
TD-266	Tertiary Drain	22.28	2.50-3.50	0.64-1.25	New	3rd
TD-267	Tertiary Drain	8.44	2.50-3.50	0.64-1.25	New	3rd
TD-286	Tertiary Drain	42.31	2.50-3.50	0.64-1.25	New	3rd
TD-287	Tertiary Drain	62.12	2.50-3.50	0.64-1.25	New	3rd
TD-288	Tertiary Drain	41.98	2.50-3.50	0.64-1.25	New	3rd
TD-289	Tertiary Drain	144.43	2.50-3.50	0.64-1.25	New	3rd
TD-290	Tertiary Drain	33.55	2.50-3.50	0.64-1.25	New	3rd
TD-316	Tertiary Drain	56.63	2.50-3.50	0.64-1.25	New	3rd
TD-317	Tertiary Drain	354.02	2.50-3.50	0.64-1.25	New	3rd
TD-318	Tertiary Drain	44.65	2.50-3.50	0.64-1.25	New	3rd
TD-319	Tertiary Drain	96.36	2.50-3.50	0.64-1.25	New	3rd
TD-324	Tertiary Drain	41.38	2.50-3.50	0.64-1.25	New	3rd
TD-335	Tertiary Drain	115.25	2.50-3.50	0.64-1.25	New	3rd
TD-354	Tertiary Drain	111.37	2.50-3.50	0.64-1.25	New	3rd
TD-388	Tertiary Drain	113.51	2.50-3.50	0.64-1.25	New	3rd
TD-403	Tertiary Drain	147.48	2.50-3.50	0.64-1.25	New	3rd
TD-404	Tertiary Drain	0.23	2.50-3.50	0.64-1.25	New	3rd
TD-405	Tertiary Drain	85.33	2.50-3.50	0.64-1.25	New	3rd

Besides, it will be necessary to re-excavate the khals that serve as primary drains flowing of Water through them. **Map 15.20** represents proposed Road and Drainage Network for Ward 7.

Map 15.20: Proposed Road & Drainage Network of Ward No. 7



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Bridge
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- Waterbody

Meters
0 5 10 20 30 40

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In Association with

15.9.2.5 Urban Services

a. Solid Waste Management

The consultant proposes solid waste transfer stations in some suitable locations for the management of solid waste. 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.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

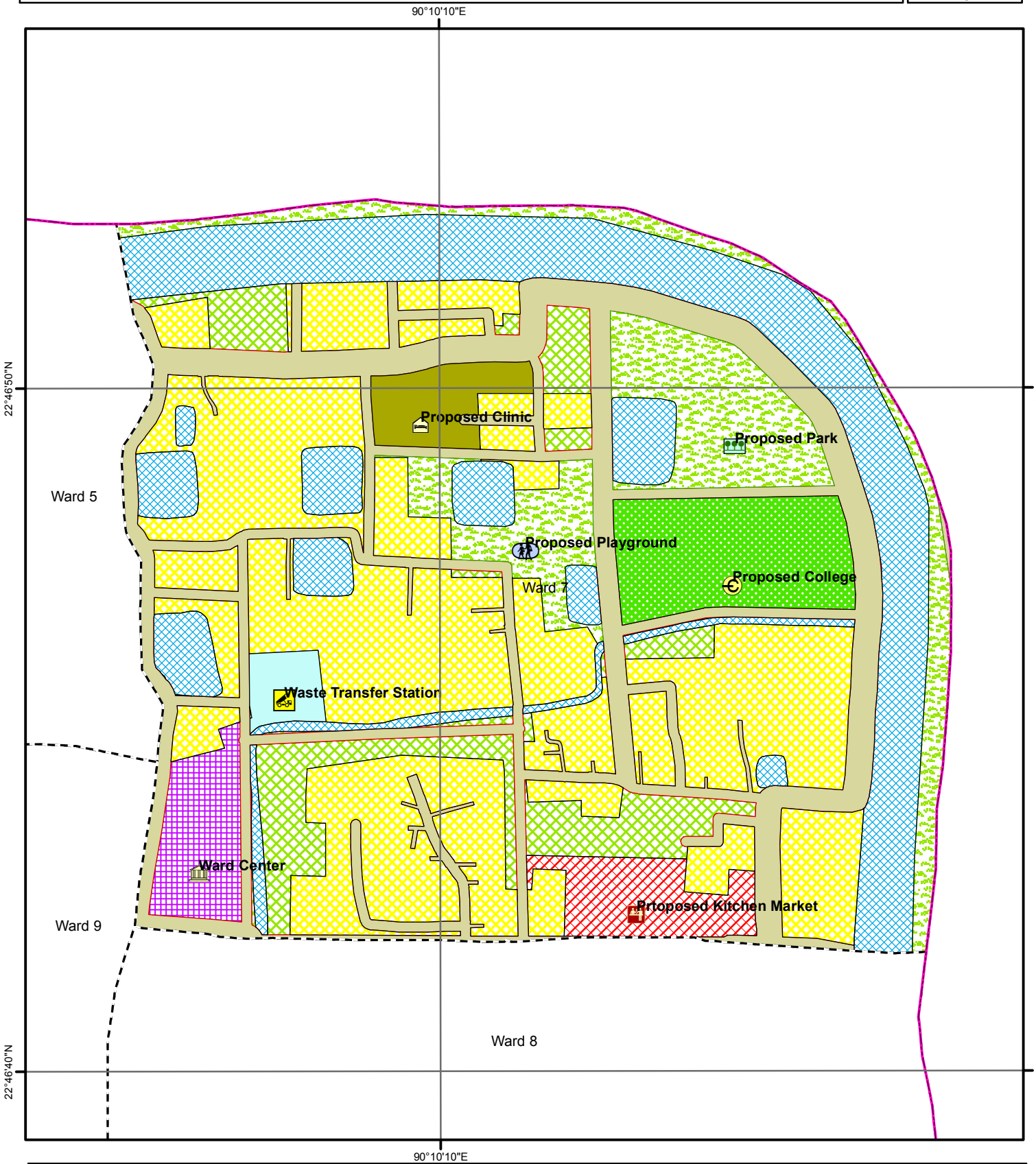
The Paurashava must try to promote hygienic sanitation for the whole Paurashava to ensure better public health.

Table 15.35: Urban Services Development Proposals for ward 07

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.68
Commercial Activity	Kitchen Market	1	0.69
Education & Research	College	1	1.33
Health Facility	Clinic	1	0.49
Open Space	Linear Park	1	1.07
	Park	1	1.18
	Playground	1	0.72
Utility Services	Electricity Line	As per existing program of PDB	-
	Waste Transfer Station	1	0.26

Map 15.21 represents proposed urban services for ward 7.

Map 15.21 : Development Proposal for Ward No. 7



Legend

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- Ward Boundary

- Ward Center
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- Graveyard
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- Madrasha
- Market
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- Tempo Stand
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- Playground
- Waste Transfer Station

Meters
0 5 10 20 30 40

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15.10 Ward Action Plan for Ward No. 08

15.10.1 Demography

Ward No. 8 is located on the South-Eastern part of the town. The estimated population for the year 2031 will be 2321 with a density of 50 persons per acre. Table 15.36 shows the detail.

Table 15.36: Population Statistics of Ward No. 08

Item	Year			
	2016	2021	2026	2031
Area (acre)	46.19	46.19	46.19	46.19
Population	1894	2027	2169	2321
Density of Population (acre)	41	44	47	50

15.10.2 Ward Action Plan Proposals

15.10.2.1 Review of Existing Land Use

Out of total 46.19 acres of land of this ward more than 18.33 acre of land i.e. 39.69% is used as residential land. The next use is agricultural; 15.11 acres are used as this purpose. It occupies almost 32.70% of total land. Waterbody occupies about 19.07% land. More than 5.30% is used as circulation network. Only 2.30% of land is used as Commercial activities.

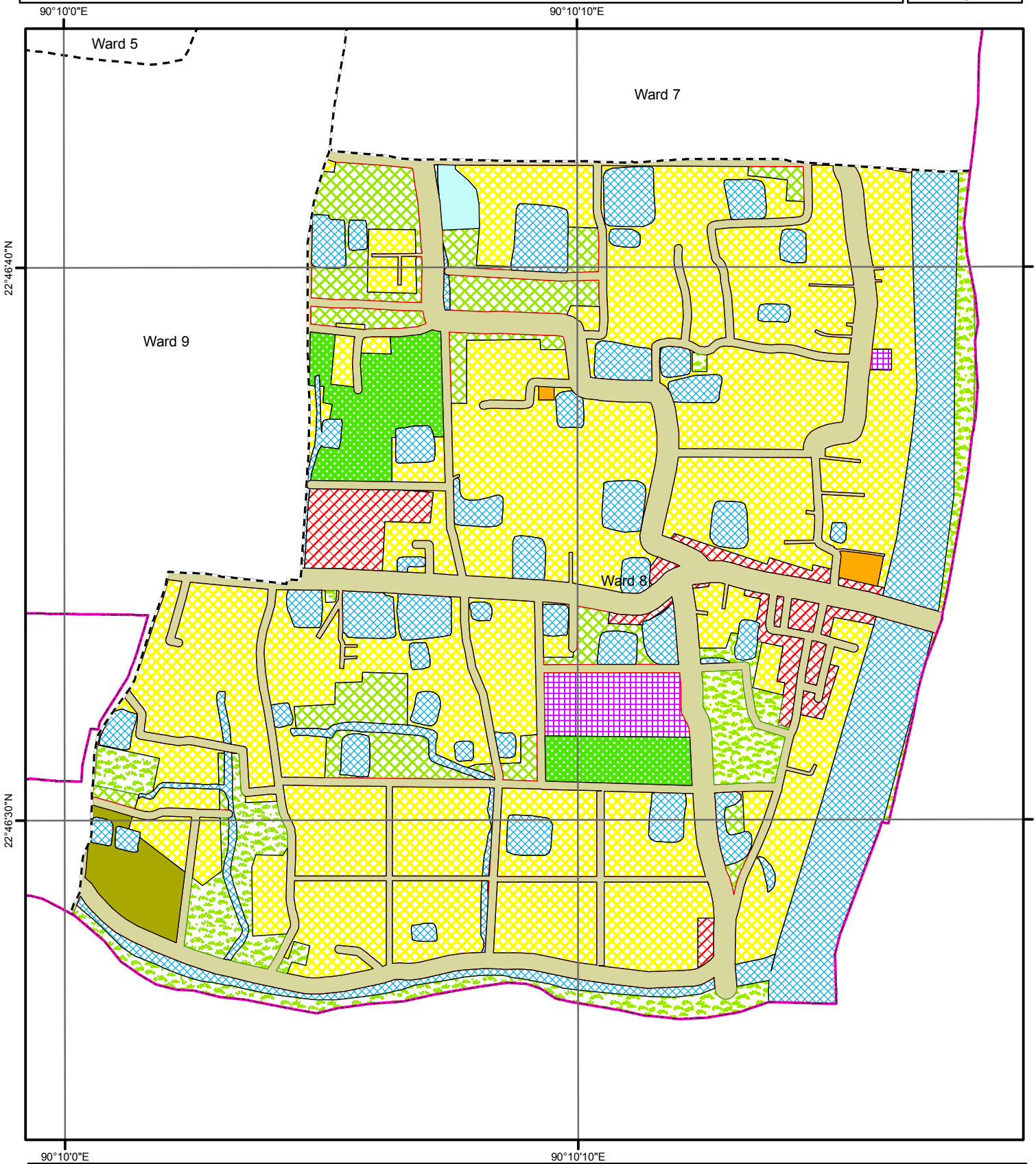
15.10.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.37 shows the amount of land existing and proposed uses in Ward no. 8. **Map 15.22** shows proposed land use of Ward 08

Table 15.37: Comparative Scenario of Existing and Proposed Land Use of Ward No. 08

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agricultural	15.11	32.70	1	Administrative	0.71	1.53
2	Circulation Network	2.45	5.30	2	Agriculture	2.63	5.70
3	Commercial Activity	1.06	2.30	3	Circulation Network	8.52	18.45
4	Community Facilities	0.11	0.24	4	Commercial Activity	1.26	2.74
5	Open Space	0.27	0.59	5	Community Facilities	0.10	0.21
6	Residential Area	18.33	39.69	6	Education and Research	1.53	3.31
7	Service Activity	0.05	0.10	7	Health Facilities	0.54	1.18
8	Waterbody	8.81	19.07	8	Open Space	2.74	5.92
				9	Urban Settlement	19.93	43.15
				10	Utility Service	0.17	0.36
				11	Waterbody	8.06	17.45
	Total	**46.19**	**100**		**Total**	**46.19**	**100**

Map 15.22:Proposed Landuse Map of ward no. 8



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
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- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

Meters
0 510 20 30 40

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15.10.2.3 Proposed Road Infrastructure Development

Total 5.12 km road development proposal have been proposed for this ward. Total length of tertiary road will be 3.60 km and width of these roads will be 20 ft. Total length of secondary road will be 1.52 km and width of these roads will be 30 to 40 ft for this ward. Detail scenario of road network development proposal was given in table 15.38.

Table 15.38: Road Network Proposal at Ward no.08 of Banaripara Paurashava

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Secondary Road	SR-21	40	115.35	Widening	1st
Secondary Road	SR-24	40	172.59	Widening	1st
Secondary Road	SR-36	40	183.45	Widening	1st
Secondary Road	SR-37	40	249.78	Widening	1st
Secondary Road	SR-38	40	186.74	Widening	1st
Secondary Road	SR-39	40	231.43	Widening	1st
Secondary Road	SR-34	30	252.03	Widening	1st
Secondary Road	SR-40	30	128.54	Widening	1st
Tertiary Road	TR-278	20	75.23	Widening	2nd
Tertiary Road	TR-279	20	69.86	Widening	2nd
Tertiary Road	TR-303	20	50.30	Widening	2nd
Tertiary Road	TR-478	20	184.10	New	3rd
Tertiary Road	TR-483	20	54.29	New	3rd
Tertiary Road	TR-486	20	85.85	New	3rd
Tertiary Road	TR-488	20	148.76	New	3rd
Tertiary Road	TR-489	20	77.26	New	3rd
Tertiary Road	TR-490	20	114.50	New	3rd
Tertiary Road	TR-491	20	82.20	New	3rd
Tertiary Road	TR-492	20	108.16	New	3rd
Tertiary Road	TR-493	20	83.23	New	3rd
Tertiary Road	TR-494	20	81.62	New	3rd
Tertiary Road	TR-522	20	26.34	New	3rd
Tertiary Road	TR-523	20	76.89	New	3rd
Tertiary Road	TR-524	20	66.13	New	3rd
Tertiary Road	TR-546	20	30.01	New	3rd
Tertiary Road	TR-524	20	0.00	New	3rd
Tertiary Road	TR-340	20	43.98	Widening	3rd
Tertiary Road	TR-342	20	29.18	Widening	3rd
Tertiary Road	TR-343	20	210.68	Widening	3rd
Tertiary Road	TR-348	20	10.15	Widening	3rd
Tertiary Road	TR-348	20	0.99	Widening	3rd
Tertiary Road	TR-349	20	51.17	Widening	3rd
Tertiary Road	TR-350	20	30.28	Widening	3rd
Tertiary Road	TR-351	20	226.55	Widening	3rd
Tertiary Road	TR-352	20	121.94	Widening	3rd
Tertiary Road	TR-353	20	5.59	Widening	3rd
Tertiary Road	TR-354	20	35.70	Widening	3rd
Tertiary Road	TR-355	20	38.50	Widening	3rd
Tertiary Road	TR-356	20	8.29	Widening	3rd
Tertiary Road	TR-357	20	8.08	Widening	3rd
Tertiary Road	TR-358	20	54.39	Widening	3rd
Tertiary Road	TR-380	20	8.59	Widening	3rd
Tertiary Road	TR-381	20	11.62	Widening	3rd
Tertiary Road	TR-382	20	9.60	Widening	3rd
Tertiary Road	TR-383	20	31.00	Widening	3rd
Tertiary Road	TR-384	20	9.63	Widening	3rd
Tertiary Road	TR-385	20	26.62	Widening	3rd
Tertiary Road	TR-386	20	143.33	Widening	3rd
Tertiary Road	TR-387	20	36.18	Widening	3rd
Tertiary Road	TR-388	20	75.99	Widening	3rd
Tertiary Road	TR-389	20	53.74	Widening	3rd
Tertiary Road	TR-390	20	74.69	Widening	3rd
Tertiary Road	TR-391	20	75.40	Widening	3rd
Tertiary Road	TR-392	20	28.58	Widening	3rd

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Tertiary Road	TR-404	20	29.77	Widening	3rd
Tertiary Road	TR-405	20	22.94	Widening	3rd
Tertiary Road	TR-406	20	72.67	Widening	3rd
Tertiary Road	TR-407	20	24.48	Widening	3rd
Tertiary Road	TR-408	20	24.97	Widening	3rd
Tertiary Road	TR-409	20	171.95	Widening	3rd
Tertiary Road	TR-410	20	41.50	Widening	3rd
Tertiary Road	TR-411	20	43.51	Widening	3rd
Tertiary Road	TR-412	20	19.89	Widening	3rd
Tertiary Road	TR-413	20	12.50	Widening	3rd
Tertiary Road	TR-431	20	63.94	Widening	3rd
Tertiary Road	TR-438	20	0.09	Widening	3rd
Tertiary Road	TR-439	20	21.83	Widening	3rd
Tertiary Road	TR-440	20	18.88	Widening	3rd
Tertiary Road	TR-441	20	7.15	Widening	3rd
Tertiary Road	TR-442	20	25.73	Widening	3rd
Tertiary Road	TR-443	20	78.31	Widening	3rd
Tertiary Road	TR-444	20	25.21	Widening	3rd
Tertiary Road	TR-445	20	6.92	Widening	3rd
Tertiary Road	TR-446	20	9.26	Widening	3rd
Tertiary Road	TR-358	20	0.00	Widening	3rd

- "TR" for tertiary road, and "SR" for secondary road.

15.10.2.4 Drainage Development Plan

There are both natural and manmade drainage facilities at ward no. 08 of Banaripara Paurashava. Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on this natural channel. Table 15.39 shows the detail.

Table 15.39: Drainage Development Plan Proposals for ward 08

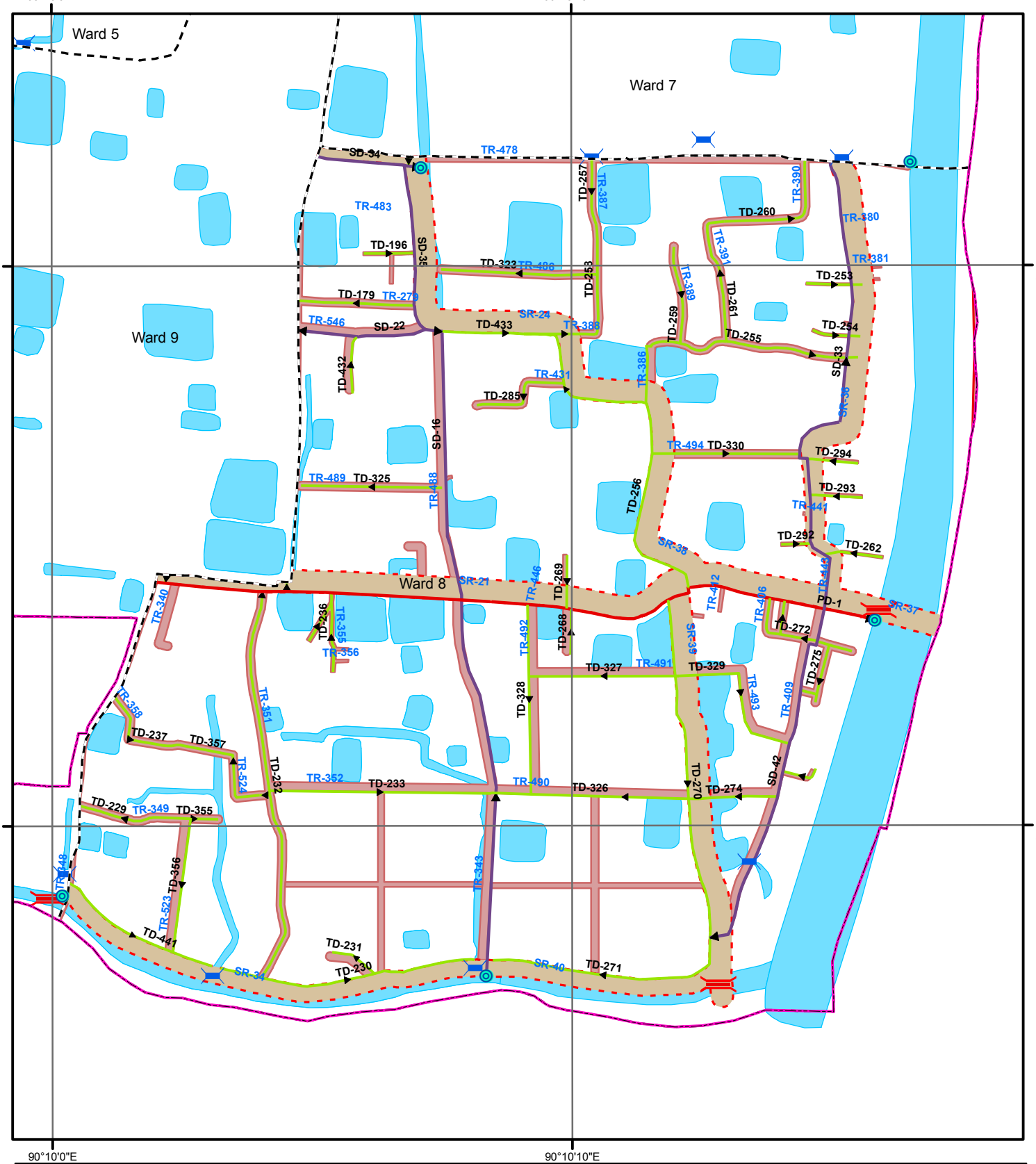
Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
PD-1	Primary Drain	404.46	4.50-5.50	2.25-3.50	New	1st
SD-16	Secondary Drain	356.85	3.50-4.50	1.25-2.25	New	2nd
SD-22	Secondary Drain	70.93	3.50-4.50	1.25-2.25	New	2nd
SD-33	Secondary Drain	144.99	3.50-4.50	1.25-2.25	New	2nd
SD-42	Secondary Drain	328.00	3.50-4.50	1.25-2.25	New	2nd
SD-30	Secondary Drain	0.35	3.50-4.50	1.25-2.25	New	3rd
SD-34	Secondary Drain	57.14	3.50-4.50	1.25-2.25	New	3rd
SD-35	Secondary Drain	101.73	3.50-4.50	1.25-2.25	New	3rd
SD-30	Secondary Drain	0.27	3.50-4.50	1.25-2.25	New	3rd
TD-256	Tertiary Drain	189.20	2.50-3.50	0.64-1.25	New	2nd
TD-179	Tertiary Drain	63.62	2.50-3.50	0.64-1.25	New	3rd
TD-196	Tertiary Drain	27.72	2.50-3.50	0.64-1.25	New	3rd
TD-223	Tertiary Drain	4.53	2.50-3.50	0.64-1.25	New	3rd
TD-224	Tertiary Drain	5.13	2.50-3.50	0.64-1.25	New	3rd
TD-229	Tertiary Drain	51.15	2.50-3.50	0.64-1.25	New	3rd
TD-230	Tertiary Drain	142.30	2.50-3.50	0.64-1.25	New	3rd
TD-231	Tertiary Drain	27.07	2.50-3.50	0.64-1.25	New	3rd
TD-232	Tertiary Drain	218.17	2.50-3.50	0.64-1.25	New	3rd
TD-233	Tertiary Drain	121.94	2.50-3.50	0.64-1.25	New	3rd
TD-234	Tertiary Drain	5.59	2.50-3.50	0.64-1.25	New	3rd
TD-235	Tertiary Drain	29.87	2.50-3.50	0.64-1.25	New	3rd
TD-236	Tertiary Drain	38.50	2.50-3.50	0.64-1.25	New	3rd
TD-237	Tertiary Drain	54.39	2.50-3.50	0.64-1.25	New	3rd
TD-253	Tertiary Drain	31.00	2.50-3.50	0.64-1.25	New	3rd
TD-254	Tertiary Drain	26.62	2.50-3.50	0.64-1.25	New	3rd
TD-255	Tertiary Drain	151.59	2.50-3.50	0.64-1.25	New	3rd
TD-257	Tertiary Drain	36.18	2.50-3.50	0.64-1.25	New	3rd
TD-258	Tertiary Drain	100.15	2.50-3.50	0.64-1.25	New	3rd

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
TD-259	Tertiary Drain	53.74	2.50-3.50	0.64-1.25	New	3rd
TD-260	Tertiary Drain	74.40	2.50-3.50	0.64-1.25	New	3rd
TD-261	Tertiary Drain	75.40	2.50-3.50	0.64-1.25	New	3rd
TD-262	Tertiary Drain	32.32	2.50-3.50	0.64-1.25	New	3rd
TD-268	Tertiary Drain	24.93	2.50-3.50	0.64-1.25	New	3rd
TD-269	Tertiary Drain	29.13	2.50-3.50	0.64-1.25	New	3rd
TD-270	Tertiary Drain	204.44	2.50-3.50	0.64-1.25	New	3rd
TD-271	Tertiary Drain	122.30	2.50-3.50	0.64-1.25	New	3rd
TD-272	Tertiary Drain	66.27	2.50-3.50	0.64-1.25	New	3rd
TD-273	Tertiary Drain	18.59	2.50-3.50	0.64-1.25	New	3rd
TD-274	Tertiary Drain	43.05	2.50-3.50	0.64-1.25	New	3rd
TD-275	Tertiary Drain	41.64	2.50-3.50	0.64-1.25	New	3rd
TD-285	Tertiary Drain	57.76	2.50-3.50	0.64-1.25	New	3rd
TD-291	Tertiary Drain	21.83	2.50-3.50	0.64-1.25	New	3rd
TD-292	Tertiary Drain	16.39	2.50-3.50	0.64-1.25	New	3rd
TD-293	Tertiary Drain	28.66	2.50-3.50	0.64-1.25	New	3rd
TD-294	Tertiary Drain	27.97	2.50-3.50	0.64-1.25	New	3rd
TD-317	Tertiary Drain	5.30	2.50-3.50	0.64-1.25	New	3rd
TD-323	Tertiary Drain	85.85	2.50-3.50	0.64-1.25	New	3rd
TD-325	Tertiary Drain	77.26	2.50-3.50	0.64-1.25	New	3rd
TD-326	Tertiary Drain	114.50	2.50-3.50	0.64-1.25	New	3rd
TD-327	Tertiary Drain	82.20	2.50-3.50	0.64-1.25	New	3rd
TD-328	Tertiary Drain	104.26	2.50-3.50	0.64-1.25	New	3rd
TD-329	Tertiary Drain	89.75	2.50-3.50	0.64-1.25	New	3rd
TD-330	Tertiary Drain	81.08	2.50-3.50	0.64-1.25	New	3rd
TD-355	Tertiary Drain	26.34	2.50-3.50	0.64-1.25	New	3rd
TD-356	Tertiary Drain	74.26	2.50-3.50	0.64-1.25	New	3rd
TD-357	Tertiary Drain	66.13	2.50-3.50	0.64-1.25	New	3rd
TD-432	Tertiary Drain	31.83	2.50-3.50	0.64-1.25	New	3rd
TD-433	Tertiary Drain	69.71	2.50-3.50	0.64-1.25	New	3rd
TD-441	Tertiary Drain	92.84	2.50-3.50	0.64-1.25	New	3rd
TD-237	Tertiary Drain	0.00	2.50-3.50	0.64-1.25	New	3rd
TD-357	Tertiary Drain	0.00	2.50-3.50	0.64-1.25	New	3rd
TD-260	Tertiary Drain	0.27	2.50-3.50	0.64-1.25	New	3rd

Besides, it will be necessary to re-excavate the khals that serve as primary drains. The consultants have identified existing whole of the khals need to be re-excavated to allow smooth flow of water through them.

Map 15.23 represents proposed Road and Drainage Map of ward 8.

Map 15.23: Proposed Road & Drainage Network of Ward No. 8



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Bridge
- Culvert
- Pipe Culvert
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Primary Road
- Secondary Road
- Tertiary Road
- Waterbody

Meters
0 5 10 20 30 40

Local Government Engineering Department (LGED)
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Ministry of Local Government, Rural Development and Cooperatives Local Government Division

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15.10.2.5 Urban Services

a. Solid Waste Management

Solid waste management is a major urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is also a major factor influencing the volume of solid waste. Population and the volume of waste in the Paurashava are yet to be large enough to become a problem for the city. But the present management system is not satisfactory and it might to lead to problem in future. The consultant proposes solid waste transfer stations in a suitable location. 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.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

c. Sanitation

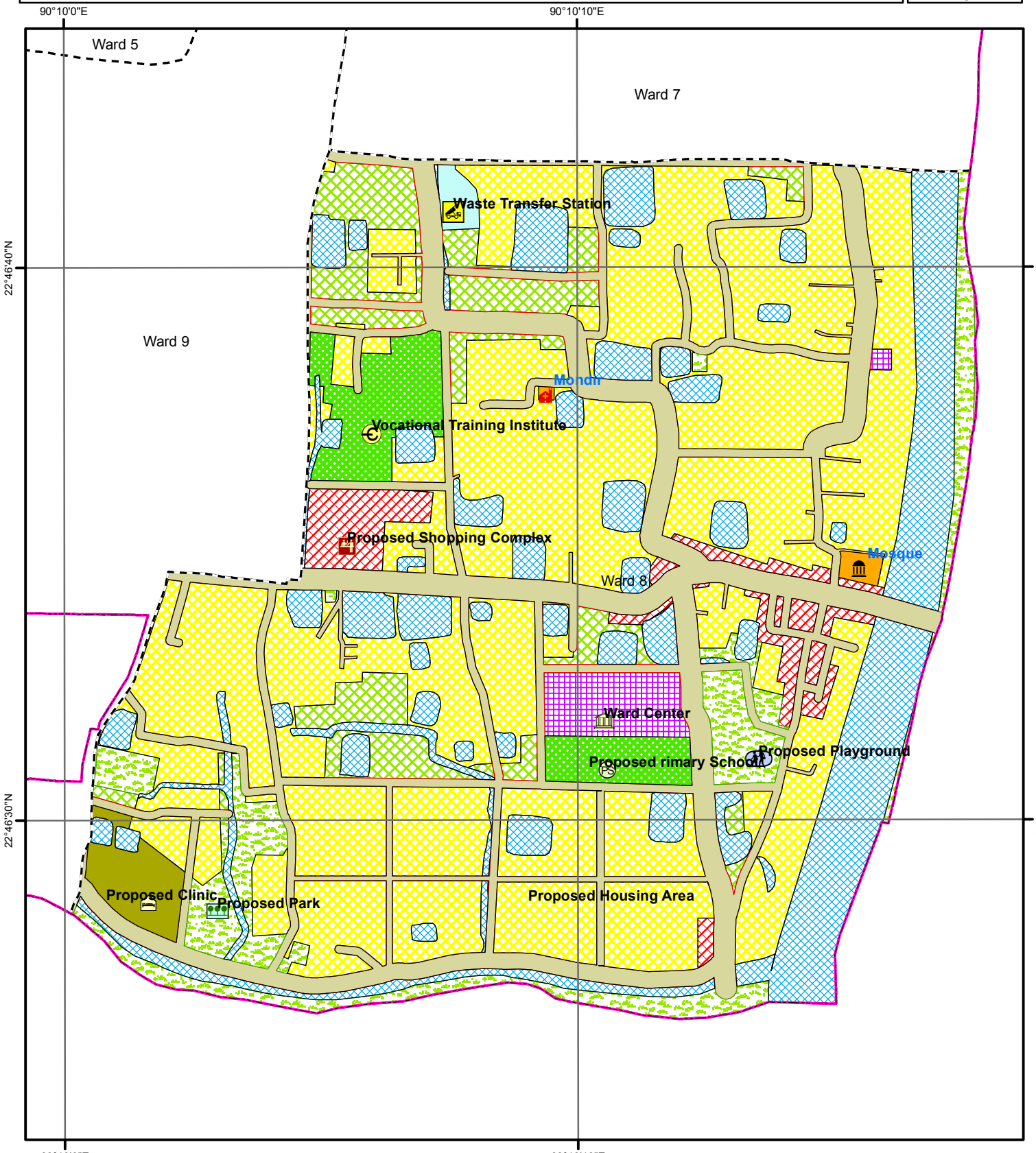
The Paurashava must try to promote hygienic sanitation for the whole Paurashava to ensure better public health.

