

7.2.2 Estimated Future Land Use

a. Basis of Estimation

The important basis of estimating the amount of land under each land use type is the size of population in different periods of the Master Plan. The distribution of existing land uses have been estimated considering the total requirements of land in future. Land for different uses have been determined on the basis of estimated future demand for each category of land use.

b. Estimation of Residential Land Requirement

The present population of the planning area has been estimated as 61457 (2010) as per growth rate of 2.63%. This gives a gross density of 9 persons/acre.

The future housing area need to be based on a recommended planning standard of 150 persons per acre. The projected population for 2030 is 103289. But considering urbanization trend and migration the team takes the target of 1, 50,000 population for 2030. With this standard, the estimation shows, the land required to accommodate total projected population (1, 50,000) in the year 2030 will be 1000 acres. But survey of existing land use has identified 1131.46 acres of land currently under residential use with a low density of population (about 9 persons per acre). So there need no additional residential use in Narail Paurashava.

Table- 7.6: Land Required for Housing

Use/Facility	Recommended standard	Estimation of Land Requirement	Existing Land (acre)	Required Total Land in Acre (2030)
Residential	150 persons/acre	150000 /150 persons / acre = 1000 acre	1131.46	-

c. Estimation of Land for Commercial and Mixed Use

There is no reason to expect any sharp rise in business activities in next 20 years in the Narail . The current land under commercial (business/trading) use is 37.98 acres including business areas of shopping and bazaar areas. Market facilities are usually provided privately on commercial basis depending on trend of sale of goods. So it is not possible to fix a standard or project actual area for these services. Field observations shows that most commercial areas are actually mixed areas combined with residence and small scale industry. So, instead of marking commercial areas exclusively for commerce use these areas can develop as mixed use.

Table- 7.7: Land Required for Commerce and Mixed use

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Total Required Land (2030)
Wholesale market:	6 acre per town centre including services/ repairing & supplies	6	6	0
Retail sale market:	5 acre includes market square, occasional supplies & shop like use	5	0	5
Corner Shop:	0.2/ 2,500 Population	12	8	4
Retail Katcha Bazar:	1 in each ward & also for every 20,000 Population, 0.3 acre minimum space for each Bazaar	9	3	6
Neighborhood Market	0.5 acre per 10,000 Population	7.5	0	7.5
Super Market (locally known as new market):	1.5 – 2.5 acre per	2.5	0	2.5
Other Commercial (Servicing & repairing, Hardware & Furnishing, Market square)	-		0	0
Total		42	36.34	5.66
Mixed Use	-		95.34	

For the sake of current planning the team can earmark land as per standard for commercial land use and put them at appropriate locations where commercial facilities may be developed privately or publicly. The total required commercial land will stand at only 42 acres. The extra land requirement will stands at 5.66 acres. Where as the existing mixed use land in Narail is 95.34 acre.

d. Estimation of Land for Industry

According to planning standard the total land for industries comes to 75.00 acres with 15.00 acres for small scale industries and 60.00 acres for cottage and agro based industries. We assume that the estimated land will cover BSCIC initiative to set up a minimum 15 acres industrial estate in every Paurashava.

Therefore, in the years 2030, the estimated land for general industry and manufacturing will stand at 75.00 acres and the existing land use of this purpose is 11.73 acres. So 63.27 acres of additional land will be required.

Table- 7.8: Land Required for General Industries

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
Small scale	BSCIC area minimum 15 acres per	15	0	15
Cottage/agro-based	1.00 acres /5000 population	30	11.73	18.27
Total		75	11.73	63.27

e. Education

Estimation of land according to standard indicates there will be a land requirement of 92 acres to accommodate educational facilities by the year 2030. If we deduct the already available 28.96 acres of existing land uses under various education facilities there will be a need of additional 63.04 acres of land for education facilities.

Table- 7.9: Land Required for Education Facilities

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
Nursery	0.4 acre for 5,000 Population	12	0.8	11.2
Primary School	0.30 acre for 1 Primary School; 1 Primary School for 2,000 People, Minimum no of students (from class 1 to 5): 150 Persons, Minimum land for each school (within): 12 decimal, Distance between two primary school: 2 km	22.5	10.26	12.24
Secondary School or high School	Minimum land within 1 acre	18	5.5	12.5
Alim & Dakhil Madrasa	Minimum land within 0.75 acre	1	0.58	0.42
Fazil & Kamil Madrasa	Minimum land within 1 acre	1	0	1
Other Madrasa	1 acre/ 20,000 Population; 1000 seats	7.5	0	7.5
Technical School & college	Minimum land for establishment of Engineering College 8 acre, Minimum land for Polytechnic Institute 5 acre, Minimum land for Technical School & College 2 acre	8	3.5	4.5
Intermediate / Degree College	2 acres for 1College; 1 College for 15,000 Population	20.00	9.4	10.6
University	Minimum land for establishment of private university 2 acres	2	0	2
Total		92.0	28.96	63.04

f. Health

There already exists Narail Sadar hospital on an area of 3.5 acres. Estimate shows there need additional 2.5 acres of land for the hospital according to recommended standard. The consultant feels there need a hospital in Narail. In future, as the population and density increases, demand for local health facilities will increase. So, additional land of 38 acres will be needed for Health centre/ Maternity clinic.

Table- 7.10: Land Required for Health Facilities

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
Hospital	4 acre per 10,000 Population & minimum 100 bed per hospital	6	3.5	2.5
Clinic	0.6 acre per 5,000 Population	18	0.52	17.48
Health centre / Maternity clinic	0.6 acre per 5,000 Population	18	0	18
Total		42	4.02	37.98

g. Open Space & Recreational

Total recommended land required for various recreation facilities stands at 62 acres. The facilities include, play field/ground, parks of various categories and stadium/sport complex. But as per the standard the required open space is 262.5 acre.

Table- 7.11: Land Required for Open Space Recreation

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
Motel and Tourist Centre	Minimum land: 2 acres	2	0	2
Play field/ground	2 acre per 25,000 Population; minimum walking distance 1.5 km	12	2.28	9.72
Park/ Neighborhood park	2 acre per 10,000 Population	30	0	30
Stadium/sports complex	5 acre per 50,000 Population	15	5.75	9.25
Cinema/ Theatre	0.5 acre 25,000 Population	3	0.327	2.673
Total		62	8.357	53.643
Open Space	1.75 acre per 1,000 Population	262.5	448.91	0

h. Transportation

In the field of transport establishment the Consultants proposes such facilities as, truck terminal, rickshaw stands at selected places, baby taxi/tempo stand and passenger shed for local bus users. However, many of the proposals may seem pre matured, but will be necessary in future. If land acquisition for these facilities is delayed, land may not be available in future for providing such facilities.

Table-7.12: Land Required for Transportation Facilities

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
Bus terminal	Minimum 3 acres per terminal, 3 acres per 1,00,000 Population	4.5	1.7	2.8
Truck terminal	Minimum 3 acres per terminal	6	0	6
Baby taxi/tempo stand	0.5 acre per stand	2	0	2
Rickshaw stand	0.3 acre per stand	1.2	0	1.2
Water way & Landing Station:	Minimum 2 acres for landing station & office, For off-shore land: 500 meter on both sides of the landing station	2	0	2
Rail way & Station:	From one home signal to another home signal: length 3,000 feet & width 500 feet, Total land area: 34.72 acres, Minimum land width for establishment of single line: 100 feet for Broad Gage and 90 feet for meter Gauge (considerable average height of the embankment 10 feet), Minimum land width for establishment of double line: 125 feet for Broad Gage and 115 feet for meter Gauge	34.72	0	34.72

	(considerable average height of the embankment 10 feet)			
Total		50.42	1.7	48.72

i. Administration

Land for administration is meant for public sector office activities.

