Chapter- 2
Critical Planning Issues

2.0 Introduction

The current chapter analyzes the existing development pattern of the project area and identities critical issues. It includes such issues as residential, commercial and industrial development patterns, services facilities, description about non-urbanized areas, infrastructure facilities and land value and population growth.

2.1 Existing Development Pattern

2.1.1 General

Location-1 is a part of north-western fringe of Dhaka City. It is a crescent shaped area surrounding entire Mirpur area from east to west moving through north. It is a vast undeveloped area on the western fringe of Uttara Model Town and Hazrat Shahjalal (R) International Airport. The area was typical rural in character even a few years back. Lack of proper infrastructure including road and communication facilities led to spontaneous development in the areas which is very close to Mirpur. Further north, the areas are mostly low lying and development is slow owing to absence of road infrastructure. The area is now growing fast as an urban fringe inhabited mostly by a mixed group comprising middle, lower middle and low income people. Before implementation of the Flood Protection Embankment the area was annually inundated during the monsoon, where only agriculture could be done. A significant number of the residents are unemployed and live a subsistence life. This may be related to the fact that there are not sufficient numbers of industrial enterprises the area, which could have contributed to the reduction of poverty and unemployment. The planning area can be described as dominated by rural character located within the close vicinity of city. The spatial growth pattern of Locatio-1 is shown in **Map-2.1**.

2.1.2 Socio-economic Profile

It was found in the socio-economic survey the income range of most of the residents is between Taka 3500 and Taka 6500. A major portion of their income is devoted to procure food. When priority is placed on survival, housing will suffer. Thus settlements are typically kutcha and rural in character and lacks all the basic amenities required for healthy living, although some houses are semi-pucca and quite a few are pucca. Land within the study area is devoted mostly, to housing, agriculture and small retail business.

The planning area has been growing spontaneously without proper transportation and communication facilities. Before the implementation of the flood protection embankment the area was subject to inundation during the monsoon. Household work is also to be major occupation of the residents. A significant number of the residents are unemployed and live subsistence life.

a. Family Size

The household size in the area reflects that more than 75% households are with 3 to 4 family members. About 15% households have been found with 5 to 6 family members, while more than 8% households with 7 to 8 family members. The national average household size as is about 5.5 members/households.

b. Age and Sex Structure

The distribution of household population in the designated area by age group and gender is quite identical. It has been found that in most of the age group, distribution of males/females is almost same and close to equal. But variation has bee found in the age group of 55-59. In age group 55-59 years, male population is almost double than the females (male 4.48% and female 2.22%).

c. Religious Groups

Religious composition of the population in the area has various implications for spatial planning and overall welfare of the population. Data collected through the socio-economic survey regarding religious status has revealed that about 92% households of the study are belonging to the Muslim community followed by Hindu (7.78%). Other religious community like Christian and Buddhist could also be found but they are negligible.

d. Educational Status

Overall 12% of the total population aged 6 years or above have never attended schools, and the remaining 79% have some sort of education. About 42% have completed or attended primary school, 25% have attained some secondary level of education, only 15% have completed SSC and the remaining 18% have HSC and the above level of education.

e. Occupation/Employment Pattern

Occupational pattern of population of the project area mainly reflect the urban based job and business. About 22% are either under aged or students and about 27% are involved in household works that is they are all females. About 39% are engaged in some earning activities and 13% are unemployed. About 12% work in government/private/autonomous organizations, 7% are involved in business, 8% are day labours and 2% are land owner farmers. The remaining 10% are involved in other activities like, industrial works, skilled/unskilled professions, etc.

f. Income and Expenditure Levels

Monthly household income and expenditure indicate socio-economic status of the area. These also allow examining the household saving rate. Here, income means income of a household for a month from all sources such as production, property, salary and business, and expenditure means amount of money that a household spends for all types of consumptions. It has been found that the households with monthly income more than Tk. 6000 spend fewer amounts than income and these households are able to save some money. But the situation is opposite among the low income group households. More than 28% households have monthly income within Tk. 4500, while 54.24% households have monthly income between Tk. 4501 and Tk. 10,000, and more than 18% have monthly income of more than Tk. 10,000. As regards monthly expenditure, about 47.24% households expend Tk. 4500 or less, about 44.72% are able to spend Tk. 4501 to 10,000, and rest 8.84% spends more than Tk. 10,000 for a month.

g. Source of Income

From the socio-economic survey it has been revealed that a household receives income from more than one source. In the study area, daily wage accounts for more than 30% of all household incomes, followed by salary (25.58%), business (22.09%) and agriculture (8.28%). About 14.14% households also derive income from some other sources like property, house rent, livestock, fisheries, handicrafts, remittance etc. and livestock.

h. Migration

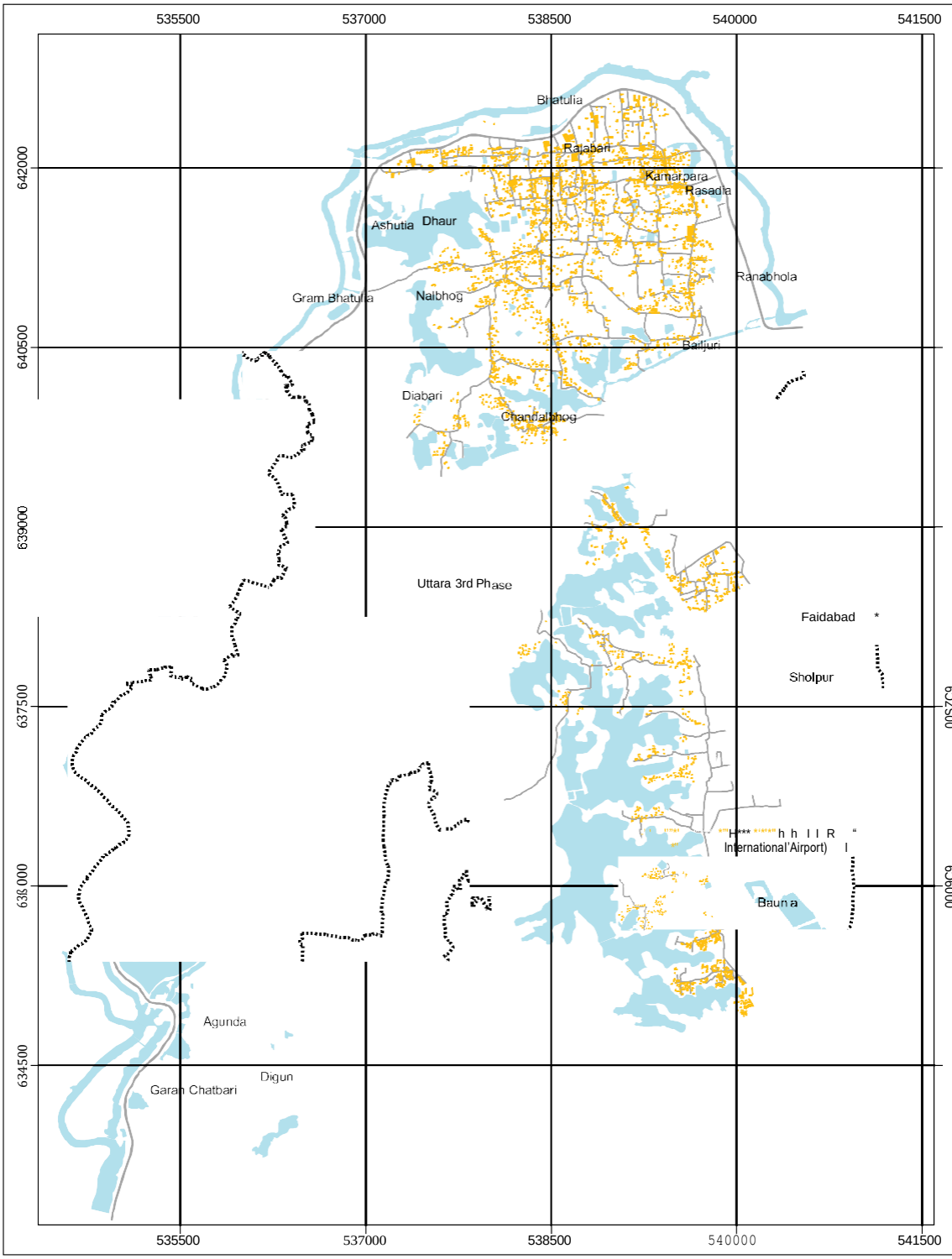
It has been revealed that about 44.11% of the households are local residents and about 55.81% are migrated from different parts of the country.