Table 15.40: Urban Service Development Proposals for ward 08

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.68
Commercial Activity	Shopping Complex	1	0.58
Education & Research	Primary School	1	0.52
	Vocational Training Institute	1	1.01
Health Facility	Clinic	1	0.55
Open Space	Park	1	0.69
	Playground	1	0.46
Urban Settlement	Housing Area	1	4.18
Utility Services	Electricity Line	As per existing program of PDB	-
	WasteTransfer Station	1	0.17

Map 15.24 represents proposed urban services for ward 8

Map 15.24 : Development Proposal for Ward No. 8



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary

- Ward Center
- Stadium
- Bus Stand/Terminal
- Cinema Hall
- Clinic/Hospital
- Cluster Village
- College
- Community Center
- Dumping Site
- Eidgah
- Ferry ghat/Lanch ghat
- Fuel Station
- Graveyard
- High School
- Industry
- Low Income Housing
- Madrasha
- Market
- Mosque
- Park
- Primary School
- Resettelement Zone
- Rickshaw Stand
- Roundabout
- Shamshan Ghat
- Electric-Sub-Station
- Tempo Stand
- Tourist Spot
- Truck Stand/Termianal
- Playground
- Waste Transfer Station

Meters
0 510 20 30 40

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15.11 Ward Action Plan for Ward No. 09

15.11.1 Demography

Ward No. 9 is located on the Southern part of the town. It has the low density of 8 persons per acre with population of 703 persons.

Table 15.41: Population Statistics of Ward No. 09

Item	Year			
	2016	2021	2026	2031
Area (acre)	84.78	84.78	84.78	84.78
Population	574	614	657	703
Density of Population (acre)	7	7	8	8

15.11.2 Ward Action Plan Proposals

15.11.2.1 Review of Existing Land Use

Out of total about 84.78 acre of land of this ward almost 38.20 acre of land i.e. 45.06% of the total land is under residential use. Agricultural use occupies 27.93% land of the ward. 5.86% land is for circulation network, 0.28% is for community services, 16.25% land is for water bodies in this ward.

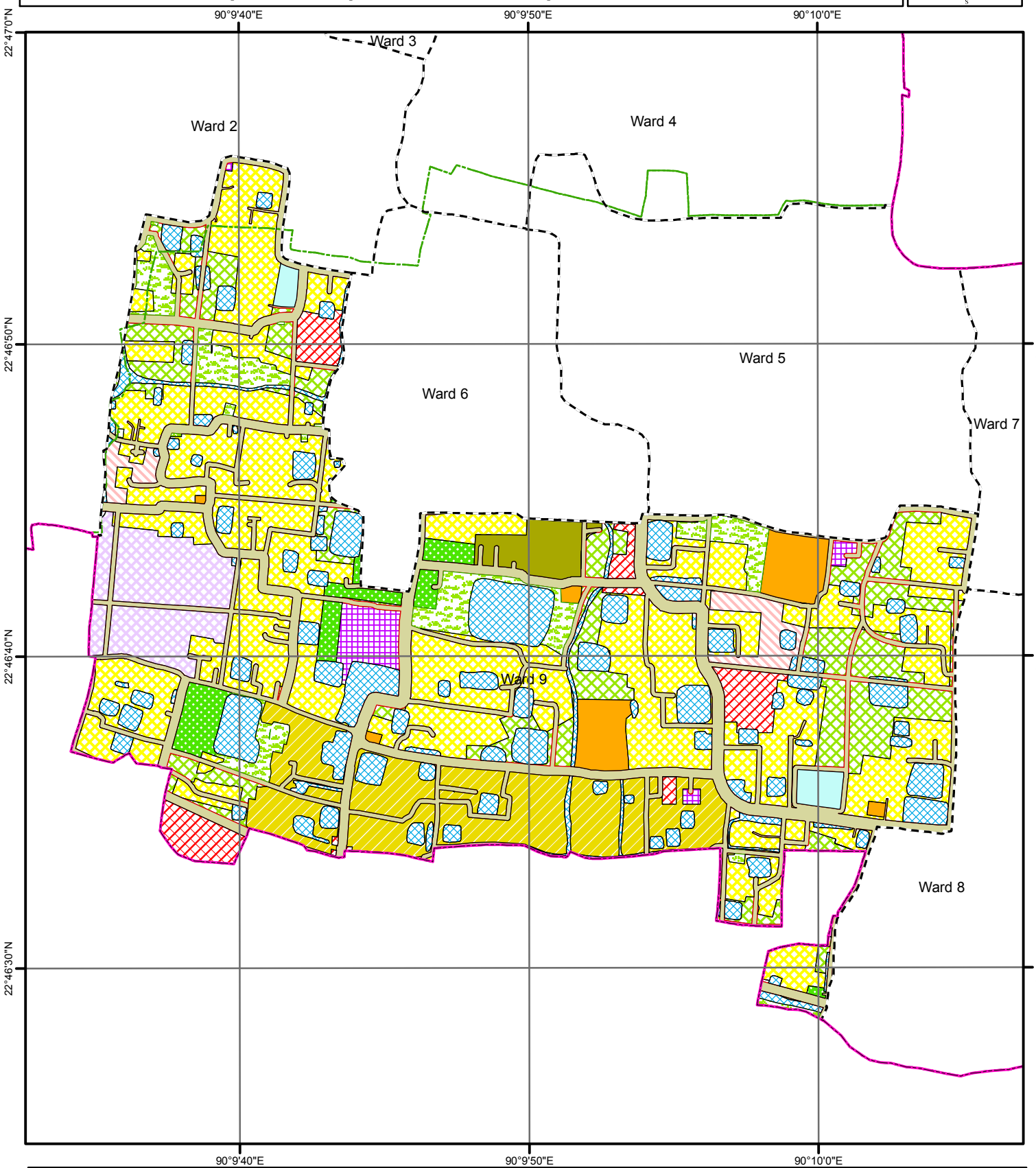
15.11.2.2 Proposed Land Use Zoning

The category wise proposals are presented here. Table 15.42 shows the amount of land existing and proposed uses in Ward no. 9. **Map 15.25** shows proposed land use of Ward 09.

Table 15.42: Comparative Scenario of Existing and Proposed Land Use of Ward no. 09

Sl. No.	Landuse (Existing)	Area (Acre)	%	Sl. No.	Landuse (Proposed)	Area (Acre)	%
1	Agricultural	23.68	27.93	1	Administrative	1.04	1.22
2	Circulation Network	4.97	5.86	2	Agriculture	7.92	9.34
3	Commercial Activities	0.53	0.62	3	Circulation Network	14.68	17.32
4	Community Facilities	0.24	0.28	4	Commercial Activities	2.45	2.89
5	Educational and Research	1.26	1.48	5	Community Facilities	2.00	2.35
6	Governmental Service	0.64	0.76	6	Educational Facilities	1.72	2.03
7	Non Governmental Service	0.03	0.03	7	Health Facilities	1.12	1.32
8	Open Space	0.19	0.23	8	Mixed use	1.19	1.40
9	Residential Area	38.20	45.06	9	Open Space	3.36	3.96
10	Service Activity	1.27	1.50	10	Rural Settlement	7.24	8.54
11	Waterbody	13.78	16.25	11	Transportation & Communication	0.01	0.01
				12	Urban Deferred	3.68	4.34
				13	Urban Settlement	26.85	31.67
				14	Utility Service	0.59	0.69
				15	Waterbody	10.96	12.93
	Total	**84.78**	**100**		**Total**	**84.78**	**100**

Map 15.25:Proposed Landuse Map of ward no. 9



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Administrative
- Agriculture
- Circulation Network
- Commercial Activity
- Community Facility
- Open Space
- Deferred Area
- Education & Research
- Health Facility
- Industrial
- Mixed
- Utility Service
- Recreational Facilities
- Restricted Area
- Rural Settlement
- Transportation Facilities
- Urban Residential Zone
- Waterbody

Meters
0 10 20 40 60 80

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15.11.2.3 Proposed Road Infrastructure Development

Total 10.41 km road development proposal have been proposed for Ward no. 09 of Banaripara Paurashava. Total length of tertiary road will be 7.45 km and width of these roads will be 20 ft. Total length of secondary road will be 2.94 km and width of these roads will be 30 to 40 ft for this ward. Total length of primary road will be 0.01 km and width of these roads will be 80 ft. Detail scenario of road network development proposal was given in Table 15.43. **Map 15.26** represents proposed Road network for ward 9.

Table 15.43: Road Network Proposal at Ward no. 09

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Primary Road	PR-3	80	11.59	Widening	1st
Secondary Road	SR-12	40	27.52	Widening	1st
Secondary Road	SR-16	40	168.09	Widening	1st
Secondary Road	SR-21	40	548.96	Widening	1st
Secondary Road	SR-24	40	31.62	Widening	1st
Secondary Road	SR-31	40	177.12	Widening	1st
Secondary Road	SR-49	40	18.55	Widening	1st
Secondary Road	SR-17	30	105.32	Widening	1st
Secondary Road	SR-18	30	20.70	Widening	1st
Secondary Road	SR-19	30	553.86	Widening	1st
Secondary Road	SR-30	30	140.70	Widening	1st
Secondary Road	SR-32	30	91.79	Widening	1st
Secondary Road	SR-33	30	359.69	Widening	1st
Secondary Road	SR-34	30	0.04	Widening	1st
Secondary Road	SR-41	30	95.55	Widening	1st
Secondary Road	SR-52	30	229.31	Widening	1st
Secondary Road	SR-46	30	104.32	New	2nd
Secondary Road	SR-53	30	159.13	New	2nd
Secondary Road	SR-66	30	108.76	New	2nd
Tertiary Road	TR-129	20	56.51	Widening	2nd
Tertiary Road	TR-163	20	19.56	Widening	2nd
Tertiary Road	TR-164	20	69.01	Widening	2nd
Tertiary Road	TR-169	20	17.81	Widening	2nd
Tertiary Road	TR-170	20	10.46	Widening	2nd
Tertiary Road	TR-173	20	51.25	Widening	2nd
Tertiary Road	TR-174	20	30.31	Widening	2nd
Tertiary Road	TR-176	20	0.02	Widening	2nd
Tertiary Road	TR-177	20	45.73	Widening	2nd
Tertiary Road	TR-178	20	71.43	Widening	2nd
Tertiary Road	TR-179	20	3.85	Widening	2nd
Tertiary Road	TR-180	20	5.45	Widening	2nd
Tertiary Road	TR-181	20	9.78	Widening	2nd
Tertiary Road	TR-182	20	23.13	Widening	2nd
Tertiary Road	TR-183	20	65.28	Widening	2nd
Tertiary Road	TR-184	20	105.43	Widening	2nd
Tertiary Road	TR-266	20	1.27	Widening	2nd
Tertiary Road	TR-267	20	22.46	Widening	2nd
Tertiary Road	TR-268	20	9.19	Widening	2nd
Tertiary Road	TR-275	20	75.72	Widening	2nd
Tertiary Road	TR-276	20	90.53	Widening	2nd
Tertiary Road	TR-277	20	107.09	Widening	2nd
Tertiary Road	TR-279	20	172.29	Widening	2nd
Tertiary Road	TR-280	20	71.53	Widening	2nd
Tertiary Road	TR-281	20	16.01	Widening	2nd
Tertiary Road	TR-282	20	66.44	Widening	2nd
Tertiary Road	TR-283	20	21.57	Widening	2nd
Tertiary Road	TR-284	20	1.09	Widening	2nd
Tertiary Road	TR-288	20	210.97	Widening	2nd
Tertiary Road	TR-289	20	62.16	Widening	2nd
Tertiary Road	TR-290	20	83.19	Widening	2nd
Tertiary Road	TR-291	20	27.14	Widening	2nd
Tertiary Road	TR-301	20	32.12	Widening	2nd

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Tertiary Road	TR-302	20	27.53	Widening	2nd
Tertiary Road	TR-304	20	19.79	Widening	2nd
Tertiary Road	TR-311	20	32.56	Widening	2nd
Tertiary Road	TR-312	20	14.49	Widening	2nd
Tertiary Road	TR-313	20	11.34	Widening	2nd
Tertiary Road	TR-314	20	5.63	Widening	2nd
Tertiary Road	TR-315	20	6.55	Widening	2nd
Tertiary Road	TR-316	20	47.41	Widening	2nd
Tertiary Road	TR-317	20	29.82	Widening	2nd
Tertiary Road	TR-318	20	19.19	Widening	2nd
Tertiary Road	TR-319	20	272.93	Widening	2nd
Tertiary Road	TR-320	20	147.58	Widening	2nd
Tertiary Road	TR-321	20	71.23	Widening	2nd
Tertiary Road	TR-322	20	34.02	Widening	2nd
Tertiary Road	TR-323	20	8.74	Widening	2nd
Tertiary Road	TR-324	20	22.80	Widening	2nd
Tertiary Road	TR-325	20	22.66	Widening	2nd
Tertiary Road	TR-326	20	72.61	Widening	2nd
Tertiary Road	TR-327	20	43.64	Widening	2nd
Tertiary Road	TR-466	20	91.80	New	3rd
Tertiary Road	TR-467	20	7.92	Widening	3rd
Tertiary Road	TR-468	20	13.55	Widening	3rd
Tertiary Road	TR-484	20	34.81	New	3rd
Tertiary Road	TR-485	20	73.44	New	3rd
Tertiary Road	TR-495	20	87.76	New	3rd
Tertiary Road	TR-502	20	60.19	Widening	3rd
Tertiary Road	TR-503	20	190.85	Widening	3rd
Tertiary Road	TR-506	20	6.03	New	3rd
Tertiary Road	TR-508	20	45.21	New	3rd
Tertiary Road	TR-509	20	48.55	New	3rd
Tertiary Road	TR-510	20	44.74	New	3rd
Tertiary Road	TR-511	20	81.51	New	3rd
Tertiary Road	TR-512	20	105.66	New	3rd
Tertiary Road	TR-513	20	5.18	New	3rd
Tertiary Road	TR-514	20	10.18	New	3rd
Tertiary Road	TR-515	20	44.91	New	3rd
Tertiary Road	TR-517	20	27.35	New	3rd
Tertiary Road	TR-518	20	11.86	New	3rd
Tertiary Road	TR-519	20	59.72	New	3rd
Tertiary Road	TR-520	20	15.27	New	3rd
Tertiary Road	TR-546	20	250.75	New	3rd
Tertiary Road	TR-547	20	157.42	New	3rd
Tertiary Road	TR-548	20	156.23	New	3rd
Tertiary Road	TR-549	20	94.87	New	3rd
Tertiary Road	TR-550	20	177.05	New	3rd
Tertiary Road	TR-556	20	0.29	New	3rd
Tertiary Road	TR-557	20	101.47	New	3rd
Tertiary Road	TR-558	20	44.82	New	3rd
Tertiary Road	TR-562	20	51.57	New	3rd
Tertiary Road	TR-563	20	134.87	New	3rd
Tertiary Road	TR-564	20	33.26	Widening	3rd
Tertiary Road	TR-565	20	22.92	Widening	3rd
Tertiary Road	TR-566	20	132.21	New	3rd
Tertiary Road	TR-567	20	154.76	New	3rd
Tertiary Road	TR-568	20	15.12	Widening	3rd
Tertiary Road	TR-569	20	13.27	New	3rd
Tertiary Road	TR-571	20	106.97	New	3rd
Tertiary Road	TR-572	20	20.07	Widening	3rd
Tertiary Road	TR-466	20	12.58	New	3rd
Tertiary Road	TR-328	20	37.87	Widening	3rd
Tertiary Road	TR-329	20	12.41	Widening	3rd
Tertiary Road	TR-330	20	43.36	Widening	3rd

Type	Proposed Road ID	Width in (ft)	Length in (m)	Remark	Phase
Tertiary Road	TR-331	20	84.19	Widening	3rd
Tertiary Road	TR-332	20	81.02	Widening	3rd
Tertiary Road	TR-333	20	26.00	Widening	3rd
Tertiary Road	TR-334	20	18.27	Widening	3rd
Tertiary Road	TR-335	20	122.28	Widening	3rd
Tertiary Road	TR-336	20	24.72	Widening	3rd
Tertiary Road	TR-337	20	76.53	Widening	3rd
Tertiary Road	TR-338	20	166.92	Widening	3rd
Tertiary Road	TR-339	20	27.12	Widening	3rd
Tertiary Road	TR-340	20	1.17	Widening	3rd
Tertiary Road	TR-341	20	108.36	Widening	3rd
Tertiary Road	TR-344	20	123.90	Widening	3rd
Tertiary Road	TR-345	20	11.82	Widening	3rd
Tertiary Road	TR-346	20	23.78	Widening	3rd
Tertiary Road	TR-347	20	27.79	Widening	3rd
Tertiary Road	TR-348	20	0.99	Widening	3rd
Tertiary Road	TR-348	20	175.24	Widening	3rd
Tertiary Road	TR-349	20	2.21	Widening	3rd
Tertiary Road	TR-351	20	2.19	Widening	3rd
Tertiary Road	TR-358	20	3.89	Widening	3rd
Tertiary Road	TR-359	20	19.65	Widening	3rd
Tertiary Road	TR-360	20	56.48	Widening	3rd
Tertiary Road	TR-361	20	40.79	Widening	3rd
Tertiary Road	TR-362	20	16.51	Widening	3rd
Tertiary Road	TR-363	20	55.75	Widening	3rd
Tertiary Road	TR-364	20	30.24	Widening	3rd
Tertiary Road	TR-365	20	53.00	Widening	3rd
Tertiary Road	TR-366	20	58.10	Widening	3rd
Tertiary Road	TR-368	20	37.42	Widening	3rd
Tertiary Road	TR-370	20	19.63	Widening	3rd
Tertiary Road	TR-414	20	83.65	Widening	3rd
Tertiary Road	TR-415	20	45.03	Widening	3rd
Tertiary Road	TR-416	20	13.08	Widening	3rd
Tertiary Road	TR-417	20	72.11	Widening	3rd
Tertiary Road	TR-421	20	38.34	Widening	3rd
Tertiary Road	TR-422	20	17.37	Widening	3rd
Tertiary Road	TR-423	20	14.59	Widening	3rd
Tertiary Road	TR-424	20	42.22	Widening	3rd
Tertiary Road	TR-438	20	5.60	Widening	3rd
Tertiary Road	TR-447	20	25.37	Widening	3rd
Tertiary Road	TR-448	20	33.19	Widening	3rd
Tertiary Road	TR-449	20	133.37	Widening	3rd
Tertiary Road	TR-450	20	13.43	Widening	3rd
Tertiary Road	TR-164	20	12.58	Widening	3rd

- "TR" for tertiary road, "SR" for secondary road, and "PR" for primary road.

15.11.2.4 Drainage Development Plan

There are both natural and manmade drainage facilities at ward no. 09 of Banaripara Paurashava. Existing drainage is mostly depending on natural drainage facilities. The proposed drainage facilities will be developed based on this natural channel. Table 15.44 shows the detail.

Table 15.44: Drainage Development Plan Proposals for ward 09

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
PD-1	Primary Drain	130.72	4.50-5.50	2.25-3.50	New	1st
SD-13	Secondary Drain	373.10	3.50-4.50	1.25-2.25	New	2nd
SD-14	Secondary Drain	280.15	3.50-4.50	1.25-2.25	New	2nd
SD-15	Secondary Drain	209.04	3.50-4.50	1.25-2.25	New	2nd

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
SD-19	Secondary Drain	230.23	3.50-4.50	1.25-2.25	New	2nd
SD-22	Secondary Drain	255.75	3.50-4.50	1.25-2.25	New	2nd
SD-23	Secondary Drain	151.57	3.50-4.50	1.25-2.25	New	2nd
SD-28	Secondary Drain	138.84	3.50-4.50	1.25-2.25	New	2nd
SD-8	Secondary Drain	346.36	3.50-4.50	1.25-2.25	New	2nd
SD-17	Secondary Drain	111.39	3.50-4.50	1.25-2.25	New	3rd
SD-25	Secondary Drain	115.32	3.50-4.50	1.25-2.25	New	3rd
SD-27	Secondary Drain	35.28	3.50-4.50	1.25-2.25	New	3rd
SD-34	Secondary Drain	83.16	3.50-4.50	1.25-2.25	New	3rd
TD-399	Tertiary Drain	45.93	2.50-3.50	0.64-1.25	New	1st
TD-410	Tertiary Drain	53.78	2.50-3.50	0.64-1.25	New	1st
TD-411	Tertiary Drain	108.31	2.50-3.50	0.64-1.25	New	1st
TD-422	Tertiary Drain	38.50	2.50-3.50	0.64-1.25	New	1st
TD-423	Tertiary Drain	39.74	2.50-3.50	0.64-1.25	New	1st
TD-424	Tertiary Drain	0.06	2.50-3.50	0.64-1.25	New	1st
TD-425	Tertiary Drain	124.68	2.50-3.50	0.64-1.25	New	1st
TD-92	Tertiary Drain	0.67	2.50-3.50	0.64-1.25	New	2nd
TD-111	Tertiary Drain	3.91	2.50-3.50	0.64-1.25	New	2nd
TD-115	Tertiary Drain	45.62	2.50-3.50	0.64-1.25	New	2nd
TD-116	Tertiary Drain	281.45	2.50-3.50	0.64-1.25	New	2nd
TD-117	Tertiary Drain	52.16	2.50-3.50	0.64-1.25	New	2nd
TD-118	Tertiary Drain	63.83	2.50-3.50	0.64-1.25	New	2nd
TD-119	Tertiary Drain	23.13	2.50-3.50	0.64-1.25	New	2nd
TD-202	Tertiary Drain	198.13	2.50-3.50	0.64-1.25	New	2nd
TD-338	Tertiary Drain	186.88	2.50-3.50	0.64-1.25	New	2nd
TD-428	Tertiary Drain	88.78	2.50-3.50	0.64-1.25	New	2nd
TD-435	Tertiary Drain	256.64	2.50-3.50	0.64-1.25	New	2nd
TD-173	Tertiary Drain	22.46	2.50-3.50	0.64-1.25	New	3rd
TD-177	Tertiary Drain	96.89	2.50-3.50	0.64-1.25	New	3rd
TD-178	Tertiary Drain	102.33	2.50-3.50	0.64-1.25	New	3rd
TD-179	Tertiary Drain	172.29	2.50-3.50	0.64-1.25	New	3rd
TD-180	Tertiary Drain	71.53	2.50-3.50	0.64-1.25	New	3rd
TD-181	Tertiary Drain	16.01	2.50-3.50	0.64-1.25	New	3rd
TD-182	Tertiary Drain	69.40	2.50-3.50	0.64-1.25	New	3rd
TD-183	Tertiary Drain	21.57	2.50-3.50	0.64-1.25	New	3rd
TD-188	Tertiary Drain	68.29	2.50-3.50	0.64-1.25	New	3rd
TD-189	Tertiary Drain	91.12	2.50-3.50	0.64-1.25	New	3rd
TD-190	Tertiary Drain	27.14	2.50-3.50	0.64-1.25	New	3rd
TD-194	Tertiary Drain	27.17	2.50-3.50	0.64-1.25	New	3rd
TD-195	Tertiary Drain	21.60	2.50-3.50	0.64-1.25	New	3rd
TD-197	Tertiary Drain	19.79	2.50-3.50	0.64-1.25	New	3rd
TD-201	Tertiary Drain	28.08	2.50-3.50	0.64-1.25	New	3rd
TD-203	Tertiary Drain	30.38	2.50-3.50	0.64-1.25	New	3rd
TD-204	Tertiary Drain	149.88	2.50-3.50	0.64-1.25	New	3rd
TD-206	Tertiary Drain	88.63	2.50-3.50	0.64-1.25	New	3rd
TD-207	Tertiary Drain	188.73	2.50-3.50	0.64-1.25	New	3rd
TD-208	Tertiary Drain	22.80	2.50-3.50	0.64-1.25	New	3rd
TD-209	Tertiary Drain	74.25	2.50-3.50	0.64-1.25	New	3rd
TD-210	Tertiary Drain	69.23	2.50-3.50	0.64-1.25	New	3rd
TD-211	Tertiary Drain	38.18	2.50-3.50	0.64-1.25	New	3rd
TD-212	Tertiary Drain	37.87	2.50-3.50	0.64-1.25	New	3rd
TD-213	Tertiary Drain	12.41	2.50-3.50	0.64-1.25	New	3rd
TD-214	Tertiary Drain	43.36	2.50-3.50	0.64-1.25	New	3rd
TD-215	Tertiary Drain	78.95	2.50-3.50	0.64-1.25	New	3rd
TD-216	Tertiary Drain	76.88	2.50-3.50	0.64-1.25	New	3rd
TD-217	Tertiary Drain	21.86	2.50-3.50	0.64-1.25	New	3rd
TD-218	Tertiary Drain	13.73	2.50-3.50	0.64-1.25	New	3rd
TD-219	Tertiary Drain	114.84	2.50-3.50	0.64-1.25	New	3rd
TD-220	Tertiary Drain	24.72	2.50-3.50	0.64-1.25	New	3rd
TD-221	Tertiary Drain	82.70	2.50-3.50	0.64-1.25	New	3rd
TD-222	Tertiary Drain	166.92	2.50-3.50	0.64-1.25	New	3rd

Proposed Drain ID	Proposed Hierarchy	Length (m)	Width (ft)	Depth (m)	Remark	Phasing
TD-223	Tertiary Drain	28.51	2.50-3.50	0.64-1.25	New	3rd
TD-224	Tertiary Drain	108.89	2.50-3.50	0.64-1.25	New	3rd
TD-225	Tertiary Drain	117.87	2.50-3.50	0.64-1.25	New	3rd
TD-226	Tertiary Drain	11.82	2.50-3.50	0.64-1.25	New	3rd
TD-227	Tertiary Drain	23.78	2.50-3.50	0.64-1.25	New	3rd
TD-228	Tertiary Drain	21.19	2.50-3.50	0.64-1.25	New	3rd
TD-229	Tertiary Drain	4.12	2.50-3.50	0.64-1.25	New	3rd
TD-237	Tertiary Drain	3.89	2.50-3.50	0.64-1.25	New	3rd
TD-238	Tertiary Drain	19.65	2.50-3.50	0.64-1.25	New	3rd
TD-239	Tertiary Drain	60.34	2.50-3.50	0.64-1.25	New	3rd
TD-240	Tertiary Drain	47.00	2.50-3.50	0.64-1.25	New	3rd
TD-241	Tertiary Drain	22.51	2.50-3.50	0.64-1.25	New	3rd
TD-242	Tertiary Drain	55.75	2.50-3.50	0.64-1.25	New	3rd
TD-243	Tertiary Drain	30.24	2.50-3.50	0.64-1.25	New	3rd
TD-244	Tertiary Drain	59.35	2.50-3.50	0.64-1.25	New	3rd
TD-245	Tertiary Drain	35.64	2.50-3.50	0.64-1.25	New	3rd
TD-278	Tertiary Drain	88.04	2.50-3.50	0.64-1.25	New	3rd
TD-279	Tertiary Drain	9.80	2.50-3.50	0.64-1.25	New	3rd
TD-280	Tertiary Drain	68.09	2.50-3.50	0.64-1.25	New	3rd
TD-281	Tertiary Drain	41.16	2.50-3.50	0.64-1.25	New	3rd
TD-282	Tertiary Drain	44.98	2.50-3.50	0.64-1.25	New	3rd
TD-295	Tertiary Drain	27.32	2.50-3.50	0.64-1.25	New	3rd
TD-296	Tertiary Drain	33.19	2.50-3.50	0.64-1.25	New	3rd
TD-297	Tertiary Drain	13.43	2.50-3.50	0.64-1.25	New	3rd
TD-312	Tertiary Drain	106.31	2.50-3.50	0.64-1.25	New	3rd
TD-321	Tertiary Drain	34.81	2.50-3.50	0.64-1.25	New	3rd
TD-322	Tertiary Drain	73.44	2.50-3.50	0.64-1.25	New	3rd
TD-331	Tertiary Drain	84.83	2.50-3.50	0.64-1.25	New	3rd
TD-337	Tertiary Drain	60.19	2.50-3.50	0.64-1.25	New	3rd
TD-341	Tertiary Drain	6.03	2.50-3.50	0.64-1.25	New	3rd
TD-343	Tertiary Drain	45.21	2.50-3.50	0.64-1.25	New	3rd
TD-344	Tertiary Drain	48.56	2.50-3.50	0.64-1.25	New	3rd
TD-345	Tertiary Drain	44.74	2.50-3.50	0.64-1.25	New	3rd
TD-346	Tertiary Drain	81.51	2.50-3.50	0.64-1.25	New	3rd
TD-347	Tertiary Drain	7.45	2.50-3.50	0.64-1.25	New	3rd
TD-348	Tertiary Drain	10.18	2.50-3.50	0.64-1.25	New	3rd
TD-349	Tertiary Drain	44.91	2.50-3.50	0.64-1.25	New	3rd
TD-351	Tertiary Drain	29.57	2.50-3.50	0.64-1.25	New	3rd
TD-352	Tertiary Drain	11.86	2.50-3.50	0.64-1.25	New	3rd
TD-353	Tertiary Drain	207.81	2.50-3.50	0.64-1.25	New	3rd
TD-371	Tertiary Drain	157.42	2.50-3.50	0.64-1.25	New	3rd
TD-372	Tertiary Drain	100.01	2.50-3.50	0.64-1.25	New	3rd
TD-373	Tertiary Drain	97.19	2.50-3.50	0.64-1.25	New	3rd
TD-374	Tertiary Drain	177.05	2.50-3.50	0.64-1.25	New	3rd
TD-379	Tertiary Drain	62.24	2.50-3.50	0.64-1.25	New	3rd
TD-383	Tertiary Drain	55.03	2.50-3.50	0.64-1.25	New	3rd
TD-384	Tertiary Drain	33.26	2.50-3.50	0.64-1.25	New	3rd
TD-385	Tertiary Drain	22.92	2.50-3.50	0.64-1.25	New	3rd
TD-386	Tertiary Drain	132.21	2.50-3.50	0.64-1.25	New	3rd
TD-387	Tertiary Drain	13.27	2.50-3.50	0.64-1.25	New	3rd
TD-389	Tertiary Drain	20.07	2.50-3.50	0.64-1.25	New	3rd
TD-390	Tertiary Drain	156.71	2.50-3.50	0.64-1.25	New	3rd
TD-397	Tertiary Drain	44.33	2.50-3.50	0.64-1.25	New	3rd
TD-400	Tertiary Drain	26.38	2.50-3.50	0.64-1.25	New	3rd
TD-412	Tertiary Drain	40.86	2.50-3.50	0.64-1.25	New	3rd
TD-434	Tertiary Drain	41.85	2.50-3.50	0.64-1.25	New	3rd
TD-440	Tertiary Drain	87.72	2.50-3.50	0.64-1.25	New	3rd
TD-441	Tertiary Drain	2.27	2.50-3.50	0.64-1.25	New	3rd
TD-205	Tertiary Drain	26.75	2.50-3.50	0.64-1.25	New	3rd
TD-442	Tertiary Drain	78.01	2.50-3.50	0.64-1.25	New	3rd
TD-442	Tertiary Drain	105.49	2.50-3.50	0.64-1.25	New	3rd

Besides, it will be necessary to re-excavate the khals that serve as primary drains. The consultants have identified existing whole of the khals need to be re-excavated to allow smooth flow of water through them.