Table-7.13: Land Required for Administration

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
Youth Development centre	Minimum 2 — 3 acres lands for establishment of Youth training centre & Regional Human Development Centre	3	0	3
DC Office	Office: 4 acres; Residence .5 acre	4.5	4.5	0
Judge Court	District Judge Court: 1 acre; Residence 33 decimal	1.33	1.56	0
SP Office	SP office: 1 acre; Residence: Residence 33 decimal	1.33	1.5	0
Police Line	10 acres	10		10
Thana	1 acre	1	1.18	0
Police Fari	33 decimal	0.99	0.99	0
Circuit House	1.5 acres	1.5	1.5	0
Civil Surgeon	Office: 0.25 acre; Residence 33 decimal	0.58	0.58	0
XEN (PWD)*	Office: 0.25 acre; Residence 33 decimal	0.58	0.58	0
Office for Islamic Foundation	Minimum 0.10 decimal	0.1	0	0.1
Jail	Minimum land 5 acre	5	6.7	0
Others	As per concerned department	0	0	0
Total		29.91	19.09	13.1

The existing Office premise is situated in an area of 2.10 acres. The Consultants consider that this is enough for Narail Paurashava.

j. Public utilities

A number of utility establishments are required in a town to run services properly. There will be 9 waste transfer stations for collection of solid waste. Each ward will have one station with an area of 0.20 acre. So there will be need for 1.8 acres for 9 transfer stations. A dumping site will be developed over an area of 5.00 acres for final disposal of the solid waste. The total additional land requirement under this category is 4.85 acres.

Table- 7.14: Land Required for Utilities

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
Bangladesh Oil, Gas & Mineral Resource Corporation	For establishment of CNG station: 120 feet X 120 feet; (1400 sq. ft or 33 decimal along the road), Distance within two station: 3 km considering one side of road & 2 km considering both sides of roads, Necessary requirements of the corporation must have to be fulfilled	0.33	0	0.33
Power Development Board	Minimum land for construction of 33/11 KV & 2*10 MVA Substation .07 acre, Minimum land for construction of GIS Substation less than .07 acre, Minimum distance for installation of 33 KV, 11 KV & 4 KV line 30-40 meters	0.07	5	4.93
Fire Services	Minimum 50 decimal for "A" Category, Minimum 30 decimal for "B" Category	0.5	0.5	0
Post office	0.4 acres per 20,000 Population	3	0.35	2.65
Solid waste transfer station	Minimum 20 decimal per ward	1.8	0	1.8
Solid waste disposal site	Minimum 5 acre per ***	5	0	5
Total		10.7	5.85	4.85

k. Community Facilities

For various community facilities, the land requirement has been fixed at 50.25 acres. There need community center in Narail Paurashava. As the Paurashava is far from costal region so there need no cyclone center here.

Table-7.15: Estimation of Land Requirement for Community Facilities

Use/Facility	Recommended standard	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
Community centre	1 acre per 20,000 population	7.5	0	7.5
Mosque/Church/ Temple	0.1 acre per 10,000 Population	1.5	7.12	0
Eidgah	0.5 acre per 20,000 Population	3.75	2.17	1.58
Graveyard	5 acre per 20,000 Population	37.5	8.13	29.37
Total		50.25	17.42	32.83

7.2.3 Summary showing distribution of land for existing and proposed land use

The following table is the illustration of land for existing and proposed land use. There is a need of minimum 1043.09 acres of land for future allocation.

Table-7.: Summary Distribution of land for existing and proposed land use

Sl. No.	Use/ Facilities	Estimation of Land Requirement (acre)	Existing Land (acre)	Required Additional Land (2030)
1.	Residential	1000	1131.46	720
2.	Commercial	42	36.34	5.66
3.	Mixed Use		95.34	
4.	Industrial	75	11.73	63.27
5.	Educational	92.0	28.96	63.04
6.	Health	42	4.02	37.98
7.	Open Spaces & Recreational	324.5	457.267	53.64
8.	Transportation	50.42	1.7	48.72
9.	Administrative	29.91	19.09	13.1
10.	Community Facility	50.25	17.42	32.83
11.	Utility Services	10.7	5.85	4.85
Total				1043.09

7.3: Land Use Proposals

7.3.1 Introduction

Development control is an essential part of urban planning. For development control certain procedures have to be followed for approval of designs of various categories of structures, establishments and land uses. The first condition is to secure land use permit according to approved zoning plan followed by approval of the design of proposed building/structure.

In land use zoning, the entire area of a town is divided into suitable land use zones to create congenial and livable environment and thereby enhance land value. In Bangladesh such land use zoning is incorporated as a part of the master plan / land use plan/urban area plan. Before submitting building plans for approval an applicant must secure land use permit from the Paurashava. For land use permit, an applicant's prospective use of structure must be compatible with the approved land use zone of the site. Land use zoning limits activities that can or cannot function on a land parcel by establishing a range of development options. Land use zoning is a legal instrument by application of which can control,

- The height of building/structure,
- The area of a land parcel that must be left vacant, and
- The use of a building and land occupancy

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

Area Zoning

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

Density Zoning

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

Height Zoning

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

Considering the existing level of development and development prospects, the Consultants recommend to follow the area zoning only.

Zoning is only a part of development control regulations. A prospective developer in a has to comply with other rules and regulations, like, Building Construction Rules, 1996 under East Bengal Building Construction Act 1952, Bangladesh National Building Code 1993 and other conditions of construction method, building safety and associated issues.

7.3.2 Designation of Future Land Use

Designation of future land use (Land Use Zoning) as is required to fulfill the requirements of the approved TOC requires information on (a) Sectoral Projects, (b) Means of implementation and (c) Responsible authority. This corresponds to the decisions of the standing committee (Sec. 67 of Act 2009) as urban management and services responsibilities as under:

Table-7.17: Decision of the standing committee as urban management and services responsibility

Sl. No.	Sector	Functions/ Services	Agency responsible for implementation	Source (as per Act 2009)
1	Planning and Development Control	- Strategic Structure Planning - Area and Local Planning - Multi Sectoral Investment Planning/ Master Plan, etc.	- - -	- Sec.53-54 - Sec. 32 - Do
2	Water, Sanitation and Drainage	- Water Supply - Drainage - Flood Control	- - Do - WDB/	- Sec. 53, Sub sec. (2) & Sec 10 - Do (3) & Sec 12 - Do, Sec 2 & Sec 47
3	Other Utilities	- Electricity - Gas - Telecom	- DESCO, PDB, REB -BTCL	- - -
4	Roads & Transport	- Main Road - Other Road - Street Lighting - Traffic Management - Traffic Control - Bus Terminal, Rail/ Water/ Air Transportation	- / RHD - / LGED - - / Police - Police - BRTC/ IWTA/Civil aviation, Private/ Other	- Sec 38, 53(2) - Do, Sec 39 - Schedule 2 Sec 41 - Sec 40-44 - Sec 43 - Sec 53(2)
5	Municipal Services	- Solid Waste - Street Sweeping - Market - Slaughter House - Parks & Green	- - - - -	- Sec 53(1) - Do - Sec 21, Sch 2 - Do - Sec 23, Sch 2,
6	Protective Services	- Police - Fire	- Police/ - Civil Defense	-Sec 53(1) - Sec 45
7	Housing and Land Development Plan	- Government Building - High income land development/ Housing - Low Income housing and Land Development - Area Development and Upgrading - Industrial Estate - Commercial Estate - Land Acquisitions	-PWD - Private - / NGO/ Other – / Private - BSCIC/ BEPZA - / Private/ Other - ADCLA; CLAC -	- -Sec 2, Sec 32, Sec 34 - Do-Sec 33, Sch (2), - Sec 62 - - Sch (2) - Sec 64 -
8	Social Service, Education and Culture	- Education - Primary - Secondary	- Dept. of Education - Dept. of Technical Education	- Sch (2), Sec 56-61 - Sch(2), Sec 59 - Sch(2), Sec 60

		Technical - Culture - Library - Primary Health Care - Hospital - Social Welfare - Public Health/ Sanitation - Health Center	- - - DPHE/ - -DSW/ - -	- Sch(2), Sec 9, 56-57 - Sch(2), Sec 8 - Sch (2), Sec 61, 63 - Sch(2), Sec 1-9 - Do
--	--	--------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------	-------------------------------------------------------------------------------------------------

7.3.3 Proposed Land use Category

The following land use zone classification is recommended under the current Master Plan.