2.1.3 Land Use

a. Residential Areas

Residential settlements are found particularly in areas of higher elevation following linear pattern along major and along the internal roads. Dhaur, Gram Bhatulia, Ranabhola, Chandalbhog, Baunia areas are the densest parts of the planning area. In most areas new residential developments are coming up spontaneously, which make provision of services difficult. A little over 39 percent of the planning area is occupied by residential land use. A vast tract of land remains vacant because of lower elevation of lands that get flooded during monsoon. As a result development is costlier in the area that involves large scale land filling. Large and small commercial developers and individuals land developers are the main actors of land development in the area. They are carrying on development by filling up low lands and heavy foundation.

MAP-2.1: SPATIAL GROWTH PATTERN OF LOCATION - 1 AREA



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Detailed Area Plan for DMDP Area (Location - 1)

LEGEND

Location-1 Boundary

Existing Road

Existing Settlement

Waterbody

b. Industrial and Commercial Development

Industrial and commercial land uses follow along the roads giving a linear shape. There are different categories of industries. A few numbers of garment and knit wear factories have been found in the area, while large number of furniture making and other small scale home manufacturing and processing units exist. However, the total coverage of all categories of industries and commerce is only about 6.79 acres that is very much insignificant compared to the total planning area. The main industrial agglomerations are observed in Dhaur, Bhatalia, Ranabhola area. Commercial developments are found mainly in Kamarpara area.

c. Amenities and Urban Facilities

It is ascertained from the study that there is serious shortage of play field and parks for local level active and passive recreation. Absence of open space particularly affects children and the adolescent classes in terms of growth of their body and mind. Adolescent devoid of playing areas are often found to get involved in drug addiction and anti social activities. A variety of uses like, bank, health facilities, power sub station, treatment plants, engineering workshops, hotel, restaurant, police, fire brigade and like are included in this category of land use. It has been found from the survey that service activities occupy 0.58 acres of land in the project area.

d. Non Urbanized Area

Within the planning area major land coverage is non-urbanized. They are either low lying and vacant or belong to agriculture, and or water body. The total area belonging to non-urbanized category constitutes over 55 percent of the total planning area. So there are still vast opportunities for urban expansion in the area. But urbanization has to proceed with land filling to raise it above flood level which is costlier. Vacant lands are mostly fallow lands where no agriculture is done due to indiscriminate land filling and for want of irrigation water after the monsoon.

2.1.4 Infrastructure

a. Circulation Network

Location-1 is bounded by Mirpur flood protection embankment which is an embankment cum road. It is the only major road of the project area. The project area is connected with this road to the other parts of the DMDP area. Apart from this road, most of the roads of Location-1 area have been developed spontaneously and through community initiative. A good proportion of roads in Location-1 area are bituminous (89.58%) that have mainly been developed in DCC areas. Over 3.05 percent of the project area roads have been found katcha or unpaved. The most important problem of roads is that they are very narrow and tortuous that makes movement of vehicles difficult. There is about 15.11 km of embankment cum road in the planning area.

2.1.5 Land Ownership

Household survey shows, more than 78% of the families are owner of their landed property through the law of inheritance. About 15.25% became owner of land by means of purchase, while 5.47% received their land through the means of gift.

2.2 Expected Development

2.2.1 Population

There prevails a rapid trend of urbanization in Location-1 area. Population projection shows a high growth of population in the area. Current population growth and increased density give evidence it this. Current gross density of the area is 28 persons per acre and net density is 41 persons per acre. Future projected population is compared in the following table with population of 2001. The projection shows that by the year 2015 the population of Location-1 area will be about 398110. Please see **Table-2.1.**

Table- 2.1: Projected Population and Household of the Project Area

Name of Mouza	Census Population		Projected Population (r = 7.486973%)	
	1991	**2001**	**2010**	**2015**
Agunda	377	763	1461	2097
Ashutia	274	348	666	956
Baijuri	1274	2139	4097	5877
Baunia	8840	21297	40787	58519
Bhatulia	2360	4095	7843	11252
Chandalbhog	1138	1659	3177	4559
Dhaur	2762	4086	7825	11227
Diabari	1572	2137	4093	5872
Digun	9841	19897	38106	54673
Faidabad	15180	41722	79904	114643
Garan Chatbari	9211	18624	35668	51175
Gram Bhatulia	3173	6415	12286	17627
Kamarpara	5220	8100	15513	22257
Sholpur	516	1043	1998	2866
Nalbhog	2987	3263	6249	8966
Rajabari	1614	2301	4407	6323
Ranabhola	3462	5817	11140	15984
Rasadia	225	445	852	1223
Total	**70026**	**144151**	**278081**	**398110**

Source: *BBS and Compiled by Consultants*

2.2.2 Economic Activities

The current socio-economic survey shows a significant number of people are either jobless or has no contribution to GDP (involved in household work). 25.5% people are service holder in Government and private companies. More than 27 % people are engaged in some sort of business or entrepreneurship. So economic activates are very low within the project area. More employment opportunities are immediate needs for the project area. Despite unemployment there is a trend of growing economic activities in the area. In the built up parts of the planning area, retail shops are coming up along major roads, workshops for furniture making, knitwear manufacturing are slowly growing. These activities are creating new job opportunities. As a developing fringe, regular employments are being created in the construction sector, as new buildings are coming up in vacant plots. Real estate developers have already penetrated into this mixed income area as land for development is gradually shrinking in the city core areas leading to soaring prices.

2.3 Development Problems

2.3.1 Hydrology (Drainage and Flooding)

Flooding and Water Logging

The general characteristics of this area are its low in elevation and proneness to inundation in case of rain, resulting in existing residential areas to go under water during monsoon. The area is subject to frequent flooding due to its close proximity to the Turag River. The possibility of severe flooding has been greatly reduced by the implementation of the Flood Protection and Drainage Programme for western Dhaka. Water logging due to precipitation and lack of internal drainage, however, still exist. The construction of the pump station and its retention pond is expected to take care of this problem. Realization of the FAP 8B proposals will augment the supply of flood protected land, which will require less land fill for development. It should be kept in mind that indiscriminate developments should not be allowed in any case, otherwise, the main objectives of the FAP 8B will be defeated.

Flood Proneness

The area is still a flood prone area as no retention pond has so far been built, to hold rainwater till the water is pumped into the Turag River. As a result flood water still submerges large areas including the settlements.

2.3.2 Spontaneous Development

Some major land filling projects have been undertaken within the project area. Haphazard land filling increase the frictional surface and further reduce the velocity of flow. As a consequence, this is creating the problem of drainage congestion especially during the rainy season. Land grabbers sometime fill the natural drainage channels and khals not keeping in mind that it'll make the drainage congestion in the area. This illegal land filling is aggravating the flooding situation.

Development control function is very poor in the project area. With present capacity RAJUK cannot oversee or pro-act to guide and steer development in desired areas of urban expansion. This resulted in:

- Un-necessary invasion of agricultural land by urbanization.
- Non-conforming uses are found every where.

No initiative for retention pond

Retention ponds are proposed to keep the urban area free from internal drainage congestion. These retention ponds will contain the rain water until they are pumped to natural drainage channels. But no initiative has ever been taken before DAP to demarcate the exact location of retention ponds.