Map 15.26 represents proposed Road and Drainage network for ward 9.

15.11.2.5 Urban Services

a. Solid Waste Management

Solid waste management is a major urban service. As density of population increases the volume of solid waste also increases proportionately. However, the income level is also a major factor influencing the volume of solid waste. Population and the volume of waste in the Paurashava are yet to be large enough to become a problem for the city. But the present management system is not satisfactory and it might to lead to problem in future. The consultant proposes solid waste transfer stations in a suitable location. 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.

b. Water Supply

It is proposed to install a network based water supply system by exploring fresh water from the Sandhya River for the entire Paurashava. And water supply lines in this ward will be established along all categories of roads as per the growth of the settlement.

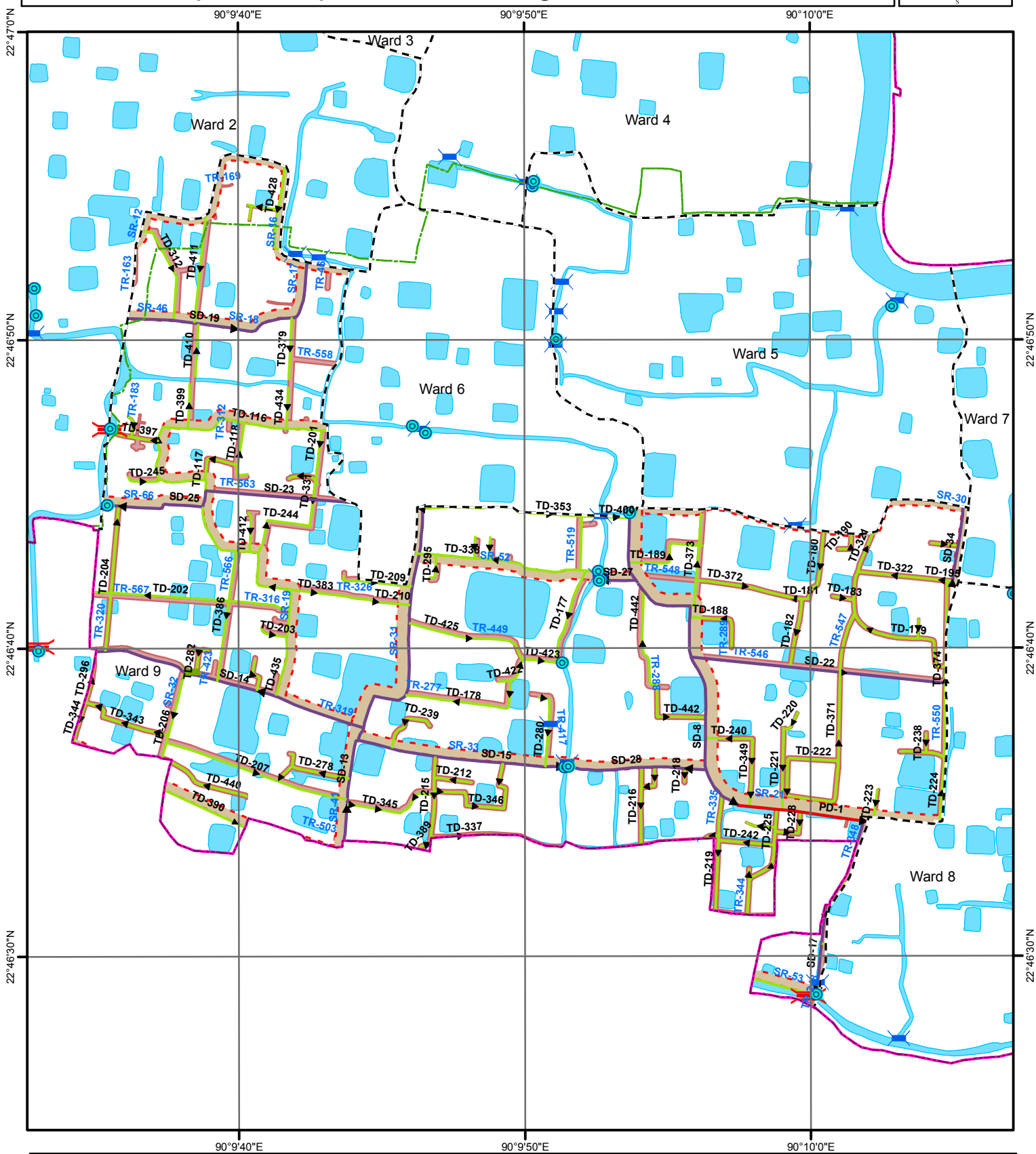
c. Sanitation

The Paurashava must try to promote hygienic sanitation for the whole Paurashava to ensure better public health. **Map 15.27** represents proposed urban services for ward 9.

Table 15.45: Urban Service Development Proposals for ward 09

Landuse	Item	No.	Area (acre)
Administrative	Ward Center	1	0.85
Commercial Activity	Wholesale Market	1	0.78
	Super Market	1	0.75
	Neighborhood Market	1	0.52
Community Facilities	Eidgah	1	0.86
	Community Center	1	0.95
Education & Research	Secondary School	1	1.08
Health Facility	Clinic	1	0.55
Industrial Zone	General Industry	1	5.05
Open Space	Park	2	1.67
	Playground	2	0.88
Transportation & Communication	Bus Stand	1	0.76
	Truck Stand	1	0.29
Utility Services	Electricity Line	As per existing program of PDB	-
	Waste Transfer Station	1	0.20

Map 15.26: Proposed Road & Drainage Network of Ward No. 9



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary
- Proposed Outfall
- Bridge
- Culvert
- Pipe Culvert
- Primary Drain
- Secondary Drain
- Tertiary Drain
- Primary Road
- Secondary Road
- Tertiary Road
- Waterbody

Meters
0 10 20 40 60 80

Local Government Engineering Department (LGED)
Government of the People's Republic of Bangladesh
Ministry of Local Government, Rural Development and Cooperatives Local Government Division

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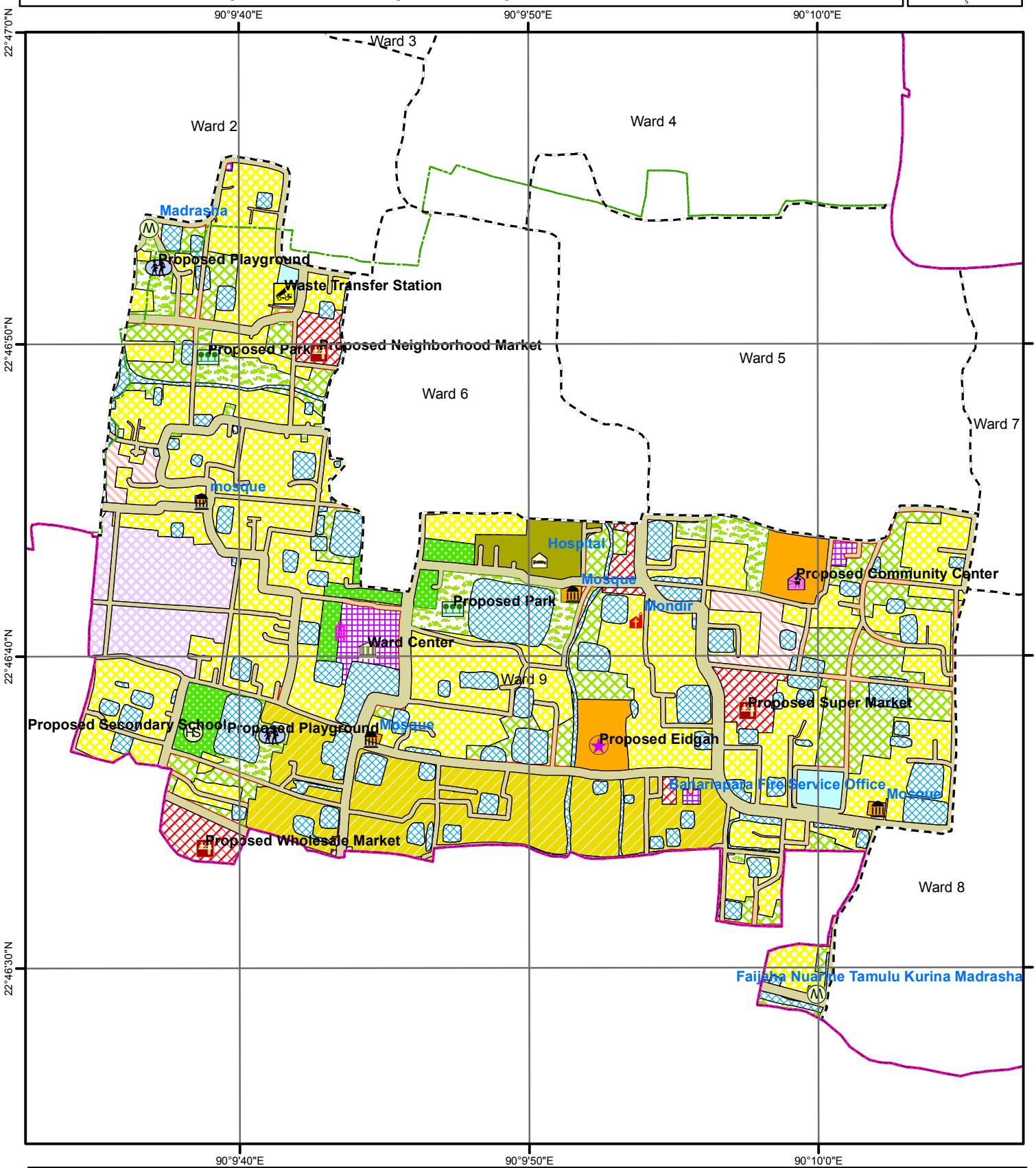
Map 15.27 : Development Proposal for Ward No. 9



Legend

- Pourashava Boundary
- Mouza Boundary
- Ward Boundary

- Ward Center
- Stadium
- Bus Stand/Terminal
- Cinema Hall
- Clinic/Hospital
- Cluster Village
- College
- Community Center
- Dumping Site
- Eidgah
- Ferry ghat/Lanch ghat
- Fuel Station
- Graveyard
- High School
- Industry
- Low Income Housing
- Madrasha
- Market
- Mosque
- Park
- Primary School
- Resettelement Zone
- Rickshaw Stand
- Roundabout
- Shamshan Ghat
- Electric-Sub-Station
- Tempo Stand
- Tourist Spot
- Truck Stand/Termianal
- Playground
- Waste Transfer Station

Meters
0 10 20 40 60 80

Local Government Engineering Department (LGED)
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Annexure

15.12: Implementation Guidelines

The Master Plan of Banaripara Paurashava will be an effective tool for planned urban development, if it is implemented properly with legal enforcement. The different components of the Master Plan have varied implications if they are not implemented in an integrated manner. There is no separate laws related directly to the implementation of Master Plan of the Paurashavas in the country other than the Paurashava Ordinance/Act 2009 and some relevant national policies and laws as discussed in chapter 5 under the Structure Plan.

However, the legal provisions that have been made in the Paurashava Ordinance/Act 2009 can effectively be applied in the implementation of the Master Plan of Banaripara Pauashava for the time being along with other relevant national policies and laws that have also implications at Paurashava level, such as Wetland Conservation Act 2000 and BNBC 1993. Other national policies, guidelines and laws relevant to population, agriculture, environment, tourism, building materials, building construction etc. have implications for the implementation of various components including the Ward Action Plan of the Master Plan of Banaripara Paurashava.

Therefore, until specific laws and guidelines are made by the government for the Paurashavas in Bangladesh for the implementation of Master Plans, the existing laws, policies and guidelines should be strictly followed so that the goal and objectives of these plans are achieved. Effective application of the various existing policies and laws require prudent exercise of professional knowledge and expertise, which is lacking in the existing human resources of the Paurashavas in Bangladesh. In particular, the Paurashavas require professional urban/town planner(s) in the set up of their manpower. In this context, there is an urgent need for the creation of a planning division/section in the existing set up of the Paurashava Organogram.

15.12.1 Proposals for Mitigation of Identified Issues

The critical issues of planning and development identified in the Structure Plan have been addressed through the preparation of Urban Area Plan and Ward Action Plan. The proposals made in these plans resolve the issues addressed in the Structure Plan.

15.12.2 Comparative Advantage of Master Plan

The Paurashavas in Bangladesh do not have any practicing plans at present in regard to organized development of land use or infrastructure. This situation has been continuing over a long period of time in the past promoting spontaneous land and infrastructure development. As a result, there are examples of unplanned development creating discomfort to the people living in almost all Paurashavas in the country. The implementation of the currently prepared Master Plan of the Paurashava will remove those obstacles by applying the principles, guidelines and proposals of various components of its Master Plan. The Ward Action Plan prepared following the Urban Area Plan will solve the most pressing needs of the town in infrastructure development.

15.13 Conclusion

The Paurashavas in Bangladesh for the first time in its history are having their detailed Master Plans prepared scientifically using modern tools and techniques. These Master Plans will be effective tools for planned development of most of the urban centers in Bangladesh. The planned township development will also ensure required services for the rural areas of the country. This in turn will make a positive impact on economic growth, social progress and environmental sustainability. Banaripara Paurashava must avail this opportunity for its progress in the future by implementing its newly prepared Master Plan.

Team Composition of Master Plan Preparation

A.1 Personnel of the Project Management Office (UTIDP, LGED)

Sl No.	Name	Position
1	Md. Moslah Uddin	Project Director
2	Md. Manzurul Islam	Deputy Project Director
3	Syed Shahriar Amin	Urban Planner
4	Pulin Chandra Golder	Urban Planner
5	Ziaul Huq	Urban Planner
6	Md. Saifur Rahman	Junior Urban Planner
7	Md. Rakibul Hossain	Junior Urban Planner
8	Md. Saifur Rahman	Junior Urban Planner
9	Md. Rakibul Hossain	Junior Urban Planner

A.2 Personnel of the Consultancy Firm Sheltech Consultants (Pvt.) Ltd.

A. Key Personnel:

Sl No.	Name	Position
1	Sultana Dilruba Aziz	Team Leader
2	Afsana M Kamal	Deputy Team Leader
3	Rukhsana Parveen	Urban Planner
4	Dr. Md. Altaf Hossain	Urban Planner
5	A.K.M. Mahfuzul Kabir	Demographer/Statistician
6	Dr. Santi Ranjan Hawlader	Urban Development Economist
7	Lipika Khan	Transport Planning Expert
8	Mohammed Iqbal Hossain	Municipal Engineer
9	Mohammad Ferozuddin	Architect Planner
10	Mohammad Quadiruzzaman	Environmental Analyst
11	Tripal Kumar Sen	GIS Specialist
12	Md. Hefzul Bari	Legal Expert

B. Supporting Stuff:

Sl No.	Name	Position
1	Mohammad Helal	Office Manager
2	M.A. Quayum	Computer Operator
3	Md. Jahangir Hossain	Computer Operator
4	Raihanul Islam	CAD Operator
5	Zakaria Ahmed	CAD Operator
6	ANM Shafiqul Alam	Surveyor
7	Aolad Hossain	Surveyor

রেজিস্টার্ড নং ডি এ-১

বাংলাদেশ গেজেট

অতিরিক্ত সংখ্যা

কর্তৃপক্ষ কর্তৃক প্রকাশিত

মঙ্গলবার, জুলাই ২৪, ১৯৯০

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

স্থানীয় সরকার, পল্লী উন্নয়ন ও সমবায় মন্ত্রণালয়

স্থানীয় সরকার বিভাগ

(শা-পৌর-২)

প্রজ্ঞাপন

ঢাকা, ৬ই শ্রাবণ, ১৩৯৭/২২শে জুলাই, ১৯৯০

নং এস.আর.ও ২৭৩-আইন/৯০/শা-পৌর-২/২সি-২৩/৮৮—Pourashava Ordinance, 1977 (XXVI of 1977) এর section 4(a) তে প্রদত্ত ক্ষমতাবলে সরকার নিম্ন তফসিলে উল্লেখিত শহর এলাকাকে পৌর এলাকা (Municipality) ঘোষণা করিল:

তফসিল

ক্রমিক নং।	জেলার নাম।	উপজেলার নাম।	মৌজার নাম।	ইউনিয়ন	জে, এল, নং।	দাগ নং
১	বরিশাল	বানারীপাড়া	বানারীপাড়া	বানারীপাড়া	৪২	১ হইতে ৯৯১ পর্যন্ত
২	বরিশাল	বানারীপাড়া	কুন্দিহার	বানারীপাড়া	৭৪	১ হইতে ৬৫৪ পর্যন্ত

রাষ্ট্রপতির আদেশক্রমে

মোঃ হাফিজউদ্দিন খান

যুগ্ম-সচিব।

মোঃ সিদ্দিকুর রহমান, ডেপুটি কন্ট্রোলার, বাংলাদেশ সরকারী মুদ্রণালয়, ঢাকা কর্তৃক মুদ্রিত। মোহাম্মদ আবদুল কুদ্দুস, ডেপুটি কন্ট্রোলার, বাংলাদেশ ফরমস্ ও প্রকাশনী অফিস, তেজগাঁও, ঢাকা কর্তৃক প্রকাশিত।

(৬৩৪৯)

মূল্য : ৩০ পয়সা

Annex- C: Land use Permission

a. Urban Residential Land Use

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table C.1: Land Use Permitted

Permitted Urban Residential Uses
Artisan's Shop
Assisted Living or Elderly Home
Confectionery Shop
Barber Shop
Child Daycare \ Preschool
Cleaning \ Laundry Shop
Communication Service Facilities
Communication Tower Within Permitted Height
Condominium or Apartment
Cottage
Cyber Café
Daycare Center (Commercial or Nonprofit)
Drug Store or Pharmacy
Employee Housing (Guards \ Drivers) \ Ancillary Use
General Store
Grocery Store
High School
Household Appliance and Furniture Repair Service (No Outside Storage)
Housing For Seasonal Firm Labor
Landscape and Horticultural Services
Mosque, Place Of Worship
Newspaper Stand
Nursery School
Orphanage
Eidgah
Photocopying and Duplicating Services (No Outside Storage)
Pipelines and Utility Lines
Playing Field
Primary School
Private Garages (Ancillary Use)
Project Identification Signs
Property Management Signs
Public Transport Facility
Satellite Dish Antenna
Shelter (Passers By)
Shoe Repair or Shoeshine Shop (Small)
CBO Office
Special Dwelling
Temporary Tent
Temporary tent for Permitted Function
Newspaper Stand
Specialized School: Dance, Art, Music, Physically Challenged & Others
Transmission Lines
Urban-Nature Reserve
Utility Lines
Woodlot
Children's Park (Must Have Parking)
ATM Booth
Water Pump \ Reservoir
Monument (Neighborhood Scale)
Bill Payment Booth
Boarding and Rooming House
Dormitory
Memorial Structure (Ancillary)
Neighborhood Center* *(Where Neighborhood Center exists)*
Permitted
Community Center
Doctor \ Dentist Chamber
Cultural Exhibits and Libraries
Fast Food Establishment \ Food Kiosk
Flowers, Nursery Stock and Florist Supplies
Fitness Centre
Gaming Clubs
Departmental Stores
Retail Shops \ Facilities

Source: Compiled by the Consultants

*Permission of Neighborhood Center Facilities in absence of formal neighborhood should be subject to Landuse Permit Committee

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure while the application meets the criteria mentioned in the requirement.

Table C.2: Land Use Conditionally Permitted

Conditionally Permitted Urban Residential Uses
Addiction Treatment Center
Amusement and Recreation (Indoors)
Funeral Services
Art Gallery, Art Studio \ Workshop
Automobile Driving Academy
Beauty and Body Service
Billiard Parlor \ Pool Hall
Book or Stationery Store or Newsstand
Building Maintenance \ Cleaning Services, No Outside Storage
Bus Passenger Shelter
Graveyard \ Cemetery
Coffee Shop \ Tea Stall
Correctional Institution
Courier Service
Crematorium
Plantation (Except Narcotic Plant)
Furniture & Variety Stores
Emergency Shelter
Energy Installation
Garages
Garden Center or Retail Nursery
Fire Brigade Station
Police Station
Temporary Rescue Shed
Guest House
Slaughter House
Static Transformer Stations
Tourist Home or Resort
Market (Bazar)
Optical Goods Sales
Outdoor Café
Outdoor Fruit and Vegetable Markets
Community Hall
Neighborhood Co-Operative Office
Overhead Water Storage Tanks
Row House
Paints and Varnishes Store
Parking Lot
Patio Homes
Photofinishing Laboratory
Post Office
Postal Facilities
Sports and Recreation Club
Tennis Club
Flood Management Structure
Telephone Sub Station
Electrical Sub Station

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

b. General Industry

Land use Permitted

General Industry land use category approve only Green and Orange-A category industry mentioned in *The Environmental Conservation Rule, 1997*.The following uses in the tables are proposed to be applicable for this zone only.

Table C.3: Land Use Permitted

Permitted General Industrial Activities
Confectionery Shop
Bank & Financial Institution
Bicycle Assembly, Parts and Accessories
Blacksmith
Bus Passenger Shelter
Communication Tower Within Permitted Height
Freight Transport Facility
Police Box \ Barrack
Fire \ Rescue Station
Grocery Store
Household Appliance and Furniture Repair Service

Permitted General Industrial Activities
Machine Sheds
Meat and Poultry (Packing & Processing)
Mosque, Place Of Worship
Newspaper Stand
Photocopying and Duplicating Services
Pipelines and Utility Lines
Printing, Publishing and Distributing
Public Transport Facility
Restaurant
Retail Shops \ Facilities
Salvage Processing
Salvage Yards
Satellite Dish Antenna
Sawmill, Chipping and Pallet Mill
Shelter (Passers By)
Television, Radio or Electronics Repair (No Outside Storage)
Transmission Lines
Truck Stop & Washing or Freight Terminal
Utility Lines
Wood Products
Woodlot
ATM Booth
Water Pump \ Reservoir
Effluent Treatment Plant
Social Forestry

Source: Compiled by the Consultants

Land Use Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee following appropriate procedure.

Table C.4: Land Use Conditionally Permitted

Conditionally Permitted General Industrial Land Uses
Amusement and Recreation (Indoors)
Appliance Store
Plantation (Except Narcotic Plant)
Cyber Café
Daycare Center (Commercial or Nonprofit)
Doctor \ Dentist Chamber
Electrical and Electronic Equipment and
Instruments Sales
Employee Housing
Energy Installation
Fast Food Establishment \ Food Kiosk
Garages
Grain & Feed Mills
Incineration Facility
Super Store
Lithographic or Print Shop
Motor Vehicle Fuelling Station \ Gas Station
Motorcycle Sales Outlet
Outdoor Fruit and Vegetable Markets
Outside Bulk Storage
Overhead Water Storage Tanks
Painting and Wallpaper Sales
Paints and Varnishes
Parking Lot
Parking Lot (Commercial)
Private Garages
Retail Shops Ancillary To Studio \ Workshop
Jute Mill

Source: Compiled by the Consultants

Restricted Uses

All other uses; except the permitted and conditionally permitted uses.

c. Commercial Zone

Land Use Permitted

Commercial zone is mainly intended for supporting the office and business works. There are several functions that are permitted in this zone.

Table C.5: Land Use Permitted

Permitted Commercial Activity
Accounting, Auditing or Bookkeeping Services
Billboards, Advertisements & Advertising Structure
Agri-Business
Agricultural Sales and Services
Ambulance Service
Antique Shop
Appliance Store

Permitted Commercial Activity
Auction Market
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Auto Leasing or Rental Office
Auto Paint Shop
Auto Parts and Accessory Sales (Indoors)
Auto Repair Shop (With Garage)
Automobile Wash
Automobile Sales
Confectionery Shop
Bakery or Confectionery Retail
Bank & Financial Institution
Bar (Licensed)
Barber Shop
Beauty and Body Service
Bicycle Shop
Billiard Parlor \ Pool Hall
Book or Stationery Store or Newsstand
Building Material Sales or Storage (Indoors)
Bulk Mail and Packaging
Bus Passenger Shelter
Cinema Hall
Communication Service Facilities
Communication Tower Within Permitted Height
Computer Maintenance and Repair
Computer Sales & Services
Conference Center
Construction Company
Courier Service
Cyber Café
Daycare Center (Commercial or Nonprofit)
Department Stores, Furniture & Variety Stores
Doctor \ Dentist Chamber
Drug Store or Pharmacy
Electrical and Electronic Equipment and Instruments Sales
Fast Food Establishment \ Food Kiosk
Freight Handling, Storage & Distribution
Freight Transport Facility
Freight Yard
General Store
Grocery Store
Guest House

Permitted Commercial Activity
Hotel or Motel
Inter-City Bus Terminal
Jewelry and Silverware Sales
Junk \ Salvage Yard
Super Store
Market (Bazar)
Mosque, Place Of Worship
Motorcycle Sales Outlet
Multi-Storey Car Park
Newspaper Stand
Outdoor Fruit and Vegetable Markets
Outdoor Recreation, Commercial
Parking Lot (Commercial)
Pet Store
Photocopying and Duplicating Services
Photofinishing Laboratory & Studio
Pipelines and Utility Lines
Post Office
Preserved Fruits and Vegetables Facility \ Cold Storage
Printing, Publishing and Distributing
Project Identification Signs
Property Management Signs
Public Transport Facility
Refrigerator or Large Appliance Repair
Resort
Restaurant
Retail Shops \ Facilities
Salvage Processing
Salvage Yards
Satellite Dish Antenna
Sawmill, Chipping and Pallet Mill
Shelter (Passers By)
Shopping Mall \ Plaza
Slaughter House
Software Development
Sporting Goods and Toys Sales
Taxi Stand
Telephone Exchanges
Television, Radio or Electronics Repair (No Outside Storage)
Theater (Indoor)
Transmission Lines
Utility Lines
Vehicle Sales & Service, Leasing or Rental

Permitted Commercial Activity
Veterinarian Clinics, Animal Hospitals, Kennels and Boarding Facilities
Warehousing
Wood Products
Woodlot
ATM Booth
Water Pump \ Reservoir
Agro-Based Industry (Rice Mill, Saw Mill, Cold Storage)
Social Forestry

Source: Compiled by the Consultants

Land Use Conditionally Permitted

Some functions are permitted with some condition in this zone.

Table C.6: Land Use Conditionally Permitted

Conditionally permitted commercial activities
Amusement and Recreation (Indoors)
Bicycle Assembly, Parts and Accessories
Broadcast Studio \ Recording Studio (No Audience)
Coffee Shop \ Tea Stall
Concert Hall, Stage Shows
Construction, Survey, Soil Testing Firms
Trade Shows
Craft Workshop
Plantation (Except Narcotic Plant)
Energy Installation
Firm Equipment Sales & Service
Agricultural Chemicals, Pesticides or Fertilizers Shop
Fitness Centre
Flowers, Nursery Stock and Florist Supplies
Forest Products Sales
Fuel and Ice Dealers
Garages
Garden Center or Retail Nursery
Police Box \ Barrack
Fire \ Rescue Station
Grain & Feed Mills
Household Appliance and Furniture Repair Service

Conditionally permitted commercial activities
Incineration Facility
Indoor Amusement Centers, Game Arcades
Indoor Theatre
Lithographic or Print Shop
Motor Vehicle Fuelling Station \ Gas Station
Musical Instrument Sales or Repair
Optical Goods Sales
Painting and Wallpaper Sales
Paints and Varnishes
Parking Lot
Patio Homes
Postal Facilities
Poultry
Private Garages
Professional Office
Retail Shops Ancillary To Studio \ Workshop
Stone \ Cut Stone Products Sales

Source: Compiled by the Consultants

Restricted Uses

All other uses except;, the permitted and conditionally permitted uses.

d. Rural Settlement

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table C.7: Land Use Permitted

Permitted Rural Settlement
Agricultural Dwellings
Animal Husbandry
Animal Shelter
Graveyard \ Cemetery
Child Daycare \ Preschool
Primary School
Communication Tower Within Permitted Height
Cottage
Crematorium
Dairy Firming
General Store
Grocery Store
Handloom (Cottage Industry)

Permitted Rural Settlement
Housing For Seasonal Firm Labor
Mosque, Place Of Worship
Newspaper Stand
Nursery School
orphanage
Outdoor Religious Events (Eidgah)
Playing Field
Satellite Dish Antenna
NGO \ CBO Facilities
Special Dwelling (E.G. Dorm For Physically Challenged Etc.)
Temporary Shed \ Tent
Specialized School: Dance, Art, Music, Physically Challenged & Others
Static Electrical Sub Stations
Transmission Lines
Utility Lines
Woodlot
Plantation (Except Narcotic Plant)
Social Forestry
Memorial Structure

Source: Compiled by the Consultants

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure while the application meets the criteria mentioned in the requirement.

