THE PREPARATORY STUDY ON THE DHAKA MASS RAPID TRANSIT DEVELOPMENT PROJECT (TOD) IN BANGLADESH

FINAL REPORT

DECEMBER 2018

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

ALMEC CORPORATION
ORIENTAL CONSULTANTS GLOBAL CO., LTD.
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Exchange Rate (July 2018)

1USD=110JPY

1USD=83BDT

1BDT=1.32JPY

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ABBREVIATIONS

ADB	Asian Development Bank
AFD	Agence Francaise de Developpement
BBA	Bangladesh Bridge Authority
BIWTA	Bangladesh Inland Water Transport Authority
BIWTC	Bangladesh Inland Water Transport Corporation
BR	Bangladesh Railway
BRT	Bus Rapid Transit
BRTA	Bangladesh Road Transport Authority
BRTC	Bangladesh Road Transport Corporation
BUET	Bangladesh University of Technology
C&B	Construction & Building
CASE	Clean Air and Sustainable Environment
CNG	Compressed Natural Gas
DAP	Detail Area Plan
DCC	Dhaka City Corporation
DF/R	Draft Final Report
DFID	Department for International Development
DHUTS	Dhaka Urban Transportation Network Development Study
DMA	Dhaka Metropolitan Area
DMDP	Dhaka Metropolitan Development Plan
DMP	Dhaka Metropolitan Police
DMTA	Dhaka Metropolitan Transport Authority
DMTCL	Dhaka Mass Transit Company Limited
DNCC	Dhaka North City Corporation
DPP	Department of Printing and Publications
DRTM	Directorate of Road Transport Maintenance
DSCC	Dhaka South City Corporation
DTCA	Dhaka Transport Coordination Authority
DTCB	Dhaka Transport Coordination Board
ECNEC	Executive Committee of the National Economic Council
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
F/R	Final Report
FIRR	Financial Internal Rate of Return
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GIBR	Government Inspector of the Bangladesh Railways
GOB	Government of Bangladesh
GOJ	Government of Japan
GPS	Global Positioning System
HIS	Household Interview Survey
IC/R	Inception Report
IT/R	Interim Report
JICA	Japan International Cooperation Agency
LDC	Least Developed Country
LGD	Local Government Division
LGED	Local Government Engineering Department

MOC	Ministry of Communication
MOHPW	Ministry of Housing and Public Works
MOR	Ministry of Railways
MRT	Mass Rapid Transit
NGO	Non-Governmental Organizations
OD	Origin and Destination
ODA	Official Development Assistance
PPPO	Public Private Partnership Office
PT	Project Team
RAJUK	Rajdhani Unnayan Kartripakkha
RD	Record of Discussions
RHD	Road and Highway Department
RTC	Regional Transport Committee
SC	Steering Committee
SEA	Strategic Environmental Assessment
SPA	Survey and Plan Area
STP	Strategic Transport Plan for Dhaka
TDM	Traffic Demand Management
TOR	Terms of Reference
UMRT	Urban Mass Raid Transit
WB	World Bank
WG	Working Group

1 Introduction

1.1 Background and Objectives

1.1. Dhaka City is the capital of the People's Republic of Bangladesh. The population of Dhaka Metropolitan Area (DMA) was 9.3 million in 2011. Currently, urban transportation in the DMA relies mostly on road transport, where car, bus, auto-rickshaw, rickshaw, etc. coexist. Serious traffic congestion creates health hazards especially due to air pollution. With the rapid national economic growth, the urban population is expected to increase and so will the number of privately owned automobiles. Therefore, improving the urban (public) transportation system in the DMA has become a critical issue to ease traffic congestion and mitigate environmental deterioration.

1.2. This study—The Preparatory Study on The Dhaka Mass Rapid Transit Development Project (Line 1 and Line 5)—follows on a series of previous studies funded and implemented by the Japanese International Cooperation Agency (JICA) and other international donors. In 2005, the government of Bangladesh (GOB) formulated the "Strategic Transport Plan for Dhaka" (STP) in cooperation with the World Bank (WB). Since the STP was officially approved by the GOB, it has been expected that different international donors would thereafter provide assistance based on this STP to improve the urban transportation situation. The JICA conducted the Dhaka Urban Transportation Network Development Study (DHUTS) Phase 1 from March 2009 with the Dhaka Transport Co-ordination Authority (DTCA) as its counterpart agency. The study objectives were to conceptualize the basic urban development scenario for the DMA by 2025 and to select priority projects that would help build such scenario. That study recommended focusing on MRT Line 6 as a priority project. As a result, JICA conducted next the feasibility study on MRT Line 6 under DHUTS Phase 2. Following these two studies, the GOB and JICA concluded the loan agreement on the "Dhaka Mass Rapid Transit Development Project" on February 2013 to construct MRT Line 6. Meanwhile, the World Bank finished the feasibility study and basic design of BRT Line 3 and is now preparing the project's detailed design. On the other hand, the Asian Development Bank (ADB) has already completed the basic design of the BRT Line 3 extension project (from the airport to Gazipur) and since April 2013 has conducted the activities for the detailed design stage. As for the transportation network plan, the 2005 STP identified three BRT lines (i.e., BRT Lines 1, 2, and 3) that were supposed to commence before 2010. But except for MRT Line 6 and BRT Line 3 above, other projects stated in the STP have not started yet and so the STP needed to be reviewed and updated. And JICA conducted the Project on the Revision and Updating of the Strategic Transport Plan for Dhaka (RSTP) from May 2014 with the DTCA as its counterpart agency. It is thus under these circumstances that the GOB and JICA have made several preliminary discussions in order to identify priority projects in the field of transport sector and agreed to make preparation for the present study on Dhaka Mass Rapid Transit Development Project (Line 1 and Line 5). Accordingly, JICA dispatched a mission on the project to GOB from March 7, 2016 to March 10, 2018 in order to develop the scope and make arrangements for a future survey, which would further study the project's feasibility.

1.3. MRT Line 1 and 5 are expected that relieving chronic traffic congestion and improving air quality will foster economic development and improve Dhaka's urban environment. In order to maximize the benefits of MRT, it is necessary to develop concrete development

plans around stations. Station plazas, *i.e.* the areas immediately surrounding MRT stations, have a critical role to play as intermodal transportation hubs. Without carefully planned and designed station plazas, intermodal connectivity would be deficient: pedestrians would have poor access to the stations, which would seriously limit the potential gains from MRT. Therefore, this study carefully focuses on the planning of station plazas, considered indispensable in order to maximize the effect of MRT.

1.4. Development of MRT will be backbone of urban development, and the stations will be core of not only transportation systems but also integrated urban development as the center of regional development. Therefore, the integration of concreate development plans and intermodal facilities should be implemented simultaneously, and the concept is summarized into TOD (Transit Oriented Development). Concretely, in order to improve the transportation network around the stations and living environment, “pedestrian network within catchment area (600-800m radius from stations)”, “intermodal facilities like station plaza”, mixed use and high-density urban development” should be promoted. The objective is (i) to confirm the development potential of each station area, considering the legal and regulatory framework for urban and real estate development, and (ii) to prepare case studies of major stations which present potential for successful TOD.

1.2 Study Areas

1.5. Study areas include all the stations of MRT Line 1 and 5. MRT Line 1 is composed of two branches, (i) the Airport Line from Kamlapur station to Airport station, and (ii) the Purbachal Line, from Notun Bazar to Purubachal Terminal. The total number of stations is 19. MRT Line 5 has the section from Hemayetpur station to Vatara station, the total number of stations is 14.

1.6. Among the stations that present high potential to implement TOD, Gabtoli, Kamlapur and stations in Purbachal area have been selected as case study stations.

Table 1.2.1 List of stations

Line	Station	Line	Station
Line1 Total19 Stations	Kamalapur Rajarbagh Malibagh Rampura Hatir Jheel Badda Uttar Badda Notun Bazar Future Park Khilkhet Airport Terminal 3 Airport Bashundhara POHS Mastul Purbachal West Purbachal Central Purbachal East Purbachal Terminal	Line 5 Total 14 Stations	Hemayetpur Baliapur Bilamalia Amin Bazar Gabtoli Dar-us-Salam Mirpur 1 Mirpur 10 Mirpur 14 Kochunkhet Banani Gulshan 2 Notun Bazar Vatara

Figure 1.2.1 Outline of MRT Line 1,5 and 6

2 TOD Issues in Dhaka

2.1 Current Situation and Future outlook of urban transport in Dhaka

1) Urban Transport Demand Characteristics

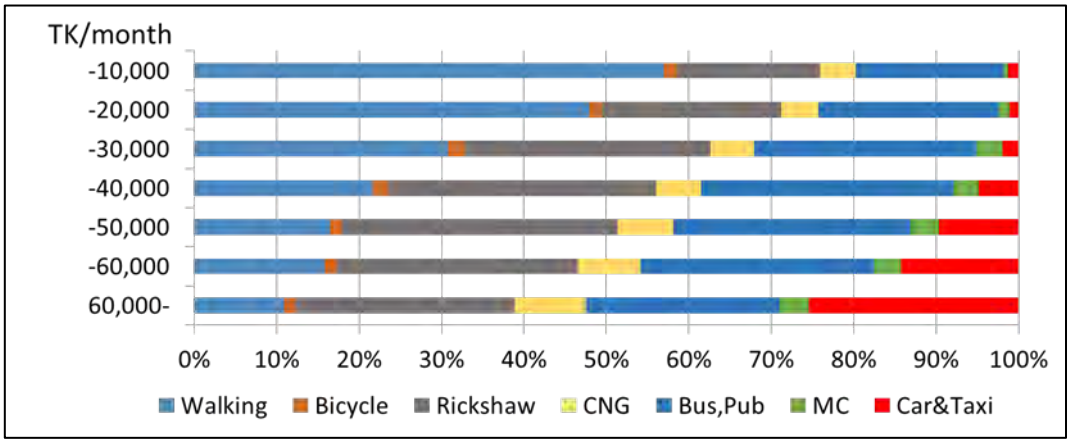
2.1 Total daily traffic demand, including walking trips, is about 30 million trips per day, and trip characteristics vary by income group. The trip rate of high-income groups is higher than that of lower income groups. This can be explained by lifestyles and business activities as people with higher income tend to generate more business trips, shopping trips etc. 77 % of all trips are made by the population groups with income less than 30,000 TK per month (Table 2.1.1).

Table 2.1.1 Number of Trips and Trip Rate by Household Income

Household Monthly Income (TK)	Population		No. of Trips		Trip Rate
	(x 1,000)	%	(x 1,000)/day	%	
-10,000	4,385	26.3	6,791	23.2	1.5
-20,000	6,426	38.5	10,926	37.3	1.7
-30,000	2,543	15.2	4,676	16.0	1.8
-40,000	1,109	6.6	2,187	7.5	2.0
-50,000	638	3.8	1,279	4.4	2.0
-60,000	441	2.6	928	3.2	2.1
60,000-	1,158	6.9	2,511	8.6	2.2
合計	16,700	100	29,298	100	1.8

Source : RSTP Person Trip Survey

2.2 The main travel modes in GDA are motorcycle, car, micro bus, truck, bus, minibus, and taxi. Figure 2.1.1 shows the modal share by income group. For households in the lowest income group, “Walking” is the primary travel mode while the share diminishes as household incomes increase. On the contrary, the “Car & Taxi” share increases with income. The other modal shares—Bicycle, Rickshaw, CNG, Bus and Motorcycle—remain basically constant across income groups.



Source : RSTP Person Trip Survey

Figure 2.1.1 Modal Share by Household Income Group, including Walking and Bicycle

2) Future Traffic Demand

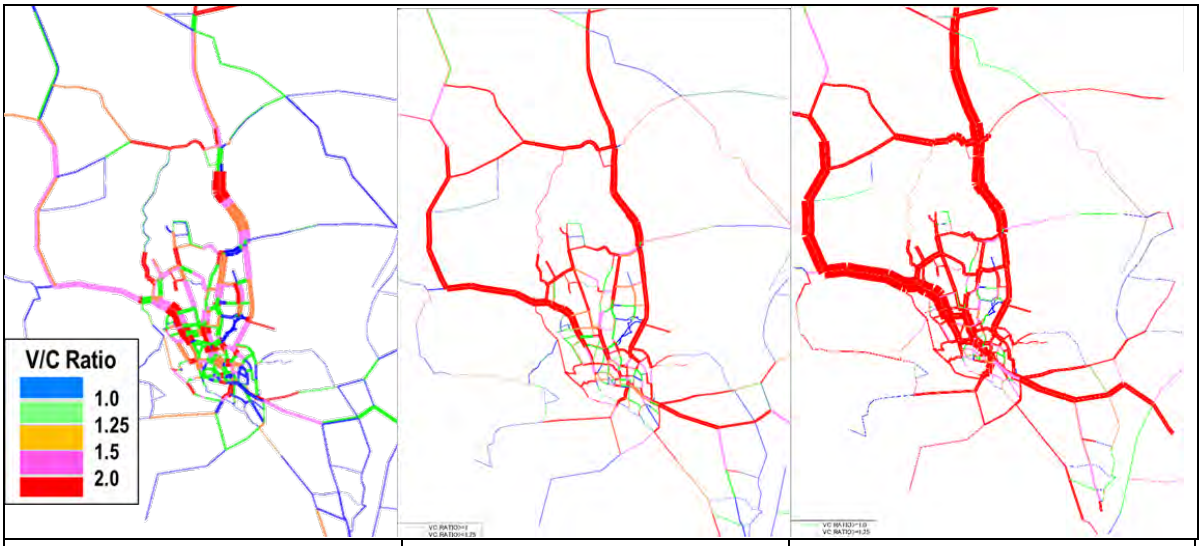
2.3 Table 2.1.2 shows the future traffic demand in GDA as estimated in the RSTP. Due to population growth, the traffic demand is expected to increase rapidly. Especially, urbanization in outer areas is supposed to be significant and trip lengths are also expected to increase in length due to suburbanization.

Table 2.1.2 Estimated Traffic Demand by Area (Including Walking)

Area	No. of Trips (x 1,000 / day)			AGR (%/yr)	
	2014	2025	2035	14-25	25-35
DMA	20,041	24,523	28,532	1.9%	1.5%
Gazipur	2,681	4,834	6,135	5.5%	2.4%
Purbachal	799	1,931	2,941	8.4%	4.3%
Sonargaon	605	1,197	1,161	6.4%	-0.3%
Narayanganj	2,096	3,406	3,971	4.5%	1.5%
Kareniganj	974	1,788	2,056	5.7%	1.4%
Savar	2,713	5,022	6,384	5.8%	2.4%
Total	**29,909**	**42,701**	**51,180**	**3.3%**	**1.8%**

Source: RSTP

2.4 Figure 2.1.2 shows the traffic assignment results of current and future traffic demand to the current transport network. According to the result of current traffic demand, most roads in DMA are congested. Due to heavy traffic congestion, the road transport situation in Dhaka would be one of a complete gridlock by 2035 without any additional road and public transport provision. The expected economic loss due to congestion would also be huge.



Source: RSTP

Figure 2.1.2 Traffic Assignment Result of Current and Future Traffic Demand to the Current Transport Network

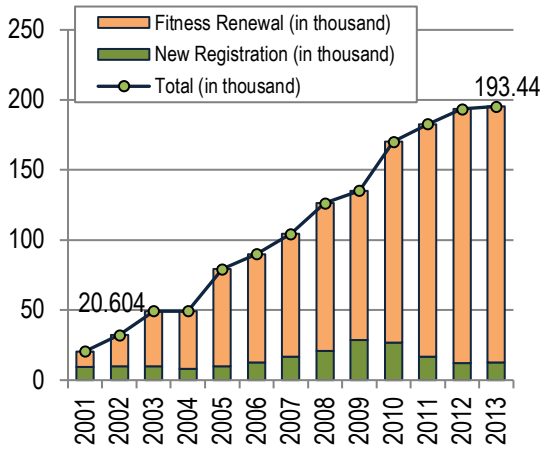
3) Current Transportation Modes in Dhaka

(a) Motorized Private Modes

(i) Private Cars (Sedan, Jeep, Microbus)

2.5 The number of private cars has been increasing since 2001. It now represents a 30% modal share in GDA. Basically, private cars are used by middle and high income people.

2.6 One of the reasons for the increasing number of private cars is the low operating cost when using Compressed Natural Gas (CNG). Since CNG is being produced locally, its cost is quite low compared to other types of fuel, such as octane, which needs to be imported from abroad.



Source: BRTA

Figure 2.1.3 Number of Private Cars in GDA

2.7 The Government has been making an effort to control the number of cars by imposing different types of duties and taxes since 2009, especially import taxes. In addition to import taxes, a supplementary duty is also applied. The amount varies from 30% to 500% of vehicle price depending on the vehicle type, engine capacity, etc. Therefore, the overall tax burden for importing a private car may vary from around 100% to 600%. This is the main reason for the sudden decline in number of newly registered private cars since 2010 as observed in Figure 2.1.3.

(ii) Motorcycle

2.8 Motorcycle is becoming a popular mode of transport in Dhaka city, because of its flexibility. As it can be driven through narrow spaces, it is considered a helpful transport means to reach destinations in the midst of the city's traffic congestion. Besides, fuel consumption is quite low compared to other private vehicles. The number of registered motorcycles increased between 2001 to 2011. In 2011, the Government had increased up to 45% the supplementary duty for importing completely assembled motorcycles, which resulted in a decrease in the number of new motorcycles in the city. However, the number of newly registered motorcycles were still high in 2013, with 27,291 motorcycles added to the traffic of Dhaka City.

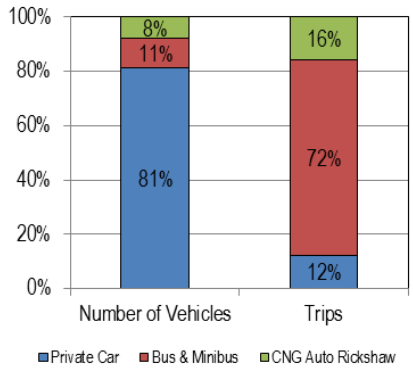
(iii) Truck

2.9 Truck is an important mode to transport goods between the districts of Bangladesh. In 2004-05, the modal split for freight transportation between two most important districts of Bangladesh, Dhaka and Chittagong, was as follows: around 90% by road, only 3.7% by rail and 6.5% by water (Source: DHUTS). The number of truck trips within Dhaka city has been increasing every year. In 2009, a total of 28,706 trips were counted within a 24-hour period (Source: DHUTS). Due to traffic congestion, Dhaka Metropolitan Police issued an order last July 2012 restricting trucks from entering Dhaka city on a specified time table, thus trucks can only enter the DMP area between 21:30 and 8:00.

(b) **Motorized Public Modes**

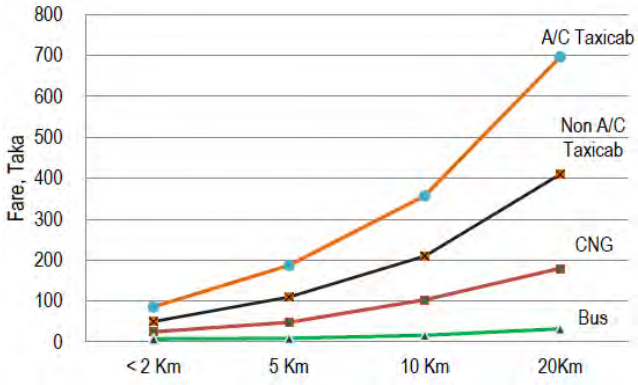
2.10 Major motorized public transport modes in GDA include bus, human hauler, train, water vessel, taxi cab, CNG and rickshaw. Recently, a new service locally known as 'easy bike' (basically a battery-operated rickshaw) has been added to the public transport fleet in some areas. Figure 2.1.4 compares the trip shared generated by motorized modes, including private cars, different types of buses and CNG, as opposed to the shares of registered vehicles for each mode in 2009. Buses and minibuses are generating 72% of all the person trips whereas they represent only 11% of all the registered vehicles.

2.11 Public transport fare rate is under the regulation of 'Bangladesh Road Transport Authority' (BRTA), an agency formed by the Government. The fare structure of public transport is shown in Figure 2.1.5



Source: DHUTS & BRTA

Figure 2.1.4 Modal Share and Generated Trips of Motorized Vehicles in 2009)



Source: BRTA Website

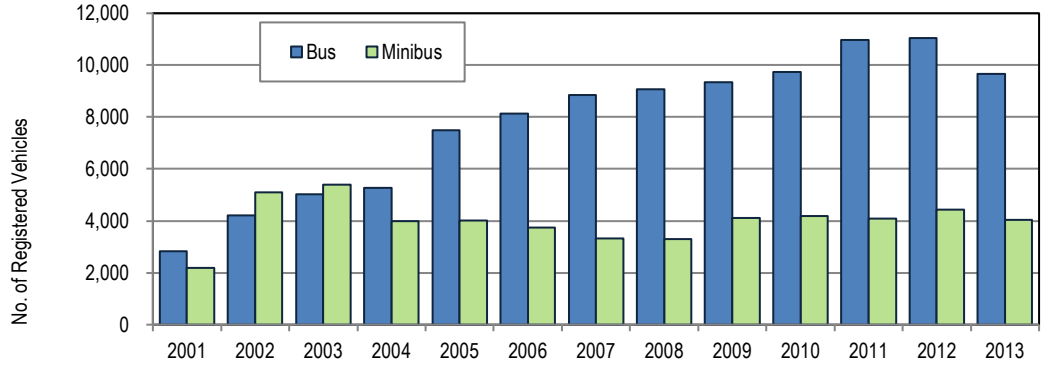
Figure 2.1.5 Comparative Analysis of Different Public Transport Fare

(i) Bus

2.12 Currently, bus and minibus are the primary transportation mode in Dhaka. The number of bus routes has been increasing every year to meet the travel demand of the population. As shown in Figure 2.1.6. The number of registered buses has been rapidly increasing along with the trip demand. Additionally, the government has encouraged the introduction of CNG buses and large buses (articulated bus and double-decker bus) into the public transport system, in order to mitigate the environmental impact of the transportation sector.