1. Administrative
2. Agricultural
3. Commercial
4. Community Facility
5. Educational
6. Health
7. General Industrial Area
8. Noxious Industrial Area
9. Mixed Use
10. Open Spaces and Recreational
11. Residential
12. Restricted Area
13. Transportation
14. Urban Reserve Area
15. Utility Services
16. Water Bodies

In the sections below, the general definition of the use and description of associated permitted and conditionally permitted uses under each land use zone have been provided. The uses that are not listed here in any of the categories shall be treated as Restricted Use for the corresponding land use category and shall not be permitted only except unanimously decided otherwise by the appropriate authority. In such situations the use shall get permission in the category of New Use. The following table describes the area of specific area of the corresponding land use category.

Table- 7.18: Area of Different Proposed Land Use Category

Sl. No.	Proposed Land use	Area in acre	Area in Sq. km.	Percentage
1.	Administrative	78.1264	0.316173	1.08
2.	Agricultural	2126.9841	8.607787	29.40
3.	Commercial Area	68.7075	0.278055	0.95
4.	Community Facilities	83.4915	0.337885	1.15
5.	Educational Area	149.6912	0.605792	2.07
6.	General Industrial Area	476.5472	1.92856	6.59
7.	Health Services	12.0412	0.04873	0.17
8.	Mixed use	96.9338	0.392286	1.34
9.	Noxious Industrial Area	177.4776	0.718242	2.45
10.	Open Space and Recreational	47.8850	0.193788	0.66
11.	Residential	2341.2232	9.4748	32.36
12.	Defense & Security	11.2211	0.045411	0.16
13.	Transportation & Communication	649.1493	2.627071	8.97
14.	Urban Deferred Area	423.6561	1.714513	5.86
15.	Utility Services	96.1609	0.389158	1.33
16.	Water bodies	396.4237	1.604305	5.48
Total		7235.7198	29.28256	100.00

Following is a short description on recommended land use zones.

a. Residential

The total land proposed for residential zone is 2341.22 acres (947.48 hectares) which is about 32% of the Urban Area Plan area. Different categories of housing areas have been proposed in the development plan under the categories of residential. These categories have been made for promotion of housing through private and public initiatives. The residential category includes all

areas of future residential development, public housing and hotels and lodging establishments and existing housing areas.

The existing staff housing areas of different public sector agencies have been marked as public housing. As per EBBC Act 1952 all categories of structures need approval from appropriate authority before undertaking their construction. Therefore, developers of public buildings should also seek approval before construction. All housing areas will be allowed to have ancillary processing and service land uses to support the residential dwellers.

This zone will allow residential uses as listed in Table-7.19.

b. Commercial

Commercial zones are designed into two types: office and business predominated. Commercial Office Zone is an office pre-dominated commercial zone that mainly supports the official works. It supports other types of commercial activities, too. Proposals for these areas involve large-scale buildings and require a high degree of accessibility and parking space for car users and delivery vehicles. Existing commercial areas and areas potential for future commercial development have been placed under commercial use.

The other type commercial areas generally contain one or more of a wide variety of uses that includes business uses, offices, hotel, public houses, and limited forms of retailing. Mainly bazar, shopping agglomerations and areas suitable for commercial development have been placed under this category. This zone has an area of 68.70 acres designated up to 2030. This zone will permit and conditionally permit commercial uses as listed in Table-7.19.

c. Mixed Use Zone

Mixed use zones have been recommended to allow some flexibility in development. Such a like Narail, as the trend shows, an exclusive commercial land use is unlikely to function. Admixture of land uses will allow flexibility of development, instead of restricting development. Total area for mixed uses has been put to 96.93 acres, including both, existing and proposed land uses. This zone will allow residential structures together with commercial uses as listed in Table-7.19.

d. Transport & Communication

Estimates show that about 649.15 acres of land under the existing and proposed road and relevant infrastructure facilities. This constitutes about 8.97% of the planning area. Other transport facilities like, bus and truck terminal etc have been included in this zone.

e. Industrial

The purpose and intent of industrial zone is to provide areas in appropriate locations where various light and heavy industrial operations can be conducted without creating hazards to surrounding land uses. Industrial zones have been categorized into two zones like general industrial and noxious industrial zones.

Industrial land use includes areas where industries have already been developed, BSCIC, industrial clusters and areas that are potential for future industrial development. The land earmarked for general and noxious industrial use stands at 476.5472 and 177.47 acres. In these zones a complex line of industrial and supporting non-industrial land uses will be permitted and conditional permission will be given to a number of other land uses as specified on Table-7.19.

f. Agricultural area

The Paurashava has a vast area of agricultural land that demands formation of a separate zone like, Agricultural zone. This land use type also includes lands lying outside of the urban growth boundary and identified as green belt and encompassed by the agricultural area Boundary. The total area under this use has been proposed as 4481 acres that include existing and proposed land uses. The following are permitted Uses within the Urban Reserve (UR) Zone:

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

Details of permitted and conditional uses are presented in Table-7.19. The total area under this use has been estimated as 2126.98 acres that include existing and proposed land uses.

g. Educational

Under the category of educational area all institutional uses like education and research institute, etc have been included. Land belonging to educational use includes all categories of educational and training institutions. Educational institute like Medical College, Animal Hospital & research Institutes etc have been included in this zone. Total land under this land use is 149.69 acres which is about 2.07 % of the study area.

h. Health

The health area includes all existing health service establishments and the areas proposed for health facilities. The total land earmarked for this category stands at 12.04 acre (0.17%).

i. Administrative

Administrative zone covers all kinds of government and non-government offices in the town. The permitted use in this zone and conditional uses as listed in Table-7.19. The total area under this use has been estimated as 78.12 acres that include existing and proposed land uses.

j. Open spaces and Recreational

The planning area has extremely low level of formal open space. The proposed open space cover the parks, play fields and the existing open space areas like, forest, park, etc. The proposed recreational facilities for open space will increase the urban breathing space in the planning area. The total area under recreational land stands at 47.88 acres which is 0.66% of the planning area.

k. Community Facilities

This land use covers all categories of community facilities and establishments like mosque, temple, church, Eidgah, graveyard, community centre etc. This type of facility are scattered all over the master plan area. This land has an area of about 83.49 acres.

l. Water bodies

The planning area has 396.42 acres of water body within the . The plan suggests preserving most of these water bodies for two purposes, first, to serve as source of water, second to serve as water retention area during monsoon. The ponds with an area equal to or more than 0.25 acres will be preserved as the water retention ponds. There will be permitted uses in this zone and allow some other uses conditionally as stated in Table-7.19.

m. Utility Services

Public utilities for various services like fire service, post office, solid waste transfer station, solid waste disposal centre, electric sub-station, filling station, etc are an important land use for Narail . The Consultants have delineated 96.16 acre of land for public utilities.

n. Urban deferred Area

Lands have been deferred in different parts of the Structure Plan area for future urban development. The total amount of such land stands at 423.65 acres (5.86%).