Table No. C.8: Land Use Conditionally Permitted

Conditionally permitted uses under Rural Settlement
Artisan's Shop (Potter, Blacksmith, and Goldsmith Etc.)
Research organization (Agriculture \ Fisheries)
Energy Installation
Fish Hatchery
Garden Center or Retail Nursery
Emergency Shelter
Sports and Recreation Club, Firing Range: Indoor

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

e. Mixed use zone

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table C.9: Land Use Permitted

Permitted uses in Mixed Use Zone
Accounting, Auditing or Bookkeeping Services
Addiction Treatment Center
Billboards, Advertisements & Advertising Structure
Agricultural Sales and Services
Antique Store
Appliance Store
Art Gallery, Art Studio \ Workshop
Artisan's Shop
Assisted Living or Elderly Home
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Auto Leasing or Rental Office
Automobile Wash
Automobile Driving Academy
Confectionery Shop
Bakery or Confectionery Retail
Bank & Financial Institution
Barber Shop
Bicycle Shop
Billiard Parlor \ Pool Hall
Blacksmith
Boarding and Rooming House
Book or Stationery Store or Newsstand
Bus Passenger Shelter
Child Daycare \ Preschool
Cleaning \ Laundry Shop
Commercial Recreational Buildings
Communication Service Facilities
Communication Tower Within Permitted Height
Community Center
Condominium or Apartment

Permitted uses in Mixed Use Zone
Correctional Institution
Courier Service
Cyber Café
Daycare Center (Commercial or Nonprofit)
Doctor \ Dentist Chamber
Employee Housing
Fabric Store
Fast Food Establishment \ Food Kiosk
Funeral Services
General Store
Grocery Store
Guest House
Hospital
Jewelry and Silverware Sales
Landscape and Horticultural Services
Mosque, Place Of Worship
Newspaper Stand
Nursery School
Photocopying and Duplicating Services
Pipelines and Utility Lines
Primary School
Project Identification Signs
Property Management Signs
Public Transport Facility
Resort
Satellite Dish Antenna
Shelter (Passers By)
Shoe Repair or Shoeshine Shop (Small)
Slaughter House
Social organization
Software Development
Special Dwelling
Toys and Hobby Goods Processing and Supplies
Training Centre
Transmission Lines
Utility Lines
Vehicle Sales & Service, Leasing or Rental
Warehousing
Woodlot
Children's Park
ATM Booth
Water Pump \ Reservoir
Social Forestry
Dormitory
Rickshaw \ Auto Rickshaw Stand

Source: Compiled by the Consultants

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table C.10: Land Use Conditionally Permitted

Conditionally permitted uses in Mixed Use Zone
Agricultural Chemicals, Pesticides or Fertilizers Shop
Amusement and Recreation (Indoors)
Beauty and Body Service
Broadcast Studio \ Recording Studio (No Audience)
Building Maintenance \ Cleaning Services, No Outside Storage
Building Material Sales or Storage (Indoors)
Graveyard \ Cemetery
Coffee Shop \ Tea Stall
Computer Maintenance and Repair
Computer Sales & Services
Concert Hall, Stage Shows
Conference Center
Construction Company
Construction, Survey, Soil Testing Firms
Cottage
Counseling Services
Craft Workshop
Crematorium
Plantation (Except Narcotic Plant)
Cultural Exhibits and Libraries
Department Stores, Furniture & Variety Stores
Drug Store or Pharmacy
Energy Installation
Fitness Centre
Flowers, Nursery Stock and Florist Supplies
Freight Handling, Storage & Distribution
Freight Transport Facility
Gaming Clubs
Garages
Garden Center or Retail Nursery
Commercial Office
Project Office
Government Office
Hotel or Motel

Conditionally permitted uses in Mixed Use Zone
Household Appliance and Furniture Repair Service
Indoor Amusement Centers, Game Arcades
Indoor Theatre
Lithographic or Print Shop
Market (Bazar)
Health Office, Dental Laboratory, Clinic or Lab
Musical Instrument Sales or Repair
Optical Goods Sales
Outdoor Café
Outdoor Fruit and Vegetable Markets
Painting and Wallpaper Sales
Paints and Varnishes
Patio Homes
Photofinishing Laboratory & Studio
Poultry
Printing, Publishing and Distributing
Psychiatric Hospital
Retail Shops Ancillary To Studio \ Workshop
Radio \ Television or T&T Station With Transmitter Tower
Refrigerator or Large Appliance Repair
Restaurant
Retail Shops \ Facilities
Sporting Goods and Toys Sales
Sports and Recreation Club, Firing Range: Indoor
Telephone Exchanges
Television, Radio or Electronics Repair (No Outside Storage)

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

f. Education and Research Area

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table C.11: Land Use Permitted

Permitted uses under Education & Research Zone
Addiction Treatment Center
Billboards, Advertisements & Advertising Structure
Art Gallery, Art Studio \ Workshop

Permitted uses under Education & Research Zone
Automobile Driving Academy
Confectionery Shop
Bus Passenger Shelter
Child Daycare \ Preschool
College, University, Technical Institute
Communication Service Facilities
Communication Tower Within Permitted Height
Conference Center
Correctional Institution
Cultural Exhibits and Libraries
Cyber Café
Freight Transport Facility
General Store
Grocery Store
High School
Hospital
Lithographic or Print Shop
Mosque, Place Of Worship
Multi-Storey Car Park
Newspaper Stand
Nursery School
Outdoor Religious Events
Photocopying and Duplicating Services
Post Office
Primary School
Professional Office
Project Identification Signs
Property Management Signs
Public Transport Facility
Satellite Dish Antenna
School (Retarded)
Scientific Research Establishment
Shelter (Passers By)
Specialized School: Dance, Art, Music & Others
Training Centre
Transmission Lines
Utility Lines
Vocational, Business, Secretarial School
Woodlot
ATM Booth
Water Pump \ Reservoir
Social Forestry
Dormitory
Veterinary School \ College and Hospital

Source: Compiled by the Consultants

Land Use Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table C.12: Land Use Conditionally Permitted

Conditionally permitted uses under Education and Research Zone
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Bank & Financial Institution
Barber Shop
Boarding and Rooming House
Book or Stationery Store or Newsstand
Coffee Shop \ Tea Stall
Counseling Services
Courier Service
Plantation (Except Narcotic Plant)
Daycare Center (Commercial or Nonprofit)
Doctor \ Dentist Chamber
Drug Store or Pharmacy
Fast Food Establishment \ Food Kiosk
Flowers, Nursery Stock and Florist Supplies
Gallery \ Museum
Garages
Indoor Theatre
orphanage
Outdoor Café
Parking Lot
Pipelines and Utility Lines
Postal Facilities
Psychiatric Hospital

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

g. Government Office

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table C.13: Land Use Permitted

Permitted uses under Government Office Zone
Accounting, Auditing or Bookkeeping Services
Billboards, Advertisements & Advertising Structure
Confectionery Shop
Bus Passenger Shelter
Civic Administration
Communication Service Facilities
Communication Tower Within Permitted Height
Construction, Survey, Soil Testing Firms
Cultural Exhibits and Libraries
Cyber Café
Emergency Shelter
Freight Transport Facility
General Store
Project Office
Government Office
Grocery Store
Guest House
Multi-Storey Car Park
Newspaper Stand
Outdoor Religious Events
Photocopying and Duplicating Services
Post Office
Professional Office
Public Transport Facility
Satellite Dish Antenna
Scientific Research Establishment
Shelter (Passers By)
Training Centre
Transmission Lines
Utility Lines
Woodlot
ATM Booth
Water Pump \ Reservoir
Social Forestry

Source: Compiled by the Consultants

Land Use Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table C.14: Land Use Conditionally Permitted

Conditionally permitted uses under Government office
Amusement and Recreation (Indoors)
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention
Bank & Financial Institution
Boarding and Rooming House
Book or Stationery Store or Newsstand
Coffee Shop \ Tea Stall
Conference Center
Courier Service
Plantation (Except Narcotic Plant)
Daycare Center (Commercial or Nonprofit)
Detention Facilities
Doctor \ Dentist Chamber
Energy Installation
Fast Food Establishment \ Food Kiosk
Flowers, Nursery Stock and Florist Supplies
Freight Handling, Storage & Distribution
Freight Yard
Gallery \ Museum
Garages
Police Box \ Barrack
Fire \ Rescue Station
Lithographic or Print Shop
Mosque, Place Of Worship
Outdoor Café
Parking Lot
Parking Lot (Commercial)
Pipelines and Utility Lines
Postal Facilities

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

h. Agricultural Zone

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table C.15: Land Use Permitted

Permitted uses under Agricultural Zone
Food Grain Cultivation
Vegetable Cultivation
Cash Crop Cultivation
Horticulture
Arboriculture
Dairy Firming
Deep Tube Well
Shallow Tube Well
Irrigation Facilities (Irrigation Canal, Culvert, Flood Wall etc)
Temporary Structure (Agricultural)
Animal Shelter
Duckery
Aquatic Recreation Facility (Without Structure)
Tree Plantation (Except Narcotic Plant)
Aquaculture
Static Transformer Stations
Transmission Lines
Utility Lines
Woodlot
Social Forestry

Source: Compiled by the Consultants

Land Use Conditionally Permitted

Table A18: Land Use Conditionally Permitted

Conditionally permitted uses under Agricultural Zone
Graveyard \ Cemetery
Communication Tower Within Permitted Height
Crematorium
Fish Hatchery
Garden Center or Retail Nursery
Poultry

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted in this zone.

j. Open Space

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table C.16: Land Use Permitted

Permitted uses under Open Space
Botanical Garden & Arboretum
Bus Passenger Shelter
Caravan Park \ Camping Ground
Carnivals and Fairs
Circus
Plantation (Except Narcotic Plant)
Landscape and Horticultural Services
Open Theater
Park and Recreation Facilities (General)
Pipelines and Utility Lines
Playing Field
Special Function Tent
Tennis Club
Transmission Lines
Urban-Nature Reserve
Utility Lines
Woodlot
Zoo
Roadside Parking
Social Forestry
Memorial Structure

Source: Compiled by the Consultants

Landuse Conditionally Permitted

Table C.17: Land Use Conditionally Permitted

Conditionally permitted uses under open space
Communication Tower Within Permitted Height
Trade Shows
Fitness Centre
Flowers, Nursery Stock and Florist Supplies
Golf Course
Motorized Recreation
Outdoor Recreation Facilities
Outdoor Recreation, Commercial
Outdoor Sports and Recreation
Park Maintenance Facility
Retreat Center
Sports and Recreation Club, Firing Range: Indoor

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted.

k. Water Body

Retaining water is the main purpose of this type of Landuse.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table C.18: Land Use Permitted

Permitted uses under Water Body
Aquatic Recreation Facility (Without Structure)
Fishing Club
Utility Lines
Water Parks
Memorial Structure

Source: Compiled by the Consultants

Land Use Conditionally Permitted

The following uses may be permitted or denied in this zone after review and approval by the authority/committee.

Table C.19: Land Use Conditionally Permitted

Conditionally permitted uses under water body
Plantation (Except Narcotic Plant)
Marina \ Boating Facility
Motorized Recreation

Source: Compiled by the Consultants

Restricted Uses

All uses except permitted and conditionally permitted uses are restricted.

বানারীপাড়া পৌরসভার মহাপরিকল্পণার উপর চূড়ান্ত মতবিনিময় সভার কার্যবিবরণী

তারিখ: ১৩/১২/২০১৩
স্থান: বানারীপাড়া পৌরসভা
সময়: সকাল ৯:০০ ঘটিকায়

স্থানীয় সরকার প্রকৌশল অধিদপ্তর, বানারীপাড়া পৌরসভা ও পরামর্শক প্রতিষ্ঠানের যৌথ উদ্যোগে বানারীপাড়া পৌরসভার মহাপরিকল্পণার উপর মাননীয় মেয়র জনাব গোলাম সালেহ্ এর সভাপতিত্বে চূড়ান্ত মতবিনিময় সভা অনুষ্ঠিত হয়। উক্ত মতবিনিময় সভায় পৌরসভার কাউন্সিলরবৃন্দ সহ স্থানীয় গণ্যমাণ্য ব্যক্তি বর্গ, বিভিন্ন সরকারি-বেসরকারি অধিদপ্তরের কর্মকর্তাবৃন্দ, স্থানীয় সরকার প্রকৌশল অধিদপ্তরের প্রতিনিধি এবং মহাপরিকল্পণা প্রণয়ন প্রকল্পে নিযুক্ত পরামর্শকবৃন্দ উপস্থিত হয়ে আলোচনায় অংশগ্রহন করেন।

সভার শুরুতে মাননীয় মেয়র মহোদয় জনাব গোলাম সালেহ্ উপস্থিত সকলকে শুভেচ্ছা জানিয়ে আনুষ্ঠানিকভাবে সভার কার্যক্রম শুরু করেন এবং স্বাগত বক্তব্যে উল্লেখ করেন যে, আগামী (২০) বিশ বছরের জন্য এই মহাপরিকল্পণা। উক্ত পরিকল্পণায় উপস্থিত সকলকে সুচিন্তিত মতামত প্রদানের জন্য আহ্বান করেন যাতে করে পরিকল্পণাটি আরও গঠণমূলক ও বাস্তব সম্মত হয়।

পরামর্শক প্রতিষ্ঠানের পক্ষ থেকে ডঃ নুরুল ইসলাম নাজেম, উপস্থিত সকলকে স্বাগত জানিয়ে মহাপরিকল্পণার উপর Power Point Presentation এর মাধ্যমে তার বক্তব্য তুলে ধরেন। তিনি কার্যক্রমসমূহ, উন্নয়নের সম্ভাবনাসমূহ ধাপে ধাপে বর্ণনা করেন। এরপর মহাপরিকল্পণার কোথায় কিভাবে প্রস্তাবনা সমূহ ওয়ার্ড ভিত্তিক দেওয়া হয়েছে সেসব বিষদ আলোচনা করেন। তিনি আরও উল্লেখ করেন যে, সকলের মতামতের ভিত্তিতে যে প্রস্তাবসমূহ দেওয়া হয়েছিল তা নিম্নরূপ:

Proposed Facility	Area (acre)	Ward No.	Plot No.	Mouza Name
Cluster Village	5.94	1	21,27-29,44-49,919	Banaripara
Housing Area	4.18	8	475-76,485-86,497-04	Kundohar
Resettlement Zone	6.03	Extension Area	-	-
Super Market	0.75	9	407,410,412-15	Kundohar
Shopping Complex	0.58	8	395,398	Kundohar
Kitchen Market	0.69	7	333-35,343-44, 347	Kundohar
Retailsale Market	1.40	2	809	Banaripara
Wholesale Market	0.78	9	108-09	Kundohar
Pauro Market	0.38	3	521-22,527-28, 530	Banaripara
Neighborhood Market	0.64	4	888-89,895	Banaripara
Ship Building Industry	1.78	1	177,183-85, 192-96, 919	Banaripara
Industrial Zone	5.05	9	142,458	Kundohar
Stadium	2.25	2	812-13,815,829-32,835-37	Banaripara
Cinema Hall	0.37	4	559-62,570,584-86,588-89,592-93	Banaripara
Tourist Spot	0.59	4	600-02, 604, 99999	Banaripara
Community Park	1.88	3	508-09,512-15,530-38, 550	Banaripara
Hospital	0.99	4	205-06	Kundohar

Proposed Facility	Area (acre)	Ward No.	Plot No.	Mouza Name
			892-94,896-99, 903-05,907	Banaripara
Community Center	0.95	9	415,435-37	Kundohar
Eidgah	0.86	9	448,450-52	Kundohar
College cum Cyclone Shelter	1.33	7	291-96,299-01	Kundohar
Graveyard	1.10	1	194-96	Banaripara
		2	258-61,331	Banaripara
Vocational Training Institute	1.01	8	390-93, 395, 400,422	Kundohar
Bus Terminal	1.10	1	9-11,15-19, 21, 919	Banaripara
Bus Stand	0.76	9	467-68,472	Kundohar
Truck Stand	0.29	9	142	Kundohar
Truck Terminal	0.45	1	177-78, 180, 182-83	Banaripara
Fuel station	0.53	1	72,81-83	Banaripara
Rickshaw Stand	0.49	1	10,12-13,15,99999	Banaripara
Tempo Stand	0.74	1	13	Banaripara
Waste Dumping Site	6.01	Extension Area	-	-

সমাপনি বক্তব্যে মেয়র মহোদয় পরামর্শক প্রতিষ্ঠানের পরিকল্পণাবিদগণকে এবং স্থানীয় সরকার প্রকৌশল অধিদপ্তরকে পৌরসভার মহাপরিকল্পণা প্রনয়নের জন্য পুনরায় ধন্যবাদ জ্ঞাপন করেন এবং সম্ভাব্য সকল দিকনির্দেশনাগুলি সন্নিবেশিত করে যথাশীঘ্র সম্ভব চূড়ান্ত মহাপরিকল্পণা প্রণয়ন করার জন্য অনুরোধ করেন। সভায় আর কোন আলোচনা না থাকায় সকলকে ধন্যবাদ জানিয়ে পৌরসভার স্বপ্ন বাস্তবায়নের আশা ব্যক্ত করে সভার কার্যক্রম সমাপ্তি ঘোষণা করেন।

(জনাব গোলাম সালেহ মনজু মোল্লাহ)

মেয়র, বানারীপাড়া পৌরসভা

স্থানীয় সরকার প্রকৌশল অধিদপ্তর, ঢাকা-১২০৭

উপজেলা শহর অবকাঠামো উন্নয়ন প্রকল্প, প্যাকেজ-১১

বানারীপাড়া পৌরসভার মহাপরিকল্পনার উপর চূড়ান্ত মতবিনিময় সভা

বানারীপাড়া পৌরসভা।

স্থান: বানারীপাড়া পৌরসভা। তারিখ: ১৩ ডিসেম্বর, ২০১৩ খ্রিঃ; সকাল ৯:০০ ঘটিকা

অংশগ্রহনকারীর তালিকা

ক্রমিক নং	নাম	প্রতিষ্ঠান ও পদবী	ফোন নম্বর	স্বাক্ষর
১				
২				
৩				
৪				
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৬				
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৯				
১০				
১১				

ক্রমিক নং	নাম	প্রতিষ্ঠান ও পদবী	ফোন নম্বর	স্বাক্ষর
১২	কালিদাস চন্দ্র	কাউন্সিলর ১,২,৩, সংরক্ষিত	01190853 6-64	[signature] 13.12.13
১৩	মো: মশিউর রহমান	কাউন্সিলর ৩ নং ওয়ার্ড	017204633-80	M Rahman 13.12.13
১৪	আফিফা ইয়াসমিন	উপ-সহকারী প্রকৌশলী বানারীপাড়া পৌরসভা	01748911804	আফিফা ইয়াসমিন ১৩/১২/১৩
১৫	মো: নয়ন খান	কার্য সহকারী বানারীপাড়া পৌরসভা	01715-211837	[signature]
১৬	মোঃ গোলাম মোস্তফা	কর-নির্ধারক বানারীপাড়া পৌরসভা	01721616522	[signature]
১৭	মোঃ নুরুল আমিন	নলকূপ মিস্ত্রী বানারীপাড়া পৌরসভা	01739-931800	[signature]
১৮	মো: খালেক	[illegible]	01712-5782-08	Khaled
১৯	মো: মহসীন হোসেন	হিসাব সহকারী বানারীপাড়া পৌরসভা	01712-579552	[signature]
২০	মোঃ রিয়াজ আহমেদ	কাউন্সিলর ৭ নং ওয়ার্ড	01716-14888-9	[signature]
২১	মো: রেজাউর হাসান খিরন	কাউন্সিলর ০৬নং ওয়ার্ড	01712-258583	[signature]
২২	মোঃ আলিমুর রহমান	কাউন্সিলর, ৮ নং ওয়ার্ড বানারীপাড়া পৌরসভা	01918833634	[signature] 13/12/13
২৩	মো: মোজাম্মেল হক ইসলাম ৮ নং ওয়ার্ড	৮ নং ওয়ার্ড নির্বাচিত	01924380502	[signature] ১৩/১২/১৩
২৪	মোঃ নিজাম আলম	৭ নং ওয়ার্ড	01914720457	[signature]
২৫	মো: জালাল মিয়া	৭ নং ওয়ার্ড	01798999999	[signature]

ক্রমিক নং	নাম	প্রতিষ্ঠান ও পদবী	ফোন নম্বর	স্বাক্ষর
২৬	[illegible] নাহার	মহাসচিব [illegible]	0171843 2117	[signature]
২৭	মোঃ জাহিদুল হক	এম. এল. এস. এস. বানারী পাড়া পৌরসভা	01727669496	[signature]
২৮	মোঃ এমরান হোসেন.	গাড়ী চালক. বানারীপাড়া পৌরসভা	01713958260	[signature]
২৯	মোঃ আনিসুল হক	এম এল এস এস	~~017~~ 01823169532	[signature]
৩০	মোঃ [illegible]	~~[illegible]~~ এম, এল, এস, এস	01777163452	[signature]
৩১	মোসাঃ শাহীন সুলতানা	সচিব, বানারীপাড়া পৌরসভা	01718148954	[signature]
৩২	মোঃ [illegible]	[illegible]		[signature]
৩৩	Afsana M Kamal	DTL SCPL	01819262012	[signature]
৩৪	Nurul Islam Nazem	SCPL	01819234025	[signature]
৩৫	[illegible]	[illegible]	[illegible]	[signature]
৩৬				
৩৭				
৩৮				
৩৯				

Table E1: Proposed Road Inventory

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Primary Road	PR-1		Widening	12	80	308.90	Ward 1	1st
Primary Road	PR-2		Widening	4	80	232.37	Ward 1	1st
Primary Road	PR-3		Widening	13	80	11.59	Ward 9	1st
Primary Road	PR-4		Widening	19	80	3.97	Ward 1	1st
Secondary Road	SR-2	Chakar Banaripara Road	Widening	10	40	299.60	Ward 1	1st
Secondary Road	SR-3		Widening	8	40	24.79	Ward 1	1st
Secondary Road	SR-6	Cinema Hall Road	Widening	10	40	223.43	Ward 3	1st
Secondary Road	SR-6	Cinema Hall Road	Widening	10	40	0.12	Ward 2	1st
Secondary Road	SR-8	Chakhar to Banaripara Road	Widening	10	40	302.13	Ward 1	1st
Secondary Road	SR-11		Widening	10	40	106.98	Ward 4	1st
Secondary Road	SR-11		Widening	10	40	104.88	Ward 3	1st
Secondary Road	SR-12	Nazirpur Road	Widening	13	40	456.29	Ward 2	1st
Secondary Road	SR-12	Nazirpur Road	Widening	13	40	27.52	Ward 9	1st
Secondary Road	SR-13	Nazirpur Road	Widening	10	40	66.33	Ward 2	1st
Secondary Road	SR-14		Widening	14	40	115.51	Ward 3	1st
Secondary Road	SR-14		Widening	14	40	135.54	Ward 2	1st
Secondary Road	SR-16		Widening	13	40	187.98	Ward 2	1st
Secondary Road	SR-16		Widening	13	40	168.09	Ward 9	1st
Secondary Road	SR-16		Widening	13	40	232.07	Ward 6	1st
Secondary Road	SR-21	Sodor Road	Widening	20	40	115.35	Ward 8	1st
Secondary Road	SR-21	Sodor Road	Widening	20	40	5.91	Ward 4	1st
Secondary Road	SR-21	Sodor Road	Widening	20	40	0.01	Ward 3	1st
Secondary Road	SR-21	Sodor Road	Widening	20	40	148.07	Ward 2	1st
Secondary Road	SR-21	Sodor Road	Widening	20	40	548.96	Ward 9	1st
Secondary Road	SR-21	Sodor Road	Widening	20	40	479.55	Ward 6	1st
Secondary Road	SR-24		Widening	12	40	172.59	Ward 8	1st
Secondary Road	SR-24		Widening	12	40	256.58	Ward 7	1st
Secondary Road	SR-24		Widening	12	40	232.36	Ward 5	1st
Secondary Road	SR-24		Widening	12	40	518.92	Ward 4	1st
Secondary Road	SR-24		Widening	12	40	31.62	Ward 9	1st
Secondary Road	SR-25		Widening	12	40	47.20	Ward 5	1st
Secondary Road	SR-25		Widening	12	40	276.85	Ward 4	1st
Secondary Road	SR-25		Widening	12	40	0.76	Ward 6	1st
Secondary Road	SR-29		Widening	11	40	59.67	Ward 7	1st
Secondary Road	SR-31		Widening	13	40	177.12	Ward 9	1st
Secondary Road	SR-31		Widening	13	40	273.74	Ward 6	1st
Secondary Road	SR-35		Widening	12	40	138.13	Ward 7	1st

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Secondary Road	SR-36		Widening	12	40	183.45	Ward 8	1st
Secondary Road	SR-36		Widening	12	40	428.50	Ward 7	1st
Secondary Road	SR-37		Widening	18	40	249.78	Ward 8	1st
Secondary Road	SR-38		Widening	12	40	186.74	Ward 8	1st
Secondary Road	SR-39	Kuriana Road	Widening	12	40	231.43	Ward 8	1st
Secondary Road	SR-49		Widening	13	40	18.55	Ward 9	1st
Secondary Road	SR-50	Nazirpur Road	Widening	13	40	32.74	Ward 3	1st
Secondary Road	SR-50	Nazirpur Road	Widening	13	40	375.87	Ward 2	1st
Secondary Road	SR-50	Nazirpur Road	Widening	13	40	25.16	Ward 1	1st
Secondary Road	SR-51	Dak Banglo Road	Widening	12	40	74.82	Ward 4	1st
Secondary Road	SR-51	Dak Banglo Road	Widening	12	40	2.83	Ward 3	1st
Secondary Road	SR-54		Widening	12	40	252.60	Ward 1	1st
Secondary Road	SR-1		Widening	6	30	290.95	Ward 1	1st
Secondary Road	SR-4		Widening	24	30	25.68	Ward 2	1st
Secondary Road	SR-5		Widening	11	30	155.61	Ward 2	1st
Secondary Road	SR-7		Widening	18	30	99.38	Ward 3	1st
Secondary Road	SR-9		Widening	5	30	74.52	Ward 1	1st
Secondary Road	SR-10		Widening	7	30	48.22	Ward 1	1st
Secondary Road	SR-15		Widening	13	30	110.95	Ward 3	1st
Secondary Road	SR-15		Widening	13	30	0.01	Ward 2	1st
Secondary Road	SR-17		Widening	8	30	105.32	Ward 9	1st
Secondary Road	SR-18		Widening	4	30	20.70	Ward 9	1st
Secondary Road	SR-19		Widening	10	30	553.86	Ward 9	1st
Secondary Road	SR-19		Widening	10	30	90.92	Ward 6	1st
Secondary Road	SR-20	Dak Banglo Road	Widening	12	30	125.57	Ward 4	1st
Secondary Road	SR-20	Dak Banglo Road	Widening	12	30	73.09	Ward 3	1st
Secondary Road	SR-22		Widening	8	30	138.17	Ward 5	1st
Secondary Road	SR-22		Widening	8	30	5.63	Ward 4	1st
Secondary Road	SR-23		Widening	10	30	391.84	Ward 5	1st
Secondary Road	SR-23		Widening	10	30	16.92	Ward 4	1st
Secondary Road	SR-23		Widening	10	30	2.64	Ward 6	1st
Secondary Road	SR-26		Widening	8	30	87.85	Ward 4	1st
Secondary Road	SR-27		Widening	5	30	58.79	Ward 4	1st
Secondary Road	SR-28		Widening	10	30	90.82	Ward 5	1st
Secondary Road	SR-30		Widening	11	30	0.12	Ward 7	1st
Secondary Road	SR-30		Widening	11	30	214.34	Ward 5	1st
Secondary Road	SR-30		Widening	11	30	140.70	Ward 9	1st
Secondary Road	SR-30		Widening	11	30	0.81	Ward 6	1st
Secondary Road	SR-32		Widening	9	30	91.79	Ward 9	1st