2.13 There are two types of bus operators in GDA: (i) one government-owned company called the Bangladesh Road Transport Corporation (BRTC), and (ii) many small entities that can be considered private companies. BRTA approves bus routes. There are 155 routes operated in RAJUK Area, a number that is planned to expand to 182 routes.

2.14 While the travel demand by bus has increased, a number of limitations of the bus system include: (i) lack of bus stop facilities, (ii) lack of parking, (iii) lack of maintenance of the facilities, (iv) Improper manner of bus operators.



Source: BRTA

Figure 2.1.6 Buses and Minibuses from 2001 to 2013 in GDA

(ii) Human Hauler

2.15 Smaller in size than buses, human haulers are another type of public transport in Dhaka. As per BRTA records (March 2014), there are 106 routes planned for human haulers within Dhaka city and out of these, only 34 routes are currently operating with at least 1,733 human haulers on service. Different types of human haulers include: Tempoo, Bondhuparibahan, Laguna, Champion etc. Tempoo and Laguna haulers can seat around 10 to 12 people while Bondhuparibahan and Champion have a seating capacity of 14 to 20.

(iii) Railway

2.16 The train service of Bangladesh is divided into two categories: Intercity trains and mail trains (or commuter trains). Commuter trains have positive effects for reducing the volume of road traffic. At present, a total of 16 pairs of commuter trains are operating and carrying 15,000 of passengers between Dhaka and Narayangonj every day, and 4 pairs of commuter trains between Dhaka and Joydevpur. With 3.0 million passengers in June 2014, the Kamalapur Station is the busiest station of DMA city Centre. The waiting time at level crossing also contributes to traffic congestion.

(iv) Water Transport

2.17 In Bangladesh, transport via water plays an important role, particularly for people from the southern district who uses different types of water transports like launch, ferry, steamer etc. to come to Dhaka. All long distance water vessels towards Dhaka arrive at the main water terminal called "Sadarghat". At present, there are 48 different long distance routes from Sadarghat to other districts of Bangladesh. Bangladesh Island Water Transport Authority (BIWTA) is responsible for issuing route permits and regulating fares while Bangladesh Island Water Transport Corporation (BIWTC) is responsible for operating government owned water vessels. As Dhaka is surrounded by the Buriganga, Dhaleswari, Turag, Balu and Shitalakhya rivers, introducing water transport services present a great potential for public transport and BIWTC is planning to introduce a circular water transport service in Dhaka.

(v) Taxi

2.18 Taxi-cab service was launched in Dhaka city almost 16 years ago. As per BRTA, in 2013 there were around 9,000 taxicabs in Dhaka city. Most of the older taxicabs are not air-conditioned, they are in a very poor condition, and the service quality is generally low. The government has a plan to gradually increase the number of A/C taxi cabs up to 600, to be used in Dhaka and Chittagong Metropolitan area. In April 2014, a new taxi cab service was introduced in Dhaka city under two companies: Trust Transport Services and Toma Group.

These taxi cabs have a variety of modern features such as: air conditioner, radio communications, video recording inside the car, automatic vehicle tracking, on call service, issuing money receipt etc.

(vi) CNG (Three-wheeler Auto Rickshaw)

2.19 Known as “Baby-Taxis,” three-wheeler auto rickshaws play a vital role in the public transportation system of Dhaka. Before 2002, there were around 40,000 auto rickshaws driven by two stroke petrol engines and was . Before 2002, there were around 40,000 auto rickshaws driven by two stroke petrol engines. In 2002, the Bangladeshi Government decided to replace the old baby taxis because of the huge amounts of air pollution they were generating and declared to introduce 12,000 CNG-run three-wheelers in the city. In 2013, there were around 23,500 CNG operating three-wheelers in GDA as per BRTA estimates. Out of these, around 14,000 units were registered in Dhaka district. Among the other districts of GDA, Gazipur and Narayanganj also have significant numbers of CNGs.

(vii) Easy Bike

2.20 Over the last few years, a new mode was added to the public transportation system of GDA: the easy bike. Similar to a rickshaw, the easy bike is powered by rechargeable battery. The fare is rather low, which explains its popularity. The total fare averages at 20 taka per route, to be shared by the 4-6 passengers, so approximately 5 taka per person per route. Easy bikes are registered by the BRTA as they are not considered motorized vehicles by the Ministry of Road Transport and Bridges. Therefore, all the easy bikes seen in different parts of GDA are informally operated.

(c) **Pedestrian & Non-motorized Transport**

(i) Pedestrian

2.21 Walking is the common mode of transportation for the majority of people in Dhaka city. On the one hand, the provision of pedestrian facilities is not commensurate to the pedestrian needs. The convenience of the pedestrians is not taken care of whenever a road or intersection is being constructed or renovated in Dhaka city. It can be noticed that pedestrians often share and compete with motorized vehicles for road space. In many locations, there is no dedicated space for pedestrian crossings. On the other hand, some pedestrian facilities are not being used by the pedestrians, especially crossover pedestrian bridges.

(ii) Bicycle

2.22 Bicycle is a useful and environment friendly transportation mode that plays an important role for commuting in some developed countries. However, only 2% of the trips were made by bicycle on arterial roads of Dhaka city. In the past, bicycles were used for commuting to school and offices, mostly in rural areas. One of the reasons for limited bicycle use is religious; it is not deemed appropriate for Muslim women to ride a bicycle.

(iii) Rickshaw

2.23 Dhaka city is known to be a city of rickshaws. On the one hand, they provide a convenient service for a cheap fare. It is well known that quite a number of unregistered rickshaws are operating in Dhaka. For this reason, nobody knows exactly how many rickshaws are running in the city. 330,143 rickshaws were registered between 2004 to 2011 in the urban area of Greater Dhaka area (GDA) (Source: Statistical Yearbook of Bangladesh 2010 & 2012). In Bangladesh there are no fixed fare rates for rickshaws. The fare mainly depends on the negotiation between the passenger and the rickshaw puller. In 2010, the

fare for an average rickshaw trip (about 1.5 kilometer) was approximately 20 taka, and the average travel time per trip was about 20 minutes (Source: DHUTS).

2.24 On the other hand, rickshaws contribute to traffic congestion because of their low speed and their on-street parking needs. Recently, a measure to ban their operation on the major arterial roads has been implemented.

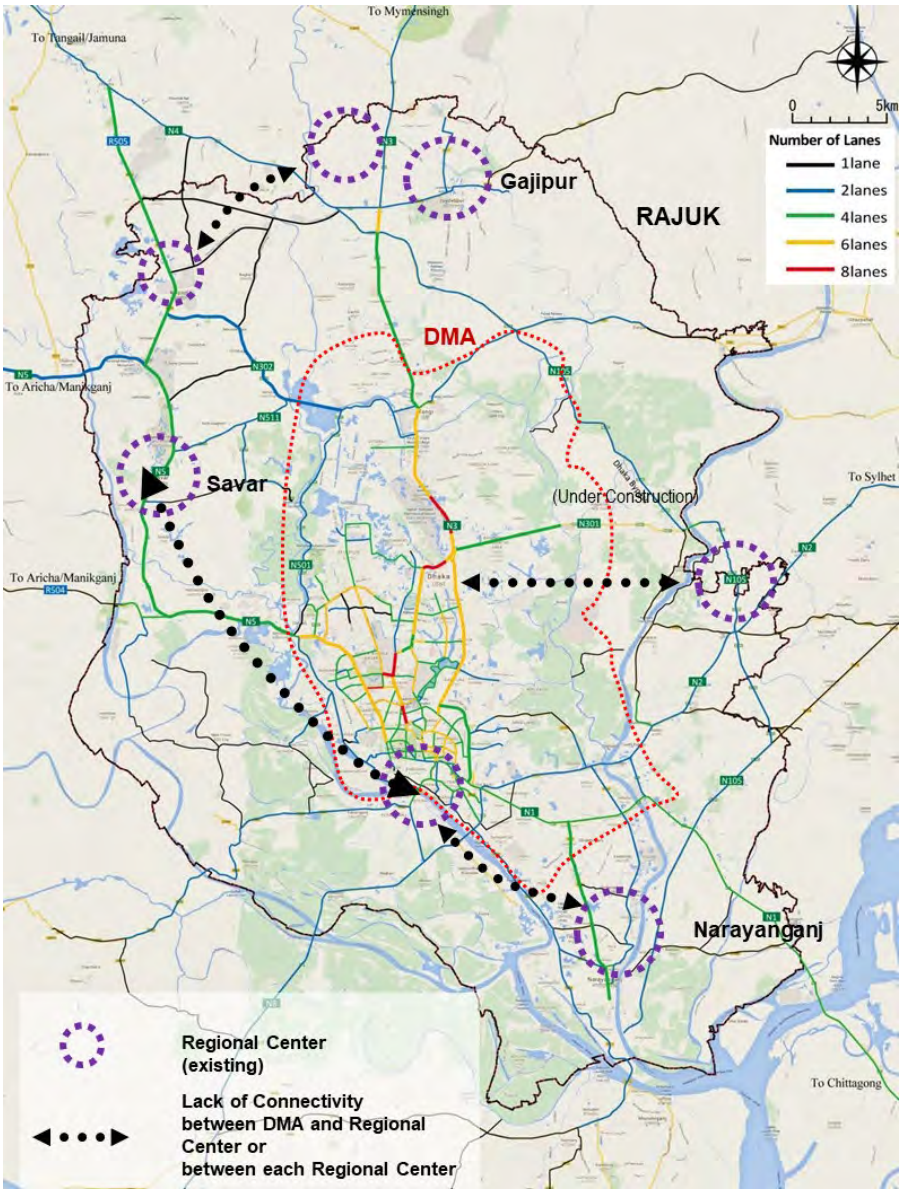
(iv) Others (Rickshaw van, Thela)

2.25 Rickshaw vans, or Thela, are a better option for people who need to transport small amount of commodities. However, rickshaw vans, or Thela, are restricted from using the rickshaw-free roads by the Dhaka Metropolitan Police. According to Dhaka City Corporations, there are around 8,000 registered rickshaw vans in Dhaka city.

4) Current Transport Network

2.26 The RAJUK Area is composed of the DMA areas and Suburban Area. Figure 2.1.7 shows the road network system of the RAJUK Area. Surrounded by the Buriganga River, Turag River and Balu River, DMA is located in the middle of RAJUK area. Although most major roads in DMA have multiple lanes and rather good pavement, traffic congestion still chronically occurs due to insufficient functional roads, some missing links, and inadequate traffic management. As for the road network and classification in the suburban area, the road density is lower than that of the urban area and connectivity is not available with some adjacent regional centers. Such situation is assumed to hamper regional development and to promote the intense concentration of population and advanced urban functions to DMA.

2.27 Urban transport highly depends on road traffic. Although the share of public transport such as bus, rickshaw, and CNG is high, most of them are road-based modes and traffic volumes exceed the road capacity. Additionally, all transport modes such as rickshaws, private vehicles and buses use the same share space on every type of roads which causes severe traffic congestion. Traffic congestion raises a series of related issues such as longer travel times, inefficient traffic movement, traffic accidents, increased fuel consumption, and air pollution. To solve these problems, various traffic management measures have been implemented, such as restricting trucks from entering Dhaka city on specific times and banning rickshaw from operating on the major arterial roads. However, traffic enforcement is insufficient and the effect of these measures remains limited. For all these reasons, alternatives to road transportation are utterly needed.



Source : RSTP

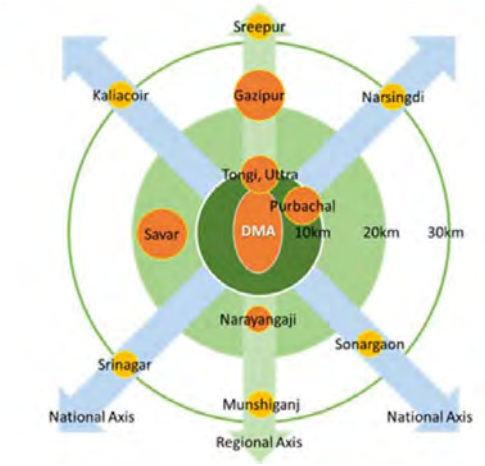
Figure 2.1.7 Current Major Transport Network of RAJUK Area

2.28 Dhaka is located at a relatively low altitude, and urbanization is expanding toward the Northern and Western clusters, such as Gazipur and Savar, two areas with relatively low risks of water disasters. Administrative, financial, commercial and business uses are concentrated in the central area whereas industrial uses have radially expanded along the arterial roads. Such land use characteristics increase the traffic volume on the limited number of arterial roads and cause serious traffic congestion. Additionally, developments in the Eastern Area and large-scale urban development projects by RAJUK, private firms and the military are also expected to have huge impacts on traffic.

5) Future Transport Network Proposed in RSTP

2.29 The 2004 Strategic Transport Plan (STP) proposed that the transport network comply with the special structure proposed in the previous DMDP (Dhaka Metropolitan Development Plan 1995-2015). However, in the previous period, urban transport infrastructure had not been developed in an integrated manner with urban development. If integrated urban transport infrastructure is not be implemented in the future either, the current concentration of activity in the central urban area will continue.

2.30 In response, Dhaka Structure Plan (or Regional Development Plan, 2016-2035) recommended the decentralization or multi polarization of urban functions. The RSTP proposed that Transit Oriented Development (TOD) be implemented, with high density and compound land uses in each of the distributed urban centers and connections between urban centers via mass transit network.



Source: RSTP

Figure 2.1.8 Future Regional Structure of GDA Proposed in RSTP

Table 2.1.3 Projected Population Estimated in RSTP

Area	Land Area (ha)	2014				2035			
		Population (x 1,000)	01-14 AGR (%/yr)	Density (no/ha)	Day night Ratio	Population (000)	14-35 AGR (%/yr)	Density (no/ha)	Day night Ratio
DMA	30,199	9,455	2.9	313	1.01	13,211	1.6	437	1.01
Gazipur	31,854	1,869	7.3	59	1.02	3,532	3.1	111	1.02
Purbachal	22,567	592	2.6	26	0.96	1,666	5.0	74	0.96
Sonargaon	12,436	474	1.9	38	1.06	616	1.3	50	1.06
Narayanganj	10,704	1,447	3.9	135	1.01	2,241	2.1	209	1.01
Kareniganj	18,303	815	2.3	45	0.97	1,165	1.7	64	0.97
Savar	29,199	1,844	9.1	63	0.99	3,749	3.4	128	0.99
Total	155,260	16,495	3.8	106	1.01	26,179	2.2	169	1.01

Source: RSTP

2.31 In RSTP (2016), the proposed future transport network is as shown in Figure 2.1.9. The contents of the plan are as follows:

(i) In the special structure, the Proposed Transport Network should support the land use pattern and movement between urban clusters as proposed in RSTP. The arterial transport network should be structured also in accordance with the special distribution of large traffic generators, such as port, airport, industrial zone, and SEZ.

(ii) Following TOD principle, public transportation services should be developed hierarchically and in accordance with the demand between urban clusters. For example, mass transit should serve to connect the CBD with sub-centres, a medium capacity system should create connections between sub-centres or newtowns, and a bus system should connect new towns.

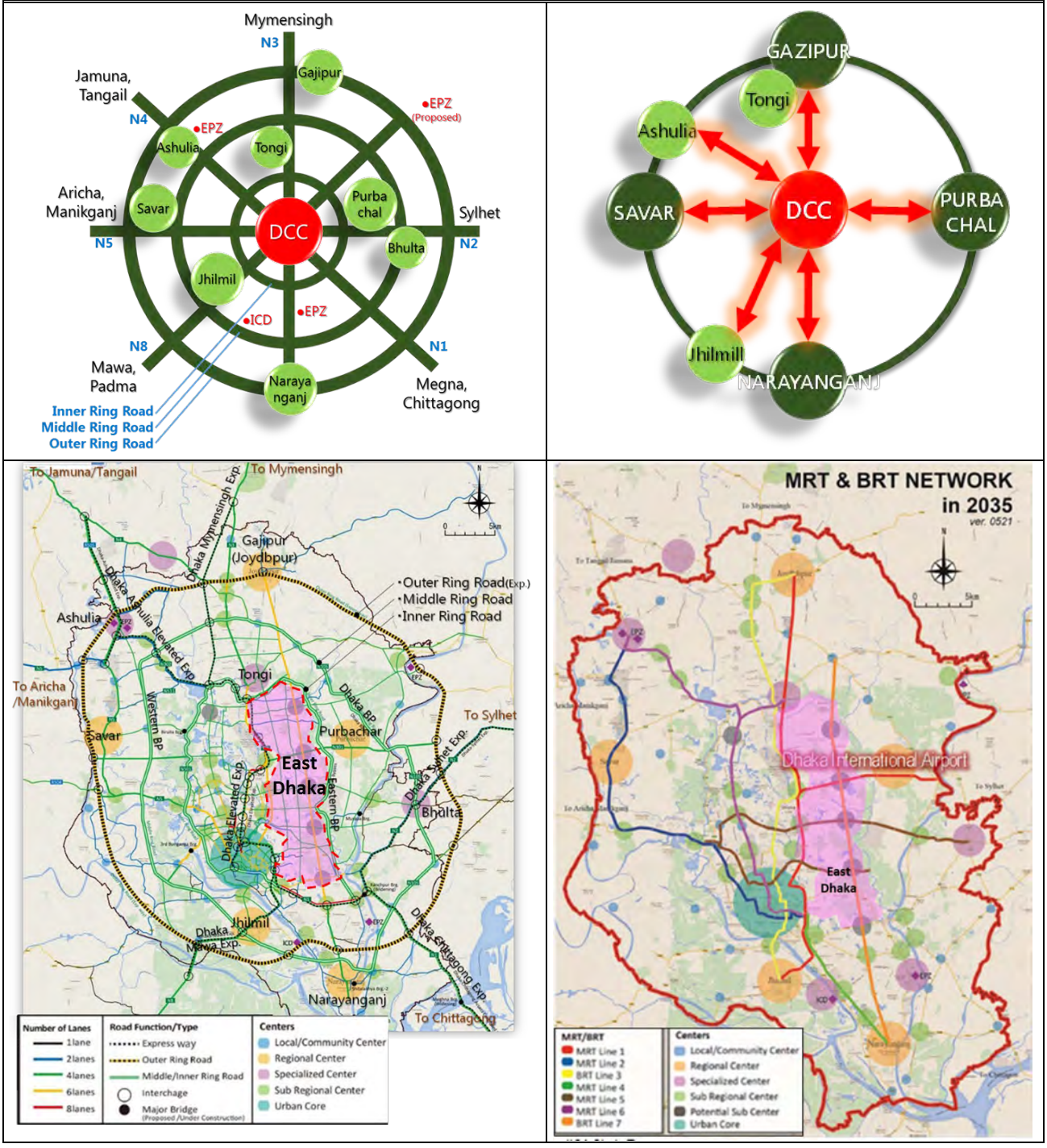
(iii) The Arterial Road network should include radial roads and circular roads, radial roads to connect with major roads in suburban area, and circular roads to connect with the radial roads and divide the urban roads and inter-urban roads.

(iv) The proposed public transport network is composed of MRT and BRT in response to spatial patterns of urban development. Only if it is well integrated and not developed as a stand-alone project will the public transport network yield maximum benefits. The proposed bus network is composed of arterial routes and feeder routes supporting the MRT and BRT system.

(v) The transport system should be structured as an extensive network comprising a primary arterial network and a secondary network. Inter-modal facilities are necessary to connect various modes. If such facilities are not provided, the impact of mass transit mode would be limited. In order to maximize the effects and benefits of the future transport network, it is important to commit at an early planning stage to providing the necessary intermodal facilities needed to achieve Transit Oriented Development.

2.32 The proposed MRT/BRT development plan includes 7 lines for a total length of 262.8 km, out of which 2 lines (78 km) are BRT lines. Among the remaining 5 lines, MRT Line 6 is currently on-going and MRT Line 1 and Line 5 are the targets of the current Study.