7.3.4 Land Development Regulations to implement the Land use Plan

7.3.4.1 Policy support to implement the Land use plan

The policy support from the Act, 2009 is as follows:

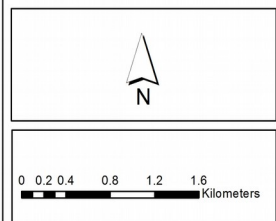
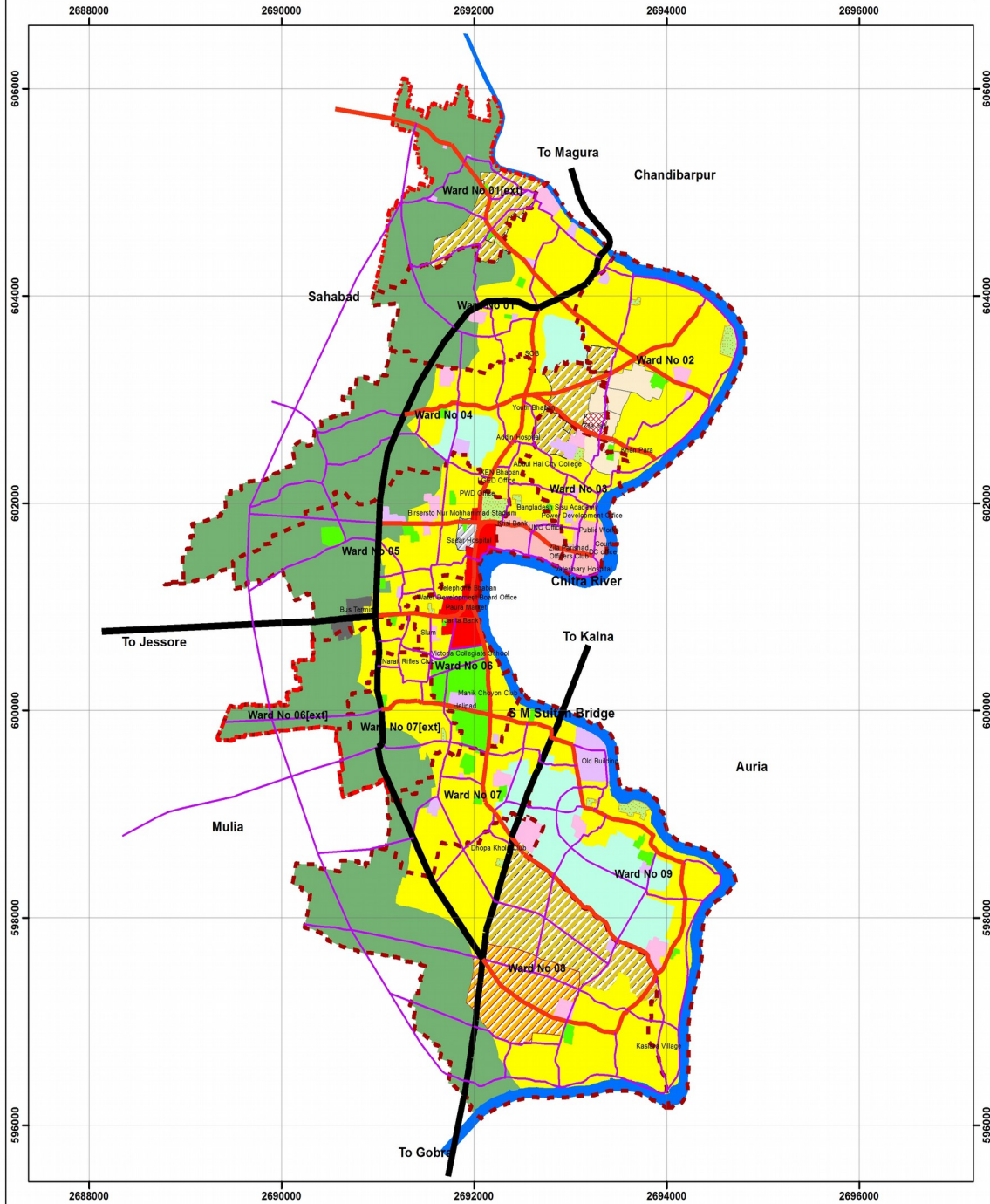
According to Second schedule 32 of section 50-71:

Master Plan

A may, and if so required by the Prescribed Authority shall, draw up a Master Plan for the municipality which shall, among other matters, provide for-

- a. a survey of the municipality including its history, statistics, public services and other prescribed particulars;
- b. development, expansion and improvement of any area within the municipality; and
- c. Restrictions, regulations and prohibitions to be imposed with regard to the development of sites, and the erection and re-erection of buildings within the municipality.”

Map 7.2: Land Use Plan Map of Narail Paurashava



Legend	
	Project Boundary
	Ward Boundary
	Proposed Road Type - Primary
	Proposed Road Type - Secondary
	Proposed Road Type - Tertiary
	Proposed Land Use - Administrative
	Proposed Land Use - Agricultural
	Proposed Land Use - Commercial Area
	Proposed Land Use - Community Facilities
	Proposed Land Use - Educational Area
	Proposed Land Use - General Industrial Area
	Proposed Land Use - Health Services
	Proposed Land Use - Mixed use
	Proposed Land Use - Noxious Industrial Area
	Proposed Land Use - Open Space and Recreational
	Proposed Land Use - Residential
	Proposed Land Use - Defense & Security
	Proposed Land Use - Transportation & Communication
	Proposed Land Use - Urban Deferred Area
	Proposed Land Use - Utility Services
	Proposed Land Use - Water bodies


AQUA Consultant & Associates Ltd.
 In association with.....


 Centre for Environmental and
 Geographical Information Science
AQUA Consultant & Associates Ltd.
 AQUA Tower, 43, Mohakhali C/A
 Dhaka-1212, Bangladesh.
www.aquacon.com.bd

According to Second schedule 33 of section 50-71:

Site Development Schemes

(1) Where Master Plan has been drawn up under section 95 and such Master Plan has been approved, with or without any modifications by the Prescribed Authority, no owner of lands exceeding such area as may be specified in this behalf in the Master plan as so approved, shall develop the site or erect or re-erect a building or any plot of land covered by the Master plan, except in conformity with the provisions of a Site Development Scheme sanctioned for the area in the prescribed manner.

(2) Among other matters, a Site Development Scheme may provide for-

- a. the division of the site into plots;
- b. the streets, drains and open spaces to be provided;
- c. the land to be reserved for public purposes and to be transferred to the ;
- d. the land to be acquired by the ;
- e. the price of plots;
- f. the works that shall be executed at the cost of the owner or owners of the site or sites; and
- g. the period during which the area shall be developed.

According to Second schedule 34 of section 50-71:

Execution of Site Development Schemes

(1) The execution of a Site Development Scheme shall be subject to the inspection and control of the , and the may give such directions with regard to the execution of the Scheme as may be necessary for the proper development of site.

(2) If any area is development or otherwise dealt with in contravention of the provisions of the sanctioned Site Development Scheme, the may by notice require the owner of such area or the person who has contravened the provisions to make such alteration in the site as may be specified in the notice and where such alteration is not made or for any reason cannot be carried out, the may, in the prescribed manner, require and enforce the demolition of the offending structure, and notwithstanding anything to the contrary contained in any law, no compensation shall be payable for such demolition.

(3) If an area for which a Site Development Scheme has been sanctioned is not developed within the period provided in the Site Development Scheme, and further extension is not allowed by the , or if the development is not in conformity with the terms of the Site Development Scheme, the may, in the prescribed manner, take over the development of the site and execute the necessary works, and the cost incurred thereon by the shall be deemed to be a tax levied on the owner or owners under this Act.”

According to Second schedule 35 of section 50-71:

Erection and re-erection of buildings

(1) No person shall erect or re-erect a building or commence to erect or re-erect a building unless the site has been approved, and the building plan has been sanctioned by the .

(2) A person intending to erect or re-erect a building, shall apply for sanction in the manner provided in the by-laws, and shall pay such fees as may be levied by the with the previous sanction of the Prescribed Authority.

(3) All building applications presented under this section shall be registered in the manner provided in the by-laws, and shall disposed of as early as possible, but not later than sixty days from the date of the registration of the application, and if no order is passed on an application within sixty days of its registration, it shall be deemed to have been sanctioned to the extent to which it does not contravene the provisions of the building by-laws, or of the Master Plan or Site Development Scheme, if any-

(4) A may, for reasons to be stated in writing, reject a site plan or a building plan, but any person aggrieved thereby may appeal to the Prescribed Authority within thirty days of the order of rejection, and the order passed by the Prescribed Authority in appeal shall be final.