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Secondary Road	SR-33	R & H Road	Widening	18	30	359.69	Ward 9	1st
Secondary Road	SR-34		Widening	8	30	252.03	Ward 8	1st
Secondary Road	SR-34		Widening	8	30	0.04	Ward 9	1st
Secondary Road	SR-40		Widening	8	30	128.54	Ward 8	1st
Secondary Road	SR-41		Widening	18	30	95.55	Ward 9	1st
Secondary Road	SR-43		Widening	6	30	21.20	Ward 1	1st
Secondary Road	SR-52		Widening	13	30	229.31	Ward 9	1st
Secondary Road	SR-52		Widening	13	30	33.06	Ward 6	1st
Secondary Road	SR-55	Nazirpur Road	Widening	10	30	20.76	Ward 2	1st
Secondary Road	SR-42		New		40	302.55	Ward 3	2nd
Secondary Road	SR-42		New		40	22.53	Ward 2	2nd
Secondary Road	SR-42		New		40	84.84	Ward 1	2nd
Secondary Road	SR-44		New		30	0.03	Ward 4	2nd
Secondary Road	SR-44		New		30	98.40	Ward 3	2nd
Secondary Road	SR-45		New		30	5.75	Ward 4	2nd
Secondary Road	SR-46		New		30	88.45	Ward 2	2nd
Secondary Road	SR-46		New		30	104.32	Ward 9	2nd
Secondary Road	SR-47		New		30	220.76	Ward 7	2nd
Secondary Road	SR-48		New		30	48.81	Ward 1	2nd
Secondary Road	SR-53		New		30	159.13	Ward 9	2nd
Secondary Road	SR-66		New		30	406.19	Ward 2	2nd
Secondary Road	SR-66		New		30	108.76	Ward 9	2nd
Tertiary Road	TR-1		Widening	6	20	10.24	Ward 1	2nd
Tertiary Road	TR-2		Widening	6	20	12.43	Ward 1	2nd
Tertiary Road	TR-3		Widening	6	20	31.87	Ward 1	2nd
Tertiary Road	TR-4		Widening	4	20	53.75	Ward 1	2nd
Tertiary Road	TR-5		Widening	5	20	27.86	Ward 1	2nd
Tertiary Road	TR-6		Widening	5	20	9.15	Ward 1	2nd
Tertiary Road	TR-7		Widening	6	20	30.71	Ward 1	2nd
Tertiary Road	TR-8		Widening	4	20	24.42	Ward 1	2nd
Tertiary Road	TR-9		Widening	5	20	31.94	Ward 1	2nd
Tertiary Road	TR-10		Widening	6	20	22.26	Ward 1	2nd
Tertiary Road	TR-11		Widening	6	20	59.23	Ward 1	2nd
Tertiary Road	TR-12		Widening	6	20	61.74	Ward 1	2nd
Tertiary Road	TR-13		Widening	12	20	50.10	Ward 1	2nd
Tertiary Road	TR-14		Widening	5	20	71.71	Ward 1	2nd
Tertiary Road	TR-15		Widening	5	20	25.85	Ward 1	2nd
Tertiary Road	TR-16		Widening	6	20	97.90	Ward 1	2nd
Tertiary Road	TR-17		Widening	5	20	31.24	Ward 1	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-18		Widening	7	20	96.22	Ward 1	2nd
Tertiary Road	TR-19		Widening	7	20	43.06	Ward 1	2nd
Tertiary Road	TR-20		Widening	4	20	24.76	Ward 1	2nd
Tertiary Road	TR-21		Widening	4	20	21.10	Ward 1	2nd
Tertiary Road	TR-22		Widening	8	20	61.74	Ward 1	2nd
Tertiary Road	TR-23		Widening	8	20	14.27	Ward 1	2nd
Tertiary Road	TR-24		Widening	8	20	24.53	Ward 1	2nd
Tertiary Road	TR-25		Widening	10	20	82.14	Ward 1	2nd
Tertiary Road	TR-26		Widening	32	20	43.81	Ward 1	2nd
Tertiary Road	TR-27		Widening	13	20	19.50	Ward 1	2nd
Tertiary Road	TR-28		Widening	8	20	29.57	Ward 1	2nd
Tertiary Road	TR-29		Widening	11	20	54.50	Ward 1	2nd
Tertiary Road	TR-30		Widening	8	20	19.39	Ward 1	2nd
Tertiary Road	TR-31		Widening	19	20	24.62	Ward 1	2nd
Tertiary Road	TR-32		Widening	8	20	40.58	Ward 1	2nd
Tertiary Road	TR-33		Widening	6	20	16.05	Ward 1	2nd
Tertiary Road	TR-34		Widening	5	20	28.32	Ward 1	2nd
Tertiary Road	TR-35		Widening	4	20	34.61	Ward 1	2nd
Tertiary Road	TR-36		Widening	7	20	44.67	Ward 1	2nd
Tertiary Road	TR-37		Widening	4	20	12.20	Ward 1	2nd
Tertiary Road	TR-38		Widening	8	20	25.91	Ward 1	2nd
Tertiary Road	TR-39		Widening	6	20	13.94	Ward 1	2nd
Tertiary Road	TR-40		Widening	6	20	13.28	Ward 1	2nd
Tertiary Road	TR-41		Widening	4	20	7.61	Ward 1	2nd
Tertiary Road	TR-42		Widening	4	20	6.80	Ward 1	2nd
Tertiary Road	TR-43		Widening	8	20	22.74	Ward 1	2nd
Tertiary Road	TR-44		Widening	4	20	11.98	Ward 1	2nd
Tertiary Road	TR-45		Widening	5	20	38.87	Ward 1	2nd
Tertiary Road	TR-46		Widening	6	20	17.14	Ward 1	2nd
Tertiary Road	TR-47		Widening	12	20	26.69	Ward 1	2nd
Tertiary Road	TR-48		Widening	8	20	53.61	Ward 2	2nd
Tertiary Road	TR-49		Widening	11	20	24.90	Ward 2	2nd
Tertiary Road	TR-50		Widening	5	20	68.81	Ward 2	2nd
Tertiary Road	TR-51		Widening	6	20	57.24	Ward 2	2nd
Tertiary Road	TR-52		Widening	6	20	10.77	Ward 2	2nd
Tertiary Road	TR-53		Widening	6	20	12.71	Ward 2	2nd
Tertiary Road	TR-54		Widening	6	20	56.93	Ward 2	2nd
Tertiary Road	TR-55		Widening	4	20	25.17	Ward 2	2nd
Tertiary Road	TR-56		Widening	7	20	64.49	Ward 2	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-57		Widening	7	20	67.50	Ward 2	2nd
Tertiary Road	TR-58		Widening	6	20	20.01	Ward 2	2nd
Tertiary Road	TR-59		Widening	7	20	43.21	Ward 2	2nd
Tertiary Road	TR-60		Widening	6	20	70.99	Ward 2	2nd
Tertiary Road	TR-61		Widening	8	20	63.03	Ward 2	2nd
Tertiary Road	TR-62		Widening	7	20	34.64	Ward 2	2nd
Tertiary Road	TR-63		Widening	5	20	24.12	Ward 2	2nd
Tertiary Road	TR-64		Widening	14	20	20.79	Ward 2	2nd
Tertiary Road	TR-65		Widening	8	20	11.74	Ward 2	2nd
Tertiary Road	TR-66		Widening	12	20	46.77	Ward 2	2nd
Tertiary Road	TR-67		Widening	8	20	11.61	Ward 2	2nd
Tertiary Road	TR-68		Widening	8	20	12.37	Ward 2	2nd
Tertiary Road	TR-69		Widening	5	20	14.83	Ward 2	2nd
Tertiary Road	TR-70		Widening	7	20	36.06	Ward 2	2nd
Tertiary Road	TR-71		Widening	9	20	18.30	Ward 2	2nd
Tertiary Road	TR-72		Widening	4	20	19.62	Ward 2	2nd
Tertiary Road	TR-73		Widening	11	20	58.71	Ward 2	2nd
Tertiary Road	TR-74		Widening	6	20	18.58	Ward 2	2nd
Tertiary Road	TR-75		Widening	9	20	33.58	Ward 2	2nd
Tertiary Road	TR-76		Widening	13	20	28.71	Ward 2	2nd
Tertiary Road	TR-77		Widening	8	20	30.95	Ward 2	2nd
Tertiary Road	TR-78		Widening	8	20	29.49	Ward 2	2nd
Tertiary Road	TR-79		Widening	6	20	52.16	Ward 2	2nd
Tertiary Road	TR-80		Widening	4	20	42.48	Ward 3	2nd
Tertiary Road	TR-80		Widening	4	20	0.12	Ward 2	2nd
Tertiary Road	TR-81		Widening	5	20	27.51	Ward 3	2nd
Tertiary Road	TR-82		Widening	6	20	6.86	Ward 3	2nd
Tertiary Road	TR-83		Widening	6	20	77.44	Ward 3	2nd
Tertiary Road	TR-84		Widening	5	20	39.42	Ward 3	2nd
Tertiary Road	TR-85		Widening	6	20	19.00	Ward 3	2nd
Tertiary Road	TR-86		Widening	11	20	11.73	Ward 3	2nd
Tertiary Road	TR-87		Widening	8	20	24.41	Ward 3	2nd
Tertiary Road	TR-88		Widening	7	20	72.78	Ward 1	2nd
Tertiary Road	TR-89		Widening	6	20	11.70	Ward 1	2nd
Tertiary Road	TR-90		Widening	6	20	17.61	Ward 1	2nd
Tertiary Road	TR-91		Widening	5	20	14.65	Ward 1	2nd
Tertiary Road	TR-92		Widening	4	20	5.03	Ward 1	2nd
Tertiary Road	TR-93		Widening	4	20	4.63	Ward 1	2nd
Tertiary Road	TR-94		Widening	7	20	14.87	Ward 1	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-95		Widening	10	20	114.61	Ward 1	2nd
Tertiary Road	TR-96		Widening	4	20	11.12	Ward 1	2nd
Tertiary Road	TR-97		Widening	4	20	5.94	Ward 1	2nd
Tertiary Road	TR-98		Widening	7	20	124.08	Ward 1	2nd
Tertiary Road	TR-99		Widening	5	20	16.74	Ward 1	2nd
Tertiary Road	TR-100		Widening	6	20	112.54	Ward 1	2nd
Tertiary Road	TR-101		Widening	6	20	72.05	Ward 1	2nd
Tertiary Road	TR-102		Widening	8	20	35.05	Ward 2	2nd
Tertiary Road	TR-103		Widening	9	20	76.72	Ward 2	2nd
Tertiary Road	TR-104		Widening	10	20	72.63	Ward 2	2nd
Tertiary Road	TR-105		Widening	10	20	163.83	Ward 2	2nd
Tertiary Road	TR-106		Widening	8	20	40.22	Ward 2	2nd
Tertiary Road	TR-107		Widening	7	20	18.08	Ward 2	2nd
Tertiary Road	TR-108		Widening	8	20	32.04	Ward 2	2nd
Tertiary Road	TR-109		Widening	6	20	41.99	Ward 2	2nd
Tertiary Road	TR-110		Widening	8	20	14.11	Ward 2	2nd
Tertiary Road	TR-111		Widening	5	20	29.41	Ward 2	2nd
Tertiary Road	TR-112		Widening	12	20	51.03	Ward 2	2nd
Tertiary Road	TR-113		Widening	7	20	51.16	Ward 2	2nd
Tertiary Road	TR-114		Widening	6	20	35.13	Ward 2	2nd
Tertiary Road	TR-115		Widening	8	20	33.07	Ward 2	2nd
Tertiary Road	TR-116		Widening	10	20	57.85	Ward 2	2nd
Tertiary Road	TR-117		Widening	8	20	35.64	Ward 2	2nd
Tertiary Road	TR-118		Widening	6	20	32.94	Ward 2	2nd
Tertiary Road	TR-119		Widening	8	20	40.70	Ward 2	2nd
Tertiary Road	TR-120		Widening	8	20	14.64	Ward 2	2nd
Tertiary Road	TR-121		Widening	6	20	68.91	Ward 2	2nd
Tertiary Road	TR-122		Widening	6	20	83.58	Ward 2	2nd
Tertiary Road	TR-123		Widening	5	20	13.55	Ward 2	2nd
Tertiary Road	TR-124		Widening	5	20	53.22	Ward 2	2nd
Tertiary Road	TR-125		Widening	4	20	23.88	Ward 2	2nd
Tertiary Road	TR-126		Widening	6	20	19.33	Ward 2	2nd
Tertiary Road	TR-127		Widening	6	20	40.69	Ward 2	2nd
Tertiary Road	TR-128		Widening	8	20	153.94	Ward 2	2nd
Tertiary Road	TR-129		Widening	10	20	159.25	Ward 2	2nd
Tertiary Road	TR-129		Widening	10	20	56.51	Ward 9	2nd
Tertiary Road	TR-130		Widening	5	20	22.20	Ward 2	2nd
Tertiary Road	TR-131		Widening	7	20	8.33	Ward 2	2nd
Tertiary Road	TR-132		Widening	6	20	19.00	Ward 2	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-133		Widening	4	20	22.92	Ward 2	2nd
Tertiary Road	TR-134		Widening	4	20	28.81	Ward 2	2nd
Tertiary Road	TR-135		Widening	7	20	23.88	Ward 2	2nd
Tertiary Road	TR-136		Widening	10	20	27.04	Ward 2	2nd
Tertiary Road	TR-137		Widening	6	20	34.95	Ward 2	2nd
Tertiary Road	TR-138		Widening	5	20	48.73	Ward 2	2nd
Tertiary Road	TR-139		Widening	22	20	16.15	Ward 2	2nd
Tertiary Road	TR-140		Widening	8	20	65.85	Ward 2	2nd
Tertiary Road	TR-141		Widening	5	20	109.77	Ward 2	2nd
Tertiary Road	TR-142		Widening	6	20	15.73	Ward 2	2nd
Tertiary Road	TR-143		Widening	5	20	25.15	Ward 2	2nd
Tertiary Road	TR-144		Widening	6	20	15.95	Ward 2	2nd
Tertiary Road	TR-145		Widening	8	20	27.87	Ward 2	2nd
Tertiary Road	TR-146		Widening	9	20	24.92	Ward 2	2nd
Tertiary Road	TR-147		Widening	8	20	37.86	Ward 2	2nd
Tertiary Road	TR-148		Widening	12	20	23.12	Ward 2	2nd
Tertiary Road	TR-149		Widening	10	20	22.74	Ward 2	2nd
Tertiary Road	TR-150		Widening	6	20	106.94	Ward 2	2nd
Tertiary Road	TR-151		Widening	7	20	48.33	Ward 2	2nd
Tertiary Road	TR-152		Widening	5	20	51.24	Ward 2	2nd
Tertiary Road	TR-153		Widening	5	20	50.24	Ward 2	2nd
Tertiary Road	TR-154		Widening	6	20	26.82	Ward 3	2nd
Tertiary Road	TR-154		Widening	6	20	0.01	Ward 2	2nd
Tertiary Road	TR-155		Widening	14	20	86.78	Ward 2	2nd
Tertiary Road	TR-156		Widening	5	20	7.90	Ward 2	2nd
Tertiary Road	TR-157		Widening	5	20	79.83	Ward 2	2nd
Tertiary Road	TR-158		Widening	5	20	6.80	Ward 2	2nd
Tertiary Road	TR-159		Widening	7	20	139.42	Ward 2	2nd
Tertiary Road	TR-160		Widening	6	20	109.04	Ward 2	2nd
Tertiary Road	TR-161		Widening	4	20	31.04	Ward 2	2nd
Tertiary Road	TR-162		Widening	4	20	90.33	Ward 2	2nd
Tertiary Road	TR-163		Widening	8	20	33.16	Ward 2	2nd
Tertiary Road	TR-163		Widening	8	20	19.56	Ward 9	2nd
Tertiary Road	TR-164		Widening	5	20	69.01	Ward 9	2nd
Tertiary Road	TR-165		Widening	6	20	60.16	Ward 2	2nd
Tertiary Road	TR-166		Widening	5	20	18.08	Ward 2	2nd
Tertiary Road	TR-167		Widening	5	20	21.11	Ward 2	2nd
Tertiary Road	TR-168		Widening	4	20	18.53	Ward 2	2nd
Tertiary Road	TR-169		Widening	5	20	17.81	Ward 9	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-170		Widening	5	20	0.09	Ward 2	2nd
Tertiary Road	TR-170		Widening	5	20	10.46	Ward 9	2nd
Tertiary Road	TR-171		Widening	5	20	68.11	Ward 2	2nd
Tertiary Road	TR-172		Widening	5	20	58.19	Ward 2	2nd
Tertiary Road	TR-173		Widening	6	20	51.25	Ward 9	2nd
Tertiary Road	TR-174		Widening	5	20	30.31	Ward 9	2nd
Tertiary Road	TR-175		Widening	4	20	13.53	Ward 2	2nd
Tertiary Road	TR-176		Widening	4	20	11.00	Ward 2	2nd
Tertiary Road	TR-176		Widening	4	20	0.02	Ward 9	2nd
Tertiary Road	TR-177		Widening	7	20	45.73	Ward 9	2nd
Tertiary Road	TR-178		Widening	7	20	71.43	Ward 9	2nd
Tertiary Road	TR-179		Widening	7	20	3.85	Ward 9	2nd
Tertiary Road	TR-180		Widening	6	20	5.45	Ward 9	2nd
Tertiary Road	TR-181		Widening	6	20	9.78	Ward 9	2nd
Tertiary Road	TR-182		Widening	6	20	23.13	Ward 9	2nd
Tertiary Road	TR-183		Widening	6	20	65.28	Ward 9	2nd
Tertiary Road	TR-184		Widening	4	20	105.43	Ward 9	2nd
Tertiary Road	TR-185		Widening	6	20	84.15	Ward 3	2nd
Tertiary Road	TR-185		Widening	6	20	5.41	Ward 2	2nd
Tertiary Road	TR-186		Widening	7	20	13.25	Ward 2	2nd
Tertiary Road	TR-187		Widening	12	20	9.26	Ward 3	2nd
Tertiary Road	TR-188		Widening	8	20	9.50	Ward 3	2nd
Tertiary Road	TR-189		Widening	6	20	59.94	Ward 3	2nd
Tertiary Road	TR-190		Widening	4	20	28.63	Ward 3	2nd
Tertiary Road	TR-191		Widening	6	20	16.23	Ward 3	2nd
Tertiary Road	TR-192		Widening	8	20	88.50	Ward 6	2nd
Tertiary Road	TR-193		Widening	6	20	32.72	Ward 3	2nd
Tertiary Road	TR-194		Widening	5	20	53.68	Ward 3	2nd
Tertiary Road	TR-195		Widening	8	20	36.37	Ward 4	2nd
Tertiary Road	TR-195		Widening	8	20	0.02	Ward 3	2nd
Tertiary Road	TR-196		Widening	5	20	40.40	Ward 4	2nd
Tertiary Road	TR-196		Widening	5	20	0.03	Ward 3	2nd
Tertiary Road	TR-197		Widening	5	20	40.12	Ward 4	2nd
Tertiary Road	TR-198		Widening	6	20	20.20	Ward 4	2nd
Tertiary Road	TR-199		Widening	6	20	15.34	Ward 4	2nd
Tertiary Road	TR-200		Widening	4	20	15.32	Ward 4	2nd
Tertiary Road	TR-201		Widening	6	20	84.18	Ward 4	2nd
Tertiary Road	TR-202		Widening	12	20	29.08	Ward 4	2nd
Tertiary Road	TR-203		Widening	6	20	102.32	Ward 4	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-203		Widening	6	20	0.28	Ward 2	2nd
Tertiary Road	TR-204		Widening	8	20	40.15	Ward 6	2nd
Tertiary Road	TR-205		Widening	6	20	0.23	Ward 4	2nd
Tertiary Road	TR-205		Widening	6	20	71.23	Ward 3	2nd
Tertiary Road	TR-206		Widening	7	20	28.47	Ward 4	2nd
Tertiary Road	TR-207		Widening	5	20	136.87	Ward 4	2nd
Tertiary Road	TR-208		Widening	11	20	66.17	Ward 4	2nd
Tertiary Road	TR-209		Widening	6	20	22.87	Ward 4	2nd
Tertiary Road	TR-210		Widening	5	20	33.98	Ward 4	2nd
Tertiary Road	TR-211		Widening	5	20	17.38	Ward 4	2nd
Tertiary Road	TR-212		Widening	5	20	37.92	Ward 4	2nd
Tertiary Road	TR-213		Widening	8	20	22.27	Ward 4	2nd
Tertiary Road	TR-214		Widening	9	20	17.86	Ward 4	2nd
Tertiary Road	TR-215		Widening	8	20	24.73	Ward 4	2nd
Tertiary Road	TR-215		Widening	8	20	1.04	Ward 6	2nd
Tertiary Road	TR-216		Widening	8	20	130.22	Ward 4	2nd
Tertiary Road	TR-217		Widening	5	20	10.45	Ward 4	2nd
Tertiary Road	TR-218		Widening	5	20	29.89	Ward 4	2nd
Tertiary Road	TR-219		Widening	6	20	20.00	Ward 4	2nd
Tertiary Road	TR-220		Widening	5	20	19.20	Ward 4	2nd
Tertiary Road	TR-221		Widening	5	20	44.47	Ward 4	2nd
Tertiary Road	TR-222		Widening	5	20	66.87	Ward 4	2nd
Tertiary Road	TR-223		Widening	5	20	19.31	Ward 4	2nd
Tertiary Road	TR-224		Widening	6	20	22.41	Ward 4	2nd
Tertiary Road	TR-225		Widening	5	20	15.60	Ward 4	2nd
Tertiary Road	TR-226		Widening	5	20	15.70	Ward 6	2nd
Tertiary Road	TR-227		Widening	5	20	19.31	Ward 4	2nd
Tertiary Road	TR-228		Widening	5	20	19.43	Ward 4	2nd
Tertiary Road	TR-229		Widening	5	20	13.65	Ward 4	2nd
Tertiary Road	TR-230		Widening	5	20	12.15	Ward 4	2nd
Tertiary Road	TR-231		Widening	5	20	2.59	Ward 5	2nd
Tertiary Road	TR-231		Widening	5	20	23.53	Ward 4	2nd
Tertiary Road	TR-232		Widening	7	20	2.69	Ward 5	2nd
Tertiary Road	TR-232		Widening	7	20	37.77	Ward 4	2nd
Tertiary Road	TR-233		Widening	5	20	16.27	Ward 5	2nd
Tertiary Road	TR-234		Widening	5	20	33.33	Ward 5	2nd
Tertiary Road	TR-235		Widening	5	20	50.90	Ward 5	2nd
Tertiary Road	TR-236		Widening	7	20	72.71	Ward 5	2nd
Tertiary Road	TR-237		Widening	5	20	19.34	Ward 5	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-238		Widening	5	20	11.20	Ward 5	2nd
Tertiary Road	TR-239		Widening	5	20	47.25	Ward 5	2nd
Tertiary Road	TR-240		Widening	7	20	36.25	Ward 5	2nd
Tertiary Road	TR-241		Widening	6	20	44.27	Ward 5	2nd
Tertiary Road	TR-242		Widening	5	20	50.70	Ward 5	2nd
Tertiary Road	TR-243		Widening	5	20	13.02	Ward 5	2nd
Tertiary Road	TR-244		Widening	6	20	6.87	Ward 5	2nd
Tertiary Road	TR-245		Widening	6	20	9.80	Ward 5	2nd
Tertiary Road	TR-246		Widening	6	20	21.39	Ward 5	2nd
Tertiary Road	TR-247		Widening	5	20	59.66	Ward 5	2nd
Tertiary Road	TR-248		Widening	12	20	74.31	Ward 5	2nd
Tertiary Road	TR-248		Widening	12	20	2.18	Ward 6	2nd
Tertiary Road	TR-249		Widening	8	20	53.59	Ward 5	2nd
Tertiary Road	TR-250		Widening	6	20	63.03	Ward 6	2nd
Tertiary Road	TR-251		Widening	5	20	20.56	Ward 5	2nd
Tertiary Road	TR-252		Widening	5	20	39.39	Ward 5	2nd
Tertiary Road	TR-253		Widening	5	20	24.26	Ward 5	2nd
Tertiary Road	TR-254		Widening	6	20	43.49	Ward 5	2nd
Tertiary Road	TR-255		Widening	5	20	39.82	Ward 5	2nd
Tertiary Road	TR-256		Widening	4	20	11.16	Ward 5	2nd
Tertiary Road	TR-257		Widening	5	20	25.15	Ward 7	2nd
Tertiary Road	TR-258		Widening	6	20	36.90	Ward 7	2nd
Tertiary Road	TR-259		Widening	4	20	31.26	Ward 5	2nd
Tertiary Road	TR-260		Widening	8	20	162.99	Ward 5	2nd
Tertiary Road	TR-261		Widening	6	20	14.97	Ward 5	2nd
Tertiary Road	TR-262		Widening	16	20	105.83	Ward 5	2nd
Tertiary Road	TR-262		Widening	16	20	4.72	Ward 6	2nd
Tertiary Road	TR-263		Widening	7	20	95.66	Ward 5	2nd
Tertiary Road	TR-264		Widening	5	20	20.23	Ward 5	2nd
Tertiary Road	TR-265		Widening	5	20	21.71	Ward 5	2nd
Tertiary Road	TR-266		Widening	7	20	1.27	Ward 9	2nd
Tertiary Road	TR-266		Widening	7	20	220.43	Ward 6	2nd
Tertiary Road	TR-267		Widening	6	20	22.46	Ward 9	2nd
Tertiary Road	TR-268		Widening	6	20	9.19	Ward 9	2nd
Tertiary Road	TR-269		Widening	7	20	30.11	Ward 6	2nd
Tertiary Road	TR-270		Widening	5	20	65.14	Ward 6	2nd
Tertiary Road	TR-271		Widening	4	20	15.22	Ward 6	2nd
Tertiary Road	TR-272		Widening	7	20	254.67	Ward 6	2nd
Tertiary Road	TR-273		Widening	4	20	9.06	Ward 6	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-274		Widening	4	20	12.06	Ward 6	2nd
Tertiary Road	TR-275		Widening	7	20	75.72	Ward 9	2nd
Tertiary Road	TR-276		Widening	6	20	90.53	Ward 9	2nd
Tertiary Road	TR-277		Widening	13	20	107.09	Ward 9	2nd
Tertiary Road	TR-278		Widening	5	20	75.23	Ward 8	2nd
Tertiary Road	TR-279		Widening	5	20	69.86	Ward 8	2nd
Tertiary Road	TR-279		Widening	5	20	172.29	Ward 9	2nd
Tertiary Road	TR-280		Widening	13	20	2.28	Ward 5	2nd
Tertiary Road	TR-280		Widening	13	20	71.53	Ward 9	2nd
Tertiary Road	TR-281		Widening	4	20	16.01	Ward 9	2nd
Tertiary Road	TR-282		Widening	7	20	66.44	Ward 9	2nd
Tertiary Road	TR-283		Widening	6	20	21.57	Ward 9	2nd
Tertiary Road	TR-284		Widening	7	20	62.97	Ward 5	2nd
Tertiary Road	TR-284		Widening	7	20	1.09	Ward 9	2nd
Tertiary Road	TR-285		Widening	7	20	90.69	Ward 5	2nd
Tertiary Road	TR-286		Widening	7	20	129.33	Ward 5	2nd
Tertiary Road	TR-287		Widening	11	20	47.09	Ward 5	2nd
Tertiary Road	TR-288		Widening	12	20	210.97	Ward 9	2nd
Tertiary Road	TR-289		Widening	7	20	62.16	Ward 9	2nd
Tertiary Road	TR-290		Widening	7	20	83.19	Ward 9	2nd
Tertiary Road	TR-291		Widening	6	20	1.84	Ward 5	2nd
Tertiary Road	TR-291		Widening	6	20	27.14	Ward 9	2nd
Tertiary Road	TR-292		Widening	7	20	17.70	Ward 5	2nd
Tertiary Road	TR-293		Widening	14	20	50.44	Ward 5	2nd
Tertiary Road	TR-294		Widening	7	20	15.59	Ward 5	2nd
Tertiary Road	TR-295		Widening	7	20	7.50	Ward 5	2nd
Tertiary Road	TR-296		Widening	7	20	6.02	Ward 5	2nd
Tertiary Road	TR-297		Widening	7	20	29.43	Ward 6	2nd
Tertiary Road	TR-298		Widening	5	20	26.07	Ward 6	2nd
Tertiary Road	TR-299		Widening	5	20	10.05	Ward 6	2nd
Tertiary Road	TR-300		Widening	8	20	12.34	Ward 6	2nd
Tertiary Road	TR-301		Widening	5	20	0.12	Ward 7	2nd
Tertiary Road	TR-301		Widening	5	20	32.12	Ward 9	2nd
Tertiary Road	TR-302		Widening	5	20	0.13	Ward 7	2nd
Tertiary Road	TR-302		Widening	5	20	27.53	Ward 9	2nd
Tertiary Road	TR-303		Widening	6	20	50.30	Ward 8	2nd
Tertiary Road	TR-304		Widening	5	20	19.79	Ward 9	2nd
Tertiary Road	TR-305		Widening	6	20	11.10	Ward 1	2nd
Tertiary Road	TR-306		Widening	5	20	10.21	Ward 1	2nd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-307		Widening	3	20	20.16	Ward 2	2nd
Tertiary Road	TR-308		Widening	8	20	55.93	Ward 2	2nd
Tertiary Road	TR-309		Widening	7	20	37.41	Ward 2	2nd
Tertiary Road	TR-310		Widening	6	20	15.01	Ward 6	2nd
Tertiary Road	TR-311		Widening	4	20	32.56	Ward 9	2nd
Tertiary Road	TR-312		Widening	7	20	14.49	Ward 9	2nd
Tertiary Road	TR-313		Widening	8	20	11.34	Ward 9	2nd
Tertiary Road	TR-314		Widening	8	20	5.63	Ward 9	2nd
Tertiary Road	TR-315		Widening	6	20	6.55	Ward 9	2nd
Tertiary Road	TR-316		Widening	6	20	47.41	Ward 9	2nd
Tertiary Road	TR-317		Widening	6	20	29.82	Ward 9	2nd
Tertiary Road	TR-318		Widening	6	20	19.19	Ward 9	2nd
Tertiary Road	TR-319	Nazirpur Road	Widening	10	20	50.99	Ward 2	2nd
Tertiary Road	TR-319	Nazirpur Road	Widening	10	20	272.93	Ward 9	2nd
Tertiary Road	TR-320		Widening	6	20	147.58	Ward 9	2nd
Tertiary Road	TR-321		Widening	6	20	71.23	Ward 9	2nd
Tertiary Road	TR-322		Widening	7	20	34.02	Ward 9	2nd
Tertiary Road	TR-323		Widening	6	20	8.74	Ward 9	2nd
Tertiary Road	TR-324		Widening	6	20	22.80	Ward 9	2nd
Tertiary Road	TR-325		Widening	5	20	22.66	Ward 9	2nd
Tertiary Road	TR-325		Widening	5	20	45.24	Ward 6	2nd
Tertiary Road	TR-326		Widening	6	20	72.61	Ward 9	2nd
Tertiary Road	TR-327		Widening	5	20	43.64	Ward 9	2nd
Tertiary Road	TR-451		New		20	169.28	Ward 1	3rd
Tertiary Road	TR-452		Widening	6	20	0.79	Ward 1	3rd
Tertiary Road	TR-453		New		20	26.34	Ward 1	3rd
Tertiary Road	TR-454		New		20	41.26	Ward 1	3rd
Tertiary Road	TR-455		New		20	167.90	Ward 1	3rd
Tertiary Road	TR-456		New		20	20.56	Ward 3	3rd
Tertiary Road	TR-457		New		20	68.50	Ward 3	3rd
Tertiary Road	TR-457		New		20	0.14	Ward 2	3rd
Tertiary Road	TR-458		New		20	28.60	Ward 3	3rd
Tertiary Road	TR-459		New		20	48.71	Ward 3	3rd
Tertiary Road	TR-460		New		20	69.99	Ward 3	3rd
Tertiary Road	TR-461		New		20	39.39	Ward 3	3rd
Tertiary Road	TR-462		New		20	0.29	Ward 4	3rd
Tertiary Road	TR-462		New		20	35.95	Ward 3	3rd
Tertiary Road	TR-463		New		20	68.44	Ward 2	3rd
Tertiary Road	TR-464		New		20	136.36	Ward 4	3rd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-465		New		20	44.08	Ward 2	3rd
Tertiary Road	TR-466		New		20	91.80	Ward 9	3rd
Tertiary Road	TR-467		Widening	8	20	7.92	Ward 9	3rd
Tertiary Road	TR-468		Widening	8	20	0.15	Ward 2	3rd
Tertiary Road	TR-468		Widening	8	20	13.55	Ward 9	3rd
Tertiary Road	TR-469		New		20	55.23	Ward 5	3rd
Tertiary Road	TR-470		New		20	97.93	Ward 5	3rd
Tertiary Road	TR-471		New		20	21.80	Ward 5	3rd
Tertiary Road	TR-472		New		20	42.99	Ward 5	3rd
Tertiary Road	TR-473		New		20	204.26	Ward 5	3rd
Tertiary Road	TR-474		New		20	0.14	Ward 7	3rd
Tertiary Road	TR-474		New		20	30.20	Ward 5	3rd
Tertiary Road	TR-475		New		20	0.06	Ward 7	3rd
Tertiary Road	TR-475		New		20	24.73	Ward 5	3rd
Tertiary Road	TR-476		New		20	77.02	Ward 7	3rd
Tertiary Road	TR-477		New		20	20.38	Ward 7	3rd
Tertiary Road	TR-478		New		20	184.10	Ward 8	3rd
Tertiary Road	TR-478		New		20	30.51	Ward 7	3rd
Tertiary Road	TR-479		New		20	27.69	Ward 7	3rd
Tertiary Road	TR-480		New		20	180.59	Ward 7	3rd
Tertiary Road	TR-481		New		20	46.11	Ward 7	3rd
Tertiary Road	TR-482		New		20	105.56	Ward 7	3rd
Tertiary Road	TR-483		New		20	54.29	Ward 8	3rd
Tertiary Road	TR-484		New		20	1.54	Ward 5	3rd
Tertiary Road	TR-484		New		20	34.81	Ward 9	3rd
Tertiary Road	TR-485		New		20	73.44	Ward 9	3rd
Tertiary Road	TR-486		New		20	85.85	Ward 8	3rd
Tertiary Road	TR-487		New		20	47.60	Ward 7	3rd
Tertiary Road	TR-488		New		20	148.76	Ward 8	3rd
Tertiary Road	TR-489		New		20	77.26	Ward 8	3rd
Tertiary Road	TR-490		New		20	114.50	Ward 8	3rd
Tertiary Road	TR-491		New		20	82.20	Ward 8	3rd
Tertiary Road	TR-492		New		20	108.16	Ward 8	3rd
Tertiary Road	TR-493		New		20	83.23	Ward 8	3rd
Tertiary Road	TR-494		New		20	81.62	Ward 8	3rd
Tertiary Road	TR-495		New		20	87.76	Ward 9	3rd
Tertiary Road	TR-496	Chakar Banaripara Road	Widening	10	20	10.82	Ward 1	3rd
Tertiary Road	TR-497	Abashon Road	Widening	11	20	187.75	Ward 1	3rd
Tertiary Road	TR-498		New		20	40.05	Ward 6	3rd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-499		New		20	116.16	Ward 7	3rd
Tertiary Road	TR-500		New		20	14.14	Ward 2	3rd
Tertiary Road	TR-501		New		20	14.49	Ward 2	3rd
Tertiary Road	TR-502		Widening	6	20	60.19	Ward 9	3rd
Tertiary Road	TR-503		Widening	6	20	190.85	Ward 9	3rd
Tertiary Road	TR-504		Widening	13	20	23.05	Ward 6	3rd
Tertiary Road	TR-505		Widening	13	20	12.06	Ward 6	3rd
Tertiary Road	TR-506		New		20	6.03	Ward 9	3rd
Tertiary Road	TR-507		New		20	83.52	Ward 1	3rd
Tertiary Road	TR-508		New		20	45.21	Ward 9	3rd
Tertiary Road	TR-509		New		20	48.55	Ward 9	3rd
Tertiary Road	TR-510		New		20	44.74	Ward 9	3rd
Tertiary Road	TR-511		New		20	81.51	Ward 9	3rd
Tertiary Road	TR-512		New		20	105.66	Ward 9	3rd
Tertiary Road	TR-513		New		20	5.18	Ward 9	3rd
Tertiary Road	TR-514		New		20	10.18	Ward 9	3rd
Tertiary Road	TR-515		New		20	44.91	Ward 9	3rd
Tertiary Road	TR-516		New		20	38.37	Ward 2	3rd
Tertiary Road	TR-517		New		20	27.35	Ward 9	3rd
Tertiary Road	TR-518		New		20	11.86	Ward 9	3rd
Tertiary Road	TR-519		New		20	59.72	Ward 9	3rd
Tertiary Road	TR-519		New		20	0.77	Ward 6	3rd
Tertiary Road	TR-520		New		20	15.27	Ward 9	3rd
Tertiary Road	TR-521		New		20	111.37	Ward 7	3rd
Tertiary Road	TR-522		New		20	26.34	Ward 8	3rd
Tertiary Road	TR-523		New		20	76.89	Ward 8	3rd
Tertiary Road	TR-524		New		20	66.13	Ward 8	3rd
Tertiary Road	TR-525		Widening	5	20	1.76	Ward 5	3rd
Tertiary Road	TR-525		Widening	5	20	199.95	Ward 4	3rd
Tertiary Road	TR-526		Widening	5	20	11.33	Ward 4	3rd
Tertiary Road	TR-527		Widening	4	20	22.17	Ward 4	3rd
Tertiary Road	TR-528		Widening	5	20	26.49	Ward 4	3rd
Tertiary Road	TR-529		Widening	5	20	23.49	Ward 4	3rd
Tertiary Road	TR-530		Widening	5	20	28.00	Ward 4	3rd
Tertiary Road	TR-531		Widening	7	20	22.73	Ward 4	3rd
Tertiary Road	TR-532		Widening	6	20	56.68	Ward 4	3rd
Tertiary Road	TR-533		New		20	151.36	Ward 1	3rd
Tertiary Road	TR-534		New		20	50.50	Ward 1	3rd
Tertiary Road	TR-535		New		20	287.87	Ward 1	3rd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-536		Widening	6	20	39.93	Ward 3	3rd
Tertiary Road	TR-537		Widening	5	20	153.58	Ward 3	3rd
Tertiary Road	TR-538		New		20	441.24	Ward 1	3rd
Tertiary Road	TR-539		New		20	334.15	Ward 1	3rd
Tertiary Road	TR-540		New		20	804.52	Ward 1	3rd
Tertiary Road	TR-541		New		20	186.83	Ward 1	3rd
Tertiary Road	TR-542		New		20	75.55	Ward 1	3rd
Tertiary Road	TR-543		New		20	158.11	Ward 1	3rd
Tertiary Road	TR-544		New		20	158.39	Ward 1	3rd
Tertiary Road	TR-545		New		20	45.28	Ward 5	3rd
Tertiary Road	TR-546		New		20	30.01	Ward 8	3rd
Tertiary Road	TR-546		New		20	250.75	Ward 9	3rd
Tertiary Road	TR-547		New		20	157.42	Ward 9	3rd
Tertiary Road	TR-548		New		20	156.23	Ward 9	3rd
Tertiary Road	TR-549		New		20	3.01	Ward 5	3rd
Tertiary Road	TR-549		New		20	94.87	Ward 9	3rd
Tertiary Road	TR-550		New		20	177.05	Ward 9	3rd
Tertiary Road	TR-551		New		20	227.57	Ward 4	3rd
Tertiary Road	TR-552		New		20	139.31	Ward 4	3rd
Tertiary Road	TR-553		New		20	99.36	Ward 4	3rd
Tertiary Road	TR-554		New		20	0.02	Ward 5	3rd
Tertiary Road	TR-554		New		20	40.16	Ward 4	3rd
Tertiary Road	TR-555		New		20	140.32	Ward 2	3rd
Tertiary Road	TR-556		New		20	118.51	Ward 2	3rd
Tertiary Road	TR-556		New		20	0.29	Ward 9	3rd
Tertiary Road	TR-556		New		20	3.04	Ward 6	3rd
Tertiary Road	TR-557		New		20	101.47	Ward 9	3rd
Tertiary Road	TR-558		New		20	44.82	Ward 9	3rd
Tertiary Road	TR-558		New		20	91.10	Ward 6	3rd
Tertiary Road	TR-560		Widening	3	20	127.91	Ward 2	3rd
Tertiary Road	TR-561		New		20	78.32	Ward 2	3rd
Tertiary Road	TR-562		New		20	51.57	Ward 9	3rd
Tertiary Road	TR-563		New		20	134.87	Ward 9	3rd
Tertiary Road	TR-563		New		20	72.42	Ward 6	3rd
Tertiary Road	TR-564		Widening	4	20	33.26	Ward 9	3rd
Tertiary Road	TR-565		Widening	6	20	22.92	Ward 9	3rd
Tertiary Road	TR-566		New		20	132.21	Ward 9	3rd
Tertiary Road	TR-567		New		20	26.56	Ward 2	3rd
Tertiary Road	TR-567		New		20	154.76	Ward 9	3rd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-568		Widening	6	20	15.12	Ward 9	3rd
Tertiary Road	TR-569		New		20	13.27	Ward 9	3rd
Tertiary Road	TR-570		New		20	124.10	Ward 7	3rd
Tertiary Road	TR-571		New		20	106.97	Ward 9	3rd
Tertiary Road	TR-572		Widening	6	20	20.07	Ward 9	3rd
Tertiary Road	TR-573		New		20	0.95	Ward 5	3rd
Tertiary Road	TR-573		New		20	91.30	Ward 4	3rd
Tertiary Road	TR-574		New		20	77.12	Ward 4	3rd
Tertiary Road	TR-575		New		20	178.52	Ward 4	3rd
Tertiary Road	TR-466		New		20	12.58	Ward 9	3rd
Tertiary Road	TR-524		New		20	0.00	Ward 8	3rd
Tertiary Road	TR-328		Widening	5	20	37.87	Ward 9	3rd
Tertiary Road	TR-329		Widening	5	20	12.41	Ward 9	3rd
Tertiary Road	TR-330		Widening	5	20	43.36	Ward 9	3rd
Tertiary Road	TR-331		Widening	6	20	84.19	Ward 9	3rd
Tertiary Road	TR-332		Widening	5	20	81.02	Ward 9	3rd
Tertiary Road	TR-333		Widening	5	20	26.00	Ward 9	3rd
Tertiary Road	TR-334		Widening	9	20	18.27	Ward 9	3rd
Tertiary Road	TR-335		Widening	6	20	122.28	Ward 9	3rd
Tertiary Road	TR-336		Widening	7	20	24.72	Ward 9	3rd
Tertiary Road	TR-337		Widening	6	20	76.53	Ward 9	3rd
Tertiary Road	TR-338		Widening	8	20	166.92	Ward 9	3rd
Tertiary Road	TR-339		Widening	5	20	27.12	Ward 9	3rd
Tertiary Road	TR-340		Widening	5	20	43.98	Ward 8	3rd
Tertiary Road	TR-340		Widening	5	20	1.17	Ward 9	3rd
Tertiary Road	TR-341		Widening	8	20	108.36	Ward 9	3rd
Tertiary Road	TR-342		Widening	5	20	29.18	Ward 8	3rd
Tertiary Road	TR-343		Widening	8	20	210.68	Ward 8	3rd
Tertiary Road	TR-344		Widening	6	20	123.90	Ward 9	3rd
Tertiary Road	TR-345		Widening	4	20	11.82	Ward 9	3rd
Tertiary Road	TR-346		Widening	10	20	23.78	Ward 9	3rd
Tertiary Road	TR-347		Widening	6	20	27.79	Ward 9	3rd
Tertiary Road	TR-348	Razzakpur Road	Widening	6	20	10.15	Ward 8	3rd
Tertiary Road	TR-348	Razzakpur Road	Widening	6	20	0.99	Ward 8	3rd
Tertiary Road	TR-348	Razzakpur Road	Widening	6	20	0.99	Ward 9	3rd
Tertiary Road	TR-348	Razzakpur Road	Widening	6	20	175.24	Ward 9	3rd
Tertiary Road	TR-349		Widening	5	20	51.17	Ward 8	3rd
Tertiary Road	TR-349		Widening	5	20	2.21	Ward 9	3rd
Tertiary Road	TR-350		Widening	5	20	30.28	Ward 8	3rd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-351	Razakpur Road	Widening	7	20	226.55	Ward 8	3rd
Tertiary Road	TR-351	Razakpur Road	Widening	7	20	2.19	Ward 9	3rd
Tertiary Road	TR-352		Widening	4	20	121.94	Ward 8	3rd
Tertiary Road	TR-353		Widening	4	20	5.59	Ward 8	3rd
Tertiary Road	TR-354		Widening	8	20	35.70	Ward 8	3rd
Tertiary Road	TR-355		Widening	7	20	38.50	Ward 8	3rd
Tertiary Road	TR-356		Widening	5	20	8.29	Ward 8	3rd
Tertiary Road	TR-357		Widening	5	20	8.08	Ward 8	3rd
Tertiary Road	TR-358		Widening	5	20	54.39	Ward 8	3rd
Tertiary Road	TR-358		Widening	5	20	3.89	Ward 9	3rd
Tertiary Road	TR-359		Widening	6	20	19.65	Ward 9	3rd
Tertiary Road	TR-360		Widening	5	20	56.48	Ward 9	3rd
Tertiary Road	TR-361		Widening	6	20	40.79	Ward 9	3rd
Tertiary Road	TR-362		Widening	5	20	16.51	Ward 9	3rd
Tertiary Road	TR-363		Widening	5	20	55.75	Ward 9	3rd
Tertiary Road	TR-364		Widening	5	20	30.24	Ward 9	3rd
Tertiary Road	TR-365		Widening	4	20	53.00	Ward 9	3rd
Tertiary Road	TR-366		Widening	4	20	58.10	Ward 9	3rd
Tertiary Road	TR-368		Widening	6	20	37.42	Ward 9	3rd
Tertiary Road	TR-369		Widening	11	20	27.87	Ward 2	3rd
Tertiary Road	TR-370		Widening	5	20	19.63	Ward 9	3rd
Tertiary Road	TR-371		Widening	7	20	68.61	Ward 7	3rd
Tertiary Road	TR-372		Widening	5	20	63.10	Ward 7	3rd
Tertiary Road	TR-373		Widening	5	20	16.49	Ward 7	3rd
Tertiary Road	TR-374		Widening	5	20	9.26	Ward 7	3rd
Tertiary Road	TR-375		Widening	7	20	115.68	Ward 7	3rd
Tertiary Road	TR-376		Widening	5	20	71.36	Ward 7	3rd
Tertiary Road	TR-377		Widening	6	20	35.10	Ward 7	3rd
Tertiary Road	TR-378		Widening	5	20	25.23	Ward 7	3rd
Tertiary Road	TR-379		Widening	5	20	7.69	Ward 7	3rd
Tertiary Road	TR-380		Widening	4	20	8.59	Ward 8	3rd
Tertiary Road	TR-381		Widening	4	20	11.62	Ward 8	3rd
Tertiary Road	TR-382		Widening	4	20	9.60	Ward 8	3rd
Tertiary Road	TR-383		Widening	4	20	31.00	Ward 8	3rd
Tertiary Road	TR-384		Widening	6	20	9.63	Ward 8	3rd
Tertiary Road	TR-385		Widening	5	20	26.62	Ward 8	3rd
Tertiary Road	TR-386		Widening	5	20	143.33	Ward 8	3rd
Tertiary Road	TR-387		Widening	5	20	36.18	Ward 8	3rd
Tertiary Road	TR-387		Widening	5	20	80.34	Ward 7	3rd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-388		Widening	7	20	75.99	Ward 8	3rd
Tertiary Road	TR-389		Widening	5	20	53.74	Ward 8	3rd
Tertiary Road	TR-390		Widening	5	20	74.69	Ward 8	3rd
Tertiary Road	TR-390		Widening	5	20	56.68	Ward 7	3rd
Tertiary Road	TR-391		Widening	5	20	75.40	Ward 8	3rd
Tertiary Road	TR-392		Widening	4	20	28.58	Ward 8	3rd
Tertiary Road	TR-393		Widening	5	20	176.83	Ward 7	3rd
Tertiary Road	TR-394		Widening	5	20	29.70	Ward 7	3rd
Tertiary Road	TR-395		Widening	5	20	23.77	Ward 7	3rd
Tertiary Road	TR-396		Widening	5	20	89.42	Ward 7	3rd
Tertiary Road	TR-397		Widening	5	20	22.28	Ward 7	3rd
Tertiary Road	TR-398		Widening	4	20	10.42	Ward 7	3rd
Tertiary Road	TR-399		Widening	6	20	18.91	Ward 7	3rd
Tertiary Road	TR-400		Widening	6	20	7.36	Ward 7	3rd
Tertiary Road	TR-401		Widening	5	20	11.42	Ward 7	3rd
Tertiary Road	TR-402		Widening	5	20	6.71	Ward 7	3rd
Tertiary Road	TR-403		Widening	5	20	8.44	Ward 7	3rd
Tertiary Road	TR-404		Widening	5	20	29.77	Ward 8	3rd
Tertiary Road	TR-405		Widening	6	20	22.94	Ward 8	3rd
Tertiary Road	TR-406		Widening	8	20	72.67	Ward 8	3rd
Tertiary Road	TR-407		Widening	6	20	24.48	Ward 8	3rd
Tertiary Road	TR-408		Widening	8	20	24.97	Ward 8	3rd
Tertiary Road	TR-409		Widening	8	20	171.95	Ward 8	3rd
Tertiary Road	TR-410		Widening	5	20	41.50	Ward 8	3rd
Tertiary Road	TR-411		Widening	5	20	43.51	Ward 8	3rd
Tertiary Road	TR-412		Widening	6	20	19.89	Ward 8	3rd
Tertiary Road	TR-413		Widening	6	20	12.50	Ward 8	3rd
Tertiary Road	TR-414		Widening	6	20	83.65	Ward 9	3rd
Tertiary Road	TR-415		Widening	6	20	45.03	Ward 9	3rd
Tertiary Road	TR-416		Widening	6	20	13.08	Ward 9	3rd
Tertiary Road	TR-417		Widening	6	20	72.11	Ward 9	3rd
Tertiary Road	TR-418		Widening	4	20	7.19	Ward 4	3rd
Tertiary Road	TR-418		Widening	4	20	1.28	Ward 6	3rd
Tertiary Road	TR-419		Widening	4	20	9.90	Ward 1	3rd
Tertiary Road	TR-420		Widening	5	20	13.90	Ward 2	3rd
Tertiary Road	TR-421		Widening	5	20	38.34	Ward 9	3rd
Tertiary Road	TR-422		Widening	4	20	17.37	Ward 9	3rd
Tertiary Road	TR-423		Widening	6	20	14.59	Ward 9	3rd
Tertiary Road	TR-424		Widening	6	20	42.22	Ward 9	3rd