Encroachment to Flood Plain from Outside

Immediately after the major flood of 1988, to protect Dhaka City from inundation "The Greater Dhaka Flood Control Committee" was formed. An embankment built along the river in western fringe. but lately it is being encroached by destitute endangering stability of the embankment.

Blockage of Storm Water Drainage

Water logging is a common problem in the project area. Indiscriminate land filling is rapidly aggravating the situation. The Dhaka Structure Plan's "Rural and Spatial Area (RS) Policy" RS/5- Flood Retention Ponds is that flood retention ponds need to be designed to reduce the intensity of local flooding within the protected areas and to reduce pumping requirements, and as such, are an integral part of the proposed flood protection schemes.

Detour Access to the City

The presence of the Cantonment, the Hazrat Shahjalal (R) International Airport, the Airforce Base, the Mirpur Zoo and the Botanical Garden results in a long detour to access the eastern part from the western part of Dhaka and vice versa. The extension of the Begum Rokeya Sarani up to the Eastern Bypass (on the Balu Embankment) is expected to visibly reduce and ease this long detour. Access to Uttara would be easier if the Rokeya Sarani upto embankment road is extended.

2.3.3 Transportation

a. Road

The entire area lacks systematic and planned road network. No road network plan was ever drawn up for this high intensity development area. As a result narrow and unplanned meandering roads have been developed spontaneously by the community efforts. If this trend continues then there will be no scope for future intervention. Due to high demand for land by a fast growing economy, rapid development is taking place in the area without considering the suitability of road network and quality. Since the investors have little or no option, they are forced to choose lands on narrow and low standard road. Many existing roads have been found to be narrow and meandering that poses as impediments in smooth movement of vehicular traffic.

Highly Potential for Immediate Urbanization

Considering the location and characteristics of the surrounding areas, the planning area is highly potential for immediate development. The planned areas of Uttara Sector 10, Sector 12, Sector 13 and Sector 14 have increased pressure for development of the adjoining areas. This has been enhanced by the proposed development of the pockets of land in Uttara Third Phase in the midst of the project area.

The location of the embankment within the western periphery of the planning area has made it free from catastrophic flood. The road-cum-embankment has also increased accessibility to the site. Implementation of retention ponds and green space will greatly increase the environmental and recreational opportunities in the planning area

b. Transportation Problem versus Urban Land Use

The plan would not be successful if there is no balance between landuse and transport planning. Many of the transportation problems is emanating from the conflict in the landuse. It is found that congestions are created due to the landuse along side of the major roads. More over, linear development along the major road substantially reduces the efficiency of a road. Roads are also constructed with complete disregard to the projected generation of trips. Conflicting land uses also result in unnecessary congestion which could be otherwise avoided. Commercial landuse should not be allowed along the major roads as they generate traffic congestion.

2.3.4 Utility Services

a. Electricity

Electricity covers almost all part of the study area. High voltage towers and transformers are distributed evenly in all unions. But the supply is inadequate like the other parts of the DMDP area.

b. Water Supply

Dhaka WASA is responsible to supply water within its jurisdiction in the study area. The socio-economic survey revealed that about 54% of the households have the access to water supplied by WASA. Others use tube well as the main source of drinking water all over the study area. No overhead tank and no deep tube well have been found in the project area.

c. Gas Supply

Titas Gas is responsible to supply gas in the Location-1 area. Gas supply is available in most part of the project area.

d. Sewage Disposal

Sewerage system is not available in the Location-1 area.

e. Drainage

Before the urban invasion started in the planning area, there was a natural drainage system in the planning area that drained out the excess rainwater during monsoon and saved the area from flooding. Almost entire project area is now without any drainage network, while rapid urban growth is being taken place everywhere. This is posing a serious threat to new settlements by water logging. Since most natural drainage systems are being filled up by new landowners, rainwater will become clogged at certain places causing water stagnation and flooding. There is no drainage development plan for the planning area undertaken by LGED or Water Development Board. Local drainage management is hampered due to non-existence of urban local government. With the rapid urbanization some of the natural drainage systems have already been filled up by new developers, at other places the land owners by the side of state owned water courses encroached into the drainage system. This tendency has caused the drainage network to squeeze down reducing their capacity to drain out enough water. Many of these natural drainage system still exist which must be protected to save the area from flood vulnerability.

f. Solid Waste Disposal

There is no proper location for the dumping of solid waste in the planning area, as a result the inhabitants dispose their waste haphazardly which pollute the environment. At the same time it decreases the aesthetics of the area. There is no waste transfer station, as a result waste is dumped everywhere.

2.3.5 Amenities and Services

a. Active and Passive Recreation

Active Recreation

Active recreational facilities furnish opportunities for the physical growth of human body by actively engaging muscles in various games. Playground, stadium and playing fields are the facilities that offer such recreation. The demand for playgrounds in recent time has greatly increased due to the rapid development of organized athletic games. The planning area seriously lacks public recreational open spaces particularly playfields. Absence of open space particularly affects children and the adolescent classes in terms of growth of their body and mind. Adolescent devoid of playing areas are often found to get involved in drug addiction and anti social activities. The playfield available in some schools in the area also serve local communities.

Passive Recreation

Passive recreational facilities are provided to meet with needs of fresh air and enjoyment of the unspoiled nature. In congested city areas, it is not possible for the inhabitants to secure this type of recreation and therefore, the parks should invariably be provided for the benefit of local community. Thus the open spaces in the form of parks furnish the passive type of recreational open space. The available nearest open space, recreation and amusement areas include Zoo and Botanical Garden. Since the area is still at the developing stage there are opportunities to create parks and open space.

b. Educational Facilities

Followings are the problems of educational facilities:

i. No public or private university
ii. No medical college
iii. No national level school/college
iv. Lack of Primary School as per requirement

c. Market Facilities

Very few small bazaars have been found in the study area formally provided by the authority. Several small daily kitchen markets have been found in Dhaur and Baunia area.

d. Community Facilities and Urban Facilities

Among all the community facilities, religious facilities are the most in the Location-1 area. Hospital/Clinic, fire service station, graveyard, post office, police station, power plant, and refueling station etc have been considered as Community facilities. But there is great dearth of community facilities in the planning area. Problems of community facilities are summarized below:

i. Graveyards and cremation grounds are inadequate. There is one major graveyard namely Kalshi Graveyard in Lalmatia.
ii. At places religious facilities like, mosque do not cater to the growing needs of the community
iii. Shortage of Community Centre
iv. Street light facilities inadequate to cover entire urban area.
v. Hospital facility in both public and private sector is inadequate.
vi. There is no specific location for waste disposal

2.3.6 Environmental Concern

The plan will have positive environmental impacts as there will be remarkable improvement in the physical environment. Planned and systematic development of infrastructure and urban services and facilities would facilitate creation of improved urban environment. Drainage system will be developed according to the plan recommendations which will reduce flood vulnerability in the low lying parts of the study area,

a. Flood Flow and Waterbodies

There are plenty of water bodies like pond, ditch, marshy land and khal in the planning area. With urbanization and industrialization through this project, many ponds and ditches will be lost for land filling by the owners that will also lead to increase of land value.

b. Pollutions

As the area is still at developing stage and there are only few industries in the area, and so pollution is yet to emerge as an environmental problem.

c. Loss of Bio-diversity

Elements of urbanization like road, infrastructure development, housing, commercial places, industrialization etc. will replace the existing green natural environment to man made environment where their plan will be executed. Trees will be cut down, water bodies will be filled up and polluted; birds and fishes will lose their habitats and as a result a big loss of biodiversity will take place due to urbanization process in the project area.

d. Potential Hazards

Groundwater is replenished or recharged through surface water seeping from lands surface, streams or lakes into the ground or through precipitation percolating into the ground. For the groundwater table to stay at the same level, the amount of recharge must equal the amount of discharge. It is reprehensible that vested quarters or groups all over the planning area make offence by diminishing the arable lands, grabbing lands by filling low lying areas, encroaching rivers, lakes, khals, etc. It is worth mentioning that urbanization poses a threat to our groundwater supply. Indiscriminate urban development increases the amount of impervious (nonporous) surface in a watershed. Impervious surface inhibits groundwater recharge because precipitation cannot penetrate the surface. As a result, groundwater is being gradually depleted. There is a concern that if soil is contaminated or surface runoff is polluted, the quality of the groundwater will also be affected. Polluted groundwater and/or a diminished supply of groundwater are of particular concerns where groundwater is the major source for drinking water.

e. Controlling Instruments for Unplanned Development

There are several laws and regulations by which the respective authorities can play vital role in controlling the unplanned development in the planning area. They are as follows:

i. Town Improvement Act, 1953
ii. Dhaka Master Plan, 1959
iii. Dhaka Metropolitan Development Plan, 1995-2015
iv. Bangladesh National Building Code, 2006
v. Dhaka Mahanagar Imarat Nirman Bidhimala, 2008
vi. Besarkari Abashik Prokolper Bhumi Unnayan Bidhimala, 2004
vii. Jaladhar Sangrakkhan Ain, 2000

But due to absence or inadequate of application, these acts and rules have become ineffective and plan violation has become a common practice.