Road Network	Urban Rail / BRT Network



Source : Prepared by Study Team based on RSTP

Figure 2.1.9 Future Transport Network

2.33 Outlines of MRT/BRT proposed in RSTP are shown below.

Table 2.1.4 Outlines of MRT/BRT

Route	Section		Length (km)		No of Stations	Opening Year
MRT Line 1	Phase 1	Airport-Notun Bazar-Kamalapur Notun Bazar-Purbachal Terminal	52	30	19	2025
	Phase 2	Kamlapur-Jhilmil Purbachal to eastern part Airport-Tongi-Gazipur		22	-	2035
MRT Line 2	Ashulia-Sawar-Gabtoli-Dhaka-DSCC-Kamalapur		40		-	2035
BRT Line 3	Gazipur-Airpot-Jhimil		42		-	n/a (On-going)
MRT Line 4	Kamalapur-Narayanganji		16		-	2035
MRT Line 5	Phase 1	Hemayetpur-Gabtoli-Mirpuir10-Banani-Gulshan-Vatara	35	20	14	2028
	Phase 2	Vatara -Bulta Gabtoli-Dhanmondi-Hatir Jheel- Nogor Para		15	-	2035
MRT Line 6	Phase 1	Uttara North-Mirpur10-Farmgate-Motijheel	41.8	19.8	16	Opened in 2024
	Phase 2	Ashulia-Uttara North		22.0	-	n/a
BRT Line 7	Eastern Fringe Area		36		-	2035

Source : Study Team

2.2 Current Situation of Urban Development in Dhaka

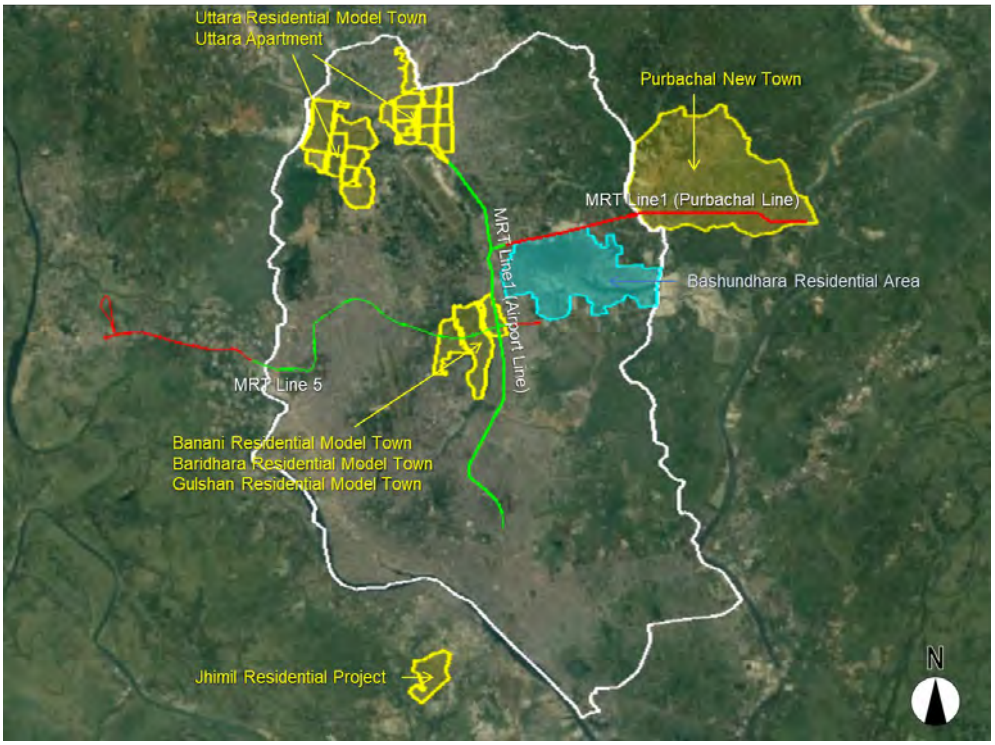
1) Urban Development by RAJUK

(i) RAJUK Project

2.34 A key actor in the rapid development process of Dhaka city, RAJUK is pushing forward new town and model town planning. Foreign companies and embassies are located in model town areas of Dhaka, such as Gulshan, Baridhara and Banani, which have been developed as residential areas. Therefore, compared with the old Dhaka, which developed without any planning, housing and infrastructure development is being implemented as planned in the new and model towns. In addition, in recent years, a large satellite town has formed in the Uttara area. Phase 1 and Phase 2 have already been completed, and Phase 3 is under construction.

2.35 Among the New Town projects implemented by RAJUK, Prubachal New Town is the largest scale project. Its planned population is 1 million, and all residential plots have already been sold out. Most of the development area was wetland and virgin land, and the development area has been expanded to the outskirts area of Dhaka city. In addition, Jhilmil residential project is planned in the south of Buriganaga River, and the expected population is approximately 133,000. From the center of Dhaka to the suburbs, new housing is thus being supplied as the New Town project is being implemented, and roads are supposed to be developed radially around the center of Dhaka in the future. Currently, the plan itself is suspended for relocation of residents and land expropriation.

2.36 The department of architecture, under the Ministry of Housing and Public Works, designed additional high-rise residential areas such as the Uttara Apartment Project for low-income and middle-income groups. However, the price range is not appropriate for them to be able to purchase such apartments.



Source: JICA Study team (using Google Earth)

Figure 2.2.1 Location of Large Scale Urban Development in Dhaka

Table 2.2.1 Overview of RAJUK Projects

Project	Current Condition	Plot	Planning Year (Approval Year)	Planned population
Gulshan Residential Model Town	Fully Developed	1,981	1961-62	
Banani Residential Model Town	Fully Developed	1,436	1968-69	
Baridhara Residential Model Town	Fully Developed	1,048	1978	
Uttara Residential Model Town （1st phase)	Fully Developed	5,930	1986	
Uttara Residential Model Town （2nd phase)	Fully Developed	4,563	1990	
Uttara Residential Model Town （3rd phase)	Progress of the project is about 80%. Already 80% (6620 nos) plot has been handed over and remaining 20% plot will be handed over by December 2016.	8,690	1997	600,000
Purbachal New Town Project	Among 25000 Residential plots more than 13000 nos plots have been handover in sector 1-5,9,11,13,14,17,18,22(Part),23(Part),29(Part)	27,176	1995-1996 Implementation started since 2002-2003	1,000,000
Jhilmil Residential Project	Overall Physical progress of the project is 82%. Land Development in the project area is completed totally. Road Construction works are also completed. Works of lake development, bridges, pipe culverts, slope maintaining & grass turning, plot pillar laying etc. work are ongoing.		1998	133,000
Uttara Apartment Project	Date of Handover 1. December 2016- 840 nos of Flats 2. June 2017- 504 nos of Flats 3. December 2017- 2772 nos of Flats 4. June 2018- 2520 nos of Flat		2011	90,000
Savar Satellite Town	Due to lacking Public support and Local Political Influence.		Stopped	
Gazipur satellite Town	Due to lacking Public support and Local Political Influence.		Stopped	

Source: RAJUK 、 Web Enable Plot Based Land Record System (WPLRS)

(ii) Center of Dhaka: Residential Model Town

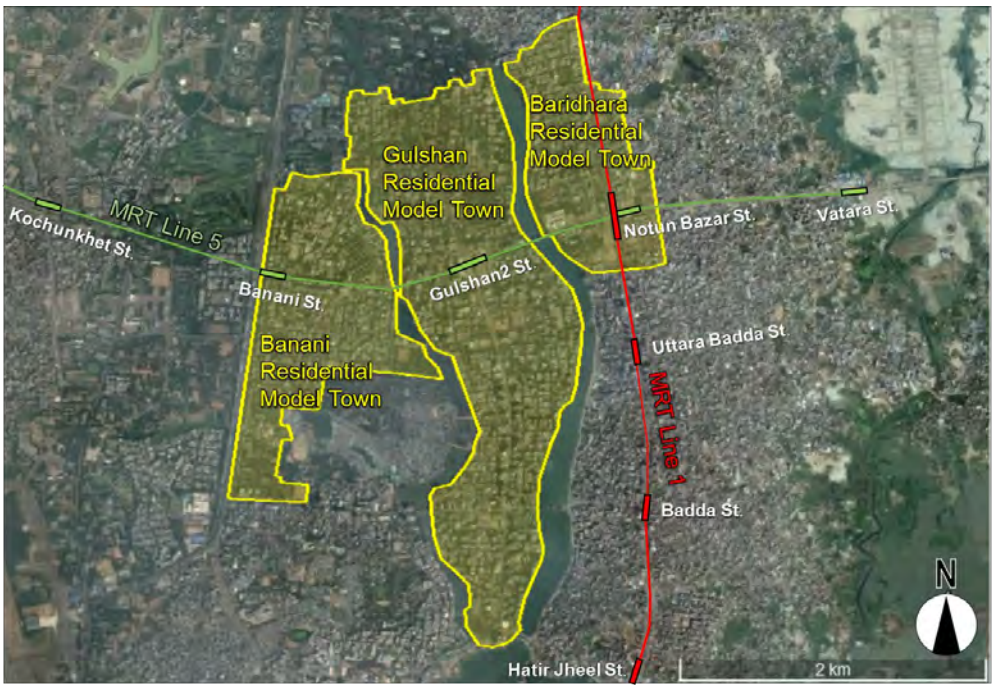
2.37 In the center of Dhaka, some urban development projects such as Gulshan, Banani and Baridhara, have been implemented so far. Land prices are the most expensive in the entire city, which explains why many foreign companies and embassies are located in these areas. Residential plots and parks are arranged functionally, but due to high demand for urban development, high-rise buildings are being built dramatically along the main roads.

2.38 These areas have become the CBD area of Dhaka city because of high demand for urban development and changing land uses from residential area to commercial area, whereas these areas were planned as residential areas in the past. MRT line 5 is planned to connect these areas, Banani, Gulshan and Baridhara, as it is prospected that many passengers will use MRT for commuting to this district. The characteristics of each area are as follows.

(a) **Banani:** Banani has mixed land uses, especially residential, office and commercial. On the one hand it is one of the economic centers in Dhaka. On the other hand, there is a slum area, Karail slum, located near Bonani lake.

(b) **Gulshan:** Many mixed-use buildings and office buildings are located in the district of Gulshan 1 circle to 2 circle. Especially, high-rise buildings are under construction along Gulshan avenue as a response to high demand for urban development in this area.

(c) **Baridhara:** Baridhara is the diplomatic area. It encompasses a secured gated community where many embassies are located, an international school, a mosque and several parks. Since land value of this area is the most expensive in Dhaka, low-rise housing structure which would to be owned by rich people have been demolished to reconstruct to high-rise buildings. Many high-income households live in this area because of its amenities, including parks, wide roads, large plots and enhanced security.



Source: JICA Study team (using Google earth)

Figure 2.2.2 Urban development around Gulshan, Banani and Baridhara

(iii) Southern Part of Dhaka: Jhilmil Residential Model Town

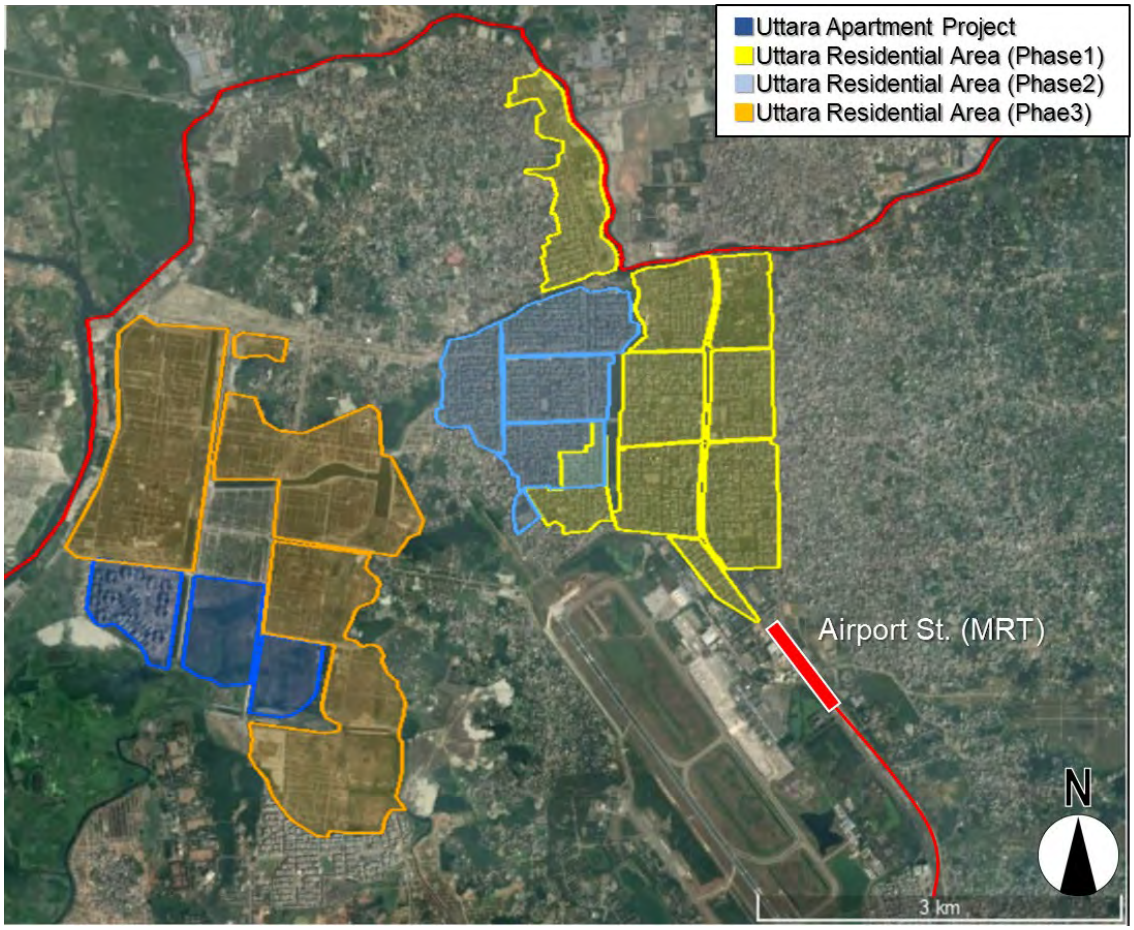
2.39 In the southern part of Dhaka the old city is located near the Buriganaga River; it is a disorderly area of very high density. The commercial core flourished around the Buriganga River and there are still many merchants and markets in this area. As there is no space to develop and carry out urban development on the northern bank, RAJUK decided to develop the Jhiliml residential model town on the southern bank of the Buriganga River. The site area is about 381 acre large. The prospected population is 133,300. There are two kinds of residential plots, *i.e.* 3katha and 5katha, and all the plots have already been sold out.

Source: JICA study team (Using google earth)

Figure 2.2.3 Urban development in southern part of Dhaka

(iv) Northwestern part of Dhaka: Uttara area

2.40 The Uttara model town is located in the north of the Shahjalal International Airport. The area was planned by RAJUK as one of the largest residential development projects in Dhaka, and many buildings have already been constructed. Most of this development project consists of a residential area, but some commercial buildings are located along the main roads and some high-rise buildings have also been built. In the future, this area should be connected to the norther part of Dhaka by BRT, from Airport station. Moreover, MRT Line 6 is currently under construction and a station will be located near the Uttara residential project in its Phase 3.

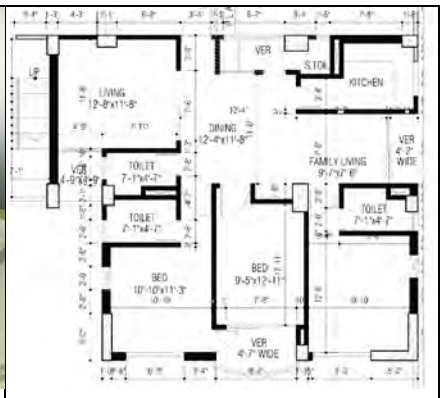


Source: JICA Study Team (Using Google Earth)

Figure 2.2.4 Urban development of Uttar area

2.41 The Uttara Apartment Project is planned near sector 18 of Uttara model town. It includes approximately 20,000 houses for middle and low-income people. However, in fact the residential units are not affordable for these populations, and most housing units consists of living room, dining room, kitchen and 3 rooms or even larger.

Uttara Apartment Project : Source RAJUK



Unit example: Source RAJUK

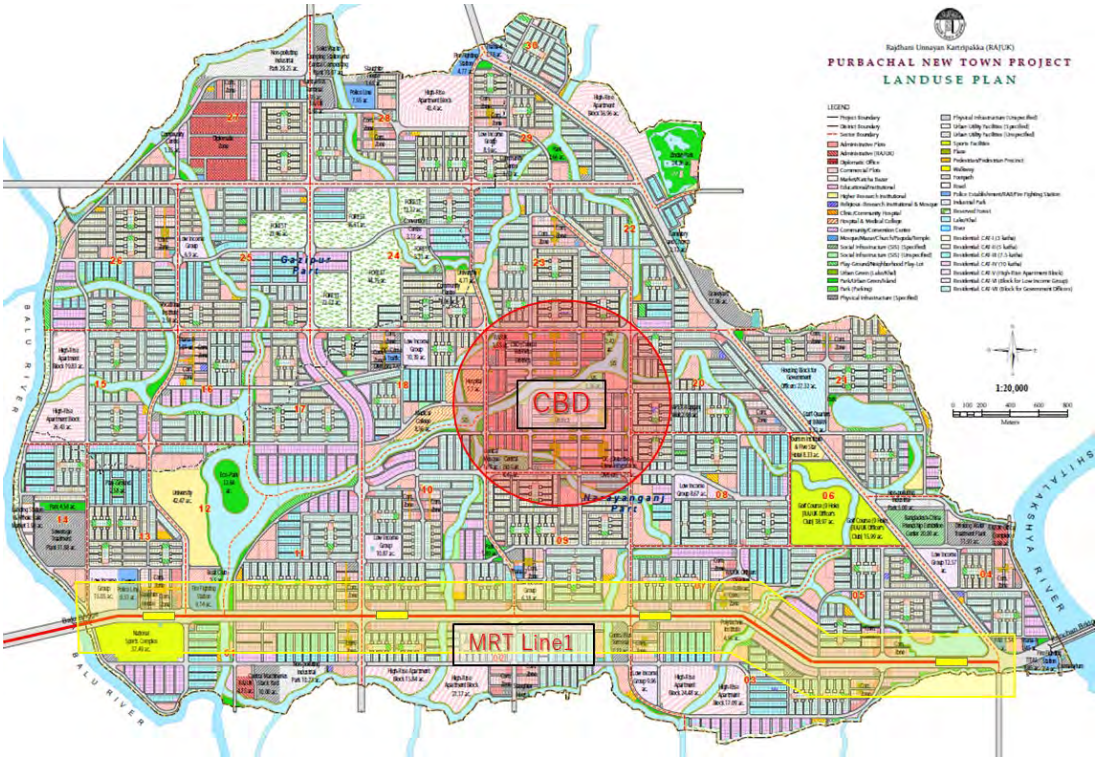
Figure 2.2.5 Uttar Apartment Project

(v) Eastern part of Dhaka : Purbachal New Town

2.42 Many urban development projects implemented by RAJUK and private companies have are taking place in the Eastern part of Dhaka. In particular, the Purbachal new town is the largest project currently on-going in Dhaka. Purbachal new town was planned as an urban entity, not only as a residential area but also with various land uses, including commercial, institutional (education, parks, administrative) uses. The site area is about 6,150 acres and the estimated population is about 1,000,000. This project will greatly influence the urban structure of Dhaka city.

2.43 The residential land is classified into 7 types. There are three categories of housing units, by area size (3katha, 5katha, 7.5katha, 10katha), one category for high-rise buildings, one for low-income housing and a last one for public workers. In addition, other categories were defined for educational facilities, research facilities, community facilities, mosques, medical facilities, parks, sidewalks. A total of 39 categories were decided. In commercial area, concrete locations such as markets, plazas are decided. However, this project is not considered the impact of MRT and the CBD is not located at near MRT stations. Therefore, in current land use, only residential area is located near stations and it is necessary to change land use in order to maximize the impact of MRT and TOD.

2.44 Residential parcels have been sold out and the bid for commercial land will soon be implemented. RAJUK sold residential plots for a low price, with great disparities with market prices. However, the commercial plots will be sold near the market price through the bid, which should generate substantial profits for RAJUK.