Proposed Hierarchy	Proposed Road ID	Road Name	Proposed Type	Existing width (ft)	Proposed width (ft)	Length (m)	Ward No.	Phasing
Tertiary Road	TR-425		Widening	7	20	22.34	Ward 5	3rd
Tertiary Road	TR-425		Widening	7	20	2.29	Ward 6	3rd
Tertiary Road	TR-426		Widening	6	20	14.24	Ward 5	3rd
Tertiary Road	TR-426		Widening	6	20	1.68	Ward 6	3rd
Tertiary Road	TR-427		Widening	6	20	15.62	Ward 5	3rd
Tertiary Road	TR-428		Widening	6	20	20.77	Ward 5	3rd
Tertiary Road	TR-429		Widening	7	20	138.73	Ward 4	3rd
Tertiary Road	TR-430		Widening	8	20	27.62	Ward 5	3rd
Tertiary Road	TR-431		Widening	7	20	63.94	Ward 8	3rd
Tertiary Road	TR-432		Widening	5	20	7.71	Ward 7	3rd
Tertiary Road	TR-433		Widening	6	20	36.52	Ward 7	3rd
Tertiary Road	TR-434		Widening	6	20	58.74	Ward 7	3rd
Tertiary Road	TR-435		Widening	5	20	36.44	Ward 7	3rd
Tertiary Road	TR-436		Widening	8	20	50.28	Ward 7	3rd
Tertiary Road	TR-437		Widening	6	20	33.55	Ward 7	3rd
Tertiary Road	TR-438		Widening	6	20	0.09	Ward 8	3rd
Tertiary Road	TR-438		Widening	6	20	5.60	Ward 9	3rd
Tertiary Road	TR-439		Widening	6	20	21.83	Ward 8	3rd
Tertiary Road	TR-440		Widening	6	20	18.88	Ward 8	3rd
Tertiary Road	TR-441		Widening	6	20	7.15	Ward 8	3rd
Tertiary Road	TR-442		Widening	5	20	25.73	Ward 8	3rd
Tertiary Road	TR-443		Widening	12	20	78.31	Ward 8	3rd
Tertiary Road	TR-444		Widening	5	20	25.21	Ward 8	3rd
Tertiary Road	TR-445		Widening	4	20	6.92	Ward 8	3rd
Tertiary Road	TR-446		Widening	4	20	9.26	Ward 8	3rd
Tertiary Road	TR-447		Widening	12	20	25.37	Ward 9	3rd
Tertiary Road	TR-448		Widening	5	20	33.19	Ward 9	3rd
Tertiary Road	TR-449		Widening	7	20	133.37	Ward 9	3rd
Tertiary Road	TR-450		Widening	5	20	13.43	Ward 9	3rd
Tertiary Road	TR-576		Widening	4	20	19.26	Ward 1	3rd
Tertiary Road	TR-164		Widening	5	20	12.58	Ward 9	3rd
Tertiary Road	TR-358		Widening	5	20	0.00	Ward 8	3rd