2.3.7 Shelter and Settlement

Owing to ineffective development control measure, indiscriminate and unplanned growth of settlements has become a common phenomenon. It has been found that new areas are brought under settlements without adequate provision of infrastructure and services. On the other hand, it has become very difficult to provide secured shelter to the urban poor at their affordable prices. The majority of the people of the project area are grouped in the middle and low income range and they are unable to buy land in the established urban areas. As a result, they are finding shelters in remote areas without basic services including access facilities. This is resulting in conversion of remote agricultural land into settlement where living environment provides little or no basic services.

2.3.8 Lack of Co-ordination among Agencies

There is lack of coordination among different public sector agencies about development management and service provision in the planning area covering following areas.

a. Duplication of Effort

Some agencies are performing same tasks without any intervention by the government. For building plan approval Dhaka Metropolitan Building Construction Rules, 2008 empowers Urban Development Agencies of divisional cities and paurashavas. But in many cities both, paurashava and urban development agencies approve building plans. These creates serious problems as paurashavas in most cases take a liberal attitude towards following building construction rules while giving construction approvals. Both Water Development Board and LGED undertake drainage and flood control schemes, sometimes without any coordination among them.

b. Disregard to Plans by Public Sector Line Agencies

According to Building Construction Rules any construction by anyone must be preceded by approval from the authority before going for construction. But most public sector agencies do not seek permission from RAJUK. This is a sheer violation of law by public sector agencies. Besides, most individual and real estate developers violate their approved plans during construction to add additional space to their structures.

2.4 Current Public Sector Investment Program

There is no current public sector investment program in the Location-1 area at the moment.

Chapter-3
Development Plan Proposal

3.0 Introduction

Chapter–3 of the Plan Report describes the development proposals. The Chapter starts with review of upper level frameworks and ends with proposals set for development including some recommended policies.

3.1 Abiding Policy Frameworks of Higher Level Plans

In this section the upper level frameworks of the current plan that is DMDP Structure Plan and Urban Area Plan policy proposals have been discussed. The policies have been discussed on sectoral basis. In the transport sector the relevant strategies and development proposals of government approved Strategic Transport Plan (STP) for Dhaka have also been discussed as an upper level framework.

Structure Plan Policies

The DMDP Structure Plan and Urban Area Plan (1995-2015) are the legally approved higher level planning frameworks of the current DAP project. In the following sections a brief review has been carried out on the relevant policy guidelines of these two plans to establish a relationship between the higher level plans and the current detailed area plan.

Relevant Structure Plan Policies

- Rural and Special Area Policy RS/5 – Flood Retention Ponds control will be maintained over the areas in order to ensure that they remain capable of fulfilling their primary function of water storage at times of flooding.
- Urban Area Policy UA/6 for New Urban Land growth promotion seeks to initiate and coordinate a range of measures aimed at stimulating and promoting the rate of development in the designated areas of the urban fringe.
- Urban Area Policy UA/7 Infrastructure Initiatives seek to promote, through the DMDP Structure Plan, an orderly sequence of new area development by means of mutually reinforcing and coordinated public sector investment programs, spearheaded by drainage, flood protection and transport development.
- Sectoral Policy SE/4 advocates for an integrated policy of the incremental environmental upgrading and relocation, where necessary, of Dhaka's polluting industries, in a manner commensurate with sound environmental practice and cost-effectiveness.
- Infrastructure Policy IN/2 promotes for incremental network development in the transport sector in order to conserve resources and being responsive to proven demand for the service being offered.
- Land Resource Optimization Policy UA/1 advocates adjusting expected increase of population and the need to maintain and develop a healthy and stimulating urban living environment, it is necessary to optimize the use of limited land and more effectively utilize the existing flood free areas of, urbanized land.
- Community Based Development Initiatives Policy UA/3 suggests to enhance access to land with secure tenure, and to affordable and appropriate levels of infrastructure and social community services provision for an increasing majority of the population.

Urban Area Plan Recommendation

The ten years span DMDP Urban Area Plan (UAP) provides an interim mid-term strategy for the development of urban area within the RAJUK administrative boundary. The validity of UAP, though expired in 2005, has been extended through a gazette notification. The UAP, through its explanatory report, resource maps, interim management report, interim planning rules, and urban area plan map provides guidelines for planning and development control of the entire RAJUK area.

The current study area of Location-1 falls in **SPZ-05** of the Structure Plan. The Planning area is only a part of **SPZ-05.**

Spatial Planning Zone-05: Mirpur

The UAP made the following population estimates for SPZ: 05: Mirpur :

Table- 3.1: Population and Density of SPZ 05, 1991-2006

Year	Population	Density (ppa)	Urban Area (acres)
1991	430,000	274	1856
2006	650,000	352	

Source: *DMDP Urban Area Plan, p-52*

Area Description

As stated in the table above, SPZ 05 has a total area of about 1856 acres that stands on the western edge of main Dhaka City area. As prepared back in 1995 the Structure Plan report views the area as a "planned *area which is largely developed to cater to the needs of the low and medium income population ……"* The trend of urbanization is very fast which is changing the entire rural scenario of the SPZ 05.

Major Issues/Problems

Following were the observations of the UAP report (1995) about SPZ 5:

- A substantial part of the zone (north-west and east side of Hazrat Shahjalal (R) International Airport) is low lying. The report expressed concern over rapid urbanization in the area which might destroy the proposed retention pond proposed for the area which is vital for flood protection as recommended by FAP 8B.
- Available vacant land will need some kind of protection from flooding if they area to be put into urban use.
- The proposed bypass connecting Rokeya Sarani with Eastern Bypass would generate additional traffic.
- Cantonment and Hazrat Shahjalal (R) International Airport has restricted east-west link which might retard development in the area.
- There are large slums in the area where there is acute shortage of basic services.
- There is lack of education facilities in the zone

Opportunities

The UAP observed the following opportunities in SPZ: 05.

- The zone is served by open space facilities at the metropolitan level.
- The graveyard for the Martyred Intellectuals provides scope of development as a site of national importance and heritage.
- The on going DUIIP project will reduce the local problems of water supply, sanitation, etc.
- The proposed north Dhaka sewerage project with treatment facilities will provide improved sanitation to a substantial part of the area.
- FAP 8B addresses drainage problems of the area to a large extent.
- The proposed Kachukhet-Banani and Mirpur Ceramic-Cantonment link roads will provide additional access facilities in the zone.
- Mirpur Ceramic Industry occupies large areas. If these areas can be released by relocating the industry, land could be utilized for other urban purposes.
- Proposed northern extension of Rokeya Sarani will link the area with Uttara and connection with Eastern Bypass will foster development in the area.