(5) A may sanction a site plan or a building plan subject to such modifications or terms as may be specified in the order of sanction.

(6) Nothing in this section shall apply to any work, addition or alteration which the may, by-law, declare to be exempt.”

According to Second schedule 36 of section 50-71:

Completion of buildings, alterations of buildings, etc

(1) every person who has erected or re-erected a building shall, within thirty days of the completion of the building, report such completion to the .

(2) The shall cause every building which has been completed to be inspected, and if it has been constructed in violation or contravention of any provision of this Ordinance, the rules or the by-laws or of the Master Plan of Site Development scheme, if any, the may require the alterations of the building so as to be in compliance therewith, and where such alteration is not possible, the may require the building or any part thereof to be demolished, or on the application of the owner such building compound the offence, provided that no offence shall be so compounded if it involves any violation or contravention of the provisions of a Master Plan or of a sanctioned Site Development Scheme.

(3) If a building is required to be demolished under the provisions of subsection (2), and such requirement is not complied with within the specified period, the may have the building demolished through its own agency, and the cost incurred thereon by the shall be deemed to be a tax levied on the owner or occupier of the building under this Ordinance.

According to Second schedule 37 of section 50-71:

Regulation of buildings

(1) If any building, or anything fixed thereon, be deemed by the to be in a ruinous state or likely to fall or in any way dangerous to any inhabitant of such building or of any neighboring building or to any occupier thereof or to passers-by, the may by notice require 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 may take the necessary steps itself and the cost incurred thereon by the shall be deemed to be a tax levied on the owner or occupier of the building under this Ordinance.

(2) If a building is in a dangerous condition, or otherwise unfit for human habitation, the may prohibit the occupation of such building till it has been suitably repaired to the satisfaction of the .”

With the help of Act, 2009 the proposed land use can implement. The proposed regulation is elaborate in the Structure Plan section.

7.3.3.2 Land use regulation for different land use zones

Summary of permitted & conditional uses of different land use category for Narail.

Table-7.19: Permitted & conditional uses of different Land use category

Permitted use	O	Residential	Commercial	Mixed Use Area	Communication Transportation &	General Industrial Area	Noxious Industrial Area	Agricultural Area	Educational Area	Health Services	Administrative	Open Space and Recreational	Community Facilities	Water Body	Restricted Area	Utility Services	Urban Deferred Area
Not permitted	N																
Land use																	
Agriculture, Forestry & grazing		N	N	N	C	N	N	O	N	N	N	O	C	O	O	C	O
Aquaculture & fisheries		N	N	N	C	N	N	O	N	N	N	O	C	O	O	C	O
Brick fields		N	N	N	N	N	N	C	N	N	N	C	N	C	N	N	O
Cemeteries / graveyard		C	N	C	C	C	C	O	N	C	N	C	O	N	O	O	O
Cinemas		N	O	C	O	N	N	N	N	N	C	N	O	N	O	N	N
Clinics, medical		C	O	O	O	O	C	N	C	O	C	N	O	N	O	C	C
Clubs, private		C	O	O	C	C	N	N	N	C	C	N	O	N	O	C	N

<table border="1"> <tr> <td>Permitted use</td> <td>O</td> </tr> <tr> <td>Conditional use</td> <td>C</td> </tr> <tr> <td>Plan review required</td> <td>P</td> </tr> <tr> <td>Not permitted</td> <td>N</td> </tr> </table>	Permitted use	O	Conditional use	C	Plan review required	P	Not permitted	N	Residential	Commercial	Mixed-Use Area	Communication Transportation &	General Industrial Area	Noxious Industrial Area	Agricultural Area	Educational Area	Health Services	Administrative	Open Space and Recreational	Community Facilities	Water-Body	Restricted Area	Utility Services	Urban Deferred Area
	Permitted use	O																						
	Conditional use	C																						
	Plan review required	P																						
	Not permitted	N																						
Colleges & universities	C	C	P	N	N	N	C	O	C	C	N	O	N	N	N	N								
Dwellings, farm	O	N	O	N	N	N	O	N	N	N	O	N	C	N	N	O								
Dwellings, minimal housing	O	N	O	N	C	N	O	N	N	N	N	N	C	C	C	C								
Dwellings, single/multi family	O	N	O	N	N	N	N	O	C	C	N	O	N	N	C	C								
Flood management structures	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O								
Hospitals (with morgue)	N	C	P	C	N	N	C	N	O	N	N	C	N	O	N	N								
Hotel guest house	N	O	O	O	N	N	N	N	C	C	N	O	N	N	C	N								
Hotel international class	N	O	O	O	N	N	N	N	N	C	N	O	N	N	N	N								
Industrial , orange a	N	C	C	C	O	C	N	C	C	C	N	C	N	C	C	C								
Industrial , orange b	N	N	N	N	O	C	N	N	N	N	N	N	N	N	N	N								
Industrial , red	N	N	N	N	N	O	N	N	N	N	N	N	N	N	N	N								
Institutions	C	O	O	N	O	N	N	O	C	O	N	O	N	C	N	N								
Major development	C	C	C	O	C	C	C	C	C	O	C	O	O	O	O	O								
Offices / services	C	O	O	O	C	C	N	C	C	O	N	O	N	C	O	N								
Parking facilities, commercial	C	O	C	O	O	O	N	C	C	O	C	O	C	C	O	N								
Petrol stations	N	O	C	O	O	O	N	N	N	O	N	O	N	N	O	N								
Public uses & structures	C	O	O	O	O	O	N	C	C	O	C	O	O	N	O	N								
Recreation facilities, outdoor	O	O	O	O	O	N	O	C	C	C	O	O	O	N	C	O								
Religious uses & structures	O	O	O	O	O	C	O	O	O	O	O	O	O	O	O	O								
Repair shops, major	N	O	N	N	O	O	N	N	N	N	N	C	N	N	N	N								
Repair shops. Minor	C	O	O	C	O	O	N	C	N	C	N	O	C	C	C	N								
Retail shops & restaurants	C	O	O	O	C	C	N	C	C	O	O	O	C	O	C	N								
Schools, private	O	C	C	N	N	N	N	O	N	C	N	O	N	O	N	N								
Schools, government, religious	O	C	O	N	N	N	N	O	N	C	N	O	N	O	N	N								
Shopping center / large market	N	O	P	N	N	N	N	N	N	N	N	C	N	N	C	N								

<table border="1"> <tr><td>Permitted use</td><td>O</td></tr> <tr><td>Conditional use</td><td>C</td></tr> <tr><td>Plan review required</td><td>P</td></tr> <tr><td>Not permitted</td><td>N</td></tr> </table>	Permitted use	O	Conditional use	C	Plan review required	P	Not permitted	N	Residential	Commercial	Mixed Use Area	Communication Transportation &	General Industrial Area	Noxious Industrial Area	Agricultural Area	Educational Area	Health Services	Administrative	Open Space and Recreational	Community Facilities	Water Body	Restricted Area	Utility Services	Urban Deferred Area
	Permitted use	O																						
	Conditional use	C																						
	Plan review required	P																						
	Not permitted	N																						
Stadium, sports	N	C	P	N	N	N	N	N	N	N	O	C	N	N	C	N								
Terminals, train, bus	N	O	P	O	N	N	N	N	N	N	O	O	O	N	O	N								
Trade center	N	O	P	N	N	N	N	N	N	N	N	O	N	N	N	N								
Utility installations	C	C	P	C	C	C	C	C	C	C	C	O	C	C	O	C								
Ware housing & distribution	N	O	C	O	O	O	N	N	N	N	N	C	C	N	C	N								
Waste disposal & processing/ incinerator	N	N	N	C	C	O	C	N	C	C	C	O	N	C	O	O								

7.3.5 Implementation, monitoring and Evaluation of the Land Use Plan

7.3.5.1 Implementation Strategy

Traditionally, owing to complexities, government does not involve people in the planning and development process of any project and attempt to implement it with own or procured fund through land acquisition. Such a policy has some built-in problems that sometimes strongly resist its implementation.