Source: RAJUK

Figure 2.2.6 Land Use of Purbachal new town

Table 2.2.2 Proportion of land use in Purbachal new town

Land Use		Area			
		Katha	Acre	ha	Percentage (%)
Residential	Residential Block	20,497	339	139	5.6
	Residential Plot	121,103	2,002	821	33.1
Commercial		12,751	211	86.5	3.5
Industrial		5,686	94	38.5	1.6
Public Service	Heath	1,701	28	11.5	0.5
	Education	14,741	244	100	4.0
Government / Institutional	Administrative	9,164	151	61.9	2.5
	Research and Institutional	5,957	98	40.2	1.6
	Community Organization	1,721	28	11.5	0.5
Infrastructure/ Utility	Pedestrian	7,966	132	54.1	2.2
	Physical Infrastructure	8,623	143	58.6	2.4
	Road	86,545	1,430	586	23.6
	Social Infrastructure(SIS)	5,499	91	37.3	1.5
	Urban Utility Facilities	2,744	45	18.5	0.8
Open Space / Natural Resources	Sports Facilities	6,854	113	46.3	1.9
	Forest and Eco-Park	10,072	166	68.1	2.8
	Play-Ground/Play-Lot	2,157	36	14.8	0.6
	Plaza	1,444	24	9.8	0.4
	Urban Green	14,079	233	95.5	3.9
	Water-Body	26,165	432	177	7.2
	Wakf Land	18	0	0.0	0.0
GRAND TOTAL		**365,468**	**6,041**	**2,476.8**	**100**

Source: RAJUK

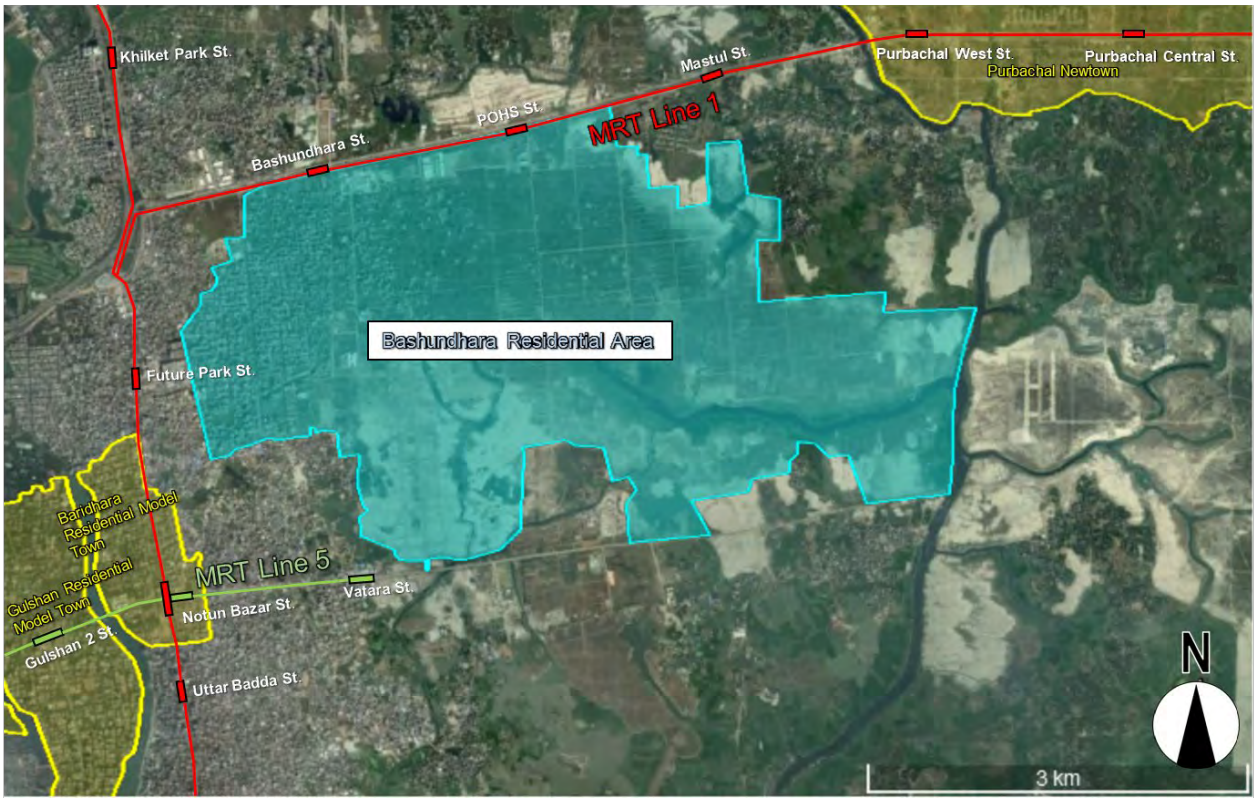
2) Urban Development by the Private Sector

(i) Bashundhara Residential Area

2.45 Many urban development projects have been implemented, and many of them are planned in suburban areas of Dhaka. RAJUK enacted ”Private Residential Land Development Rules” to set regulations applicable for private development projects. The regulations apply to projects of, 5 acres or more in Dhaka and 10 acres or more in other areas.

2.46 Bashundhara Residential Area has been implemented by Bashundhara group along MRT line 1 and 5. The area is more than 3,400-acre large. Before the development started in this area, Jamuna Future Park had already been operating for 3 years. It is a commercial complex with many facilities, such as a movie theater, a shopping center, a food court and an amusement park. Many families and young people visit Future Park on holidays.

2.47 According to the land use planning of Bashundhara residential area, the commercial area shall be located along MRT, but it is unclear how to use lands along MRT. It is necessary to arrange a station plaza to increase the number of passengers and develop more effectively.



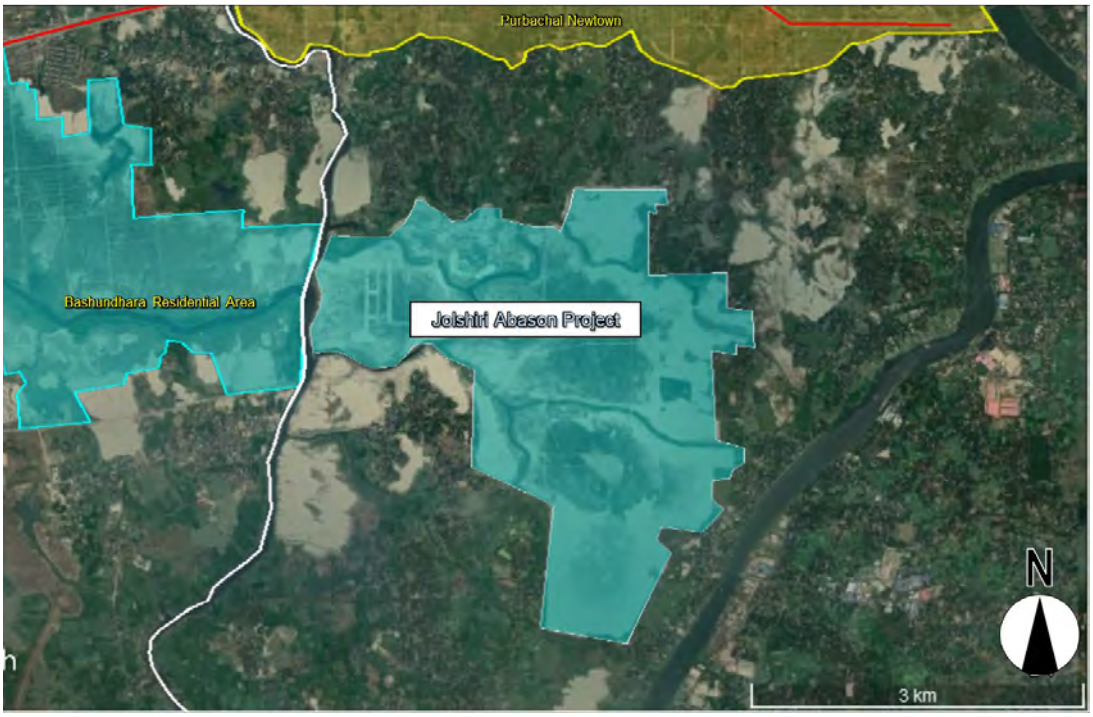
Source: JICA study team (Using Google Earth)

Figure 2.2.7 Bashundhara residential area

(ii) Jolshiri Abashon (JA) Project

2.48 Jolshiri Abashon project has been progressing as well as Purbachal new town and Bashundhara residential area. JA is implemented by the Bangladesh army. The road from Purbachal new town to this area will be connected to ensure road access. The size of the land is about 2,100 acres and a circular commercial zone is located in the center of the planned area.

2.49 The area has been developing as planned. Utility poles and site plots can be partially confirmed. Since MRT line 5 is planned to expand to Vatara station, the JA project is expected to benefit from the MRT extension in the future. Therefore, it is desirable that the area should be planned with consideration for integrating TOD from an early phase.



Source: JICA study team (using Google earth)

Figure 2.2.8 Jolshiri Abashon Project

2.3 Urban Planning in Dhaka City

1) Relevant laws for urban planning of Dhaka

2.50 In Dhaka city, the first master plan was established in 1959, and it has been updated several times until now. However, it has been influenced by various factors including political background such as independence from Pakistan and population growth exceeding expectations. For that reason, a mega city has emerged, which developed beyond the master plan of 1959. In the RAJUK area involving this project, the concept plan in the area was decided by Dhaka structure plan, and land use was determined by DAP (Detailed Area Plan). DAP control land use and FAR, building regulations, such as MGC, height of building and others, was restricted by Dhaka Mahanagar Building construction act. Urban development projects and building construction is being controlled by the system.

2.51 Moreover, in Dhaka city many private companies have been carrying out development projects and it influences the decrease of wetlands and prevention to develop public transportation systems. Therefore, Private Residential Land Development Rules was enacted in 2004. Urban development project which is 5 acres or more in Dhaka and 10 acres or more in other area, is controlled and must be permitted by this rule. Other development project is controlled by Mahanagar Building Construction Act.

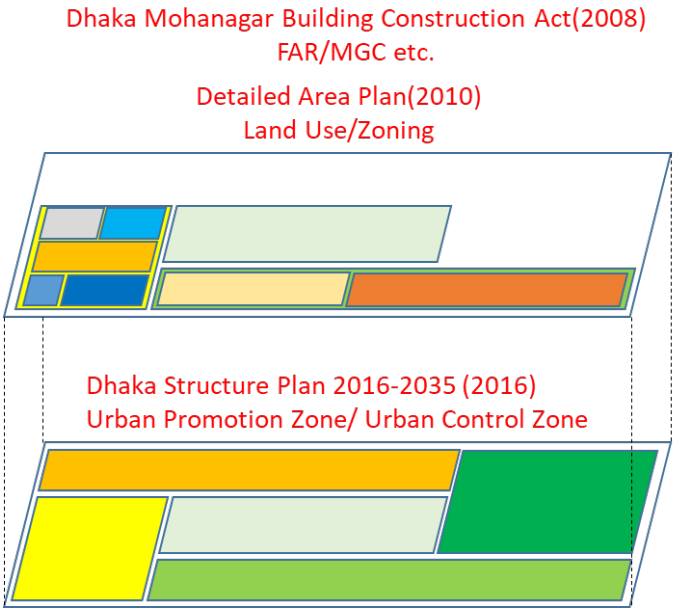
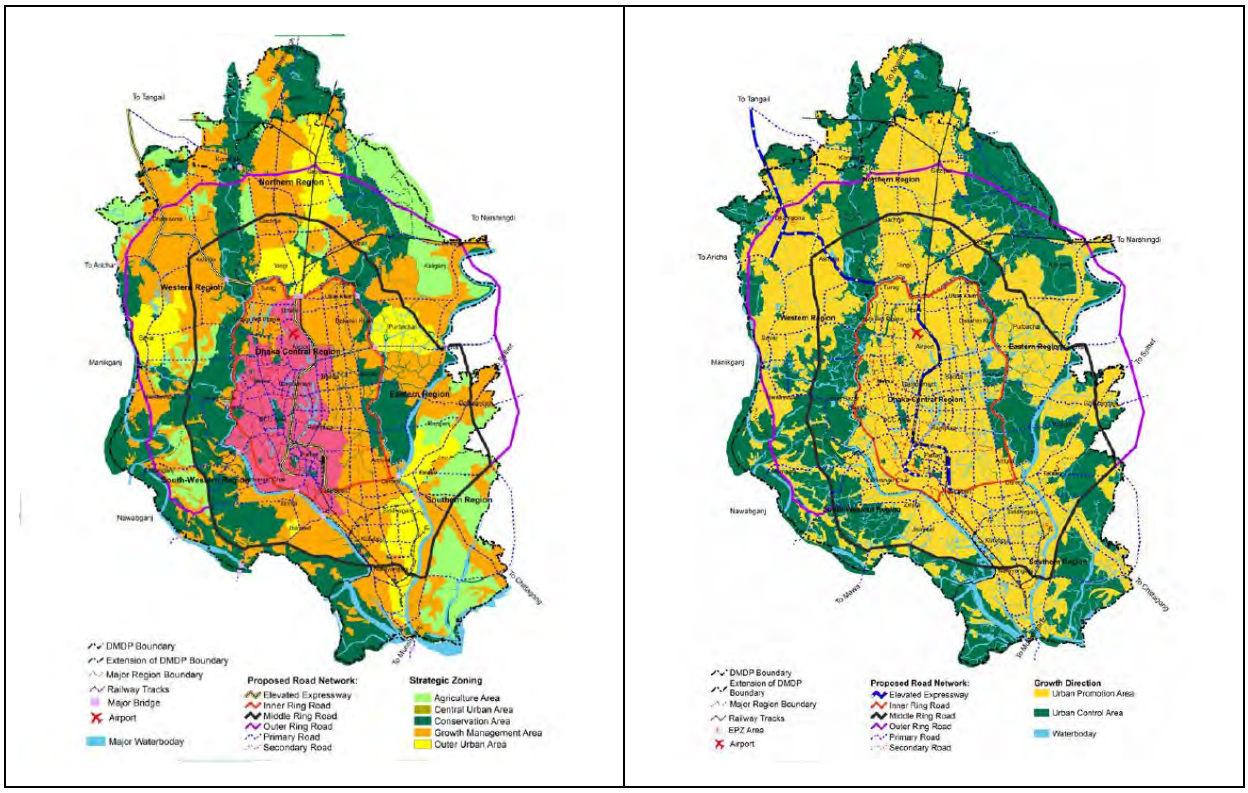


Figure 2.3.1 Urban development system in Dhaka

(i) Dhaka Structure Plan 2016-2035

2.52 The preparation of Dhaka Structure Plan was supported by ADB between December 2012 to March 2015. It is part of the Regional Development Project. The main objectives were to revise DMDP (1995-2015) and adopt the law into current conditions. According to the report of Dhaka Structure Plan 2016-2035, it addressed issues related to transportation, drainage , social services, public facilities, economy, energy and so on, and the overall objective was for Dhaka to become a livable city. The plan enacted an Urban promotion area and an Urban control area. Nevertheless, the plan did not integrate MRT projects and therefore might need major revisions in the future.



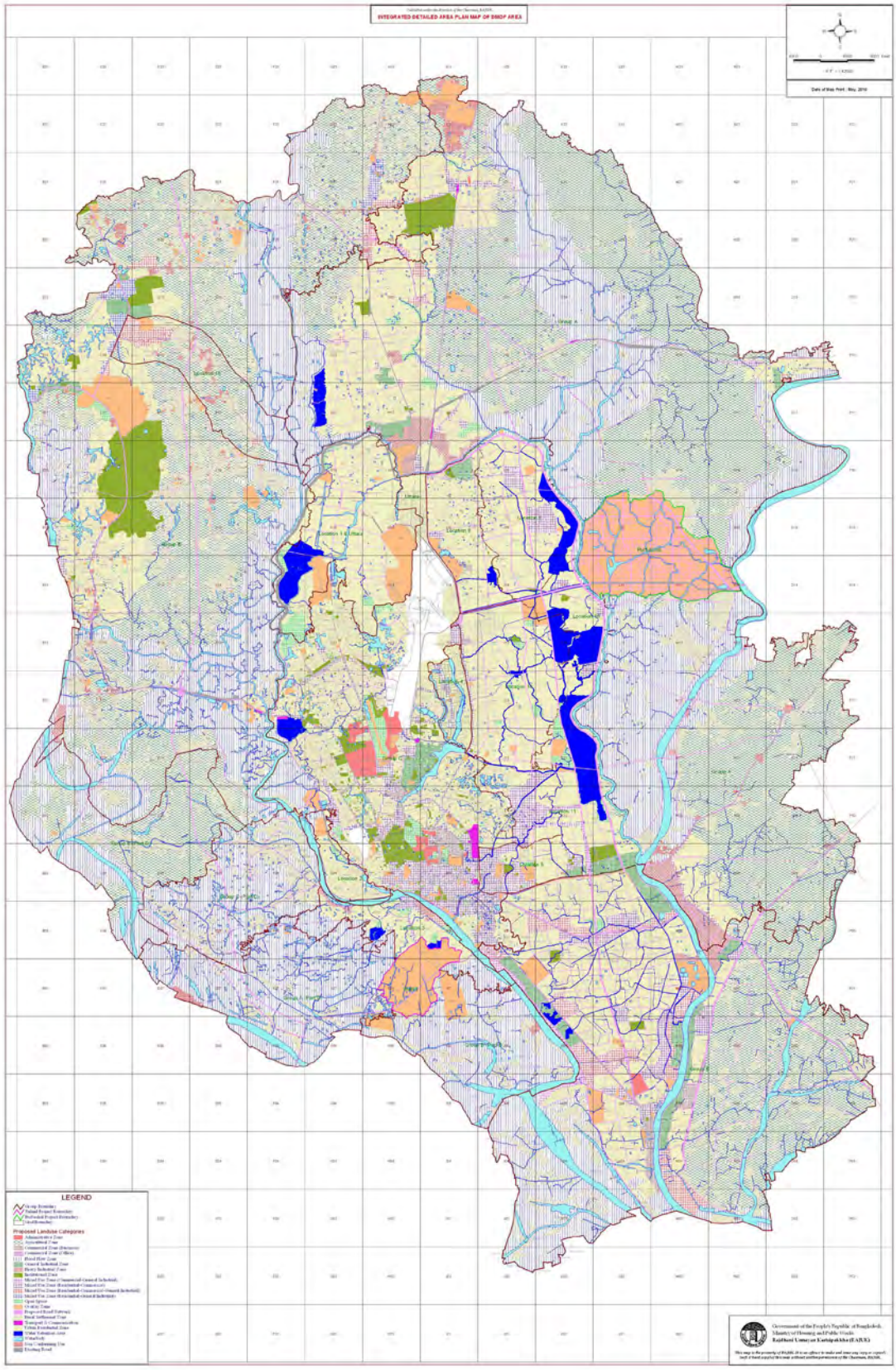
Source : RAJUK HP

Figure 2.3.2 Dhaka Structure Plan 2016-2035

(ii) Detailed Area Plan 2010

2.53 The Detailed Area Plan provides details about land use. It was enacted by RAJUK in 2010. Initially, the DMDP, Structure Plan, Urban Plan and Detailed Area Plan were supposed to be enacted at the same time, in 1995, but the formulation of DAP was postponed due to technical issues. DAP was finally enacted in 2010. However, it does not include concepts related to TOD and MRT projects, so it might be necessary to adjust and revise the DAP to maximize the impact of MRT and carry out urban development around stations.

2.54 RAJUK has been preparing the next DAP for the 2016-2035 period. RAJUK plans to finalize the DAP in 2018 and then revise it every 5-year based on population growth circumstances. The new DAP should be revised to adjust and integrate into MRT and TOD project. The combination between transportation planning and land use planning is necessary to implement TOD.



Source : RAJUK HP

Figure 2.3.3 Detailed Area Plan 2010

(iii) Private Residential Land Development Rules

2.55 These rules were formulated under the provisions of The Building Construction Act, 1952 and of The Town Improvement Act, 1953. Thus these Rules are applicable only in the Capital Development Authority's (RAJUK) jurisdiction. These rules refer to land re-adjustment and oblige private companies to work with urban development experts such as architects and urban planners.

2.56 The rules to implement urban development projects for private companies are as follows. (see appendix for requires area.)

(a) Total completion time of the project within a maximum period of 10 years as per final layout and development plan.

(b) The approved layout plan should be kept at the project office and if required instantly, shown to the visiting officer authorized by the concerned Authority.

(c) Approved layout plan and other related designs cannot be altered without prior approval of the Authority or, as applicable, of the committee.

(d) No new area can be added to an approved project without permission of the Authority or, as the case may be, of the committee.

(e) Taking necessary steps to maintain the project's land elevation above the highest flood level.

(f) In case of any existing canal, lake, river, channel or any other water body in the project area, ensuring full-length flow of water without any impediment up to the respective canal, lake, river, channel or water body at the other end of the project.

(g) Upgrading various utility services along with completion of a project as per direction or instruction of a related Authority or, as the case may be, of a corresponding institution.

(h) Ensuring no water clogging or environmental imbalance at the neighborhood area at the time of completion of a project.

(i) Submission of a list of previous year's allotted or, as the case may be, of sold plots, lists of plots, plots handed over and registration details of plots within the project area to the Authority by 31 January each immediately preceding year.

(j) Under no circumstances may any land marked and reserved for community facilities as per a layout plan be reduced to and allotted as residential or non-residential plot, and during the development period the duty of its maintenance will rest with the developer and after completion of the development process, that is, after handing over such land to local govt. or, as the case may be, to the local public welfare society.

(k) Handing over a space reserved for utility maintenance to the concerned authority as per its rule, which also include handing over of photocopies of allotments and handing over letters to the authority.

(l) In case of lack of electricity or water supply or any other facility at the time of project development, arranging interim water and electricity supply and other necessary facilities is at the developers own cost.

(m) Completing all road networks within the project up to bituminous level as per approved layout plan and delivery to the local govt. or as may be applicable to the municipal authority.

(n) If the project area is outside the territorial jurisdiction of Dhaka City Corporation or Dhaka WASA, arranging construction of wastewater and sewage treatment plant, composting plant and other like facilities at the developers own cost.

(o) From time to time obtaining approval from all necessary authorities for buildings to be constructed within the project as per The Building Construction Act, 1952 and constructing buildings and completion of the project as per the National Building Code.

(p) Filing environmental impact assessment report of the project to the Authority as per the Bangladesh Environmental Preservation Act, 1995.

(iv) Mahanagar Building Construction Act 2008

2.57 Adopted in 2008, the Mahanagar Building Construction Act mainly regulated building setbacks, FAR, MGC, minimum area of each facility and so on. For development permission, development projects smaller than the scale described in the above-mentioned Private Residential Land Development Rules 2004 are treated as apartment projects if the project is a residential project. Therefore, development permission must be obtained according to Land Use Clearance described in Article 3 of Mahanagar Building Construction Act. In addition, special permits are required for all buildings that meet certain criteria, and permission from the Committee member specified in Chapter 3 shall be obtained.

2.58 Procedures to get permission for development are as follows.

(a) Land Use Clearance

(b) Special Project Approval（Large or Special Project Approval Committee）

(c) Building Permission

(d) Occupancy Certificate

2.59 The procedure for Land Use Clearance is as follows.

(a) At first, collect land use related information letter by depositing BDT 400 in the bank.

(b) Fill the form of information properly and submit it to the Urban Planning Branch with the attachment of proposed partial Mouza Map.

(c) Then the form will send to the Assistant Planner according to the area.

(d) Assistant Planner will mark the surveyor. The surveyor will prepare a draft with proper land and road information with the design and again will send it to the Assistant Planner.