Actions Committed/Required

The following actions were recommended by the UAP for SPZ 05:

- Measures area required to protect the proposed retention pond areas. An integrated plan is needed to be prepared taking together the retention pond, Zoo and the Botanical Garden. Steps should be taken to shift radar station of the area on health safety reasons.
- Vacant and low lands in the eastern part of the SPZ can be used for providing housing to the low income.
- The small waterbodies in the SPZ can serve water retention as well as open space functions. They should be caught immediately through preparation of DAP.
- A DAP may be prepared for Mirpur Ceramic area to develop the space in a planned way.

- Study should be carried out to ascertain utility services needs of the area. Study is also needed to develop housing for different income groups including space earmarked for them on location basis.

3.2 Planning Principles and Standards

3.2.1 Guiding Principles

The following principles have been considered for making various designs under the planning proposals.

a. That the area determined for development has to be made accessible to make the area livable and functional by providing efficient circulation system.
b. Considering land constraint minimum possible land should be allocated for civic facilities.
c. Location of civic facilities should be chosen carefully to serve maximum possible residents.
d. During designing land use category emphasis should be laid on facilitating investment through enabling easy building permission.

3.2.2 Planning Standards

The DMDP the Urban Area Plan (UAP) report in its Section 1.2.8 (Page 12) recommended some planning standards and principles. These standards and principles have been recommended in conjunction with planning rules. The planning standards however, address only the community services, while the principles and rules cover wide areas of issues. In defining planning standard the UAP report states," *Planning standards define the target levels of publicly funded community provision needed for achieving minimum public health, education, safety, leisure and cultural levels, plus a few other essential urban services*." Before preparing the standards the DMDP experts considered the following issues:

- national goals, targets and practice;
- cultural practice;
- climatic conditions;
- resources likely to be available;
- competing demands for use of, and cost of land;
- flexibility to allow incremental improvement;
- simplicity of application and use.

Standard for Community Services

The following are the recommendations of the DMDP Urban Area Plan (UAP) about community services:

Table-3.2: Standards for Provisions of Community Services

Type of Service	Number of Area Inhabitants served Per Unit	Surface Area Needed per Unit	Remark
Primary School	15000	1 acre	• 'ideal' standard is 1 per 7000; present situation is 1 per 220000. • 16% primary schools are government schools; • the 1 acre surface includes playgrounds; • can also be double shift / dual use.
Secondary School	23000	2 acres	• the surface area includes playgrounds.
College	-	-	• Threshold number of students and area of land to be defined case by case
Playground	Double usage of primary and secondary school yards.	-	-
Park	25000	4 acres	• Larger parks may serve larger number of inhabitants.
Graveyard	Ward basis	Minimum 5 acres	-
Neighbourhood center	Ward basis	0.30 acre	-
Health post	Ward basis	-	-
Welfare centre	Ward basis	-	• Also included in community center
Hospital	-	-	• To be determined in a case by case basis

Market	Ward basis	-	
Police/Fire Station	-	-	• To be determined in a case by case basis.

Source: *DMDP Urban Area Plan, 1995.*

Planned development ensuring community's active participation is the key to successful transformation of today's Dhaka into tomorrows adorned green Dhaka. Keeping that vision in mind, DAP Consultants developed an optimum standard for the amenities and community facilities that the city dwellers deserve (**Table-3.3**).

Table- 3.3: Facility Standard at Neighborhood Level

Sl.	Name of the Facility	Quantity		Area		
		Min.	Max.	Minimum for Unit Facility	Sub Class Total	Class Total
		(No.)	(No.)			(Acre)
1	Primary School(Public or private)	2	3	1 Acre		3
2	High School(Public or private)	1	2	1.5 Acre		3
3	Open space			10 Acre		12
	i) Park/children's park	1	2	0.3 Acre	1 Acre	
	ii) Water body/ Canal/Pond	As per Planner		1.5 Acre	6 Acre	
	iii) Play field	2	3	1 Acre	3 Acre	
	iv) Green/Vegetation/Water Front	As per Planner		0.5 Acre	2 Acre	
4	Mosque and Maktab/ Worship Places	2	3	0.2 Acre		0.6
5	Library(central)	1	1	0.1 Acre		0.2
6	Services			0.3 Acre		0.5
	i) Dentist/Doctor's Chamber	2	3	40 sq.m	120 sq.m	
	ii) Beauty Parlour	1	2	50 sq.m	100 sq.m	
	iii) Laundry	2	3	16 sq.m	50 sq.m	
	iv) Hair Dresser	2	3	12 sq.m	40 sq.m	
	v) Cyber Café/Internet service provider	1	2	50 sq.m	100 sq.m	
	vi) Photocopy / mobile / land phone / fax	2	2	12 sq.m	40 sq.m	
	vii) Computer based (word processing, printing etc) services	1	1	30 sq.m	30 sq.m	
	viii) Motor bike Repair, vulcanising etc.(optional)	1	1	50 sq.m	50 sq.m	
	ix) NMT repair service (Rickshaw, bicycle etc)	1	2	30 sq.m	60 sq.m	
	x) Post Office / Courier Services	1	2	20 sq.m	40 sq.m	
	xi) Sports / Recreational facilities(games, indoor games etc)	1	2	50 sq.m	100 sq.m	
	xii) Rickshaw/Auto stand (General)	2	4	100 sq.m	400 sq.m	
	xiii) Restaurant, Tea bar, Fast food	2	4	10 sq.m	100 sq.m	
	xiv) Tailoring	1	2	20 sq.m	40 sq.m	
7	Solid waste transfer station(may also small scale processing)	1	1	0.5 Acre		1
8	Utility Facilities					1*
9	Neighborhood Co-operative Office Complex			0.33 Acre		0.5
	i) Offices	2	4	15 sq.m	60 sq.m	
	ii) Committee rooms	2	3	40 sq.m	120 sq.m	
	iv) Community Club including indoor games (male and female)	2	2	200 sq.m	400 sq.m	
	v) Cultural Facilities (Rehearsal, Music room etc)	1	2	30 sq.m	60 sq.m	
	vi) Community Police Barrack	1	1	40 sq.m	50 sq.m	
	vii) Technician Service (Electrical, Plumber, AC, Freeze etc.)	2	4	25 sq.m	100 sq.m	
10	Community Hall	1	2	0.33 Acre		0.5
11	Shops			0.33 Acre		0.5
	i) General store	3	4	25 sq.m	100 sq.m	
	ii) Grocery	4	6	25 sq.m	150 sq.m	
	iii) Stationary	2	3	25 sq.m	150 sq.m	
	iv) Confectionary / Bakery	2	3	25 sq.m	80 sq.m	
	v) Departmental Store**	1	2	100 sq.m	200 sq.m	
	vi) Medicine Shop	2	3	25 sq.m	80 sq.m	
	vii) Sweet Meat Shop	2	3	25 sq.m	80 sq.m	
	viii) Book / Newspaper Stall	2	3	10 sq.m	30 sq.m	

	ix) Fresh Corner (Vegetable, fish, meat, egg, chicken etc.)	2	3	12 sq.m	40 sq.m
	x) Fruit Shop	2	3	10 sq.m	30 sq.m
	xi) Flower Stall	2	2	10 sq.m	30 sq.m
	xii) Gift shop	1	2	10 sq.m	30 sq.m
	Total Area for the Neighborhood Facilities				**22.8 Acres (approx.)**

Source: *Proposed by the Consultants*

* May be added as per decision of the Nagar Unnayan Committee under New use category

**Area under Departmental Store shall be calculated on the basis of the spaces allocated against one of the corresponding services in this table (cumulative area)

Gross area of neighborhood : 50 acres [approx.]. It may vary depending on the population density of the planning area.

Gross density : 225 to 250 persons per acre.

Standard for Building Construction

For control of building construction the Dhaka Metropolitan Building Construction Rules 2008 (under Section 18 of EBBC Act 1952) and the Building Code 1993 will be followed.