People rightly feel that they have the right to know about the plan which has direct bearing on their life and property. The plan regardless of its quality uproots many people from their home and community they belong to. Thus sometimes a strong and desperate group of affected people together with their friends and allies resist, with their united strength, the implementation process of a development project.

In our country, during land purchase people records land at considerably low price than the actual. This reality makes people financially looser when the land is acquired by government. Compensation all over the world is a complicated process. Brokers prop up to bridge the gap between innocent people and the government machinery. Money sticks to broker's hands. Plan Implementation through Active Community Participation Technique is the answer to offset these impossible obstacles on the way to plan implementation. The plan recommends involving beneficiaries in plan implementation.

7.3.5.2 Land Management

Effective land management is one of the most important tools for the implementation of spatial development plans. For existing urban areas of middle to high densities, the most effective approaches are urban rehabilitation/upgrading and land sharing, either or not engaging community based development techniques for which proper institutional and financial mechanisms have to be established. On the contrary, for existing urban areas with relatively low densities, government agencies may acquire land for construction of infrastructure and provision of urban service, and also for the implementation of site and services schemes that can offer low cost plots to low income households. Mechanism for institutional and financial support for disadvantaged group may be adopted like cross subsidy, etc.

7.3.5.2.1 Land Management Techniques

Urban Renewal

Urban renewal is necessary for a built up urban areas where there is considered blight and obsolescence and derelict and not fit for human habitation. It is necessary for those areas that are already threatened by degradation of physical environment due to over population, congestion and unplanned development, also where the land uses are haphazard, unsystematic and incompatible.

The basic essential infrastructure urban services and community facilities are not properly exist, in the area where there is existence of heritage and which are in decaying stage.

Site and Service Scheme

Site and service schemes would be offered by private developers, including cross subsidization as part of the conditions. Such schemes will fulfill the conditions in order to obtain a development license for a larger area. Here too, institutional provisions will be needed to make this spatial land management technique work effectively. In the Site and Services schemes the most important issue is matching the plot size distribution to the income of the expected/targeted beneficiary. Community based development of (hard core poor) low-income housing including facilities in the existing urban area and the urban fringe area through consulting with facilitator and users will be the responsibilities of the public sector urban development agencies.

Land Readjustment/Guided Land Development

Land readjustment and guided land development both aim at improving accessibility and at providing better services without the (compulsory) land acquisition by government agencies. In this type of plan the development authority can play a vital role in planning and development in co-operation with land owners and other service giving agencies. Success depends to a high degree on limiting the amount of land that is needed for these purposes. Therefore, improvement of accessibility should aim at widening and improving capacity of existing roads (and providing some missing links) rather than the construction of completely new roads. Similarly, the provision of services should not go beyond strict minimum standards. New neighborhood centers (in which most services should be concentrated) in newly developing areas can be located just outside existing core areas, so that they serve both the new development and existing area. For good accessibility these centers should be situated near the major junctions of the road network. Minimum standards for some urban services are given in the Urban Area Plan. For other services minimum standards has to be prepared. In land readjustment and guided land development schemes some space will be available for new development, but improving the existing situation deserves more attention. Here, one of the most important issues is giving support to occupants to improve the quality of their own shelter (security of tenure, access to small scale loans, cheap building materials), including sanitation, water supply and garbage disposal.

7.3.5.2 Use of Appropriate Land Management Techniques

Land management in the study area will be done in three possible ways:

1. Private sector development
2. Public sector development and,
3. Development control.

Land Reservation for Infrastructure and Restriction on Land Use Clearance

Structure Plan policy recommends to reserve land earmarked for infrastructure (suggested in the current plan as advance acquisition). It is very likely that it would not be possible to implement all development proposals in a short time due to resource constraint. So, there will be need to reserve the lands earmarked for infrastructure development. This reservation may be made by way of pegging the earmarked area/boundary using marking materials. Besides, strict restriction be imposed on according permission to any development other than mentioned in the development plan proposals for that area. This however, might necessitate amending the immovable property acquisition and requisition act.

Special Area Treatment

Structure Plan mentioned about taking "special treatment" regarding some special areas "to allow their present function and future expansion to be secured." They include places of national importance, places of heritage, security establishments, etc. The Building Construction Rules 2008 (Section 61, Page 3058) also calls for conservation and preservation of important establishments and buildings of heritage. It suggests preparation of rules and regulations for proper conservation and preservation of such establishments.

7.3.5.3 Development Permit

Development Permit is the most important function of and for that matter of any City Development Authority. Master plan will have no bearing unless development can be channelized to its desirable direction through effective permit procedure. Master plan has developed its plan using GIS

database and other advanced computer software of world standard. The necessary planner to handle this database is quite available in the country. This combination provides the unique opportunity to make its plan permit procedure fast, well managed and transparent. This is also in line with the idea of digital Bangladesh pronounced by the present govt.

a. Computerization of the Permit procedure

Maintaining information of all the development activities within the jurisdiction is a mammoth task and maintain them in the present manual method is neither possible nor necessary. Consultant recommends development of customize software for the purpose. The system would prove worthwhile by saving in the form of time, cost, ease of management, ease of upgrading of information, control of corruption and so forth.

b. Landuse Permit

has the legal responsibility to develop plan for the wellbeing of the citizens within its jurisdiction and implement the same by channelizing all developments through appropriate control mechanisms. Issue Plan Permit to private plot owner/s or developers working with the consent of the owner/s that comply the set regulations constitute the most part of development control activity conducted by . Town Planner will issue permit for development proposals in accordance with the Table 7.19 of the master plan. If the proposal requires review the Town Planner will review it and submit it to the appropriate committee with recommendation for decision.

8.4.1.3 Proposed New Roads

Table-8.16: Phase wise Proposal of Roads in Narail

Phase No	Proposal of	Length (m)	Length (km)
Primary Road			
Phase 01	New Construction (7)	6859	6.85
	Widening (25)	10774	10.77
	Total (32)	17633	17.63
Total Length of Primary Road			35.33
Secondary Road			
Phase 01	New Construction (7)	2713	2.71
	Widening (54)	15063	15.06
	Total (61)	17776	17.78
Phase 02	New Construction (6)	3670	3.67
	Widening (15)	5910	5.91
	Total (21)	9580	9.58
Phase 04	New Construction (6)	1860	1.86
	Widening (147)	1850	1.85
	Total (20)	3010	3.01
Total Length of Secondary Road			33.67
Tertiary Road			
Phase 01	New Construction (8)	1392	1.38
	Widening (48)	8445	8.44
	Total (56)	9837	9.83
Phase 02	New Construction (12)	2600	2.60
	Widening (77)	2033	20.33
	Total (89)	2293	22.93
Phase 03	New Construction (27)	1415	14.15
	Widening (16)	1679	16.79
	Total (43)	3094	30.94
Phase 04	New Construction (26)	4554	45.54
	Widening (32)	1126	11.26
	Total (58)	5680	56.80
Total Length of Tertiary Road			122.026