(e) Assistant Planner will mark the designer and the draftsman to submit the document with proper analysis image.

(f) The designer and the draftsman will prepare the analysis image and send it to the Assistant Planner.

(g) The analysis image will send to the deputy designer after signing by the Assistant Planner.

(h) It will then send for issue after the sign of deputy-designer. The applicant will collect the document from there.

2.60 It is necessary for Land Use Clearance to acquire Mouza Map and relevant documents for land owner.

2.61 The building plan shown in Table 2.3.1 is an example of development requiring special permission. Many of the major buildings and large-scale buildings require similar special permission. Currently, the planned urban railway is planned along the existing main roads. Therefore, most of urban development projects around stations are required to get such permission. However, since land use is no consistent with MRT, it is necessary to design appropriate land use plan of DAP.

Table 2.3.1 Special Project Permit for Large and Specialized Projects

	Examples
1	A residential building with more than 40 (Forty) dwelling units.
2	Any Project which is constituted with a floor area of more than 7500 (Seven Thousand Five Hundred) sq.m (under FAR).
3	Shopping centre which is constituted with a floor area of more than 5000 (Five Thousand) sq.m (under FAR).
4	Any Project which is directly connected with national and zonal highway or main road.
5	Industrial factories along with brick fields which are hazardous or create pollution.
6	Architecturally or historically important buildings or any building or development that is within 250 (Two Hundred Fifty) meter distance of that area.
7	Any building or development that is within 250 (Two Hundred Fifty) meter distance of an area of natural beauty.
8	Any building or development that is within 50 (Fifty) meter distance of a hilly area or a land which is visible as a hill or such land.
9	Any building or development that is within 250 (Two Hundred Fifty) meter distance of a riverside area.

Source : Mahanagar Building Construction Act

2.62 If special permission is required, permission by the committee is required and the Large or Special Approval Committee and Urban Development Committee are to issue permission.

2.63 It is prospected that urban development project will be implemented along MRT line and around stations and most part of MRT line and stations are located along main roads. Therefore, it might be necessary to get approval from the committee to implement TOD, which might be regarded as a large and specialized project. However, as of today the special permission requirements apply only along main roads. Adding station areas (within 500-meter of stations), is desirable. It is effective to develop the area around stations.

3 Possibility and Maintenance Policy of Transit Oriented Development (TOD)

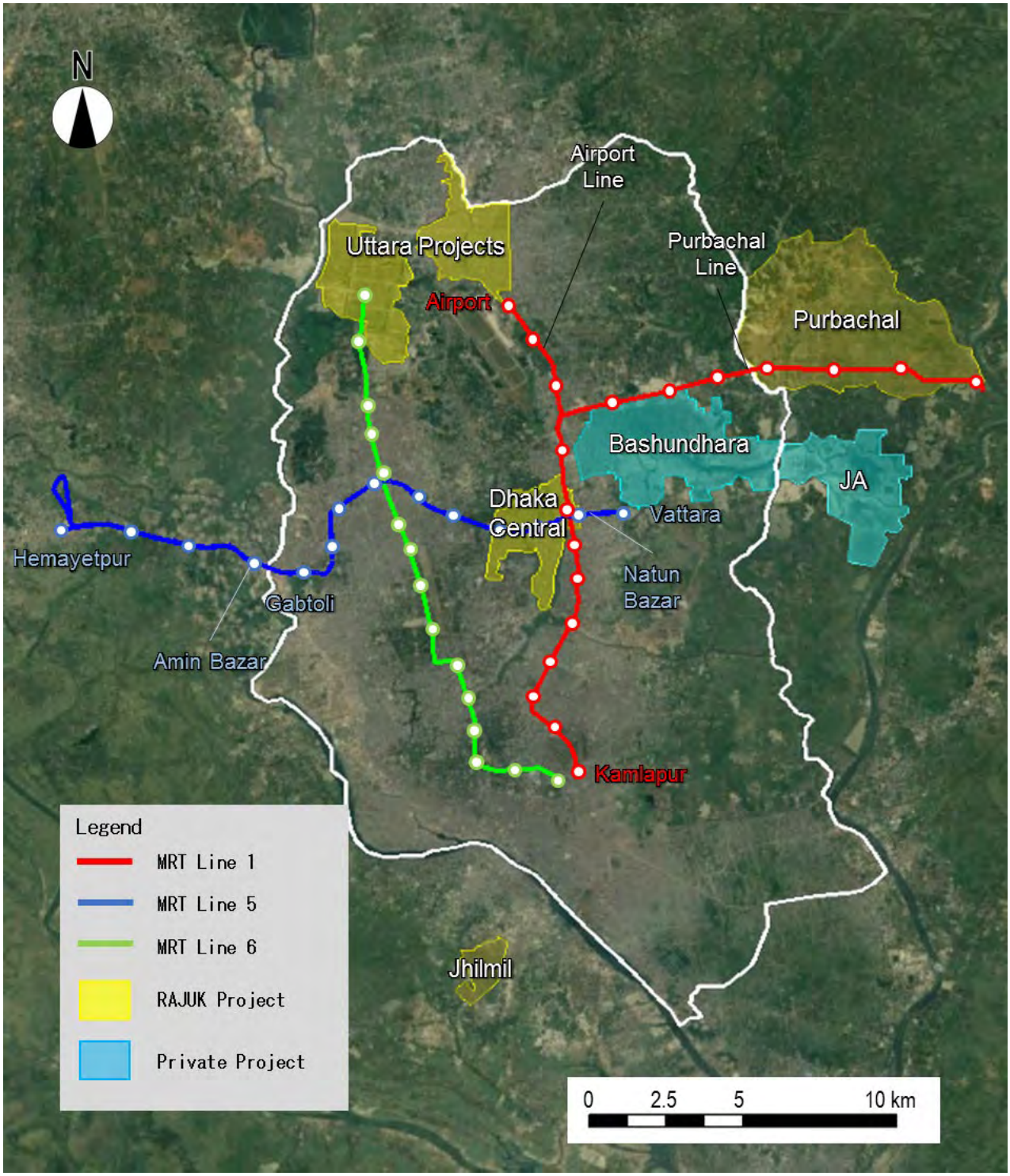
3.1 Overview of MRT Line 1 and 5

3.1 MRT Line 1 is prone to become the transportation backbone connecting the northern and southern parts of Dhaka. On the one hand, the Airport branch (12 underground stations) will connect Kamalampur station to the international airport. The Purbachal branch (7 elevated stations) will connect the Purbachal new town currently being planned, in its initial phase. Most of the airport line will pass through existing urban areas, many of which are densely populated, and have a high intensity of mixed residential and commercial uses. All stations of the airport branch are planned to be underground. On the other hand, the Purbachal line is expected to be connect existing urban areas with large-scale new developments, including Purbachal new town currently being planned by RAJUK, and other large-scale developments by private companies and the army. A large new town will be formed in the eastern part of Dhaka in the future. The Purbachal branch will be built in elevation, over the Purbachal express highway currently under construction.

3.2 MRT Line 5 is prone to become the transportation link connecting the Eastern and Western parts of Dhaka. It will also be a major backbone of the MRT transport network as it will intersect all MRT / BRT except MRT Line 4. It is particularly important to ensure Line 5's connectivity with the various north-south routes, so the MRT network truly functions as a network and therefore alleviates road traffic congestion in the city. In a first stage, the plan for MRT Line 5 is to connect Hemayetpur station (western terminal) to Vatara station as (eastern terminal). In the Western part of Dhaka, MRT will later be extended to Savar where universities and factories are located, and it also will be extended to the east towards Bashundhara residential area and JA project currently under construction. The section from Hemayetpur to Amin Bazar will be a viaduct and the section from Gabtoli to Natun Bazar will be underground to limit traffic disturbances during construction and demolitions of existing buildings.

3.3 The north-south and east-west lines have different roles. The north-south line meets the large public transport demand of the current main corridor, which is intended to alleviate traffic congestion. The East-west line is intended to secure access to the eastern part of Dhaka, where most of the rapid urban growth is taking place.

3.4 Along with MRT Line 6 currently under construction, MRT Line 1 and Line 5 shown in Figure 3.1.1, should improve traffic conditions in Dhaka and promote land use and transportation integration, also referred to as transit-oriented development (TOD). It is important to take advantage of the huge investments supporting the development of the three lines to promote TOD. TOD can be expected to increase the number of MRT patrons, and to enhance the benefits of MRT in terms of economic development through re-arrangements of land uses along MRT's rights-of-way. TOD has potential to enhance the benefits of MRT both in terms of traffic congestion alleviation and sustainable urban development. This chapter reviews the current situation around each station of MRT Line 1 and Line 5, highlights TOD opportunities and challenges in each station area, and formulates general guidelines to enhance the benefits of MRT in Dhaka through timely TOD planning.



Source: JICA Study Team (using Google earth)

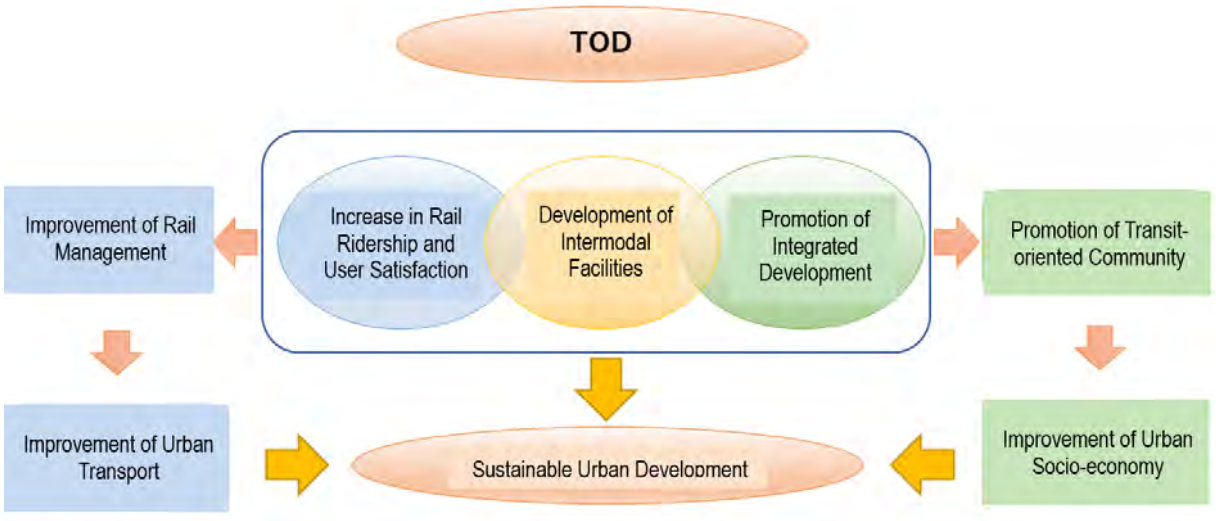
Figure 3.1.1 MRT Route of Line 1 , 5 and 6

3.2 Role and Importance of TOD (Transit-Oriented Development)

1) Concept of TOD

3.5 The concept of transit-oriented development (TOD) is defined, broadly, as urban/regional development to promote public transport and, narrowly, as high-density, mixed-use, compact urban area development. It refers to high-density residential areas; accessibility to public, commercial, and business facilities; and high-quality pedestrian network around rail stations. TOD in Japanese and European cities has been practiced for a long time. Although the understanding of TOD in developing countries vary, the commonly accepted notions include “access to public transport,” “mixed land uses,” “high density,” “multimodal transportation,” “public space,” and “pedestrian-friendly environment.”

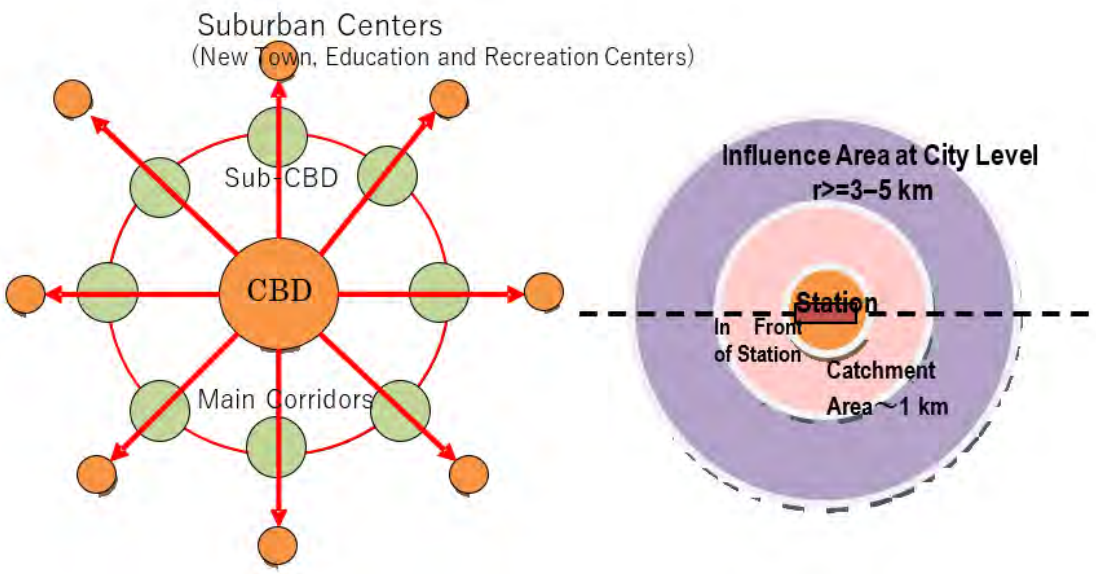
3.6 In Japan, TOD is supported by technology and institutions. The idea that urban development needs to be integrated with urban rail and has long been known and promoted as *ekimae ensenkaihatsu,* a concept that encompasses both station area development and land use development along the rights of way. Based on the TOD concept, private railway companies have developed shops using space available within stations, department stores at terminals, or new towns along railway lines to increase rail ridership and services. TOD has recently evolved further towards transforming expanded urban areas and shifting away from automobile dependence, as permitted by high-density commercial and residential development around railway stations. *Ekimae ensenkaihatsu* in Japan promotes sustainable urban development by increasing fare revenue and promoting compact urban area development.



Source JICA Study Team

Figure 3.2.1 Concept of Transit-oriented Development

3.7 The concept and role of TOD has been adopted at various spatial levels, including at the city-, district- and station level. TOD facilitates the development of sub-CBDs at the city level, land use development within the catchment at the district level (approximately 1km-radius circle around the station), and finally at the station level.

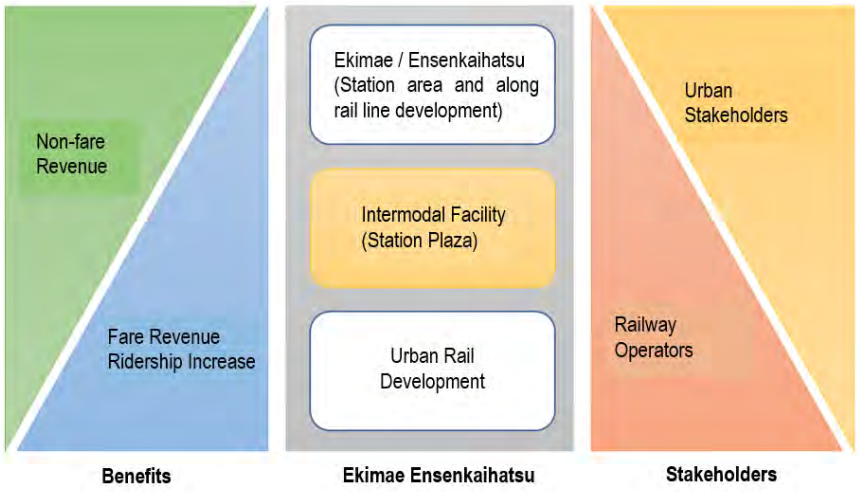


Source: JICA Study team

Figure 3.2.2 Target Areas of TOD

3.8 Figure 3.2.3 shows how the TOD concept plays out at the different levels, with an urban railway station at the core. In other words, TOD provides high-quality services for urban railways and desirable *Ekimae / Ensenkaihatsu*, it contributes to fare and non-fare revenue. Intermodal facility has a role to integrate both and the station plaza has the important role as station plaza.

3.9 "Ekinaka" was originally used to designate the remaining space within stations which could be used to develop facilities for the user or generate additional income for the business operator by turning it into commercial space. "Ekinaka" can proceed simultaneously as the railway business. "Ekimae" development is carried out at stations and station plazas, usually accompanied by land acquisition. On the other hand, development along the "railway line" aims at creating a synergy effect with land along railway (cargo yard) and railway. New Town development is a typical example.



Source: JICA Study Team

Figure 3.2.3 Ekimae Ensenkaihatsu

2) Approach

3.10 MRT Line 1 (Phase 1) is scheduled to develop with 12 stations on the airport branch and 7 stations on the Purbachal branch. This chapter proposes TOD policies and guidelines for all stations. Kamalapur station, the 4 stations of Purbachal new town, and Gabtoli station are the subject of detailed case studies presented in chapter 4.

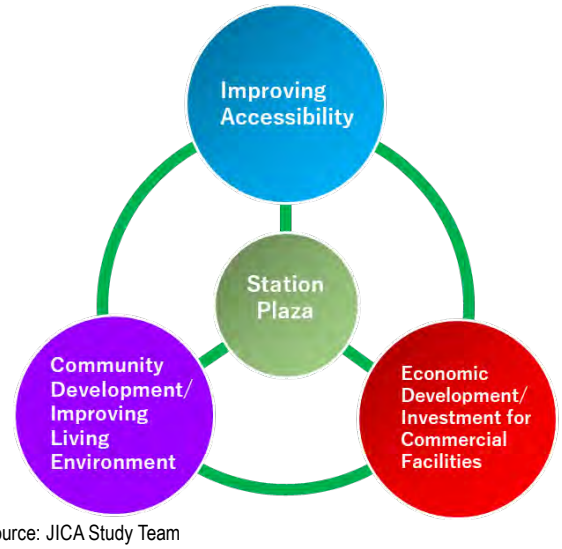
3.11 Although various perspectives and definitions exist of TOD, this survey focuses on maximizing the benefits generated by the railway business, which requires enormous construction costs, to a wide range of stakeholders. Therefore, the development having three characteristics below should be defined TOD in this report.

(i) Firstly, to secure smooth and safe access to the station by pedestrians and other feeder services. Improving walking conditions within 600 - 800m of the station and securing transfer facilities to other modes at the station expands the catchment area of urban railway and urges railway use.

(ii) Secondly, improving the walking environment and traffic access in the vicinity of the station also benefits both railway users and people who live in the surroundings. Therefore, it can be said that the benefits of railway will extend to the surrounding communities.

(iii) Thirdly, there are long-term effects for land uses around the station. In particular, the area becomes attractive for commercial development of various sizes. In order to guide this impact in a desirable direction, maintenance of a "station plaza", or a transfer facility is a key factor. By improving the station plaza, it will affect urban railway development in various ways. Without the station plaza, the access and egress transportation to the station is done on the existing road site, which has a negative influence not only on railway users but also on the traffic flow around the station. Traffic congestion around the station will result in loss of development opportunities and lower attractiveness for investments, which will negatively impact the community as a whole.

3.12 The key to this concept is “Station Plaza” , securing an appropriate off-road space adjacent to the station promotes access improvement, community development and economic development.