Table F1: Proposed Drain Inventory

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
SD-1	Secondary Drain	New	3.50-4.50	171.27	1.25-2.25	Ward 2	1st Phase
SD-2	Secondary Drain	New	3.50-4.50	234.14	1.25-2.25	Ward 3	1st Phase
SD-2	Secondary Drain	New	3.50-4.50	6.17	1.25-2.25	Ward 2	1st Phase
SD-3	Secondary Drain	New	3.50-4.50	299.18	1.25-2.25	Ward 1	1st Phase
SD-4	Secondary Drain	New	3.50-4.50	103.06	1.25-2.25	Ward 4	1st Phase
SD-4	Secondary Drain	New	3.50-4.50	93.59	1.25-2.25	Ward 3	1st Phase
SD-5	Secondary Drain	New	3.50-4.50	223.23	1.25-2.25	Ward 2	1st Phase
SD-6	Secondary Drain	New	3.50-4.50	57.34	1.25-2.25	Ward 2	1st Phase
SD-7	Secondary Drain	New	3.50-4.50	56.03	1.25-2.25	Ward 2	1st Phase
PD-1	Primary Drain	New	4.50-5.50	404.46	2.25-3.50	Ward 8	1st Phase
PD-1	Primary Drain	New	4.50-5.50	130.72	2.25-3.50	Ward 9	1st Phase
PD-2	Primary Drain	New	4.50-5.50	270.28	2.25-3.50	Ward 3	1st Phase
PD-2	Primary Drain	New	4.50-5.50	6.01	2.25-3.50	Ward 2	1st Phase
TD-399	Tertiary Drain	New	2.50-3.50	45.93	0.64-1.25	Ward 9	1st Phase
TD-401	Tertiary Drain	New	2.50-3.50	66.90	0.64-1.25	Ward 5	1st Phase
SD-36	Secondary Drain	New	3.50-4.50	0.12	1.25-2.25	Ward 1	1st Phase
SD-37	Secondary Drain	New	3.50-4.50	67.99	1.25-2.25	Ward 1	1st Phase
SD-38	Secondary Drain	New	3.50-4.50	65.95	1.25-2.25	Ward 1	1st Phase
SD-39	Secondary Drain	New	3.50-4.50	159.77	1.25-2.25	Ward 1	1st Phase
SD-40	Secondary Drain	New	3.50-4.50	84.34	1.25-2.25	Ward 1	1st Phase
SD-41	Secondary Drain	New	3.50-4.50	29.76	1.25-2.25	Ward 2	1st Phase
TD-410	Tertiary Drain	New	2.50-3.50	53.78	0.64-1.25	Ward 9	1st Phase
TD-411	Tertiary Drain	New	2.50-3.50	13.43	0.64-1.25	Ward 2	1st Phase
TD-411	Tertiary Drain	New	2.50-3.50	108.31	0.64-1.25	Ward 9	1st Phase
SD-47	Secondary Drain	New	3.50-4.50	118.02	1.25-2.25	Ward 1	1st Phase
SD-48	Secondary Drain	New	3.50-4.50	52.19	1.25-2.25	Ward 1	1st Phase
SD-49	Secondary Drain	New	3.50-4.50	181.49	1.25-2.25	Ward 1	1st Phase
SD-50	Secondary Drain	New	3.50-4.50	11.43	1.25-2.25	Ward 2	1st Phase
SD-51	Secondary Drain	New	3.50-4.50	26.43	1.25-2.25	Ward 2	1st Phase
SD-52	Secondary Drain	New	3.50-4.50	0.20	1.25-2.25	Ward 2	1st Phase
SD-53	Secondary Drain	New	3.50-4.50	71.14	1.25-2.25	Ward 2	1st Phase
SD-54	Secondary Drain	New	3.50-4.50	102.50	1.25-2.25	Ward 2	1st Phase
SD-55	Secondary Drain	New	3.50-4.50	15.78	1.25-2.25	Ward 2	1st Phase
SD-56	Secondary Drain	New	3.50-4.50	52.61	1.25-2.25	Ward 2	1st Phase
SD-57	Secondary Drain	New	3.50-4.50	19.17	1.25-2.25	Ward 2	1st Phase
TD-422	Tertiary Drain	New	2.50-3.50	38.50	0.64-1.25	Ward 9	1st Phase
TD-423	Tertiary Drain	New	2.50-3.50	39.74	0.64-1.25	Ward 9	1st Phase
TD-424	Tertiary Drain	New	2.50-3.50	0.06	0.64-1.25	Ward 9	1st Phase
TD-425	Tertiary Drain	New	2.50-3.50	124.68	0.64-1.25	Ward 9	1st Phase
SD-58	Secondary Drain	New	3.50-4.50	96.90	1.25-2.25	Ward 2	1st Phase
SD-59	Secondary Drain	New	3.50-4.50	55.46	1.25-2.25	Ward 2	1st Phase
TD-431	Tertiary Drain	New	2.50-3.50	39.37	0.64-1.25	Ward 4	1st Phase
TD-1	Tertiary Drain	New	2.50-3.50	215.31	0.64-1.25	Ward 1	2nd Phase
TD-2	Tertiary Drain	New	2.50-3.50	149.54	0.64-1.25	Ward 1	2nd Phase
TD-3	Tertiary Drain	New	2.50-3.50	202.87	0.64-1.25	Ward 1	2nd Phase
TD-4	Tertiary Drain	New	2.50-3.50	30.71	0.64-1.25	Ward 1	2nd Phase
TD-5	Tertiary Drain	New	2.50-3.50	30.42	0.64-1.25	Ward 1	2nd Phase
TD-6	Tertiary Drain	New	2.50-3.50	60.23	0.64-1.25	Ward 1	2nd Phase
TD-7	Tertiary Drain	New	2.50-3.50	45.89	0.64-1.25	Ward 1	2nd Phase
TD-8	Tertiary Drain	New	2.50-3.50	25.85	0.64-1.25	Ward 1	2nd Phase
TD-9	Tertiary Drain	New	2.50-3.50	91.24	0.64-1.25	Ward 1	2nd Phase
TD-10	Tertiary Drain	New	2.50-3.50	33.83	0.64-1.25	Ward 1	2nd Phase
TD-11	Tertiary Drain	New	2.50-3.50	96.22	0.64-1.25	Ward 1	2nd Phase
TD-12	Tertiary Drain	New	2.50-3.50	44.76	0.64-1.25	Ward 1	2nd Phase
TD-13	Tertiary Drain	New	2.50-3.50	27.07	0.64-1.25	Ward 1	2nd Phase
TD-14	Tertiary Drain	New	2.50-3.50	63.72	0.64-1.25	Ward 1	2nd Phase
TD-15	Tertiary Drain	New	2.50-3.50	20.11	0.64-1.25	Ward 1	2nd Phase
TD-16	Tertiary Drain	New	2.50-3.50	43.81	0.64-1.25	Ward 1	2nd Phase
TD-17	Tertiary Drain	New	2.50-3.50	19.50	0.64-1.25	Ward 1	2nd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
TD-18	Tertiary Drain	New	2.50-3.50	29.57	0.64-1.25	Ward 1	2nd Phase
TD-19	Tertiary Drain	New	2.50-3.50	54.50	0.64-1.25	Ward 1	2nd Phase
TD-20	Tertiary Drain	New	2.50-3.50	19.39	0.64-1.25	Ward 1	2nd Phase
TD-21	Tertiary Drain	New	2.50-3.50	24.62	0.64-1.25	Ward 1	2nd Phase
TD-22	Tertiary Drain	New	2.50-3.50	45.10	0.64-1.25	Ward 1	2nd Phase
TD-23	Tertiary Drain	New	2.50-3.50	28.32	0.64-1.25	Ward 1	2nd Phase
TD-24	Tertiary Drain	New	2.50-3.50	28.87	0.64-1.25	Ward 1	2nd Phase
TD-25	Tertiary Drain	New	2.50-3.50	50.30	0.64-1.25	Ward 1	2nd Phase
TD-26	Tertiary Drain	New	2.50-3.50	12.20	0.64-1.25	Ward 1	2nd Phase
TD-27	Tertiary Drain	New	2.50-3.50	29.19	0.64-1.25	Ward 1	2nd Phase
TD-28	Tertiary Drain	New	2.50-3.50	24.79	0.64-1.25	Ward 1	2nd Phase
TD-29	Tertiary Drain	New	2.50-3.50	15.82	0.64-1.25	Ward 1	2nd Phase
TD-30	Tertiary Drain	New	2.50-3.50	13.28	0.64-1.25	Ward 1	2nd Phase
TD-31	Tertiary Drain	New	2.50-3.50	7.61	0.64-1.25	Ward 1	2nd Phase
TD-32	Tertiary Drain	New	2.50-3.50	6.80	0.64-1.25	Ward 1	2nd Phase
TD-33	Tertiary Drain	New	2.50-3.50	22.74	0.64-1.25	Ward 1	2nd Phase
TD-34	Tertiary Drain	New	2.50-3.50	11.98	0.64-1.25	Ward 1	2nd Phase
TD-35	Tertiary Drain	New	2.50-3.50	30.82	0.64-1.25	Ward 1	2nd Phase
TD-36	Tertiary Drain	New	2.50-3.50	23.06	0.64-1.25	Ward 1	2nd Phase
TD-37	Tertiary Drain	New	2.50-3.50	26.69	0.64-1.25	Ward 1	2nd Phase
TD-38	Tertiary Drain	New	2.50-3.50	32.85	0.64-1.25	Ward 2	2nd Phase
TD-39	Tertiary Drain	New	2.50-3.50	29.26	0.64-1.25	Ward 2	2nd Phase
TD-40	Tertiary Drain	New	2.50-3.50	54.29	0.64-1.25	Ward 2	2nd Phase
TD-41	Tertiary Drain	New	2.50-3.50	61.01	0.64-1.25	Ward 2	2nd Phase
TD-42	Tertiary Drain	New	2.50-3.50	59.27	0.64-1.25	Ward 2	2nd Phase
TD-43	Tertiary Drain	New	2.50-3.50	20.01	0.64-1.25	Ward 2	2nd Phase
TD-44	Tertiary Drain	New	2.50-3.50	47.42	0.64-1.25	Ward 2	2nd Phase
TD-45	Tertiary Drain	New	2.50-3.50	76.20	0.64-1.25	Ward 2	2nd Phase
TD-46	Tertiary Drain	New	2.50-3.50	59.88	0.64-1.25	Ward 2	2nd Phase
TD-47	Tertiary Drain	New	2.50-3.50	24.12	0.64-1.25	Ward 2	2nd Phase
TD-48	Tertiary Drain	New	2.50-3.50	11.61	0.64-1.25	Ward 2	2nd Phase
TD-49	Tertiary Drain	New	2.50-3.50	12.37	0.64-1.25	Ward 2	2nd Phase
TD-50	Tertiary Drain	New	2.50-3.50	14.83	0.64-1.25	Ward 2	2nd Phase
TD-51	Tertiary Drain	New	2.50-3.50	36.06	0.64-1.25	Ward 2	2nd Phase
TD-52	Tertiary Drain	New	2.50-3.50	18.30	0.64-1.25	Ward 2	2nd Phase
TD-53	Tertiary Drain	New	2.50-3.50	19.67	0.64-1.25	Ward 2	2nd Phase
TD-54	Tertiary Drain	New	2.50-3.50	58.71	0.64-1.25	Ward 2	2nd Phase
TD-55	Tertiary Drain	New	2.50-3.50	30.95	0.64-1.25	Ward 2	2nd Phase
TD-56	Tertiary Drain	New	2.50-3.50	31.15	0.64-1.25	Ward 2	2nd Phase
TD-57	Tertiary Drain	New	2.50-3.50	52.16	0.64-1.25	Ward 2	2nd Phase
TD-58	Tertiary Drain	New	2.50-3.50	43.37	0.64-1.25	Ward 3	2nd Phase
TD-58	Tertiary Drain	New	2.50-3.50	6.38	0.64-1.25	Ward 2	2nd Phase
TD-59	Tertiary Drain	New	2.50-3.50	27.51	0.64-1.25	Ward 3	2nd Phase
TD-60	Tertiary Drain	New	2.50-3.50	77.44	0.64-1.25	Ward 3	2nd Phase
TD-61	Tertiary Drain	New	2.50-3.50	73.36	0.64-1.25	Ward 3	2nd Phase
TD-62	Tertiary Drain	New	2.50-3.50	19.00	0.64-1.25	Ward 3	2nd Phase
TD-63	Tertiary Drain	New	2.50-3.50	94.46	0.64-1.25	Ward 3	2nd Phase
TD-64	Tertiary Drain	New	2.50-3.50	80.82	0.64-1.25	Ward 1	2nd Phase
TD-65	Tertiary Drain	New	2.50-3.50	91.27	0.64-1.25	Ward 1	2nd Phase
TD-66	Tertiary Drain	New	2.50-3.50	21.88	0.64-1.25	Ward 1	2nd Phase
TD-67	Tertiary Drain	New	2.50-3.50	119.89	0.64-1.25	Ward 1	2nd Phase
TD-68	Tertiary Drain	New	2.50-3.50	125.00	0.64-1.25	Ward 1	2nd Phase
TD-69	Tertiary Drain	New	2.50-3.50	105.94	0.64-1.25	Ward 1	2nd Phase
TD-70	Tertiary Drain	New	2.50-3.50	78.69	0.64-1.25	Ward 1	2nd Phase
TD-71	Tertiary Drain	New	2.50-3.50	72.50	0.64-1.25	Ward 2	2nd Phase
TD-72	Tertiary Drain	New	2.50-3.50	29.07	0.64-1.25	Ward 2	2nd Phase
TD-73	Tertiary Drain	New	2.50-3.50	70.90	0.64-1.25	Ward 2	2nd Phase
TD-74	Tertiary Drain	New	2.50-3.50	72.76	0.64-1.25	Ward 2	2nd Phase
TD-75	Tertiary Drain	New	2.50-3.50	40.22	0.64-1.25	Ward 2	2nd Phase
TD-76	Tertiary Drain	New	2.50-3.50	72.29	0.64-1.25	Ward 2	2nd Phase
TD-77	Tertiary Drain	New	2.50-3.50	14.11	0.64-1.25	Ward 2	2nd Phase
TD-78	Tertiary Drain	New	2.50-3.50	29.41	0.64-1.25	Ward 2	2nd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
TD-79	Tertiary Drain	New	2.50-3.50	51.54	0.64-1.25	Ward 2	2nd Phase
TD-80	Tertiary Drain	New	2.50-3.50	35.13	0.64-1.25	Ward 2	2nd Phase
TD-81	Tertiary Drain	New	2.50-3.50	35.59	0.64-1.25	Ward 2	2nd Phase
TD-82	Tertiary Drain	New	2.50-3.50	32.94	0.64-1.25	Ward 2	2nd Phase
TD-83	Tertiary Drain	New	2.50-3.50	40.70	0.64-1.25	Ward 2	2nd Phase
TD-84	Tertiary Drain	New	2.50-3.50	14.64	0.64-1.25	Ward 2	2nd Phase
TD-85	Tertiary Drain	New	2.50-3.50	67.81	0.64-1.25	Ward 2	2nd Phase
TD-86	Tertiary Drain	New	2.50-3.50	83.58	0.64-1.25	Ward 2	2nd Phase
TD-87	Tertiary Drain	New	2.50-3.50	59.52	0.64-1.25	Ward 2	2nd Phase
TD-88	Tertiary Drain	New	2.50-3.50	23.88	0.64-1.25	Ward 2	2nd Phase
TD-89	Tertiary Drain	New	2.50-3.50	19.33	0.64-1.25	Ward 2	2nd Phase
TD-90	Tertiary Drain	New	2.50-3.50	40.69	0.64-1.25	Ward 2	2nd Phase
TD-91	Tertiary Drain	New	2.50-3.50	145.96	0.64-1.25	Ward 2	2nd Phase
TD-92	Tertiary Drain	New	2.50-3.50	170.89	0.64-1.25	Ward 2	2nd Phase
TD-92	Tertiary Drain	New	2.50-3.50	0.67	0.64-1.25	Ward 9	2nd Phase
TD-93	Tertiary Drain	New	2.50-3.50	15.66	0.64-1.25	Ward 2	2nd Phase
TD-96	Tertiary Drain	New	2.50-3.50	83.93	0.64-1.25	Ward 2	2nd Phase
TD-98	Tertiary Drain	New	2.50-3.50	46.48	0.64-1.25	Ward 2	2nd Phase
TD-99	Tertiary Drain	New	2.50-3.50	17.31	0.64-1.25	Ward 2	2nd Phase
TD-100	Tertiary Drain	New	2.50-3.50	60.64	0.64-1.25	Ward 2	2nd Phase
TD-101	Tertiary Drain	New	2.50-3.50	13.21	0.64-1.25	Ward 2	2nd Phase
TD-102	Tertiary Drain	New	2.50-3.50	23.31	0.64-1.25	Ward 2	2nd Phase
TD-103	Tertiary Drain	New	2.50-3.50	20.58	0.64-1.25	Ward 2	2nd Phase
TD-104	Tertiary Drain	New	2.50-3.50	51.24	0.64-1.25	Ward 2	2nd Phase
TD-105	Tertiary Drain	New	2.50-3.50	50.24	0.64-1.25	Ward 2	2nd Phase
TD-106	Tertiary Drain	New	2.50-3.50	111.21	0.64-1.25	Ward 3	2nd Phase
TD-106	Tertiary Drain	New	2.50-3.50	7.34	0.64-1.25	Ward 2	2nd Phase
TD-107	Tertiary Drain	New	2.50-3.50	26.07	0.64-1.25	Ward 3	2nd Phase
TD-107	Tertiary Drain	New	2.50-3.50	7.47	0.64-1.25	Ward 2	2nd Phase
TD-108	Tertiary Drain	New	2.50-3.50	88.39	0.64-1.25	Ward 2	2nd Phase
TD-109	Tertiary Drain	New	2.50-3.50	85.81	0.64-1.25	Ward 2	2nd Phase
TD-110	Tertiary Drain	New	2.50-3.50	130.50	0.64-1.25	Ward 2	2nd Phase
TD-111	Tertiary Drain	New	2.50-3.50	105.12	0.64-1.25	Ward 2	2nd Phase
TD-111	Tertiary Drain	New	2.50-3.50	3.91	0.64-1.25	Ward 9	2nd Phase
TD-112	Tertiary Drain	New	2.50-3.50	31.04	0.64-1.25	Ward 2	2nd Phase
TD-113	Tertiary Drain	New	2.50-3.50	56.55	0.64-1.25	Ward 2	2nd Phase
TD-114	Tertiary Drain	New	2.50-3.50	42.05	0.64-1.25	Ward 2	2nd Phase
TD-115	Tertiary Drain	New	2.50-3.50	45.62	0.64-1.25	Ward 9	2nd Phase
TD-116	Tertiary Drain	New	2.50-3.50	281.45	0.64-1.25	Ward 9	2nd Phase
TD-116	Tertiary Drain	New	2.50-3.50	86.24	0.64-1.25	Ward 6	2nd Phase
TD-117	Tertiary Drain	New	2.50-3.50	52.16	0.64-1.25	Ward 9	2nd Phase
TD-118	Tertiary Drain	New	2.50-3.50	63.83	0.64-1.25	Ward 9	2nd Phase
TD-119	Tertiary Drain	New	2.50-3.50	23.13	0.64-1.25	Ward 9	2nd Phase
TD-121	Tertiary Drain	New	2.50-3.50	84.09	0.64-1.25	Ward 3	2nd Phase
TD-121	Tertiary Drain	New	2.50-3.50	12.98	0.64-1.25	Ward 2	2nd Phase
TD-122	Tertiary Drain	New	2.50-3.50	59.94	0.64-1.25	Ward 3	2nd Phase
TD-123	Tertiary Drain	New	2.50-3.50	28.63	0.64-1.25	Ward 3	2nd Phase
TD-124	Tertiary Drain	New	2.50-3.50	57.82	0.64-1.25	Ward 2	2nd Phase
TD-124	Tertiary Drain	New	2.50-3.50	19.04	0.64-1.25	Ward 6	2nd Phase
TD-125	Tertiary Drain	New	2.50-3.50	182.50	0.64-1.25	Ward 4	2nd Phase
SD-8	Secondary Drain	New	3.50-4.50	151.02	1.25-2.25	Ward 2	2nd Phase
SD-8	Secondary Drain	New	3.50-4.50	259.95	1.25-2.25	Ward 6	2nd Phase
TD-126	Tertiary Drain	New	2.50-3.50	35.56	0.64-1.25	Ward 4	2nd Phase
SD-9	Secondary Drain	New	3.50-4.50	151.80	1.25-2.25	Ward 5	2nd Phase
SD-9	Secondary Drain	New	3.50-4.50	204.90	1.25-2.25	Ward 4	2nd Phase
SD-10	Secondary Drain	New	3.50-4.50	1.05	1.25-2.25	Ward 5	2nd Phase
SD-10	Secondary Drain	New	3.50-4.50	216.93	1.25-2.25	Ward 4	2nd Phase
TD-127	Tertiary Drain	New	2.50-3.50	40.43	0.64-1.25	Ward 4	2nd Phase
TD-128	Tertiary Drain	New	2.50-3.50	44.01	0.64-1.25	Ward 4	2nd Phase
TD-129	Tertiary Drain	New	2.50-3.50	28.12	0.64-1.25	Ward 4	2nd Phase
TD-129	Tertiary Drain	New	2.50-3.50	6.37	0.64-1.25	Ward 3	2nd Phase
TD-130	Tertiary Drain	New	2.50-3.50	102.81	0.64-1.25	Ward 4	2nd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
TD-130	Tertiary Drain	New	2.50-3.50	5.95	0.64-1.25	Ward 2	2nd Phase
TD-131	Tertiary Drain	New	2.50-3.50	38.96	0.64-1.25	Ward 6	2nd Phase
TD-132	Tertiary Drain	New	2.50-3.50	66.31	0.64-1.25	Ward 3	2nd Phase
TD-133	Tertiary Drain	New	2.50-3.50	28.47	0.64-1.25	Ward 4	2nd Phase
SD-11	Secondary Drain	New	3.50-4.50	82.64	1.25-2.25	Ward 4	2nd Phase
SD-12	Secondary Drain	New	3.50-4.50	55.31	1.25-2.25	Ward 4	2nd Phase
TD-134	Tertiary Drain	New	2.50-3.50	22.87	0.64-1.25	Ward 4	2nd Phase
TD-135	Tertiary Drain	New	2.50-3.50	33.98	0.64-1.25	Ward 4	2nd Phase
TD-136	Tertiary Drain	New	2.50-3.50	61.88	0.64-1.25	Ward 4	2nd Phase
TD-137	Tertiary Drain	New	2.50-3.50	19.40	0.64-1.25	Ward 4	2nd Phase
TD-138	Tertiary Drain	New	2.50-3.50	24.09	0.64-1.25	Ward 4	2nd Phase
TD-138	Tertiary Drain	New	2.50-3.50	6.84	0.64-1.25	Ward 6	2nd Phase
TD-139	Tertiary Drain	New	2.50-3.50	122.19	0.64-1.25	Ward 4	2nd Phase
TD-140	Tertiary Drain	New	2.50-3.50	30.54	0.64-1.25	Ward 4	2nd Phase
TD-141	Tertiary Drain	New	2.50-3.50	40.47	0.64-1.25	Ward 4	2nd Phase
TD-142	Tertiary Drain	New	2.50-3.50	38.52	0.64-1.25	Ward 4	2nd Phase
TD-143	Tertiary Drain	New	2.50-3.50	22.41	0.64-1.25	Ward 4	2nd Phase
TD-144	Tertiary Drain	New	2.50-3.50	85.56	0.64-1.25	Ward 4	2nd Phase
TD-145	Tertiary Drain	New	2.50-3.50	57.82	0.64-1.25	Ward 4	2nd Phase
TD-146	Tertiary Drain	New	2.50-3.50	25.79	0.64-1.25	Ward 4	2nd Phase
TD-147	Tertiary Drain	New	2.50-3.50	21.49	0.64-1.25	Ward 4	2nd Phase
TD-148	Tertiary Drain	New	2.50-3.50	35.44	0.64-1.25	Ward 4	2nd Phase
TD-149	Tertiary Drain	New	2.50-3.50	35.16	0.64-1.25	Ward 5	2nd Phase
TD-149	Tertiary Drain	New	2.50-3.50	2.14	0.64-1.25	Ward 4	2nd Phase
SD-13	Secondary Drain	New	3.50-4.50	373.10	1.25-2.25	Ward 9	2nd Phase
SD-13	Secondary Drain	New	3.50-4.50	75.30	1.25-2.25	Ward 6	2nd Phase
TD-202	Tertiary Drain	New	2.50-3.50	198.13	0.64-1.25	Ward 9	2nd Phase
SD-14	Secondary Drain	New	3.50-4.50	280.15	1.25-2.25	Ward 9	2nd Phase
SD-15	Secondary Drain	New	3.50-4.50	209.04	1.25-2.25	Ward 9	2nd Phase
SD-16	Secondary Drain	New	3.50-4.50	356.85	1.25-2.25	Ward 8	2nd Phase
SD-18	Secondary Drain	New	3.50-4.50	427.39	1.25-2.25	Ward 7	2nd Phase
SD-18	Secondary Drain	New	3.50-4.50	5.14	1.25-2.25	Ward 5	2nd Phase
TD-256	Tertiary Drain	New	2.50-3.50	189.20	0.64-1.25	Ward 8	2nd Phase
SD-19	Secondary Drain	New	3.50-4.50	98.70	1.25-2.25	Ward 2	2nd Phase
SD-19	Secondary Drain	New	3.50-4.50	230.23	1.25-2.25	Ward 9	2nd Phase
SD-20	Secondary Drain	New	3.50-4.50	193.94	1.25-2.25	Ward 5	2nd Phase
SD-21	Secondary Drain	New	3.50-4.50	354.80	1.25-2.25	Ward 2	2nd Phase
TD-338	Tertiary Drain	New	2.50-3.50	186.88	0.64-1.25	Ward 9	2nd Phase
TD-338	Tertiary Drain	New	2.50-3.50	35.27	0.64-1.25	Ward 6	2nd Phase
SD-22	Secondary Drain	New	3.50-4.50	70.93	1.25-2.25	Ward 8	2nd Phase
SD-22	Secondary Drain	New	3.50-4.50	255.75	1.25-2.25	Ward 9	2nd Phase
SD-23	Secondary Drain	New	3.50-4.50	151.57	1.25-2.25	Ward 9	2nd Phase
SD-23	Secondary Drain	New	3.50-4.50	65.58	1.25-2.25	Ward 6	2nd Phase
SD-24	Secondary Drain	New	3.50-4.50	174.82	1.25-2.25	Ward 1	2nd Phase
TD-396	Tertiary Drain	New	2.50-3.50	148.26	0.64-1.25	Ward 2	2nd Phase
TD-398	Tertiary Drain	New	2.50-3.50	123.61	0.64-1.25	Ward 6	2nd Phase
SD-28	Secondary Drain	New	3.50-4.50	138.84	1.25-2.25	Ward 9	2nd Phase
SD-29	Secondary Drain	New	3.50-4.50	40.51	1.25-2.25	Ward 5	2nd Phase
SD-29	Secondary Drain	New	3.50-4.50	6.81	1.25-2.25	Ward 6	2nd Phase
SD-33	Secondary Drain	New	3.50-4.50	144.99	1.25-2.25	Ward 8	2nd Phase
SD-33	Secondary Drain	New	3.50-4.50	108.48	1.25-2.25	Ward 7	2nd Phase
TD-408	Tertiary Drain	New	2.50-3.50	12.46	0.64-1.25	Ward 1	2nd Phase
TD-409	Tertiary Drain	New	2.50-3.50	59.74	0.64-1.25	Ward 2	2nd Phase
SD-42	Secondary Drain	New	3.50-4.50	328.00	1.25-2.25	Ward 8	2nd Phase
TD-413	Tertiary Drain	New	2.50-3.50	188.59	0.64-1.25	Ward 1	2nd Phase
TD-414	Tertiary Drain	New	2.50-3.50	65.21	0.64-1.25	Ward 4	2nd Phase
SD-43	Secondary Drain	New	3.50-4.50	202.64	1.25-2.25	Ward 1	2nd Phase
SD-44	Secondary Drain	New	3.50-4.50	80.71	1.25-2.25	Ward 1	2nd Phase
SD-45	Secondary Drain	New	3.50-4.50	24.20	1.25-2.25	Ward 1	2nd Phase
SD-46	Secondary Drain	New	3.50-4.50	78.56	1.25-2.25	Ward 1	2nd Phase
TD-416	Tertiary Drain	New	2.50-3.50	26.81	0.64-1.25	Ward 2	2nd Phase
TD-417	Tertiary Drain	New	2.50-3.50	31.98	0.64-1.25	Ward 2	2nd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
TD-418	Tertiary Drain	New	2.50-3.50	25.77	0.64-1.25	Ward 2	2nd Phase
TD-419	Tertiary Drain	New	2.50-3.50	77.55	0.64-1.25	Ward 2	2nd Phase
TD-420	Tertiary Drain	New	2.50-3.50	61.79	0.64-1.25	Ward 2	2nd Phase
TD-421	Tertiary Drain	New	2.50-3.50	37.54	0.64-1.25	Ward 2	2nd Phase
TD-426	Tertiary Drain	New	2.50-3.50	113.12	0.64-1.25	Ward 2	2nd Phase
TD-427	Tertiary Drain	New	2.50-3.50	3.88	0.64-1.25	Ward 2	2nd Phase
TD-428	Tertiary Drain	New	2.50-3.50	73.30	0.64-1.25	Ward 2	2nd Phase
TD-428	Tertiary Drain	New	2.50-3.50	88.78	0.64-1.25	Ward 9	2nd Phase
TD-429	Tertiary Drain	New	2.50-3.50	36.73	0.64-1.25	Ward 2	2nd Phase
SD-62	Secondary Drain	New	3.50-4.50	201.49	1.25-2.25	Ward 4	2nd Phase
SD-63	Secondary Drain	New	3.50-4.50	72.29	1.25-2.25	Ward 7	2nd Phase
TD-435	Tertiary Drain	New	2.50-3.50	256.64	0.64-1.25	Ward 9	2nd Phase
TD-436	Tertiary Drain	New	2.50-3.50	51.55	0.64-1.25	Ward 4	2nd Phase
SD-64	Secondary Drain	New	3.50-4.50	62.76	1.25-2.25	Ward 4	2nd Phase
TD-439	Tertiary Drain	New	2.50-3.50	66.30	0.64-1.25	Ward 2	2nd Phase
SD-65	Secondary Drain	New	3.50-4.50	42.68	1.25-2.25	Ward 5	2nd Phase
SD-66	Secondary Drain	New	3.50-4.50	87.10	1.25-2.25	Ward 4	2nd Phase
SD-67	Secondary Drain	New	3.50-4.50	73.20	1.25-2.25	Ward 5	2nd Phase
SD-68	Secondary Drain	New	3.50-4.50	218.16	1.25-2.25	Ward 5	2nd Phase
SD-69	Secondary Drain	New	3.50-4.50	195.25	1.25-2.25	Ward 2	2nd Phase
SD-70	Secondary Drain	New	3.50-4.50	68.85	1.25-2.25	Ward 5	2nd Phase
SD-70	Secondary Drain	New	3.50-4.50	209.88	1.25-2.25	Ward 4	2nd Phase
SD-70	Secondary Drain	New	3.50-4.50	41.42	1.25-2.25	Ward 2	2nd Phase
SD-71	Secondary Drain	New	3.50-4.50	0.72	1.25-2.25	Ward 2	2nd Phase
SD-72	Secondary Drain	New	3.50-4.50	0.85	1.25-2.25	Ward 2	2nd Phase
SD-73	Secondary Drain	New	3.50-4.50	2.31	1.25-2.25	Ward 2	2nd Phase
SD-74	Secondary Drain	New	3.50-4.50	64.77	1.25-2.25	Ward 1	2nd Phase
SD-75	Secondary Drain	New	3.50-4.50	251.51	1.25-2.25	Ward 2	2nd Phase
SD-76	Secondary Drain	New	3.50-4.50	5.15	1.25-2.25	Ward 4	2nd Phase
SD-76	Secondary Drain	New	3.50-4.50	88.67	1.25-2.25	Ward 3	2nd Phase
SD-76	Secondary Drain	New	3.50-4.50	6.08	1.25-2.25	Ward 2	2nd Phase
TD-2	Tertiary Drain	New	2.50-3.50	143.77	0.64-1.25	Ward 1	2nd Phase
SD-26	Secondary Drain	New	3.50-4.50	91.83	1.25-2.25	Ward 2	2nd Phase
SD-26	Secondary Drain	New	3.50-4.50	63.55	1.25-2.25	Ward 2	2nd Phase
SD-14	Secondary Drain	New	3.50-4.50	0.12	1.25-2.25	Ward 2	2nd Phase
SD-8	Secondary Drain	New	3.50-4.50	221.53	1.25-2.25	Ward 6	2nd Phase
SD-8	Secondary Drain	New	3.50-4.50	346.36	1.25-2.25	Ward 9	2nd Phase
TD-150	Tertiary Drain	New	2.50-3.50	52.87	0.64-1.25	Ward 5	3rd Phase
TD-150	Tertiary Drain	New	2.50-3.50	4.47	0.64-1.25	Ward 4	3rd Phase
TD-151	Tertiary Drain	New	2.50-3.50	67.71	0.64-1.25	Ward 5	3rd Phase
TD-152	Tertiary Drain	New	2.50-3.50	19.34	0.64-1.25	Ward 5	3rd Phase
TD-153	Tertiary Drain	New	2.50-3.50	47.25	0.64-1.25	Ward 5	3rd Phase
TD-154	Tertiary Drain	New	2.50-3.50	90.82	0.64-1.25	Ward 5	3rd Phase
TD-155	Tertiary Drain	New	2.50-3.50	36.25	0.64-1.25	Ward 5	3rd Phase
TD-156	Tertiary Drain	New	2.50-3.50	44.27	0.64-1.25	Ward 5	3rd Phase
TD-157	Tertiary Drain	New	2.50-3.50	50.70	0.64-1.25	Ward 5	3rd Phase
TD-158	Tertiary Drain	New	2.50-3.50	59.66	0.64-1.25	Ward 5	3rd Phase
TD-159	Tertiary Drain	New	2.50-3.50	68.20	0.64-1.25	Ward 5	3rd Phase
TD-159	Tertiary Drain	New	2.50-3.50	8.29	0.64-1.25	Ward 6	3rd Phase
TD-160	Tertiary Drain	New	2.50-3.50	49.18	0.64-1.25	Ward 5	3rd Phase
TD-161	Tertiary Drain	New	2.50-3.50	56.71	0.64-1.25	Ward 6	3rd Phase
TD-162	Tertiary Drain	New	2.50-3.50	41.92	0.64-1.25	Ward 5	3rd Phase
TD-163	Tertiary Drain	New	2.50-3.50	27.49	0.64-1.25	Ward 5	3rd Phase
TD-164	Tertiary Drain	New	2.50-3.50	45.99	0.64-1.25	Ward 5	3rd Phase
TD-165	Tertiary Drain	New	2.50-3.50	37.94	0.64-1.25	Ward 7	3rd Phase
TD-165	Tertiary Drain	New	2.50-3.50	6.01	0.64-1.25	Ward 5	3rd Phase
TD-166	Tertiary Drain	New	2.50-3.50	25.62	0.64-1.25	Ward 5	3rd Phase
TD-167	Tertiary Drain	New	2.50-3.50	344.12	0.64-1.25	Ward 5	3rd Phase
TD-167	Tertiary Drain	New	2.50-3.50	13.39	0.64-1.25	Ward 6	3rd Phase
TD-168	Tertiary Drain	New	2.50-3.50	157.77	0.64-1.25	Ward 5	3rd Phase
TD-169	Tertiary Drain	New	2.50-3.50	136.82	0.64-1.25	Ward 5	3rd Phase
TD-169	Tertiary Drain	New	2.50-3.50	8.71	0.64-1.25	Ward 6	3rd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
TD-170	Tertiary Drain	New	2.50-3.50	90.51	0.64-1.25	Ward 5	3rd Phase
TD-171	Tertiary Drain	New	2.50-3.50	20.23	0.64-1.25	Ward 5	3rd Phase
TD-172	Tertiary Drain	New	2.50-3.50	45.85	0.64-1.25	Ward 5	3rd Phase
TD-173	Tertiary Drain	New	2.50-3.50	22.46	0.64-1.25	Ward 9	3rd Phase
TD-174	Tertiary Drain	New	2.50-3.50	36.48	0.64-1.25	Ward 6	3rd Phase
TD-175	Tertiary Drain	New	2.50-3.50	58.00	0.64-1.25	Ward 6	3rd Phase
TD-176	Tertiary Drain	New	2.50-3.50	223.17	0.64-1.25	Ward 6	3rd Phase
TD-177	Tertiary Drain	New	2.50-3.50	96.89	0.64-1.25	Ward 9	3rd Phase
TD-178	Tertiary Drain	New	2.50-3.50	102.33	0.64-1.25	Ward 9	3rd Phase
TD-179	Tertiary Drain	New	2.50-3.50	63.62	0.64-1.25	Ward 8	3rd Phase
TD-179	Tertiary Drain	New	2.50-3.50	172.29	0.64-1.25	Ward 9	3rd Phase
TD-180	Tertiary Drain	New	2.50-3.50	7.44	0.64-1.25	Ward 5	3rd Phase
TD-180	Tertiary Drain	New	2.50-3.50	71.53	0.64-1.25	Ward 9	3rd Phase
TD-181	Tertiary Drain	New	2.50-3.50	16.01	0.64-1.25	Ward 9	3rd Phase
TD-182	Tertiary Drain	New	2.50-3.50	69.40	0.64-1.25	Ward 9	3rd Phase
TD-183	Tertiary Drain	New	2.50-3.50	21.57	0.64-1.25	Ward 9	3rd Phase
TD-184	Tertiary Drain	New	2.50-3.50	60.67	0.64-1.25	Ward 5	3rd Phase
TD-185	Tertiary Drain	New	2.50-3.50	90.69	0.64-1.25	Ward 5	3rd Phase
TD-186	Tertiary Drain	New	2.50-3.50	122.01	0.64-1.25	Ward 5	3rd Phase
TD-187	Tertiary Drain	New	2.50-3.50	42.12	0.64-1.25	Ward 5	3rd Phase
TD-188	Tertiary Drain	New	2.50-3.50	68.29	0.64-1.25	Ward 9	3rd Phase
TD-189	Tertiary Drain	New	2.50-3.50	91.12	0.64-1.25	Ward 9	3rd Phase
TD-190	Tertiary Drain	New	2.50-3.50	7.05	0.64-1.25	Ward 5	3rd Phase
TD-190	Tertiary Drain	New	2.50-3.50	27.14	0.64-1.25	Ward 9	3rd Phase
TD-191	Tertiary Drain	New	2.50-3.50	45.51	0.64-1.25	Ward 5	3rd Phase
TD-192	Tertiary Drain	New	2.50-3.50	26.99	0.64-1.25	Ward 6	3rd Phase
TD-193	Tertiary Drain	New	2.50-3.50	19.79	0.64-1.25	Ward 6	3rd Phase
TD-194	Tertiary Drain	New	2.50-3.50	27.17	0.64-1.25	Ward 9	3rd Phase
TD-195	Tertiary Drain	New	2.50-3.50	21.60	0.64-1.25	Ward 9	3rd Phase
TD-196	Tertiary Drain	New	2.50-3.50	27.72	0.64-1.25	Ward 8	3rd Phase
TD-197	Tertiary Drain	New	2.50-3.50	19.79	0.64-1.25	Ward 9	3rd Phase
TD-198	Tertiary Drain	New	2.50-3.50	17.23	0.64-1.25	Ward 2	3rd Phase
TD-199	Tertiary Drain	New	2.50-3.50	33.61	0.64-1.25	Ward 2	3rd Phase
TD-200	Tertiary Drain	New	2.50-3.50	15.01	0.64-1.25	Ward 6	3rd Phase
TD-201	Tertiary Drain	New	2.50-3.50	28.08	0.64-1.25	Ward 9	3rd Phase
TD-203	Tertiary Drain	New	2.50-3.50	30.38	0.64-1.25	Ward 9	3rd Phase
TD-204	Tertiary Drain	New	2.50-3.50	149.88	0.64-1.25	Ward 9	3rd Phase
TD-206	Tertiary Drain	New	2.50-3.50	88.63	0.64-1.25	Ward 9	3rd Phase
TD-207	Tertiary Drain	New	2.50-3.50	188.73	0.64-1.25	Ward 9	3rd Phase
TD-208	Tertiary Drain	New	2.50-3.50	22.80	0.64-1.25	Ward 9	3rd Phase
TD-209	Tertiary Drain	New	2.50-3.50	74.25	0.64-1.25	Ward 9	3rd Phase
TD-210	Tertiary Drain	New	2.50-3.50	69.23	0.64-1.25	Ward 9	3rd Phase
TD-211	Tertiary Drain	New	2.50-3.50	38.18	0.64-1.25	Ward 9	3rd Phase
TD-212	Tertiary Drain	New	2.50-3.50	37.87	0.64-1.25	Ward 9	3rd Phase
TD-213	Tertiary Drain	New	2.50-3.50	12.41	0.64-1.25	Ward 9	3rd Phase
TD-214	Tertiary Drain	New	2.50-3.50	43.36	0.64-1.25	Ward 9	3rd Phase
TD-215	Tertiary Drain	New	2.50-3.50	78.95	0.64-1.25	Ward 9	3rd Phase
TD-216	Tertiary Drain	New	2.50-3.50	76.88	0.64-1.25	Ward 9	3rd Phase
TD-217	Tertiary Drain	New	2.50-3.50	21.86	0.64-1.25	Ward 9	3rd Phase
TD-218	Tertiary Drain	New	2.50-3.50	13.73	0.64-1.25	Ward 9	3rd Phase
TD-219	Tertiary Drain	New	2.50-3.50	114.84	0.64-1.25	Ward 9	3rd Phase
TD-220	Tertiary Drain	New	2.50-3.50	24.72	0.64-1.25	Ward 9	3rd Phase
TD-221	Tertiary Drain	New	2.50-3.50	82.70	0.64-1.25	Ward 9	3rd Phase
TD-222	Tertiary Drain	New	2.50-3.50	166.92	0.64-1.25	Ward 9	3rd Phase
TD-223	Tertiary Drain	New	2.50-3.50	4.53	0.64-1.25	Ward 8	3rd Phase
TD-223	Tertiary Drain	New	2.50-3.50	28.51	0.64-1.25	Ward 9	3rd Phase
TD-224	Tertiary Drain	New	2.50-3.50	5.13	0.64-1.25	Ward 8	3rd Phase
TD-224	Tertiary Drain	New	2.50-3.50	108.89	0.64-1.25	Ward 9	3rd Phase
TD-225	Tertiary Drain	New	2.50-3.50	117.87	0.64-1.25	Ward 9	3rd Phase
TD-226	Tertiary Drain	New	2.50-3.50	11.82	0.64-1.25	Ward 9	3rd Phase
TD-227	Tertiary Drain	New	2.50-3.50	23.78	0.64-1.25	Ward 9	3rd Phase
TD-228	Tertiary Drain	New	2.50-3.50	21.19	0.64-1.25	Ward 9	3rd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
SD-17	Secondary Drain	New	3.50-4.50	111.39	1.25-2.25	Ward 9	3rd Phase
TD-229	Tertiary Drain	New	2.50-3.50	51.15	0.64-1.25	Ward 8	3rd Phase
TD-229	Tertiary Drain	New	2.50-3.50	4.12	0.64-1.25	Ward 9	3rd Phase
TD-230	Tertiary Drain	New	2.50-3.50	142.30	0.64-1.25	Ward 8	3rd Phase
TD-231	Tertiary Drain	New	2.50-3.50	27.07	0.64-1.25	Ward 8	3rd Phase
TD-232	Tertiary Drain	New	2.50-3.50	218.17	0.64-1.25	Ward 8	3rd Phase
TD-233	Tertiary Drain	New	2.50-3.50	121.94	0.64-1.25	Ward 8	3rd Phase
TD-234	Tertiary Drain	New	2.50-3.50	5.59	0.64-1.25	Ward 8	3rd Phase
TD-235	Tertiary Drain	New	2.50-3.50	29.87	0.64-1.25	Ward 8	3rd Phase
TD-236	Tertiary Drain	New	2.50-3.50	38.50	0.64-1.25	Ward 8	3rd Phase
TD-237	Tertiary Drain	New	2.50-3.50	54.39	0.64-1.25	Ward 8	3rd Phase
TD-237	Tertiary Drain	New	2.50-3.50	3.89	0.64-1.25	Ward 9	3rd Phase
TD-238	Tertiary Drain	New	2.50-3.50	19.65	0.64-1.25	Ward 9	3rd Phase
TD-239	Tertiary Drain	New	2.50-3.50	60.34	0.64-1.25	Ward 9	3rd Phase
TD-240	Tertiary Drain	New	2.50-3.50	47.00	0.64-1.25	Ward 9	3rd Phase
TD-241	Tertiary Drain	New	2.50-3.50	22.51	0.64-1.25	Ward 9	3rd Phase
TD-242	Tertiary Drain	New	2.50-3.50	55.75	0.64-1.25	Ward 9	3rd Phase
TD-243	Tertiary Drain	New	2.50-3.50	30.24	0.64-1.25	Ward 9	3rd Phase
TD-244	Tertiary Drain	New	2.50-3.50	59.35	0.64-1.25	Ward 9	3rd Phase
TD-245	Tertiary Drain	New	2.50-3.50	35.64	0.64-1.25	Ward 9	3rd Phase
TD-246	Tertiary Drain	New	2.50-3.50	27.87	0.64-1.25	Ward 2	3rd Phase
TD-247	Tertiary Drain	New	2.50-3.50	61.14	0.64-1.25	Ward 7	3rd Phase
TD-248	Tertiary Drain	New	2.50-3.50	16.49	0.64-1.25	Ward 7	3rd Phase
TD-249	Tertiary Drain	New	2.50-3.50	108.45	0.64-1.25	Ward 7	3rd Phase
TD-250	Tertiary Drain	New	2.50-3.50	75.93	0.64-1.25	Ward 7	3rd Phase
TD-251	Tertiary Drain	New	2.50-3.50	35.10	0.64-1.25	Ward 7	3rd Phase
TD-252	Tertiary Drain	New	2.50-3.50	25.23	0.64-1.25	Ward 7	3rd Phase
TD-253	Tertiary Drain	New	2.50-3.50	31.00	0.64-1.25	Ward 8	3rd Phase
TD-254	Tertiary Drain	New	2.50-3.50	26.62	0.64-1.25	Ward 8	3rd Phase
TD-255	Tertiary Drain	New	2.50-3.50	151.59	0.64-1.25	Ward 8	3rd Phase
TD-257	Tertiary Drain	New	2.50-3.50	36.18	0.64-1.25	Ward 8	3rd Phase
TD-257	Tertiary Drain	New	2.50-3.50	80.34	0.64-1.25	Ward 7	3rd Phase
TD-258	Tertiary Drain	New	2.50-3.50	100.15	0.64-1.25	Ward 8	3rd Phase
TD-259	Tertiary Drain	New	2.50-3.50	53.74	0.64-1.25	Ward 8	3rd Phase
TD-260	Tertiary Drain	New	2.50-3.50	74.40	0.64-1.25	Ward 8	3rd Phase
TD-260	Tertiary Drain	New	2.50-3.50	3.25	0.64-1.25	Ward 7	3rd Phase
TD-261	Tertiary Drain	New	2.50-3.50	75.40	0.64-1.25	Ward 8	3rd Phase
TD-262	Tertiary Drain	New	2.50-3.50	32.32	0.64-1.25	Ward 8	3rd Phase
TD-263	Tertiary Drain	New	2.50-3.50	29.70	0.64-1.25	Ward 7	3rd Phase
TD-264	Tertiary Drain	New	2.50-3.50	23.77	0.64-1.25	Ward 7	3rd Phase
TD-265	Tertiary Drain	New	2.50-3.50	89.42	0.64-1.25	Ward 7	3rd Phase
TD-266	Tertiary Drain	New	2.50-3.50	22.28	0.64-1.25	Ward 7	3rd Phase
TD-267	Tertiary Drain	New	2.50-3.50	8.44	0.64-1.25	Ward 7	3rd Phase
TD-268	Tertiary Drain	New	2.50-3.50	24.93	0.64-1.25	Ward 8	3rd Phase
TD-269	Tertiary Drain	New	2.50-3.50	29.13	0.64-1.25	Ward 8	3rd Phase
TD-270	Tertiary Drain	New	2.50-3.50	204.44	0.64-1.25	Ward 8	3rd Phase
TD-271	Tertiary Drain	New	2.50-3.50	122.30	0.64-1.25	Ward 8	3rd Phase
TD-272	Tertiary Drain	New	2.50-3.50	66.27	0.64-1.25	Ward 8	3rd Phase
TD-273	Tertiary Drain	New	2.50-3.50	18.59	0.64-1.25	Ward 8	3rd Phase
TD-274	Tertiary Drain	New	2.50-3.50	43.05	0.64-1.25	Ward 8	3rd Phase
TD-275	Tertiary Drain	New	2.50-3.50	41.64	0.64-1.25	Ward 8	3rd Phase
TD-278	Tertiary Drain	New	2.50-3.50	88.04	0.64-1.25	Ward 9	3rd Phase
TD-279	Tertiary Drain	New	2.50-3.50	9.80	0.64-1.25	Ward 9	3rd Phase
TD-280	Tertiary Drain	New	2.50-3.50	68.09	0.64-1.25	Ward 9	3rd Phase
TD-281	Tertiary Drain	New	2.50-3.50	41.16	0.64-1.25	Ward 9	3rd Phase
TD-282	Tertiary Drain	New	2.50-3.50	44.98	0.64-1.25	Ward 9	3rd Phase
TD-283	Tertiary Drain	New	2.50-3.50	130.24	0.64-1.25	Ward 4	3rd Phase
TD-284	Tertiary Drain	New	2.50-3.50	27.62	0.64-1.25	Ward 5	3rd Phase
TD-285	Tertiary Drain	New	2.50-3.50	57.76	0.64-1.25	Ward 8	3rd Phase
TD-286	Tertiary Drain	New	2.50-3.50	42.31	0.64-1.25	Ward 7	3rd Phase
TD-287	Tertiary Drain	New	2.50-3.50	62.12	0.64-1.25	Ward 7	3rd Phase
TD-288	Tertiary Drain	New	2.50-3.50	41.98	0.64-1.25	Ward 7	3rd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
TD-289	Tertiary Drain	New	2.50-3.50	144.43	0.64-1.25	Ward 7	3rd Phase
TD-290	Tertiary Drain	New	2.50-3.50	33.55	0.64-1.25	Ward 7	3rd Phase
TD-291	Tertiary Drain	New	2.50-3.50	21.83	0.64-1.25	Ward 8	3rd Phase
TD-292	Tertiary Drain	New	2.50-3.50	16.39	0.64-1.25	Ward 8	3rd Phase
TD-293	Tertiary Drain	New	2.50-3.50	28.66	0.64-1.25	Ward 8	3rd Phase
TD-294	Tertiary Drain	New	2.50-3.50	27.97	0.64-1.25	Ward 8	3rd Phase
TD-295	Tertiary Drain	New	2.50-3.50	27.32	0.64-1.25	Ward 9	3rd Phase
TD-296	Tertiary Drain	New	2.50-3.50	33.19	0.64-1.25	Ward 9	3rd Phase
TD-297	Tertiary Drain	New	2.50-3.50	13.43	0.64-1.25	Ward 9	3rd Phase
TD-298	Tertiary Drain	New	2.50-3.50	0.79	0.64-1.25	Ward 1	3rd Phase
TD-299	Tertiary Drain	New	2.50-3.50	38.59	0.64-1.25	Ward 1	3rd Phase
TD-300	Tertiary Drain	New	2.50-3.50	41.26	0.64-1.25	Ward 1	3rd Phase
TD-301	Tertiary Drain	New	2.50-3.50	173.46	0.64-1.25	Ward 1	3rd Phase
TD-302	Tertiary Drain	New	2.50-3.50	28.59	0.64-1.25	Ward 3	3rd Phase
TD-303	Tertiary Drain	New	2.50-3.50	74.53	0.64-1.25	Ward 3	3rd Phase
TD-303	Tertiary Drain	New	2.50-3.50	5.30	0.64-1.25	Ward 2	3rd Phase
TD-304	Tertiary Drain	New	2.50-3.50	48.71	0.64-1.25	Ward 3	3rd Phase
TD-305	Tertiary Drain	New	2.50-3.50	61.58	0.64-1.25	Ward 3	3rd Phase
TD-306	Tertiary Drain	New	2.50-3.50	44.70	0.64-1.25	Ward 3	3rd Phase
TD-307	Tertiary Drain	New	2.50-3.50	7.34	0.64-1.25	Ward 4	3rd Phase
TD-307	Tertiary Drain	New	2.50-3.50	91.09	0.64-1.25	Ward 3	3rd Phase
TD-308	Tertiary Drain	New	2.50-3.50	36.23	0.64-1.25	Ward 3	3rd Phase
TD-309	Tertiary Drain	New	2.50-3.50	63.36	0.64-1.25	Ward 2	3rd Phase
TD-310	Tertiary Drain	New	2.50-3.50	136.24	0.64-1.25	Ward 4	3rd Phase
TD-310	Tertiary Drain	New	2.50-3.50	5.21	0.64-1.25	Ward 3	3rd Phase
TD-311	Tertiary Drain	New	2.50-3.50	46.20	0.64-1.25	Ward 2	3rd Phase
TD-312	Tertiary Drain	New	2.50-3.50	5.40	0.64-1.25	Ward 2	3rd Phase
TD-312	Tertiary Drain	New	2.50-3.50	106.31	0.64-1.25	Ward 9	3rd Phase
TD-313	Tertiary Drain	New	2.50-3.50	70.90	0.64-1.25	Ward 5	3rd Phase
TD-314	Tertiary Drain	New	2.50-3.50	24.69	0.64-1.25	Ward 5	3rd Phase
TD-315	Tertiary Drain	New	2.50-3.50	16.88	0.64-1.25	Ward 5	3rd Phase
TD-316	Tertiary Drain	New	2.50-3.50	56.63	0.64-1.25	Ward 7	3rd Phase
TD-317	Tertiary Drain	New	2.50-3.50	5.30	0.64-1.25	Ward 8	3rd Phase
TD-317	Tertiary Drain	New	2.50-3.50	354.02	0.64-1.25	Ward 7	3rd Phase
TD-317	Tertiary Drain	New	2.50-3.50	5.83	0.64-1.25	Ward 5	3rd Phase
TD-318	Tertiary Drain	New	2.50-3.50	44.65	0.64-1.25	Ward 7	3rd Phase
TD-318	Tertiary Drain	New	2.50-3.50	5.50	0.64-1.25	Ward 5	3rd Phase
TD-319	Tertiary Drain	New	2.50-3.50	96.36	0.64-1.25	Ward 7	3rd Phase
TD-321	Tertiary Drain	New	2.50-3.50	7.28	0.64-1.25	Ward 5	3rd Phase
TD-321	Tertiary Drain	New	2.50-3.50	34.81	0.64-1.25	Ward 9	3rd Phase
TD-322	Tertiary Drain	New	2.50-3.50	73.44	0.64-1.25	Ward 9	3rd Phase
TD-323	Tertiary Drain	New	2.50-3.50	85.85	0.64-1.25	Ward 8	3rd Phase
TD-324	Tertiary Drain	New	2.50-3.50	41.38	0.64-1.25	Ward 7	3rd Phase
TD-325	Tertiary Drain	New	2.50-3.50	77.26	0.64-1.25	Ward 8	3rd Phase
TD-326	Tertiary Drain	New	2.50-3.50	114.50	0.64-1.25	Ward 8	3rd Phase
TD-327	Tertiary Drain	New	2.50-3.50	82.20	0.64-1.25	Ward 8	3rd Phase
TD-328	Tertiary Drain	New	2.50-3.50	104.26	0.64-1.25	Ward 8	3rd Phase
TD-329	Tertiary Drain	New	2.50-3.50	89.75	0.64-1.25	Ward 8	3rd Phase
TD-330	Tertiary Drain	New	2.50-3.50	81.08	0.64-1.25	Ward 8	3rd Phase
TD-331	Tertiary Drain	New	2.50-3.50	84.83	0.64-1.25	Ward 9	3rd Phase
TD-332	Tertiary Drain	New	2.50-3.50	176.48	0.64-1.25	Ward 1	3rd Phase
TD-333	Tertiary Drain	New	2.50-3.50	47.65	0.64-1.25	Ward 1	3rd Phase
TD-334	Tertiary Drain	New	2.50-3.50	40.05	0.64-1.25	Ward 6	3rd Phase
TD-335	Tertiary Drain	New	2.50-3.50	115.25	0.64-1.25	Ward 7	3rd Phase
TD-336	Tertiary Drain	New	2.50-3.50	11.86	0.64-1.25	Ward 2	3rd Phase
TD-337	Tertiary Drain	New	2.50-3.50	60.19	0.64-1.25	Ward 9	3rd Phase
TD-339	Tertiary Drain	New	2.50-3.50	23.05	0.64-1.25	Ward 6	3rd Phase
TD-340	Tertiary Drain	New	2.50-3.50	12.06	0.64-1.25	Ward 6	3rd Phase
TD-341	Tertiary Drain	New	2.50-3.50	6.03	0.64-1.25	Ward 9	3rd Phase
TD-342	Tertiary Drain	New	2.50-3.50	88.88	0.64-1.25	Ward 1	3rd Phase
TD-343	Tertiary Drain	New	2.50-3.50	45.21	0.64-1.25	Ward 9	3rd Phase
TD-344	Tertiary Drain	New	2.50-3.50	48.56	0.64-1.25	Ward 9	3rd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
TD-345	Tertiary Drain	New	2.50-3.50	44.74	0.64-1.25	Ward 9	3rd Phase
TD-346	Tertiary Drain	New	2.50-3.50	81.51	0.64-1.25	Ward 9	3rd Phase
TD-347	Tertiary Drain	New	2.50-3.50	7.45	0.64-1.25	Ward 9	3rd Phase
TD-348	Tertiary Drain	New	2.50-3.50	10.18	0.64-1.25	Ward 9	3rd Phase
TD-349	Tertiary Drain	New	2.50-3.50	44.91	0.64-1.25	Ward 9	3rd Phase
TD-350	Tertiary Drain	New	2.50-3.50	138.11	0.64-1.25	Ward 2	3rd Phase
TD-351	Tertiary Drain	New	2.50-3.50	29.57	0.64-1.25	Ward 9	3rd Phase
TD-352	Tertiary Drain	New	2.50-3.50	11.86	0.64-1.25	Ward 9	3rd Phase
TD-353	Tertiary Drain	New	2.50-3.50	207.81	0.64-1.25	Ward 9	3rd Phase
TD-353	Tertiary Drain	New	2.50-3.50	25.99	0.64-1.25	Ward 6	3rd Phase
TD-354	Tertiary Drain	New	2.50-3.50	111.37	0.64-1.25	Ward 7	3rd Phase
TD-355	Tertiary Drain	New	2.50-3.50	26.34	0.64-1.25	Ward 8	3rd Phase
TD-356	Tertiary Drain	New	2.50-3.50	74.26	0.64-1.25	Ward 8	3rd Phase
TD-357	Tertiary Drain	New	2.50-3.50	66.13	0.64-1.25	Ward 8	3rd Phase
TD-358	Tertiary Drain	New	2.50-3.50	137.80	0.64-1.25	Ward 4	3rd Phase
TD-359	Tertiary Drain	New	2.50-3.50	23.49	0.64-1.25	Ward 4	3rd Phase
TD-360	Tertiary Drain	New	2.50-3.50	51.28	0.64-1.25	Ward 4	3rd Phase
TD-361	Tertiary Drain	New	2.50-3.50	145.96	0.64-1.25	Ward 1	3rd Phase
TD-362	Tertiary Drain	New	2.50-3.50	44.00	0.64-1.25	Ward 1	3rd Phase
TD-363	Tertiary Drain	New	2.50-3.50	39.93	0.64-1.25	Ward 3	3rd Phase
TD-364	Tertiary Drain	New	2.50-3.50	148.74	0.64-1.25	Ward 3	3rd Phase
TD-365	Tertiary Drain	New	2.50-3.50	332.25	0.64-1.25	Ward 1	3rd Phase
TD-366	Tertiary Drain	New	2.50-3.50	162.61	0.64-1.25	Ward 1	3rd Phase
TD-367	Tertiary Drain	New	2.50-3.50	401.32	0.64-1.25	Ward 1	3rd Phase
TD-368	Tertiary Drain	New	2.50-3.50	182.46	0.64-1.25	Ward 1	3rd Phase
TD-369	Tertiary Drain	New	2.50-3.50	158.39	0.64-1.25	Ward 1	3rd Phase
TD-370	Tertiary Drain	New	2.50-3.50	26.30	0.64-1.25	Ward 5	3rd Phase
TD-371	Tertiary Drain	New	2.50-3.50	157.42	0.64-1.25	Ward 9	3rd Phase
TD-372	Tertiary Drain	New	2.50-3.50	100.01	0.64-1.25	Ward 9	3rd Phase
TD-373	Tertiary Drain	New	2.50-3.50	97.19	0.64-1.25	Ward 9	3rd Phase
TD-374	Tertiary Drain	New	2.50-3.50	177.05	0.64-1.25	Ward 9	3rd Phase
TD-375	Tertiary Drain	New	2.50-3.50	161.98	0.64-1.25	Ward 4	3rd Phase
TD-376	Tertiary Drain	New	2.50-3.50	105.32	0.64-1.25	Ward 4	3rd Phase
TD-376	Tertiary Drain	New	2.50-3.50	7.20	0.64-1.25	Ward 2	3rd Phase
TD-377	Tertiary Drain	New	2.50-3.50	5.76	0.64-1.25	Ward 5	3rd Phase
TD-377	Tertiary Drain	New	2.50-3.50	38.42	0.64-1.25	Ward 4	3rd Phase
TD-378	Tertiary Drain	New	2.50-3.50	99.84	0.64-1.25	Ward 2	3rd Phase
TD-379	Tertiary Drain	New	2.50-3.50	62.24	0.64-1.25	Ward 9	3rd Phase
TD-380	Tertiary Drain	New	2.50-3.50	86.60	0.64-1.25	Ward 6	3rd Phase
TD-381	Tertiary Drain	New	2.50-3.50	126.19	0.64-1.25	Ward 2	3rd Phase
TD-382	Tertiary Drain	New	2.50-3.50	89.55	0.64-1.25	Ward 2	3rd Phase
TD-383	Tertiary Drain	New	2.50-3.50	55.03	0.64-1.25	Ward 9	3rd Phase
TD-384	Tertiary Drain	New	2.50-3.50	33.26	0.64-1.25	Ward 9	3rd Phase
TD-385	Tertiary Drain	New	2.50-3.50	22.92	0.64-1.25	Ward 9	3rd Phase
TD-386	Tertiary Drain	New	2.50-3.50	132.21	0.64-1.25	Ward 9	3rd Phase
TD-387	Tertiary Drain	New	2.50-3.50	13.27	0.64-1.25	Ward 9	3rd Phase
TD-388	Tertiary Drain	New	2.50-3.50	113.51	0.64-1.25	Ward 7	3rd Phase
TD-389	Tertiary Drain	New	2.50-3.50	20.07	0.64-1.25	Ward 9	3rd Phase
TD-390	Tertiary Drain	New	2.50-3.50	156.71	0.64-1.25	Ward 9	3rd Phase
TD-391	Tertiary Drain	New	2.50-3.50	3.28	0.64-1.25	Ward 5	3rd Phase
TD-391	Tertiary Drain	New	2.50-3.50	88.97	0.64-1.25	Ward 4	3rd Phase
TD-392	Tertiary Drain	New	2.50-3.50	83.03	0.64-1.25	Ward 4	3rd Phase
TD-393	Tertiary Drain	New	2.50-3.50	93.81	0.64-1.25	Ward 4	3rd Phase
TD-394	Tertiary Drain	New	2.50-3.50	132.76	0.64-1.25	Ward 2	3rd Phase
TD-395	Tertiary Drain	New	2.50-3.50	179.99	0.64-1.25	Ward 1	3rd Phase
TD-397	Tertiary Drain	New	2.50-3.50	44.33	0.64-1.25	Ward 9	3rd Phase
SD-25	Secondary Drain	New	3.50-4.50	115.32	1.25-2.25	Ward 9	3rd Phase
TD-400	Tertiary Drain	New	2.50-3.50	26.38	0.64-1.25	Ward 9	3rd Phase
SD-27	Secondary Drain	New	3.50-4.50	35.28	1.25-2.25	Ward 9	3rd Phase
TD-402	Tertiary Drain	New	2.50-3.50	26.34	0.64-1.25	Ward 2	3rd Phase
TD-402	Tertiary Drain	New	2.50-3.50	215.45	0.64-1.25	Ward 6	3rd Phase
TD-403	Tertiary Drain	New	2.50-3.50	147.48	0.64-1.25	Ward 7	3rd Phase