Standards for Road

On review of Structure Plan and other standards DAP consultants proposes the following revised road standards for Detailed Area Plan:

Table - 3.4: Proposed Road Standard for DAP Area

SL No.	Road Category	Type	Built-up Area	Less Built-up Area
			ROW (Ft)/M	ROW (Ft)/M
1	Primary Road	Type-1	80 (24.39)	170 (51.83)
2	Primary Road	Type-2	80 (24.39)	130 (39.63)
3	Primary Road	Type-3	80 (24.39)	100 (30.49)
4	Secondary Road	Type-1	60 (18.29)	80 (24.39)
5	Secondary Road	Type-2	40 (12.0)	60 (18.29)
6	Tertiary Road	Type-1	40 (12.0)	40 (12.0)
7	Tertiary Road	Type-2	30 (9.19)	40 (12.0)
8	Access Road	Type-1	24 (7.32)	30 (9.19)
9	Access Road	Type-2	20 (6.10)	24 (7.32)

Source: *proposed by Consultants*

3.3 Preferred Development Strategies

Hydrological issues predominated the reasoning regarding the ways to develop the study area so near to the heart of the vibrant capital city. All the higher level plans and studies carried out at varying points of time converged to the same conclusion that the vital contribution of this low lying area bounded by rivers as main Flood Flow and Sub-Flood Flow zones allowing excess flood water to pass over it, must not be obstructed by any development. Despite this unanimous expert cautions, the area is experiencing a tremendous development pressure. DAP consultants for the study area has tried to work out an effective development strategy to address the later with acceptably low obstruction to the flood water to pass through. The strategies adopted for current planning exercise are as follows:

3.3.1 Drainage

- Non-continuous smaller rural settlements above flood level surrounded by ample low lying areas (agriculture, sub-flood flow, main flood flow) allowing uninterrupted flow of water to pass through.
- Minimize obstruction of flood water as is practicable.
- Appropriate connectivity by roads having sufficient openings to ensure needful flow of water across them as well as uninterrupted traditional water based connectivity by keeping appropriate navigation clearance at the bridges. This would help maintain the biodiversity of the area and contribute to sustainable environment in turn.

3.3.2 Residential Development

- Subdivide Residential Landuse Zone based on the potentiality, trend and opportunity.
- Adopt Neighborhood concept for new residential developments and for need assessment of community facilities.
- Avoid through traffic and heavy vehicles within the neighborhoods.
- Provision of adequate footpaths should be ensured for ease movement of residents.
- Ensure community facilities and services of appropriate scale at neighborhood level.

3.3.3 Industrial Development

- Ensure provision of central effluent treatment plant in case of industrial clusters.
- Ensure own treatment plant in case of individual facilities.
- Prohibit high hazard industries within the area.
- Heavy and noxious types of industries would be shifted to designated industrial zone;
- Heavy and polluting industries of category Orange-B and Red-B which are located in structure plan designated urban zone, would be shifted and its use would be shown as non-conforming.

3.3.4 Mixed Use Development

- Relocate noxious and heavy industries [red category as per DoE] to Heavy Industrial Zone within as soon as practicable, if any.
- Allow the red industries to maintain their status under strict abiding conditions until shifting.
- Ensure adequate safety and security of the people especially of the families residing in such mixed zones.
- Provide sufficient quantity of wide and safe footpaths to use.
- Provide zebra crossing for road crossings instead of over bridge to ease the lives of major portion of low income workers likely to traverse on foot to reach their likely abode in the busy town.
- Ensure adequate utility services to ensure uninterrupted production.

3.3.5 Transport and Connectivity

- Provide safe, adequate and comfortable pedestrian paths.
- Provide appropriate and effective public transport routes with sufficient number of quality public transport to carry passenger.
- Grade separation of national and regional highways from the local main roads, the latter being at grade and other two above grades.

3.3.6 Flood Flow Zone

- Strictly preserve the zone area as per the higher level plans and DAP.
- Promote agricultural and passive recreational use of the area during dry season.

3.3.7 Non-urban Areas

- Strictly preserve agriculture land from conversion into non-agricultural use.
- Promote traditional waterways in the low lying areas by constructing sub-merged road for dry season connectivity.
- Conserve rural characteristics in the isolated homesteads keeping mandatory buffer to make way for the flood water pass through.

3.3.8 Water Body and Open Space

- Strictly protect canal networks as per DAP.
- Make Provision for open spaces and water body at the neighborhood level.
- Strictly protect the river fronts and open it to city dwellers for serene passive recreation.
- Make city scale open space with easy accessibility especially for people of densely populated areas having meager scope for open space and recreation.

3.3.9 Amenities and Community Facilities

- Consider neighborhood concept of residential development for estimating community facilities and amenities requirement.

- Prohibit construction of religious structure unless built on own land.
- Relocate unauthorized religious structures from road right of way to safe guard greater interest of the people specially the city dwellers.
- Evict unauthorized structures and uses from road right of way to safe guard greater interest of the people specially the city dwellers.
- Close/relocate existing schools with highly inadequate class rooms, play field and essential facilities and gradually replace with standard one, one per 12000 populations per acre [approx. 50 acres].

3.3.10 Water Supply

- Private extraction by tube wells may continue in non-municipal areas where there is no piped water supply.
- In the long run, to make the supply sustainable, projects may be undertaken to procure river water and supply after treatment.
- Restriction on private extraction may strictly be imposed in municipal areas.
- Recycling of treated wastewater with separate lines for potable water and recycled water. For this, dual pipe supply system has to be introduced in a phased manner in all the areas.
- Ground water recharging through rain water harvesting, conserving water bodies and controlling groundwater extraction. Groundwater extraction is to be controlled through registering boreholes and recharging according to test yields. Ground water management is to be enforced by concerned agency.
- Focused planning and action will be required to prepare and implement rain water as roof water harvesting schemes both with the aim of optimizing water use and ground water recharge. For this suitable mandatory provision is to be made for planning and construction of various schemes.
- The planning should fit together watershed management, and arrest the run-off. It should ensure the conservation of natural valleys, water bodies and aquifers. The concepts of 'zero run-off drainage', with retention ponds, sediments traps and balancing lakes should be adopted, with a segregated wastewater disposal system. A green network overlapping the blue network would protect the ecology of aquifers, and also provide a pleasant environment. Simple methods of site planning, which incorporate porous/semi permeable paving, drop inlet/down pipe, sediment trap, retention ponds, etc. will contribute in maintaining ground water table.
- One of the prime objectives of development should be to improve the quality of river-water, to secure its continuous flow and to encourage the return of aquatic life. This needs improvement of drainage, waste water treatment and pollution abatement by sewerage improvement. The surplus water during the monsoons should be retained in balancing ponds along the riverbed rather than allowing it to the downstream areas.
- Where the hazard of pollution exists, the minimum charge for operating permits should cover the expenses of adequate policing and controls. Mandatory performance bonds and liability insurance should pay for all damages plus any corrective measures, which might be needed. As a governing rule, no new development, manufacturing, process or operation of any polluting activity should be permitted, which may result in the significant degradation of any water resource.
- The drains and waterfront can be landscaped in the form of interconnected parkways. There is no need for elaborate gardening of the greenways, but wild, simple and natural stretch by itself would be ecologically important. Such trails could be one of the cheapest forms of drainage and recreation.
- Water supply in new areas should incorporate separate lines – one for washing, water coolers and garden taps, the second for supplying potable water. All non-residential buildings having a discharge of over 10,000 litres a day should incorporate a wastewater recycling.

3.3.11 Electricity

- For all establishments with floor area of more than 500 sq m, solar energy should be encouraged.
- Compulsory Solar Panels for public advertising, lighting in open areas, public utilities, streets, etc.
- As alternate mandatory arrangement during power cuts to replace generators/inverters etc.
- Adoption of Load Management Technique.
- Tariff restructuring and improved metering arrangement to minimize power thefts/losses.
- Private Sector Participation in different stages of Power generation, transmission and Distribution;
- Incentivising energy savings and use of energy efficient gadgets.

- Public awareness, capacity building and training.