Source: JICA Study Team

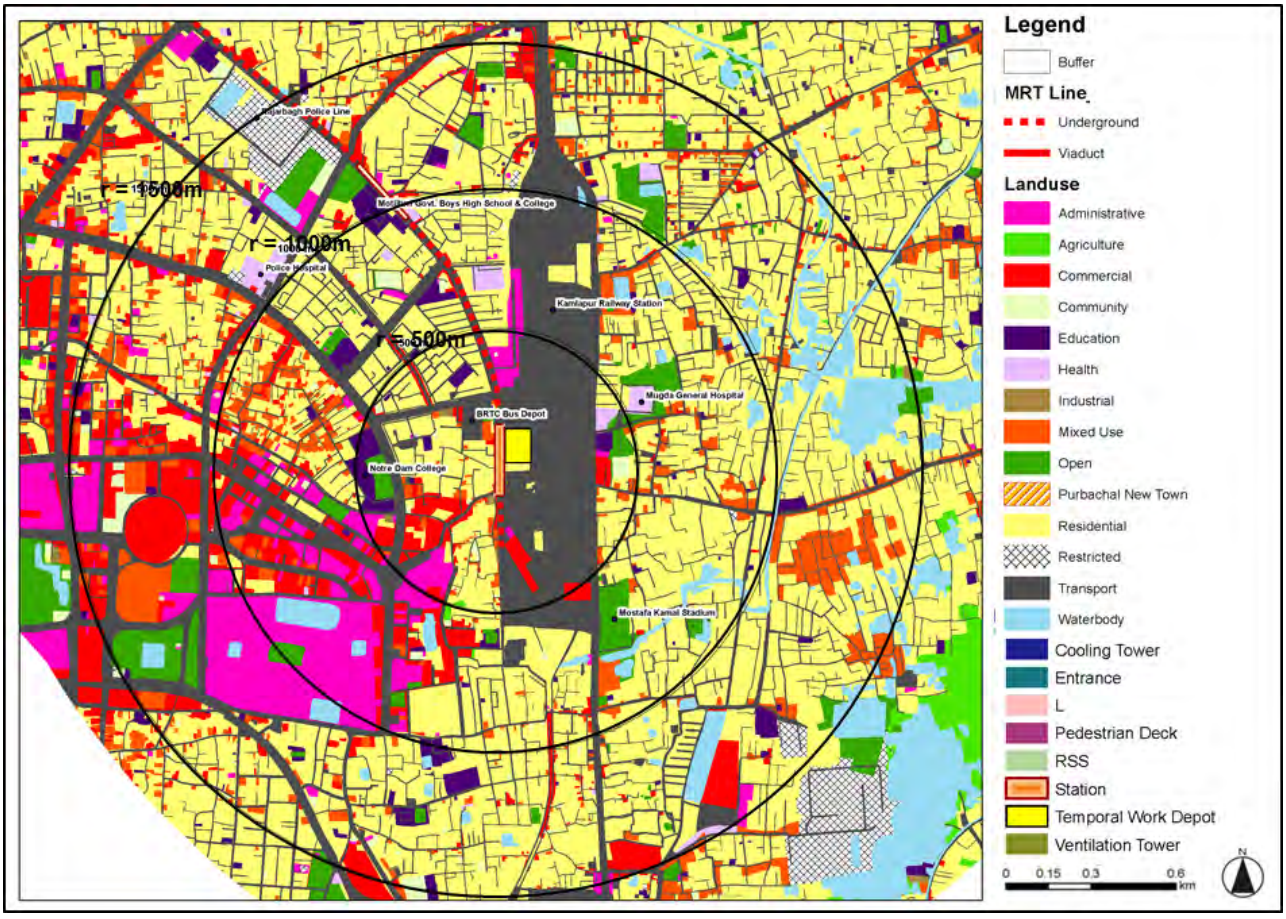
Figure 3.2.4 Concept of TOD Approach in Dhaka

3.3 MRT Line 1

1) Kamalapur Station

(a) Current Land Use of Catchment Area

3.13 The location of planned MRT Kamalapur station is near the existing central train station of Kamalapur. In the current situation, the area around the station is used as residential and commercial use, and Motijheel Station of MRT Line 6 is planned near this area. Dhaka's CBD has been developing in the area around Motijheel Station, with many major banks of Bangladesh are located, as well as offices, and public agencies. However, the area around Kamalapur station does not have much space available for real estate development as old existing residential areas prevent the expansion of the CBD from Motijheel to Kamalapur. The area is one of the most congested areas in Dhaka, it has many restraints and shops. The main road near Kamalapur station is congested because of CNGs and rickshaws waiting for passengers. The Motijheel area has been developed drastically and high-rise buildings are being constructed. Most development around Kamalapur station occurs along main roads.



Source: JICA Study Team

Figure 3.3.1 Land use around Kamalapur Station

1	2	3
		
Motijheel Area	Entrance of Kamalapur Station	Platform of Kamalapur Station
4	5	6
		
Mixed Use Building around Kamalapur Station	High Rise Structure beside Kamalapur station	Traffic Congestion at Kamalapur Intersection

Source: JICA Study Team

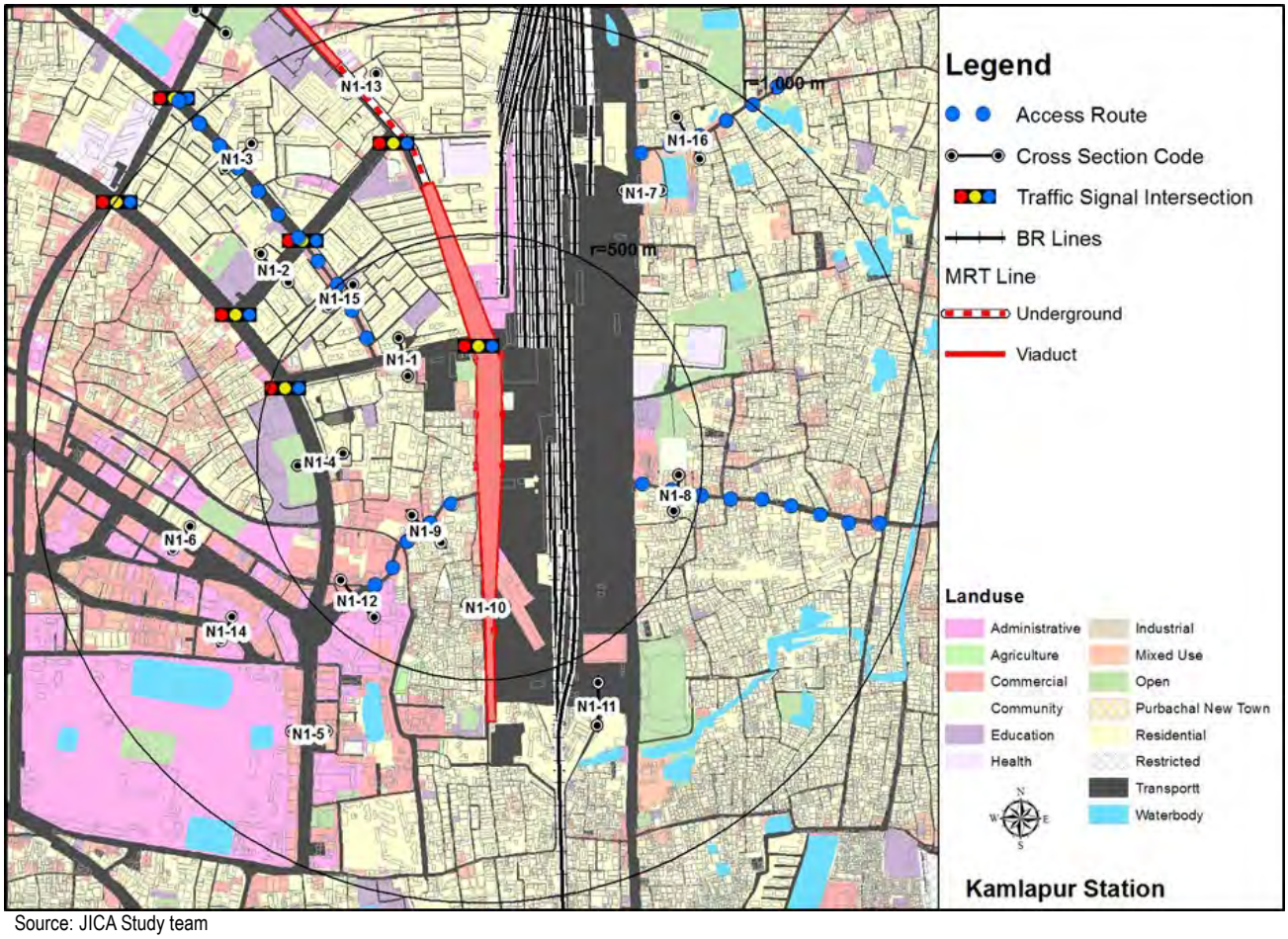
Figure 3.3.2 Current Conditions around Kamalapur Station

(b) Traffic Situation of Catchment Area

3.14 Features related to traffic conditions around the station are as follows:

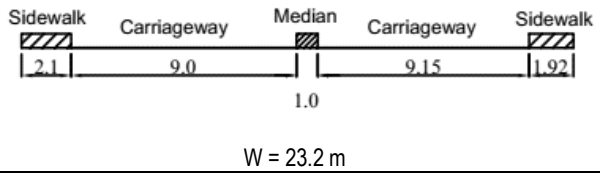
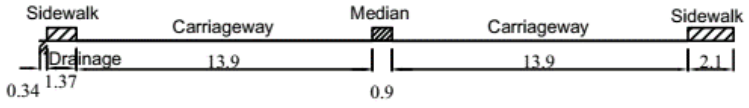
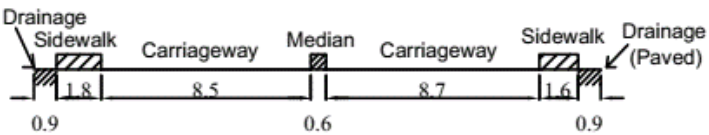
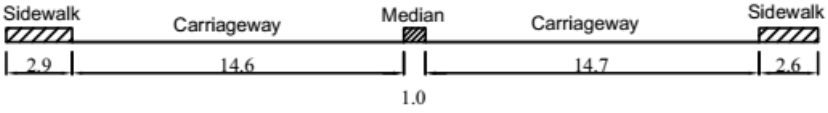
(i) Bangladesh Railway's Kamalapur station and MRT Line 6 Motijheel station are close to the planned location for MRT Line 5 Kamalapur station. This is the same area where DEE (Dhaka Elevated Expressway) is planned on the southern side of the planned station area. Sayedabad bus terminal is a major terminal to access the southern parts of Bangladesh, it is located about 1.5 km to the south. Although sidewalks around Motijheel are being developed the width is not adequate for the number of pedestrians.

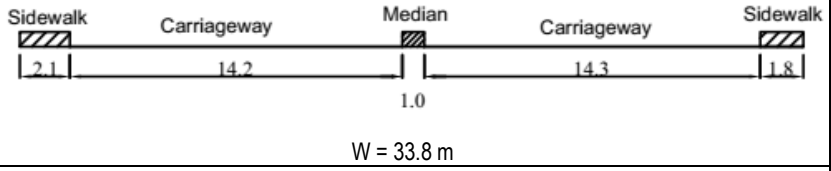
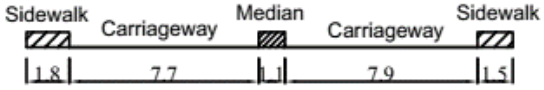
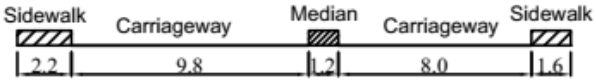
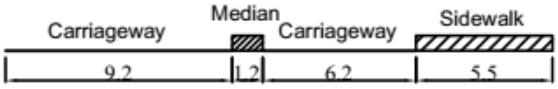
(ii) Sidewalks to residential area around Kamalapur are not developed and not paved. In addition, the access to the eastern part of station is not ensured due to the presence of an Import Container Depo (ICD) over which a narrow pedestrian bridge ensures access to the station. Many passengers will need to detour to access and improving accessibility to station shall be implemented.



Source: JICA Study team

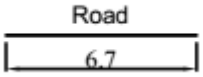
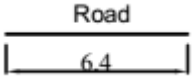
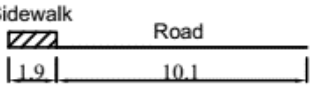
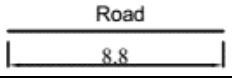
Figure 3.3.3 Transportation Network around Kamalapur Station

Id	Cross-Section	Photo
N1-1 Mirpur Main Road (Begum Rokeya Sarani)	 W = 23.2 m	
N1-2 Benarashee Palli Road	 W = 32.5 m	
N1-3 Avenue-5, section-6	 W = 23.0 m	
N1-5 Avenue-3, Block-2 Road (Hazi Road)	 W=35.8 m	

Id	Cross-Section	Photo
N1-6 No.1 Main Road (Thana Road)	 W = 33.8 m	
N1-10 Shah Ali Road	 W=20.0 m	
N1-11 Mipur Road-13 Road	 W=22.8 m	
N1-12 Opposite of Water Tank Road, section 10	 W=22.1 m	

Source: JICA Study Team

Figure 3.3.4 Main Road Section around Kamalapur Station

Id	Cross-Section	Photo
N1-8 Begum Rokeya Sarani		
N1-9 Senpara Road-5		
N1-13	 W = 12.0 m	n/a
N1-16		n/a

Source: JICA Study Team

Figure 3.3.5 Minor Road Section around Kamalapur Station

(c) MRT Impact on Urban Development

3.15 In terms of MRT impacts on the area around the station, the following can be expected.

(i) Re-development of dense existing residential areas will be facilitated by MRT and will contribute to improving the living environment.（Nighttime Population from 664 No/ha to 406 No/ha）

(ii) Redevelopment is anticipated in the area with commercial buildings and offices as well, CBD will expand due to MRT. Daytime Worker Population from 14,000 to 17,000 people）

Table 3.3.1 Socio-economic Indicators around Kamalapur Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	279.5	267.4
		Density (No/ha)	889.6	851.2
	Night	No.(000)	208.8	127.7
		Density (No/ha)	664.7	406.6
Daytime Population	Worker (000)		142.8	170.7
	Student (000)		66.6	54.1
	Total		209.4	224.8
Nighttime Population	Worker (000)		83.0	58.6
	Student (000)		55.8	26.6
	Total		138.8	85.2
Population Day/Night Ration (000)			1.3	2.1

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

3.16 ICD falls under the jurisdiction of Chittagong Port Authority. It is located right next to Kamalapur Station of Bangladesh Railway (BR). DSCC has control over the land around the station. There is some open space and a car parking near Kamalapur station that are not being used effectively. These areas should be regarded as potential development areas for a station plaza, along with the MRT construction site.

3.17 It is desirable that Kamlapur station develops as part of Dhaka's CBD and it should have intermodal facilities to facilitate transfers between MRT Line 5, Line 6 and BR. Therefore, this station is shown as a case study in chapter 4. The main issues and policies area as follows:

(i) **Development of station plazas:** The land used as construction site for MRT 1 should be used later for the development of a station plaza. As DEE will be built near the station in the future, the open space of BR and the land of construction site should be planned as station plaza as well, especially for the arrangement of an intermodal transportation hub.

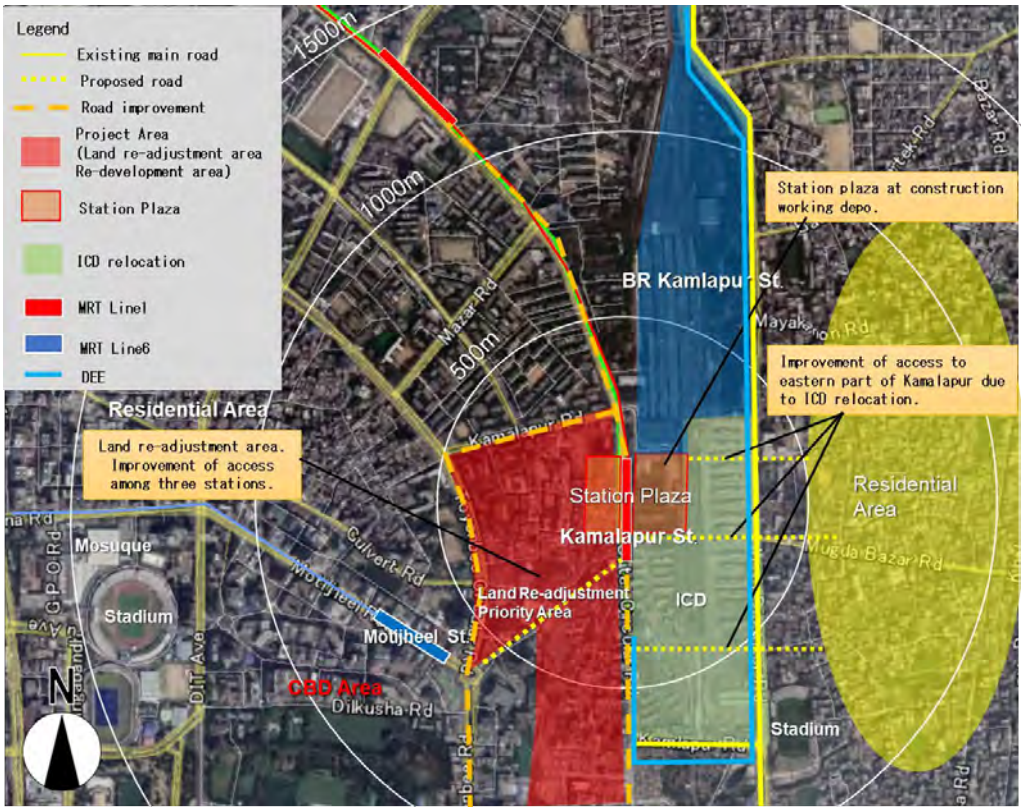
(ii) **Improving accessibility between MRT 1 and 6:** In the current situation, the most direct way to go from Kamalapur to Motijheel station would be through a narrow street with no sidewalks in a dense residential area. It is a 10-15 min walk in the current situation. In order to make this connection safe and convenient, a short-term solution is to restrict access to this street and make it accessible only to non-motorized transportation modes (walking, bicycles, and cycle-rickshaws). This street has potential to become a safe, lively and livable street in Dhaka that is

attractive for residents and tourists alike. One long-term option would be to develop an underground connection between the two stations, with a moving walkway for example.

(iii) **Alleviation of traffic congestion by traffic management:** Buses, CNGs and rickshaws have overflow roads and sidewalks in the area. Buses are parking on the road and do not depart until they are filled with passengers. Passengers should get on and off buses at specific locations of station plaza, which ensures comfortable transfers and public transport use. The station plaza should also have waiting spaces for CNG and Rikshaw.

(iv) **Improving accessibility and urban development by land re-adjustment:** Access between Kamalapur and Motijheel difficult because of old existing residential areas, and it is vulnerable to natural disasters due to high density and old buildings. The improvement of living environment, accessibility should be implemented simultaneously, and commercial area should be planned. Therefore, it is important that RAJUK fulfills land-readjustment to reformulate this area and ensure accessibility.

(v) **Urban development by relocation of ICD:** The area around Kamalapur station is expected to become attractive in terms of development opportunities after MRT construction. However, the land of ICD and BR have not been utilized effectively. Therefore, the land should be used for urban development to maximize the potential by relocation and redevelopment of existing land. In addition, the ICD divides the area into two parts, west and east. It is necessary to ensure the access form eastern part of the station.



Source: JICA Study Team

Figure 3.3.6 Concept Plan around Kamalapur Station

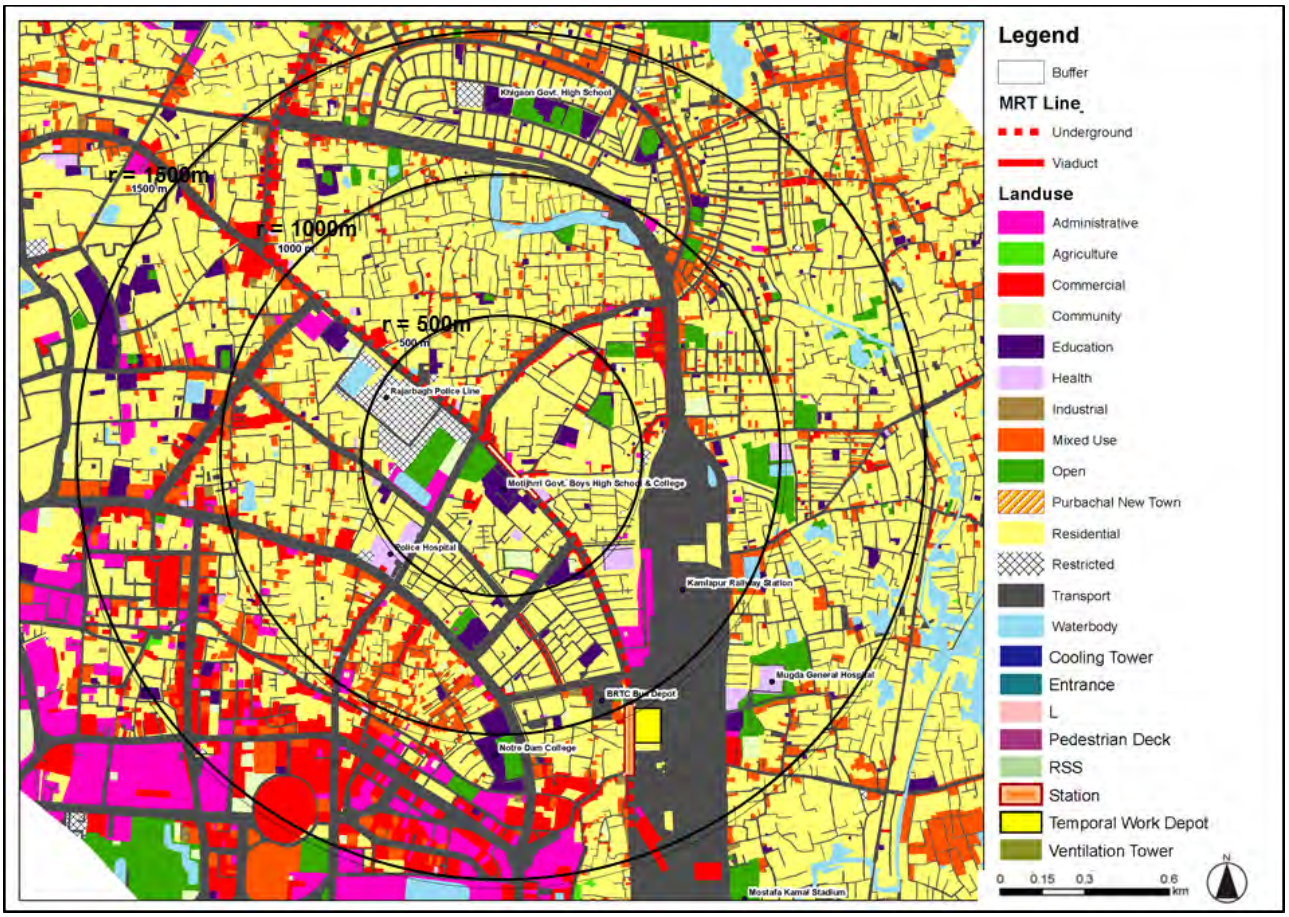
2) Rajarbagh Station

(a) Current Land Use of Catchment Area

3.18 Rajarbagh station is located north of Kamalapur station and along the outer circular road. The station location is surrounded by residential areas. Mixed-use buildings with commercial facilities on the lower floors, such as automotive shops, restaurants, or banks, and housing on the upper floors are located along outer circular road. In the vicinity of the station, there is a school with a large playground, a Rajarbagh police building, a police-related museum, a government school, and some residences.