Table-8.17: Proposed Primary Roads in Narail

Proposed ID	Existing Road Width (m)	Road Name	Existing Road Type	Remarks	Length (m)	Proposed Road width (m)	Remarks	Phase	Ward no
P18	0.00			Proposed	3976.735	36	New Construction	Phase 1	Ward 04
P22	0.00			Proposed	2332.894	36	New Construction	Phase 1	Ward 07
P25	0.00			Proposed	549.916	36	New Construction	Phase 1	Ward 01
P26	0.00			Proposed	3976.735	36	New Construction	Phase 1	Ward 01
P27	0.00			Proposed	3976.735	36	New Construction	Phase 1	Ward 05
P30	0.00			Proposed	2332.894	36	New Construction	Phase 1	Ward 07(Ext)
P32	0.00			Proposed	2332.894	36	New Construction	Phase 1	Ward 08
P1	5.50	Jessore Road	Road_Pucca	Existing	348.443	36	Widening	Phase 1	Ward 05
P2	5.60	Ghora Khali Ghat Road	Road_Pucca	Existing	361.307	36	Widening	Phase 1	Ward 01
P3	5.50	Narail- Kalna Road	Road_Pucca	Existing	2016.022	36	Widening	Phase 1	Ward 09
P4	3.50	Narail-Gobra Main Road	Road_Pucca	Existing	477.592	36	Widening	Phase 1	Ward 08
P5	3.60		Road_Pucca	Existing	251.682	36	Widening	Phase 1	Ward 06(Ext)
P6	3.60	Mulia Road	Road_Pucca	Existing	983.711	36	Widening	Phase 1	Ward 07(Ext)
P7	4.80	Magura Road	Road_Pucca	Existing	63.012	36	Widening	Phase 1	Ward 01
P8	5.50	Narail-Gobra Main Road	Road_Pucca	Existing	75.822	36	Widening	Phase 1	Ward 08
P9	3.70	Narail-Gobra Main Road	Road_Pucca	Existing	374.098	36	Widening	Phase 1	Ward 08
P10	3.70	Narail-Gobra Main Road	Road_Pucca	Existing	302.074	36	Widening	Phase 1	Ward 08
P11	3.50	Narail-Gobra Main Road	Road_Pucca	Existing	224.345	36	Widening	Phase 1	Ward 08
P12	4.00	Narail-Gobra Main Road	Road_Pucca	Existing	195.101	36	Widening	Phase 1	Ward 08
P13	3.90	Narail-Gobra Main Road	Road_Pucca	Existing	175.331	36	Widening	Phase 1	Ward 08

Proposed ID	Existing Road Width (m)	Road Name	Existing Road Type	Remarks	Length (m)	Proposed Road width (m)	Remarks	Phase	Ward no
P14	3.80	Narail-Gobra Main Road	Road_Pucca	Existing	63.166	36	Widening	Phase 1	Ward 08
P15	3.80	Narail-Gobra Main Road	Road_Pucca	Existing	97.341	36	Widening	Phase 1	Ward 08
P16	3.40	Narail-Gobra Main Road	Road_Pucca	Existing	316.848	36	Widening	Phase 1	Ward 08
P17	6.00	Jessore Road	Road_Pucca	Existing	323.979	36	Widening	Phase 1	Ward 05
P19	0.00			Existing	901.178	36	Widening	Phase 1	Ward 01
P20	3.60	Mulia Road	Road_Pucca	Existing	62.373	36	Widening	Phase 1	Ward 07(Ext)
P21	3.50	Narail-Gobra Main Road	Road_Pucca	Existing	255.030	36	Widening	Phase 1	Ward 08
P23	0.00			Existing	793.827	36	Widening	Phase 1	Ward 08
P24	0.00			Existing	2175.194	36	Widening	Phase 1	Extension
P28	3.60	Mulia Road	Road_Pucca	Existing	983.711	36	Widening	Phase 1	Ward 07(Ext)
P29	5.50	Narail- Kalna Road	Road_Pucca	Existing	2016.022	36	Widening	Phase 1	Ward 07
P31	5.50	Narail- Kalna Road	Road_Pucca	Existing	2016.022	36	Widening	Phase 1	Ward 08

Proposed secondary and tertiary roads present in the annexure.

8.4.2 Plan for Transportation Facilities

8.4.2.1 Road Infrastructure Facility Plan

First and foremost transport infrastructure planning is a process that consists of well defined tasks that must be accomplished before the final set of information is presented to those who are to decide which course of action is the best for an agency, region or community. Infrastructure facility provision should be in such a way that suits a community at the best level and the feasibility of the alternatives should be kept in mind. Sustainability of a development depends wholly on the ability to accommodate the incremental growth. The performance index of a development work is measured upon its capacity to accomplish the incremental need concept which is the key point of any kind of planning.

No matter what kind of transport facility is being provided in an urban area, it is likely that some portion of a trip will use that particular facility. These includes pedestrians who will use sidewalks that are adjacent to roads, the bicyclist who are intending to use bicycle lane, transit buses need to use bus bays. Some other features such as underpasses, overpasses, clover leaf, grade separations, and interchanges could be incorporated depending on the viability of that particular facility for a particular traffic and community.

Now a day's parking of vehicles has become a great concern while planning for a because of shortage of land, so land use pattern will define the kind of best suit parking facility. The road hierarchy of Narail Paurashava is as follows.

Primary Road:

Primary roads are the major roads that connect the adjacent districts to Narail ; these roads also enclose the . Depending on the connectivity and mobility and assuming to have a large no of AADT the geometry of this type of road is designed. Two lane single carriageway having a width of 5.5 m, a shoulder of 1.2m (both side) is selected for the first phase of development.

Secondary Road:

Secondary roads will provide the road network within the locality that will serve the shorter distance trips. For this type of road special attention should be focused on footpath facility, zebra crossings, markings, sign, signals etc. Slow moving vehicles occupy the road for longer times hence the width of secondary road is fixed to 5.5m ,shoulder of 1.1m(both side), in spite of less AADT than the AADT of primary roads.

Collector or Collector/ Tertiary Road:

Collector roads are that routes that will provide door to door services, mainly the user of these routes are pedestrians, NMV and light traffic. A width of 3.7m and a shoulder of 0.9m (both side) is selected for this type of road.

Access road:

Access roads are those routes that connect the very user end to the Collector/ Tertiary Road. Since the RoW is comparatively less than the other type of roads, the slope of the road is to maintain 1 is to 1 to provide a width of 3.25m.

The following list of guidelines has to be followed for new road construction:

- The roadway and adjacent areas shall be left with neat and finished appearances.
- No accumulation of inflammable material shall remain on or adjacent to RoW
- In agricultural areas where the ground has been formed into ridges or dikes, the ground shall be roughly leveled or graded to form a surface suitable for embankment foundation.
- Excavated materials shall be deposited so as not to cause damage to services or property and so as to cause no impediment to the drainage of the site or surrounding area.
- During construction the borrow pits shall be kept drained as far as practicable and the work shall be carried out in a neat and workmanlike manner.
- The placing of fill shall be carried out in successive layers for the full width of fill.
- Each layer shall not exceed 150mm in thickness on completion of compaction.
- Surface tolerance of +-25mm from the specified level is accepted.
- The moisture content of the fill materials before compaction shall be within +-2% of the OMC
- The achieved dry density of the embankment after compaction shall not be less than 95% of the maximum dry density.
- One density test for each 1000sqm shall be carried out
- The sub grade shall be prepared in lengths of not less than 100m at any one time.
- Sub grade material shall be scarified to a depth of 150mm until the soil is fully loosened
- In case of sub grade 98% dry density shall be achieved.
- Improved sub grade(ISG) shall be spread in layers, with uncompacted thickness upto 200mm
- CBR test shall be carried out, the CBR shall be such that the laboratory value obtained at the specified compaction and after 4 days soaking, shall exceed 8%.
- Base shall be at or near the OMC at the time of placing and spread in layers of nearly equal thickness.
- Each layer shall be thoroughly compacted with suitable and adequate compaction equipment.
- Each layer shall be compacted to at least 98% of maximum dry density.
- Rolling operations shall begin at the edges and overlap the shoulder at least 750mm.
- Bituminous mixture shall be placed only when the surface is dry, when rain does not appear imminent and when the prepared roadbed is in satisfactory condition.
- In case of spraying prime coat the distributor shall have pneumatic tyres and shall be so designed that bituminous material at constant temperature may be applied uniformly on variable width and at controlled rate of 0.2 to 2.0 L/sqm.
- Rollers shall not be allowed to stand on newly laid material that may be deformed thereby.
- The mixed bituminous seal coat shall be placed and spread over the granular base course which has been primed or bituminous carpeting to a uniform thickness which shall be a minimum of 25% greater than the specified compacted thickness, and immediately compacted with a power driven road roller.
- Paints for road marking shall be suitable for applying by brush or mechanical means.
- Sodding or turfing shall be done by planting sods or turf.