3.3.12 Gas Supply

- Explore possibility of use of gas in cylinder for domestic purposes

3.3.13 Conservation of Monument and Heritage

Built heritage of planning area needs to be protected, nourished and nurtured by all citizens and passed on to the coming generations. It is suggested that with the aim of framing policies and strategies for conservation, appropriate action plans may be prepared by all the agencies. These should include promotion of conservation of the civic and urban heritage, architecturally significant historical landmarks, living monuments, memorials and historical gardens, riverfront, city wall, gates, bridges, vistas, public places, edicts and the ridge. Listing of heritage buildings based on the following criteria:

(a) The age of the building
(b) Its special value for architectural or cultural reasons or historical periods
(c) Its relevance to history
(d) Its association with a well-known character or event
(e) Its value as part of a group of buildings
(f) The uniqueness of the building or any object or structures fixed to the building or forming part of the land and comprised within the cartilage of the building.

- Prepare guidelines for development, redevelopment, additions alterations, repairs, renovations and reuse of the heritage buildings.
- These places of interest must be marked in the map for preservation by the Department of Archaeology, Tourist Corporation and RAJUK for national interest.

3.3.14 Environmental Management

- Grouping of Hazardous Industries
- Establishment of Common Effluent Treatment Plant
- Adoption of Neighborhood Concepts for New Residential Development
- Waste Water Treatment Plant

3.3.15 Supporting the Surrounding Hinterland

- Easy accessibility from the surrounding hinterlands especially to the growth centers.
- Ensure facilities such as wholesale/retail market facilities for needful commodities and shopping to support population living in the area.

3.4 Major Infrastructure Proposals

Among the vital infrastructure supports required for the smooth functioning of urban life, the foremost is the accessibility. The physical interpretation of this requirement is an effective road network having a range of roads with

proper hierarchy starting with major traffic arteries, connectors, distributors and finally down to access roads. Almost always these road networks physically house other vital utilities of urban life – electricity, tap water, gas, sewerage disposal, storm water drainage and so forth so that the households and their facilities can be brought under their services. This calls for careful planning of the road sections off-setting the perennial cutting of urban roads causing tremendous misery which every citizen is aware of.

In the current section the consultant sets down the major infrastructure and services in the planning area. The proposals have been prepared on review of Structure Plan and Urban Area Plan the plan and also Strategic Transport Plan (STP) Project proposals. Besides, evaluation of the existing conditions about infrastructure and services and expected population growth has also been considered before drawing up proposals.

Other than the areas within Uttara extension programme, Location-1 area is expected to develop spontaneously. It is proposed that these entire developments take place based on participatory approach. For effective development under participatory approach, there is need for sufficient infrastructure and services in order to facilitate development. The consultant, therefore, put more emphasis on infrastructure development, primarily road network. Flood protection and drainage promotion will be another major facilitating element.

3.4.1 Transport

A road will be constructing from Uttara Sector-10 up to embankment road in the west. This will be a 3 km 2 lane road. Another north-south link road will be a highway (M/8) that will link Mirpur-12 with embankment road in the north. This road will have a length of 6.4 km.

Table-3.5: Proposed Major Road Proposals for Location-1

Project Description	Site Location Including SPZ	Implementing Agency
Uttara Sector-10 to Western Embankment Road 2 lane 3 km road	SPZ-05	RAJUK
M/8 Construction of Major Road from Mirpur 12 near Digun to Jamaldia via Salana 6.4 km	SPZ 05	RHD

Source: *Proposed by consultants*

Besides, there will be 5 secondary roads connecting different parts of Uttara with embankment road. **Map-3.1** shows the new road development proposals and widening of existing narrow roads.

3.4.2 Utility Services

Sewerage and Drainage

For storm water drainage and household wastewater drainage Dhaka WASA needs to extend its services to the project area through extension project. It is expected that on site septic tank system will continue for sewage disposal, but DWASA should initiate project to integrate the larger areas of the city into its existing sewerage system, that now covers only about 20% of the city area.

Though the watercourses in the project area are the paths of discharging flooding water accumulated in the core areas of the city, the natural water courses are important resources and therefore, must be protected them from filling up or encroachment. Land grabbers in many areas fill Khals indicated in CS mouza map. Steps must be taken to re-excavate those khals by DWASA. **Map-3.2** indicates the exiting natural drainage that needs preservation.

3.5 Amenity and Urban Facility Proposals

Urban Community/Social Services

Urban basic services in the project area are expected to provide by the respective service giving agencies engaged. The services like, water will be task of Dhaka WASA, and power will be provided by the DESCO, Gas by TITAS Gas

Co. There are several private sector telephone companies (including mobile) to provide telephone services including the new reorganized public sector telephone company. The other public sector service agencies will promote services in the new areas through extension projects.

Park and Playground

Recreation and open space facilities are essential parts of busy urban life. One play ground has been proposed-one in Rajabari and two parks in Ashutia, Digun, and Gram Bhatulia mauza of the project area.

Graveyard

The plan also proposed space for two graveyards- one in Kamarpara, west of Uttara sector -10 and the other in Baunia, west of Hazrat Shahjalal (R) International Airport. Besides, some space within the embankment close to Ashulia eastern bridge, a large space has been marked as recreation, where the recreation facilities have already been developed by private parties. Existing and proposed community facilities have been presented in **Map-3.3.**

3.6 Description of the Plan

Table- 3.6 and **Map-3.4** shows the proposed land use zoning of Loacation-1 area. DAP consultants have classified the proposed land uses of Location-1 into 11 classes as shown in **Table-3.6.**

Table- 3.6: Proposed Land Use Zoning

S.L No	Land Use Category	Area in Acres	Area in Hectares	%
1	Urban Residential Zone	3370.92	1364.17	47.33
2	Overlay Zone	1218.17	492.98	17.11

3	Water Retention Area	599.05	242.43	8.41
4	Water Body	391.25	158.33	5.49
5	Existing Road Network	385.74	156.10	5.42
6	Flood Flow Zone	376.82	152.49	5.29
7	Open Space	349.07	141.26	4.90
8	Proposed Road Network	346.98	140.42	4.87
9	General Industrial Zone	59.24	23.97	0.83
10	Institutional Zone	21.11	8.54	0.30
11	Mixed Use Zone (Residential-General Industrial)	3.27	1.32	0.05
12	**Total**	**7121.61**	**2882.02**	**100.00**

Source: *Proposed by Consultants*

a. Urban Residential Zone

This will be the most important land use provision in the planning area. Residential zone covers an area of 3370.92 acres of land which is about 47.33% of the land will go to this category. It is expected that the city will extend northward, while extension of Uttara Model Town will also take place in this area. The area will be primarily used for residential accommodation.