3.19 Although large-scale development has not occurred near the station, some redevelopments are being carried out at the intersection of the outer circular road and the DIT road, and along the main roads.

3.20 Public land is considered for development as police and educational institution exist around the station, and it occupies most of land around station. It is necessary to utilize the public land.



Source: JICA Study Team

Figure 3.3.7 Land use around Rajarbagh Station

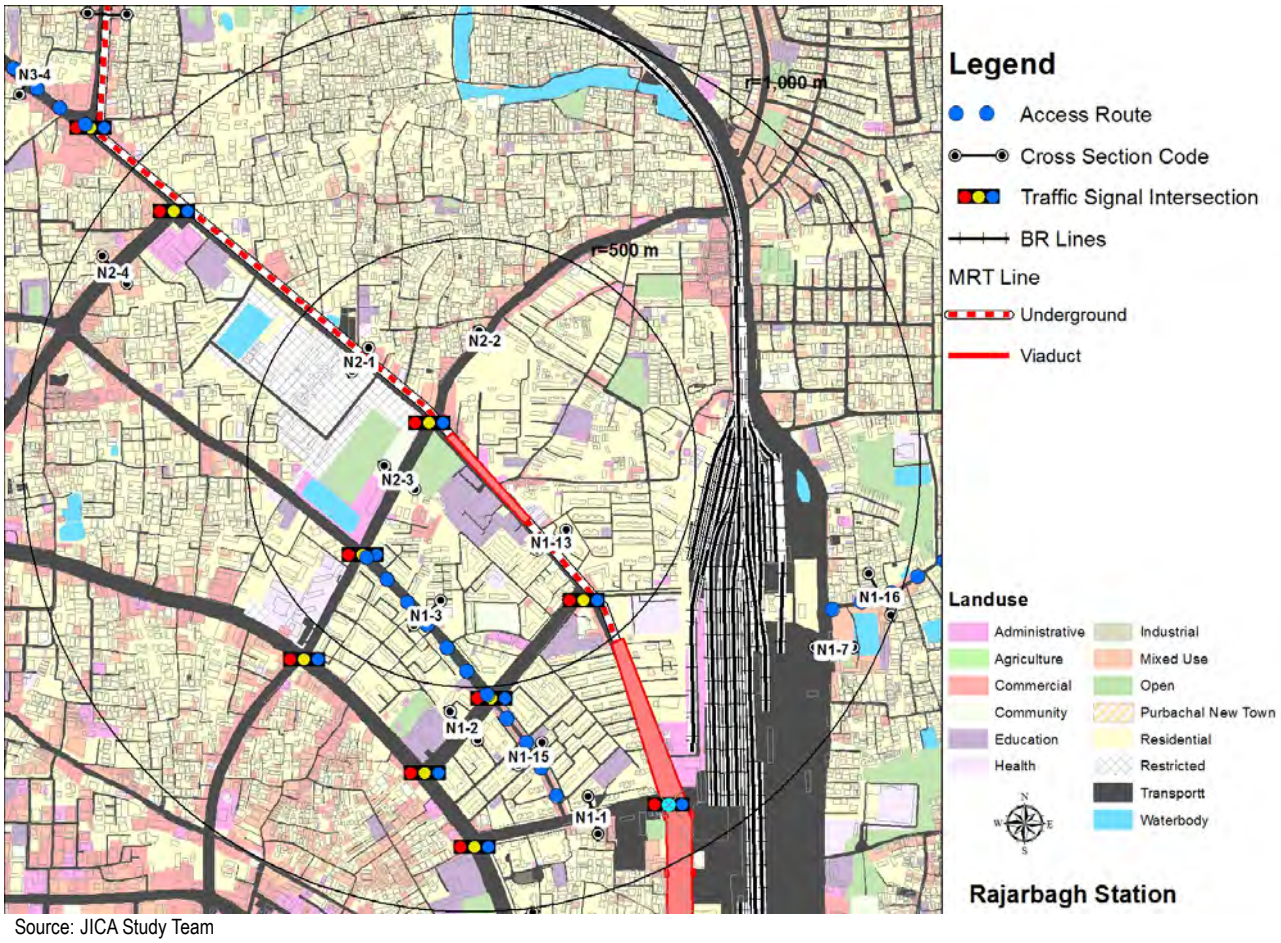
(b) Traffic Situation of Catchment Area

3.21 Features related to traffic conditions around the station are as follows:

(i) Although sidewalks exist along main roads, they are unpaved and less than 3.0 m wide. It would not be convenient for pedestrians to access the station by walking in these conditions.

(ii) There are no sidewalk and no paved roads in the dens area is located tp the north of the station.

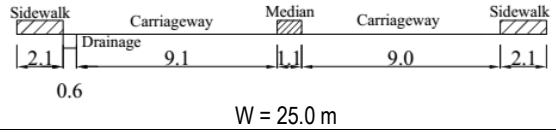
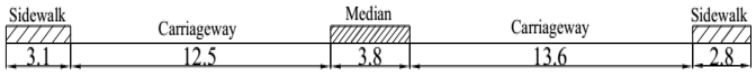
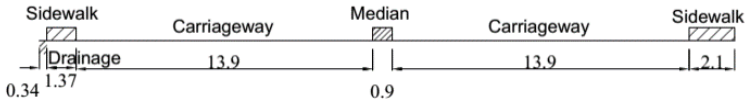
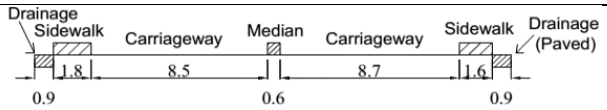
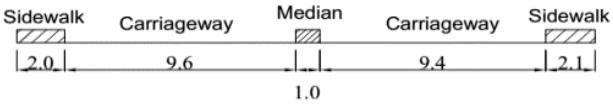
(iii) There are many buses running on the outer circular road, which is the main road connecting the southern part and the northern part of Dhaka.



Source: JICA Study Team

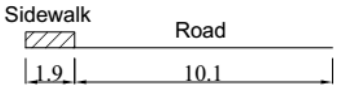
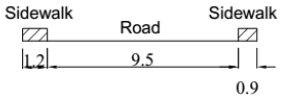
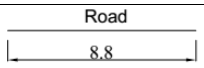
Figure 3.3.8 Transportation Network around Rajarbagh Station

Id	Cross-Section	Photo
N2-1	Sidewalk 2.8 / Carriageway 9.2 / Median 1.0 / Carriageway 11.1 / Sidewalk 3.1 W = 27.2 m	n/a
N2-2	Sidewalk 2.2 / Carriageway 8.0 / Median 1.1 / Carriageway 9.1 / Sidewalk 2.3 W=26.7 m	n/a

Id	Cross-Section	Photo
N2-3	 W = 25.0 m	n/a
N2-4	 W = 35.8 m	n/a
N1-2	 W= 32.5 m	n/a
N1-3	 W = 23.0 m	n/a
N1-7	 W = 24.1 m	n/a

Source: JICA Study Team

Figure 3.3.9 Main Road Section around Rajarbagh Station

Id	Cross-Section	Photo
N1-13	 W = 12.0 m	n/a
N1-15	 W = 11.6 m	n/a
N1-16		n/a

Source: JICA Study Team

Figure 3.3.10 Minor Road Section around Rajarbagh Station

(c) MRT Impact on Urban Development

3.22 As for the MRT impacts on the area around the station, the following is assumed.

(i) There is a high possibility that the outer circular road and the dense area will be redeveloped, and improvement of living environment is expected. （Nighttime Population 575 No/ha to 492 No/ha）

(ii) Motijheel station of MRT 6 will be located the southwest of the station. There are many commercial facilities and it is one of the areas where the daytime population is the largest in Dhaka city. With the improvement of accessibility by MRT, more commercial facilities and offices are expected to be located in the area. (Daytime population from 367,000 to 434,000 people)

Table 3.3.2 Socio-economic Indicators around Rajarbagh Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	367.6	434.1
		Density (No/ha)	1170.0	1381.7
	Night	No.(000)	180.7	154.6
		Density (No/ha)	575.2	492.0
Daytime Population	Worker (000)		240.9	315.0
	Student (000)		66.9	67.6
	Total		307.8	382.6
Night Population	Worker (000)		73.4	71.0
	Student (000)		47.6	32.2
	Total		120.9	103.2
Population Day/Night Ration (000)			2.0	2.8

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

3.23 As many public lands are located around the station, it is necessary to utilize public lands to implement urban development. The directions of TOD are as follows:

(i) **Development of station plazas**: It is important for station plaza to utilize the public lands as many public lands are located around the station.

(ii) **Improvement of access by walking**: Although residential area is spreading to the north side of the station, access by walking is restricted because sidewalks width is not sufficiently and since the pavement condition is not remarkable, it is necessary to improve sidewalks to increase pedestrian access.

(iii) **Improvement of living environment by land re-adjustment:** There are many public lands around the station, but alleys from the main road give access to large expanses of densely populated areas. Pedestrian access to the station is insufficient, and there are also many old buildings. For this reason, it is necessary to implement the land re-adjustment project according to timing of rebuilding.

Source: JICA Study Team

Figure 3.3.11 Concept Plan around Rajarbagh Station

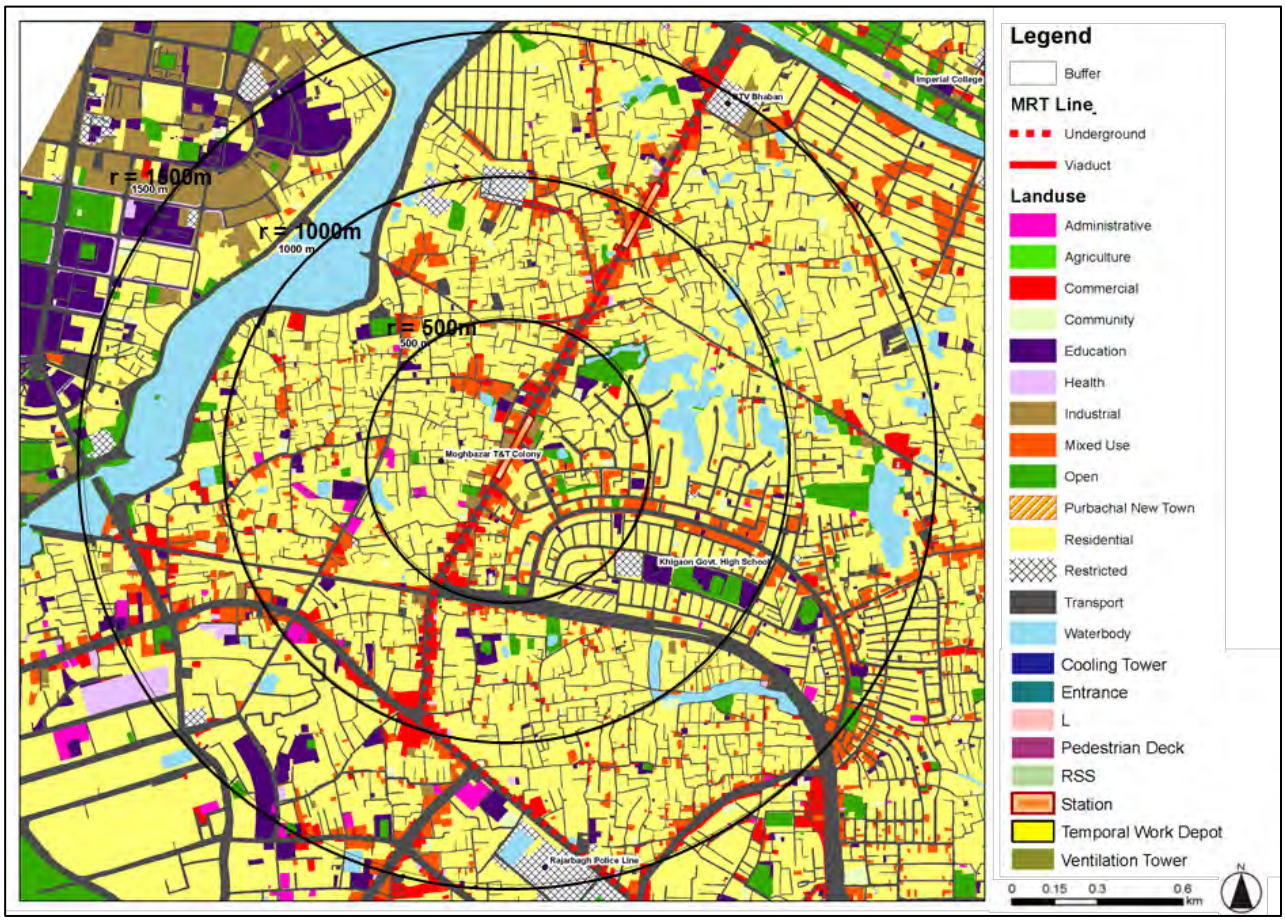
3) Malibagh Station

(a) Current Land Use of Catchment Area

3.24 Malibagh is a district where many commercial facilities are located, especially along the DIT road, which is the main road connecting Kamalapur to the northern part of Dhaka. At the intersection of DIT road and outer circular road, there is a shopping mall, and rikshaws and CNG stay nearby waiting for patrons. There are many commercial facilities along DIT road, people on the sidewalk are overflowing as bus users get on and off on DIT road and head towards work places on foot. On the side of DIT road, there is one row of mixed-used buildings where the lower floors are used as stores and the upper floors as apartments, but most of the buildings beyond this first row are residential only. .

3.25 A fly-over is planned near the station, causing heavy congestion during construction. The DIT road is a major road with high traffic demand. It is used by city buses connecting the north and the south of Dhaka. Commercial facilities are located along the DIT road and the redevelopment of middle or high-raise mixed-use buildings has been carried out. There is no large open space available near the station site in this high-density area.

3.26 There are old commercial areas around Malibagh station, various commercial facilities from small shops to shopping malls, and many workers commute to this area.



Source: JICA Study Team

Figure 3.3.12 Land use around Malibagh Station

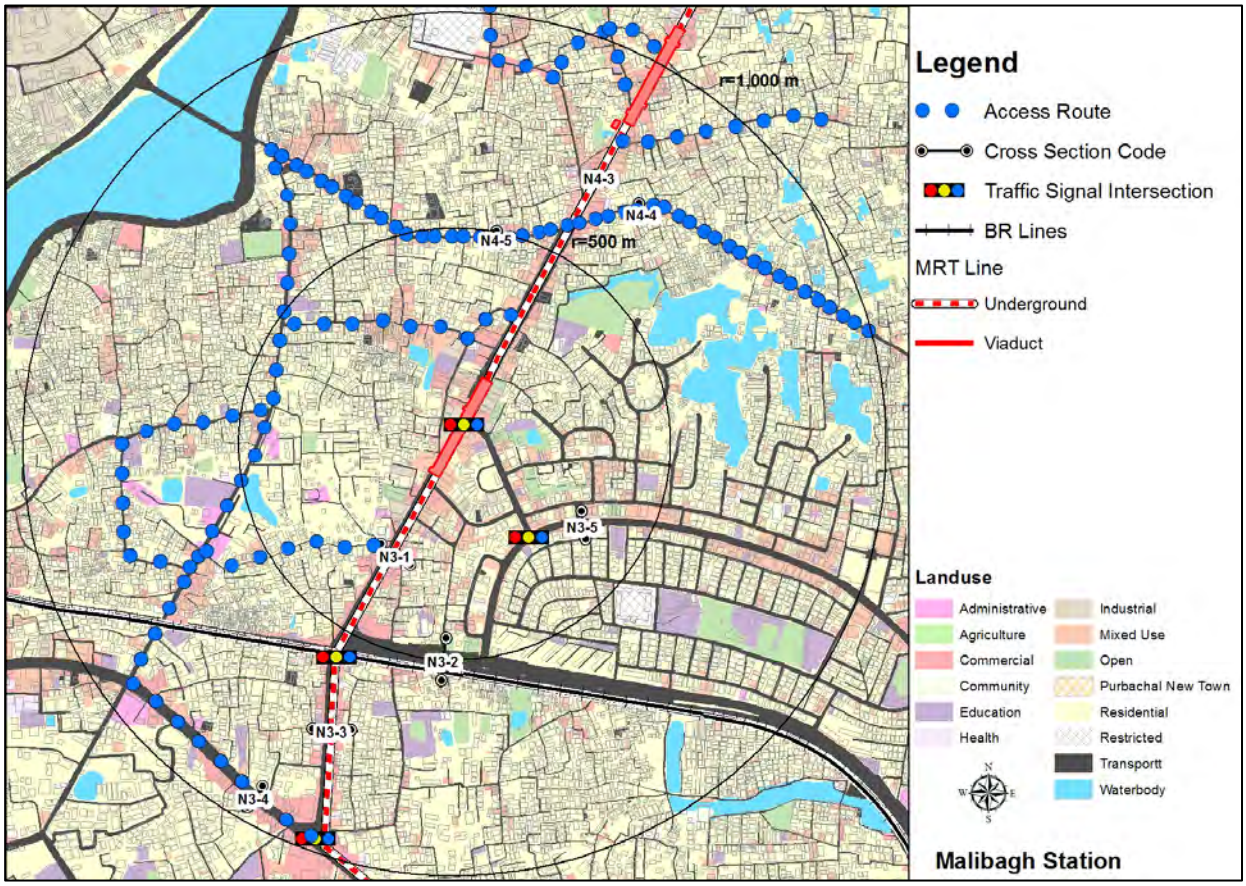
(b) Traffic Situation of Catchment Area

3.27 Features related to traffic conditions around the station are as follows:

(i) The DIT road connecting the north and south of Dhaka has a separation zone expanded by the construction of the flyover and there is no room for road widening.

(ii) Few roads connect residential areas to the DIT road, and access to the station is not secured. In addition, access roads to residential areas are narrow and sidewalks are unpaved, and passengers might not be able to access the station conveniently, especially during the rainy season.

(iii) There are many bus routes along the DIT road, which is the main north-south bus corridor. Many people commute to this area by bus and people are overflowing in the roadway at morning and evening peak.



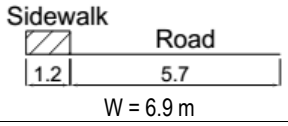
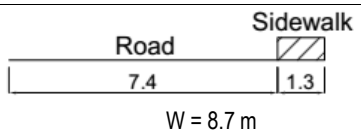
Source: JICA Study Team

Figure 3.3.13 Transportation Network around Malibagh Station

Id	Cross-Section	Photo
N3-1	Sidewalk 2.8 / Carriageway 6.4 / Median 10.2 / Carriageway 7.1 / Sidewalk 2.5 W = 29.0 m	n/a
N3-2	Sidewalk 1.9 / Carriageway 11.8 / Median 1.1 / Carriageway 11.4 / Sidewalk 1.5 W = 27.7 m	n/a
N3-3	Sidewalk 2.5 / Carriageway 11.4 / Median 4.0 / Carriageway 11.1 / Sidewalk 1.9 W = 30.9 m	n/a
N3-4	Sidewalk 2.1 / Carriageway 7.2 / Median 3.5 / Carriageway 11.1 / Drainage 0.5 / Sidewalk 2.2 W = 26.6 m	n/a
N3-5	Sidewalk 1.9 / Road 16.6 / Sidewalk 1.9 / Drainage 1.1 W = 21.5 m	n/a
N4-3	Sidewalk 2.8 / Carriageway 11.5 / Median 1.2 / Carriageway 11.1 / Sidewalk 2.5 W = 29.1 m	n/a

Source: JICA Study Team

Figure 3.3.14 Main Road Section around Malibagh Station

Id	Cross-Section	Photo
N4-4		n/a
N4-5		n/a

Source: JICA Study Team

Figure 3.3.15 Minor Road Section around Malibagh Station

(c) MRT Impact on Urban Development

3.28 In terms of MRT impacts on the area around the station, the following is assumed.

(i) There are old urban areas around the station, and various types of commercial facilities from small shops to shopping malls. The urban area is dense and vulnerable to natural disasters. With the construction of MRT, development around the station, reorganization of densely populated urban areas should be proposed (Daytime population of workers 104,000 to 180,000 people)

(ii) Many people commute to the central business district on the southern side of the station, the ratio of the population day/night ration is close to 1.0. MRT construction advances development around the station, especially along DIT road and it is further development of commercial facilities can ben expected.