Proposed Drain ID	Proposed Hierarchy	Proposed Type	Proposed Width (ft)	Proposed Length(m)	Proposed Depth(m)	Ward No	Phasing
SD-30	Secondary Drain	New	3.50-4.50	0.35	1.25-2.25	Ward 8	3rd Phase
SD-30	Secondary Drain	New	3.50-4.50	0.09	1.25-2.25	Ward 7	3rd Phase
SD-31	Secondary Drain	New	3.50-4.50	205.10	1.25-2.25	Ward 7	3rd Phase
SD-32	Secondary Drain	New	3.50-4.50	58.30	1.25-2.25	Ward 7	3rd Phase
TD-404	Tertiary Drain	New	2.50-3.50	0.23	0.64-1.25	Ward 7	3rd Phase
TD-405	Tertiary Drain	New	2.50-3.50	85.33	0.64-1.25	Ward 7	3rd Phase
SD-34	Secondary Drain	New	3.50-4.50	57.14	1.25-2.25	Ward 8	3rd Phase
SD-34	Secondary Drain	New	3.50-4.50	267.78	1.25-2.25	Ward 5	3rd Phase
SD-34	Secondary Drain	New	3.50-4.50	83.16	1.25-2.25	Ward 9	3rd Phase
SD-35	Secondary Drain	New	3.50-4.50	101.73	1.25-2.25	Ward 8	3rd Phase
TD-406	Tertiary Drain	New	2.50-3.50	398.51	0.64-1.25	Ward 1	3rd Phase
TD-407	Tertiary Drain	New	2.50-3.50	166.88	0.64-1.25	Ward 1	3rd Phase
TD-412	Tertiary Drain	New	2.50-3.50	40.86	0.64-1.25	Ward 9	3rd Phase
TD-415	Tertiary Drain	New	2.50-3.50	173.61	0.64-1.25	Ward 4	3rd Phase
SD-60	Secondary Drain	New	3.50-4.50	15.94	1.25-2.25	Ward 2	3rd Phase
SD-61	Secondary Drain	New	3.50-4.50	0.43	1.25-2.25	Ward 2	3rd Phase
TD-430	Tertiary Drain	New	2.50-3.50	71.71	0.64-1.25	Ward 4	3rd Phase
TD-432	Tertiary Drain	New	2.50-3.50	31.83	0.64-1.25	Ward 8	3rd Phase
TD-433	Tertiary Drain	New	2.50-3.50	69.71	0.64-1.25	Ward 8	3rd Phase
TD-434	Tertiary Drain	New	2.50-3.50	41.85	0.64-1.25	Ward 9	3rd Phase
TD-437	Tertiary Drain	New	2.50-3.50	79.16	0.64-1.25	Ward 2	3rd Phase
TD-438	Tertiary Drain	New	2.50-3.50	49.14	0.64-1.25	Ward 2	3rd Phase
TD-440	Tertiary Drain	New	2.50-3.50	87.72	0.64-1.25	Ward 9	3rd Phase
TD-441	Tertiary Drain	New	2.50-3.50	92.84	0.64-1.25	Ward 8	3rd Phase
TD-441	Tertiary Drain	New	2.50-3.50	2.27	0.64-1.25	Ward 9	3rd Phase
TD-205	Tertiary Drain	New	2.50-3.50	26.75	0.64-1.25	Ward 9	3rd Phase
TD-442	Tertiary Drain	New	2.50-3.50	78.01	0.64-1.25	Ward 9	3rd Phase
TD-442	Tertiary Drain	New	2.50-3.50	105.49	0.64-1.25	Ward 9	3rd Phase
TD-237	Tertiary Drain	New	2.50-3.50	0.00	0.64-1.25	Ward 8	3rd Phase
TD-357	Tertiary Drain	New	2.50-3.50	0.00	0.64-1.25	Ward 8	3rd Phase
TD-260	Tertiary Drain	New	2.50-3.50	0.27	0.64-1.25	Ward 8	3rd Phase
SD-30	Secondary Drain	New	3.50-4.50	0.27	1.25-2.25	Ward 8	3rd Phase

Table G1: Planning Schedule of Waterbodies in Banaripara Paurashava

Land Use	Mouza	Plot No	Area (acre)
Waterbody	Banaripara	34,36-38,41,43,45,48-50,54-62,64,67,69-71,75,77,79-81,85-86, 88-92,96-98,105-06,110-22,130-31,138-41,144,146-47,150-52, 155,170,173-75,179,193-99,246-47,256-61,284-90,358-61,409-49,451,463,503-06,508-12,514-15,519,522-23, 527, 530, 536, 541,544-45,548-51,553-58,560-66,569-70,577,579,581-90,592-600,603,606,608,610-12,614-17,621-23,625,628,632-33,640, 642-44,647-49,654,656-58,660-85,796-08,812,814-28,833-35, 837-43,845-53,858-63,865-72,874-75,877-78,887-89,891,893, 895-96,899-02,910,913-14,919-22,925,936-40,942-44,949-50, 954,960-64,96-68,973,976-79,982-83,991,99999	93.54
	Kundaher	1,3-5,7-8,10,13-16,18-20,25,27-28,30-31,33-34,37,44-45,50-52, 58-60,62,64-67,69,74-76,82,85-93,95-98,102,104,106,108-09, 111-12,114-18,122,124-25,127-32,135,137-40,142-43,145-50, 152,154-60,162-65,167,170-71,174,176,180,185-88,193-94, 196-01,209-10,212-17,219-27,229-34,236-38,242,245,247-50, 260-65,269-70,272-76,278-79,282-85,288-90,297-98,301-02, 305-07,310-11,313-14,324-27,332,334-35,339,341-42,345,351-53, 356-57,359,361-71,374-75,377-79,383-87,391-96,398-03, 405-08,410-11,415-17,419-23,425-26,428-31,434-35,437-40, 442-43,445-53,456,458-61,463-70,472-74,476-90,492-98,501-03,511,513-16,548-49,592,607,618-19,621,624,628-29,633-34, 641,643-45,649-52,654,99999	34.87
Total			**128.41**