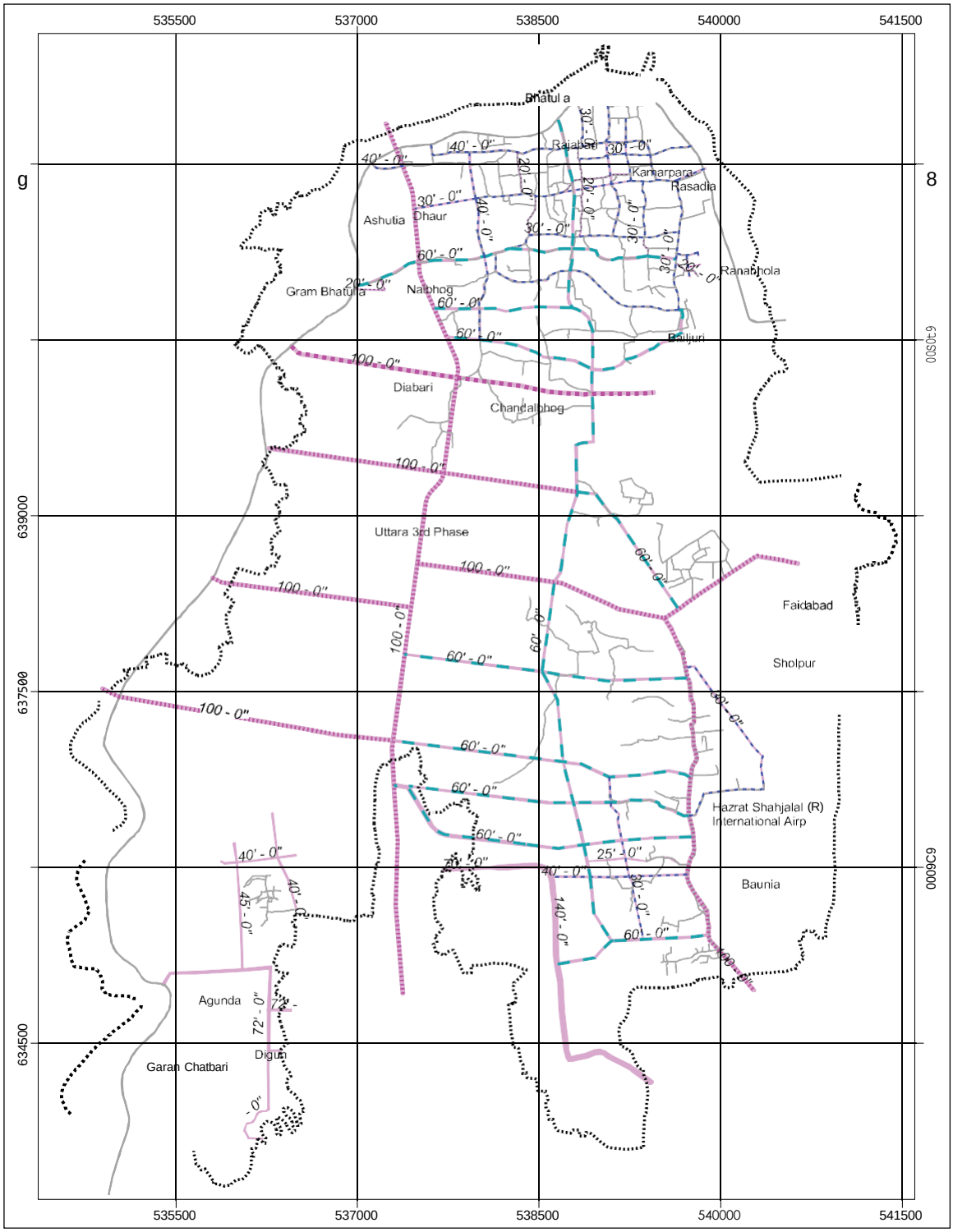
b. Open Space

A substantial area (349.07 acres) has been earmarked for recreation purpose that constitutes about 4.90% of the planning area. This includes play ground, park and other recreational facilities.

c. Water Retention Area

A large part of planning area is subject annual inundation during rainy season. This causes submerging of the substantial area. According to FAP 8B and Structure Plan, water retention areas are to be created in the low lying areas to retain rainwater for some time before they are pumped into the Turag River. For this purpose substantial areas of land have been reserved for water retention that constitutes about 599.05 acres (8.41%).

MAP-3.1: PROPOSED ROAD NETWORK OF LOCATION - 1 AREA



500 0 500 1000 Met6hG

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Detailed Area Plan for DMDP Area (Location - 1)

LEGEND

Location-1 Boundary

Existing Road

Proposed Road

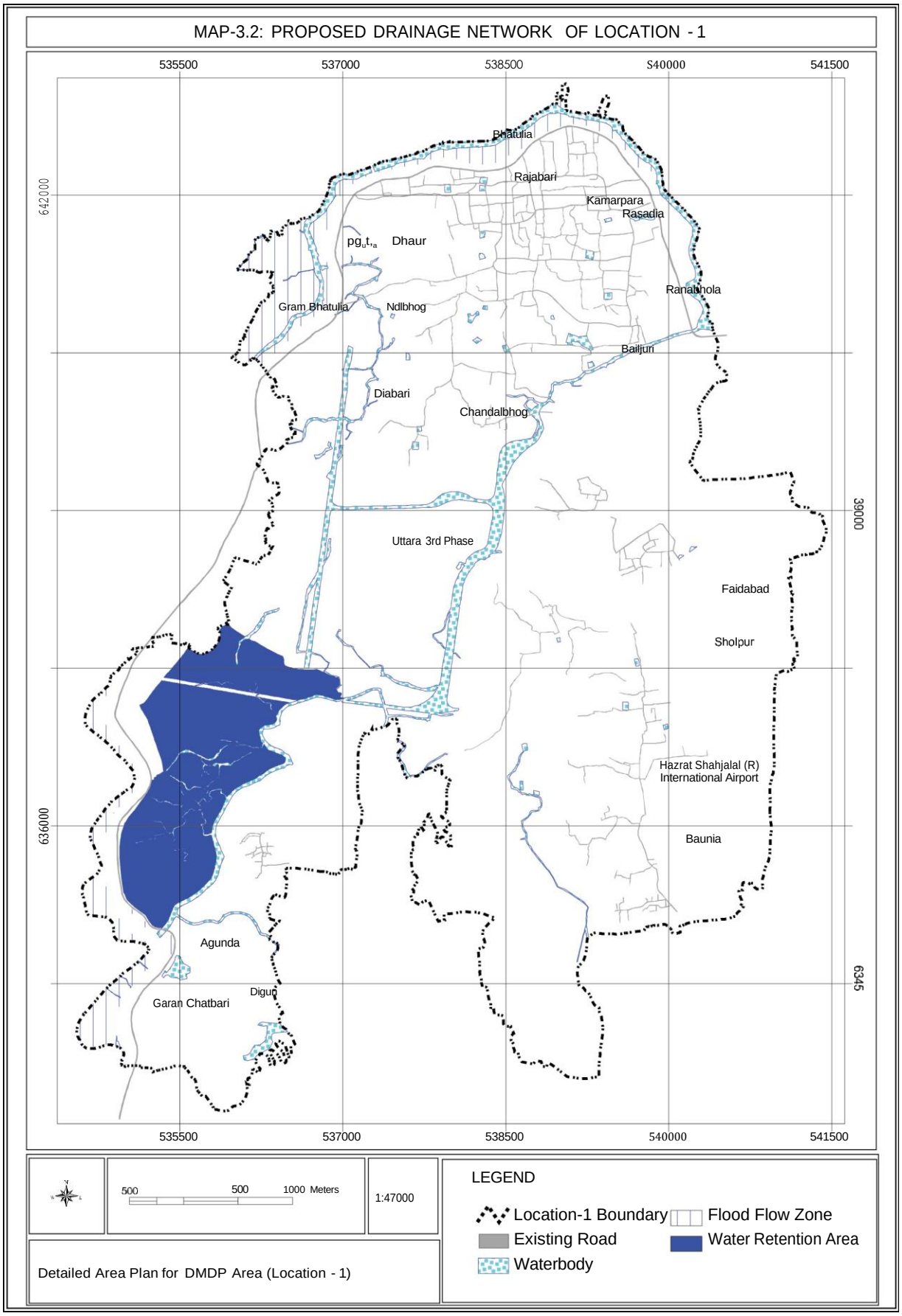
Proposed Road (ROW in Feet)

20

30 - 40

60

100


MAP-3.2: PROPOSED DRAINAGE NETWORK OF LOCATION - 1
535500
537000
538500
540000
541500
642000
636000
39000
6345
Bhatulia
Rajabari
Kamarpara
Rasadia
Dhaur
Ranashola
Gram Bhatulia
Ndlbhog
Bailjuri
Diabari
Chandalbhog
Uttara 3rd Phase
Faidabad
Sholpur
Hazrat Shahjalal (R) International Airport
Baunia
Agunda
Digun
Garan Chatbari
500
500
1000 Meters
1:47000
LEGEND
Location-1 Boundary
Flood Flow Zone
Existing Road
Water Retention Area
Waterbody
Detailed Area Plan for DMDP Area (Location - 1)