The following guideline has to be followed for widening of roads:

Where embankment fill is being carried out to widen an existing embankment the new fill material shall be fully keyed into the old embankment by means of benching which shall be in steps each not less than 300mm high 600mm wide.

Typical Plan and cross section of Primary, Secondary and Collector/ tertiary roads has been given below.

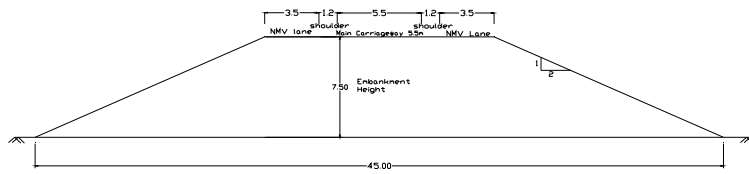
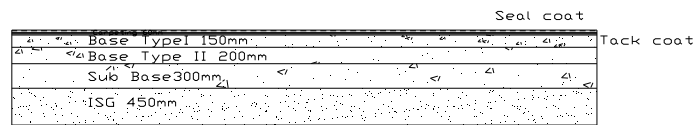


Figure 8.9: Plan of Primary Road
(All dimensions are in meter)



X-section of Primary Road

Figure 8.10: Cross Section of Primary Road

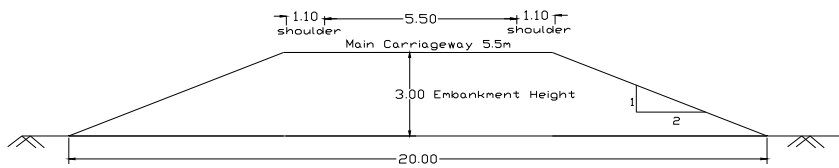
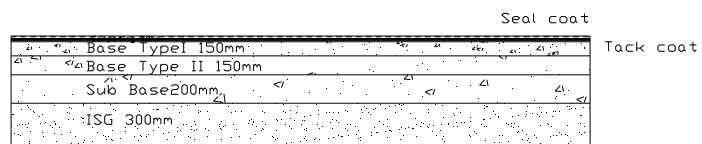


Figure 8.11: Plan of Secondary Road
(All dimensions are in meter)



X-section of Secondary Road

Figure 8.12: Cross Section of Secondary Road

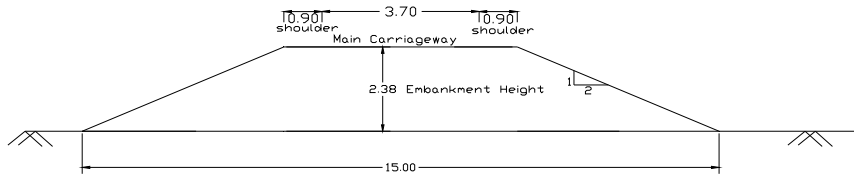
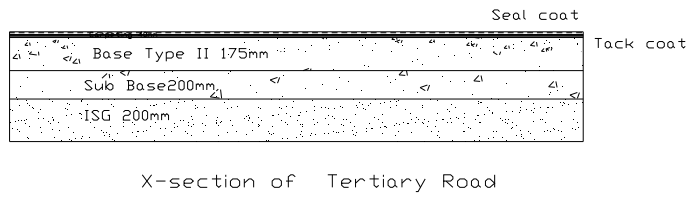


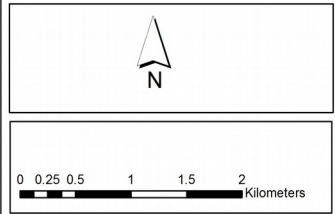
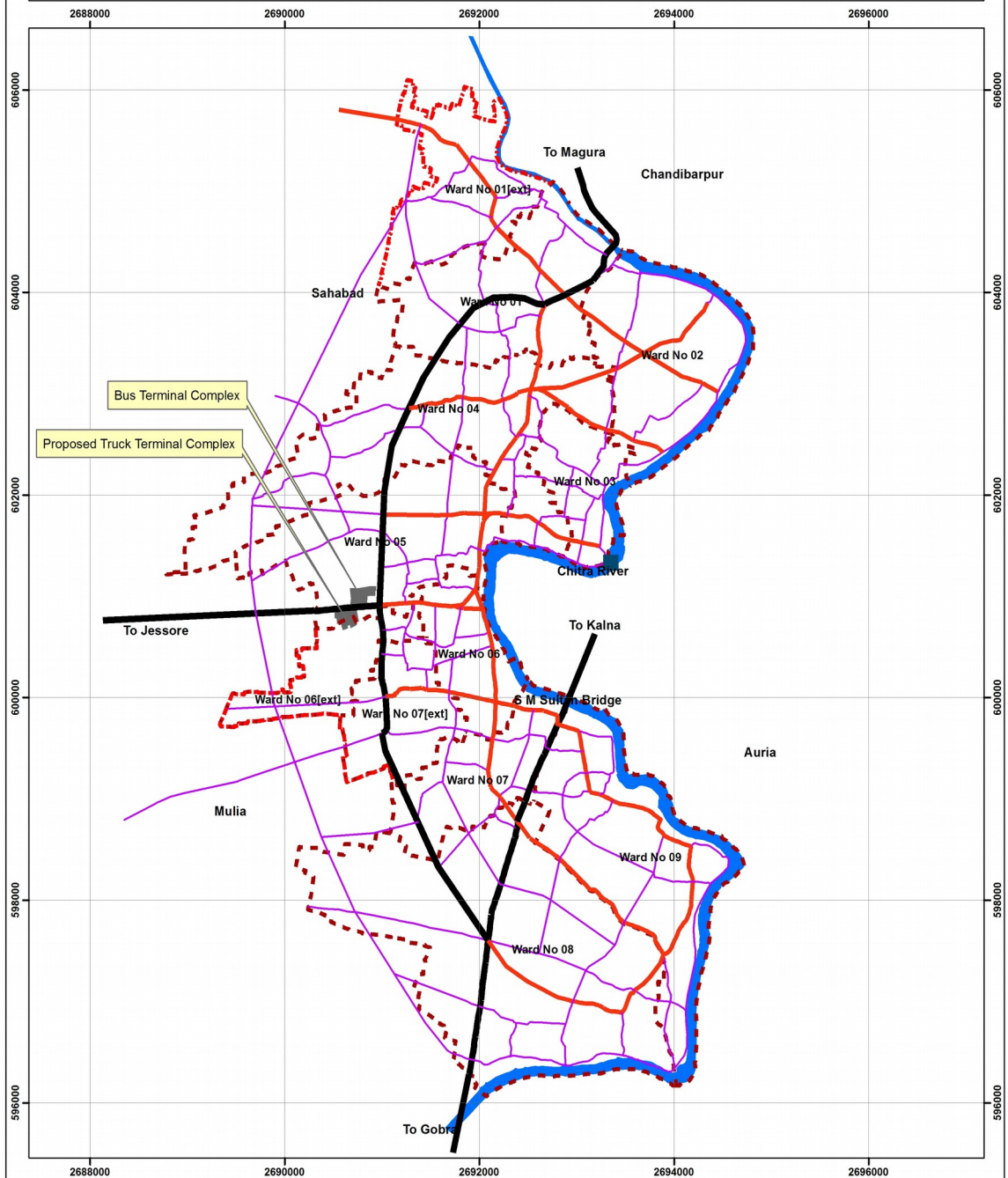
Figure 8.13: Plan of Collector or Tertiary Road
(All dimensions are in meter)



X-section of Tertiary Road

Figure 8.14: Cross section of Collector or Tertiary Road

Map 8.2: Proposed Road Network of Narail Paurashava



Legend

	Project Boundary		Proposed Road Type
	Ward Boundary		Primary
	Proposed Bridge		Secondary
			Tertiary
			Proposed Land Use
			Transportation & Communication
			Water bodies