Table 3.3.3 Socio-economic Indicators around Malibagh Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	265.8	328.6
		Density (No/ha)	846.1	1045.9
	Night	No.(000)	257.8	241.8
		Density (No/ha)	820.5	769.8
Daytime Population	Worker (000)		104.5	180.8
	Student (000)		68.1	67.2
	Total		172.6	248.0
Night Population	Worker (000)		96.5	110.9
	Student (000)		68.0	50.3
	Total		164.6	161.2
Population Day/Night Ration (000)			1.0	1.4

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

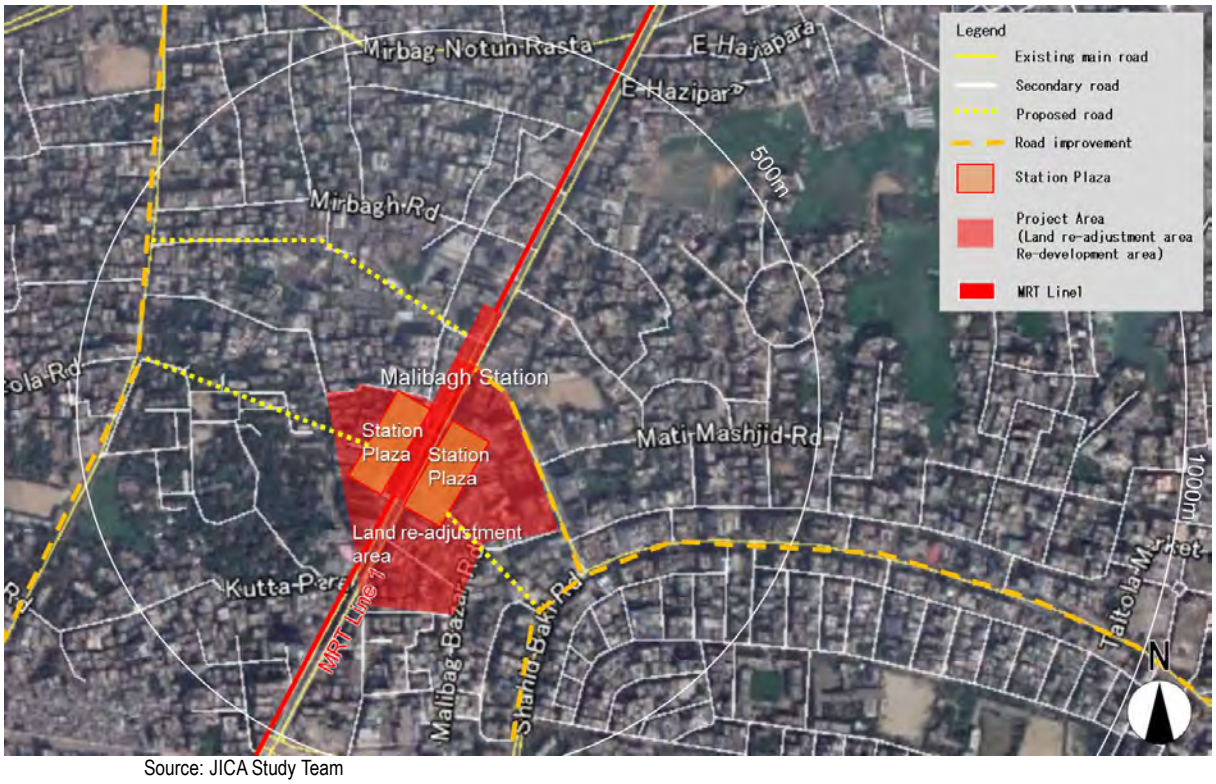
3.29 As for the station area, it currently is a high-density commercial and residential area, therefore there is no vacant land immediately available for the development of a station plaza. However, as many workers commute by bus, the road is heavily congested, it is necessary to carry out development of station plaza. The policies and directions of TOD at Malibagh station are as follows:

(i) **Development of transport hubs:** Commercial facilities are located mainly along DIT road and congestion is remarkable as many city bus lines operate on this route. There are many small-scale stores and there is no open spacesthat can promote development around the station, but it is necessary to secure sites and maintain

station plaza as buses are concentrated around DIT road, it is desirable to have a station plaza on both sides across the DIT road.

(ii) **Improvement of access road to residential area:** Since access road to residential area is not secured, extension and paving of existing roads and improvement of new access road are necessary.

(iii) **Reformulation of the surrounding urban areas by land re-adjustment project:** Buildings around the Malibagh station are old, and roads are narrow. Therefore, evacuation routes are not secured at the time of a disaster, and many buildings do not meet the building standards. In order to carry out development around the station, it is necessary to reorganize the area by land re-adjustment project.



Source: JICA Study Team

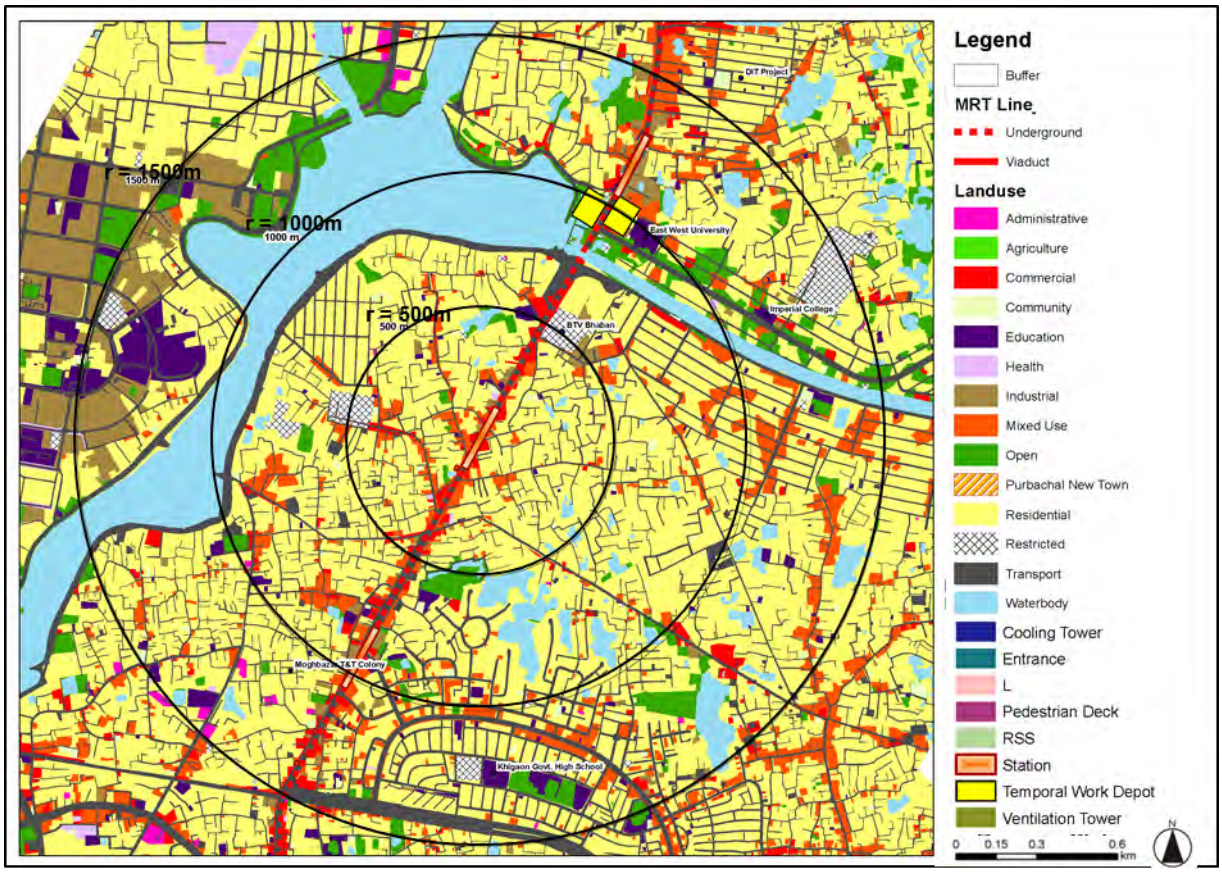
Figure 3.3.16 Concept Plan around Malibagh Station

4) Rampura Station

(a) Current Land Use of Catchment Area

3.30 The Rampura station is located on DIT road, and along the roadside are commercial and institutional facilities such as Bangladesh TV, Shonari Bank, Lupari Bank. Rampura is an old urban area. Bonshuri residential area has been developed to the east of the station location, about 500 m from DIT road. Densely commercial areas and residential areas are located around the station. In recent years, link roads along Gulshan lake and flyovers have been developed, making it possible to move quickly to CBD. Water transportation was introduced on Gulshan lake.

3.31 Other than the main roads, the secondary road system is poor. The local bazar and small shops generate most of the activity.



Source: JICA Study Team

Figure 3.3.17 Land use around Rampura Station

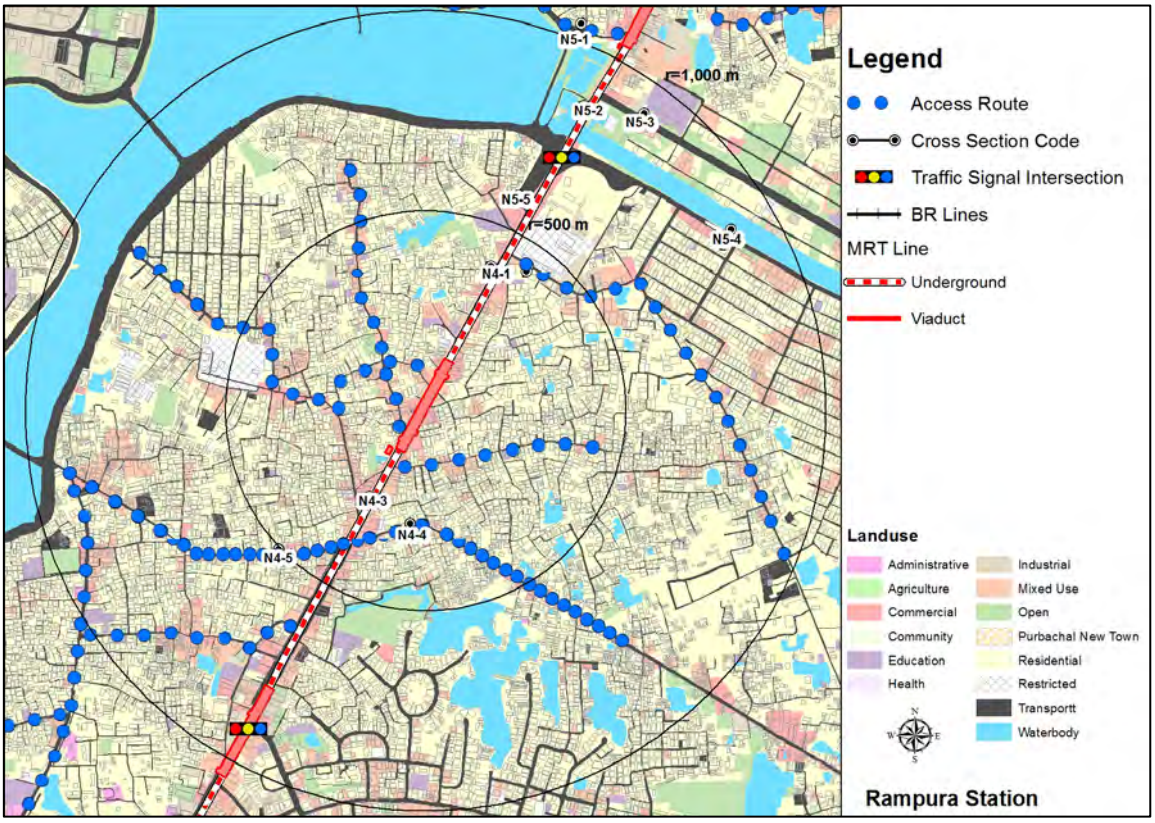
(b) Traffic Situation of Catchment Area

3.32 Features related to traffic conditions around the station are as follows:

(i) Although sidewalks exist along the DIT road, they very narrow (less than 2-meter wide).

(ii) Housing development is occurring along the shores of Gulshan lake, but access from the DIT road is insufficient, access roads are narrow, and sidewalks are not secured.

(iii) Water transport in Gulshan lake has been developed. However, access between Gulshan lake and the DIT Road is inadequate, and a detour is necessary.



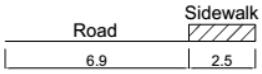
Source: JICA Study Team

Figure 3.3.18 Transportation Network around Rampura Station

Id	Cross-Section	Photo
N4-1	Sidewalk 2.4 / Carriageway 11.1 / Median 1.2 / Carriageway 10.8 / Sidewalk 2.2 W=27.7m	n/a
N4-3	Sidewalk 2.8 / Carriageway 11.5 / Median 1.2 / Carriageway 11.1 / Sidewalk 2.5 W = 29.1 m	n/a
N5-2	Sidewalk 1.6 / Carriageway 10.5 / Median 0.7 / Carriageway 10.5 / Sidewalk 1.6 W = 24.9 m	n/a
N5-3	Sidewalk 3.1 / Carriageway 11.4 / Median 2.6 / Carriageway 11.4 / Sidewalk 2.9 W = 31.4 m	n/a
N5-4	Sidewalk 1.5 / Carriageway 6.6 / Median 0.7 / Carriageway 8.0 / Sidewalk 0.6 W = 17.4 m	n/a

Source: JICA Study Team

Id	Cross-Section	Photo
N4-4	Sidewalk 1.2 / Road 5.7 W = 6.9 m	n/a
N4-5	Road 7.4 / Sidewalk 1.3 W = 8. 7 m	n/a

Id	Cross-Section	Photo
N5-5	 W = 9.4 m	n/a

Source: JICA Study Team

Figure 3.3.19 Road Section around Rampura Station

(c) MRT Impact on Urban Development

3.33 In terms of MRT impacts on the area, the following can be expected:

(i) The station location is close to a major intersection, and accessibility will be improved by MRT. Therefore, the number of commercial areas including offices will increase. (Daytime population 204,000 to 249,000)

(ii) Redevelopment along the DIT road will continue and the area will be further developed as a commercial area. (Population day/night ratio 0.7 to 0.9)

Table 3.3.4 Socio-economic Indicators around Rampura Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	204.2	249.0
		Density (No/ha)	649.9	792.6
	Night	No.(000)	278.6	273.1
		Density (No/ha)	886.8	869.5
Daytime Population	Worker (000)		61.8	108.5
	Student (000)		44.3	49.3
	Total		106.1	157.9
Night Population	Worker (000)		99.5	125.1
	Student (000)		81.0	56.9
	Total		180.5	182.0
Population Day/Night Ration (000)			0.7	0.9

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

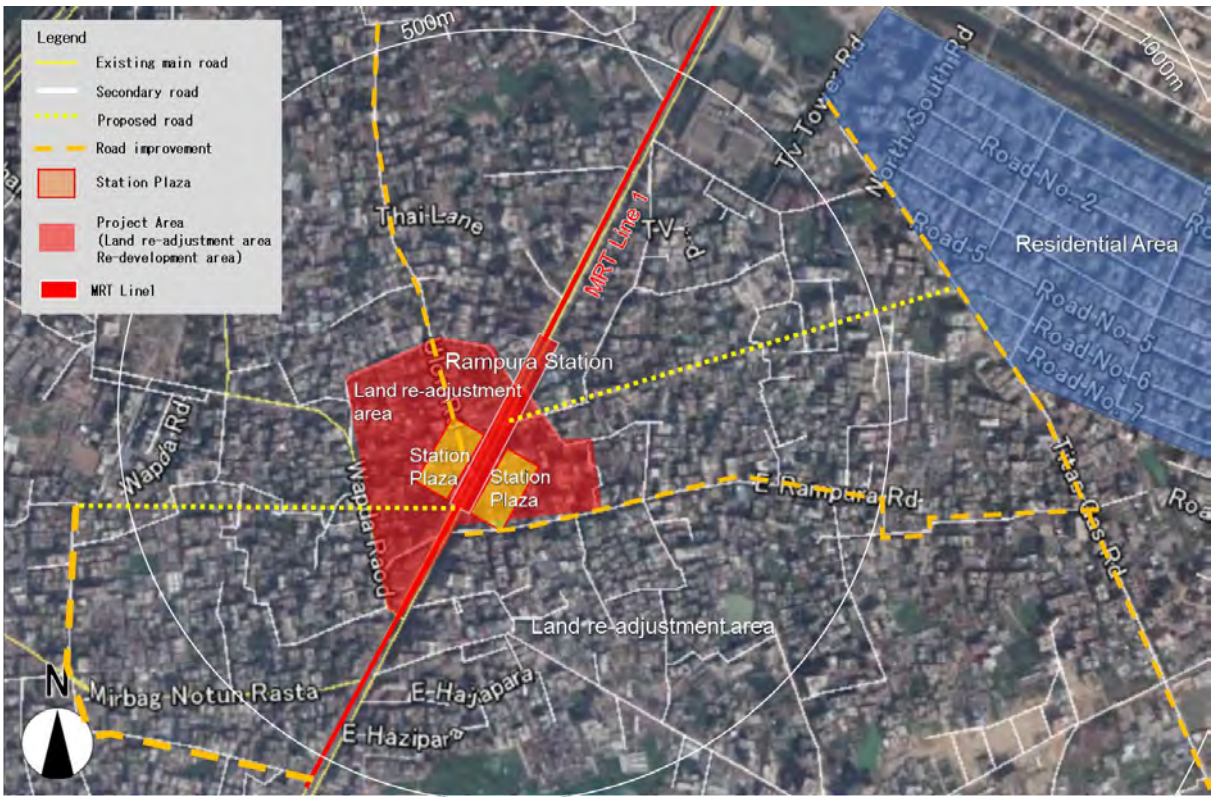
3.34 Commercial buildings such as banks and TV stations are located in the vicinity of the station, and residential areas are located in the surrounding area. Housing development is occurring around Gulshan lake, and moving forward, further development is expected. The policy of TOD at Rampura station is as follows:

(i) **Development of transport hubs:** The DIT road is a major transportation axis connecting the north and south of Dhaka, and many route buses pass through. Existing urban areas expand around the station, and it is difficult to secure land for development of a station plaza. Nevertheless, it is crucial to secure the minimum space required to create bus stops at least, so bus passengers can conveniently get on and off the bus.

(ii) **Pedestrian access improvement:** Although residential areas are scattered around the area, access to the station is not efficient. In addition, since sidewalks are too narrow not well maintained, it is essential to develop a pedestrian network together with land re-adjustment project.

(iii) **Land acquisition by land re-adjustment project:** Recent development in the transportation sector in the area include the construction of a flyover, development of water transportation. The Bangladesh TV and commercial banks are located

around the station. Many workers are assumed to use the station. As it is close to commercial areas such as Gulshan, development demand is high, but since it is a dense and old urban area, there is no suitable space for development along main roads. However, since there is a high development potential, it is necessary to tackle to secure land in the long term by using land re-adjustment project.



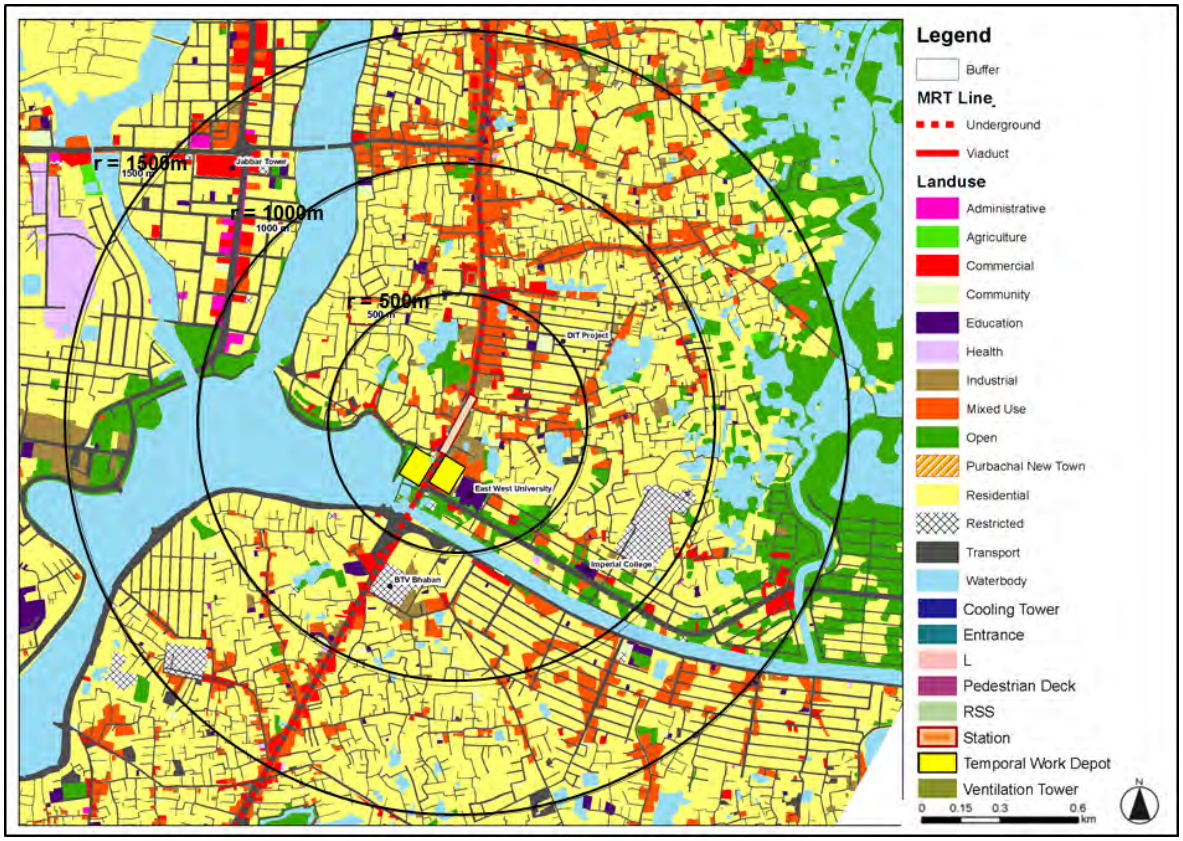
Source: JICA Study Team

Figure 3.3.20 Concept Plan around Rampura Station

5) Hatir Jheel Station

(a) Current Land Use of Catchment Area

3.35 The station is located where road traffic concentrates especially bus and car traffic, at the intersection of the DIT road and the link road along Gulshan lake. Educational facilities are located in the vicinity such as East-West University and Imperial College, and an amusement facility is currently being planned by the government. In addition, construction of houses by the private sector is being promoted due to good accessibility to Gulshan and the intersection of major roads.



Source: JICA Study Team

Figure 3.3.21 Land use around Hatir Jheel Station

(b) Traffic Situation of Catchment Area

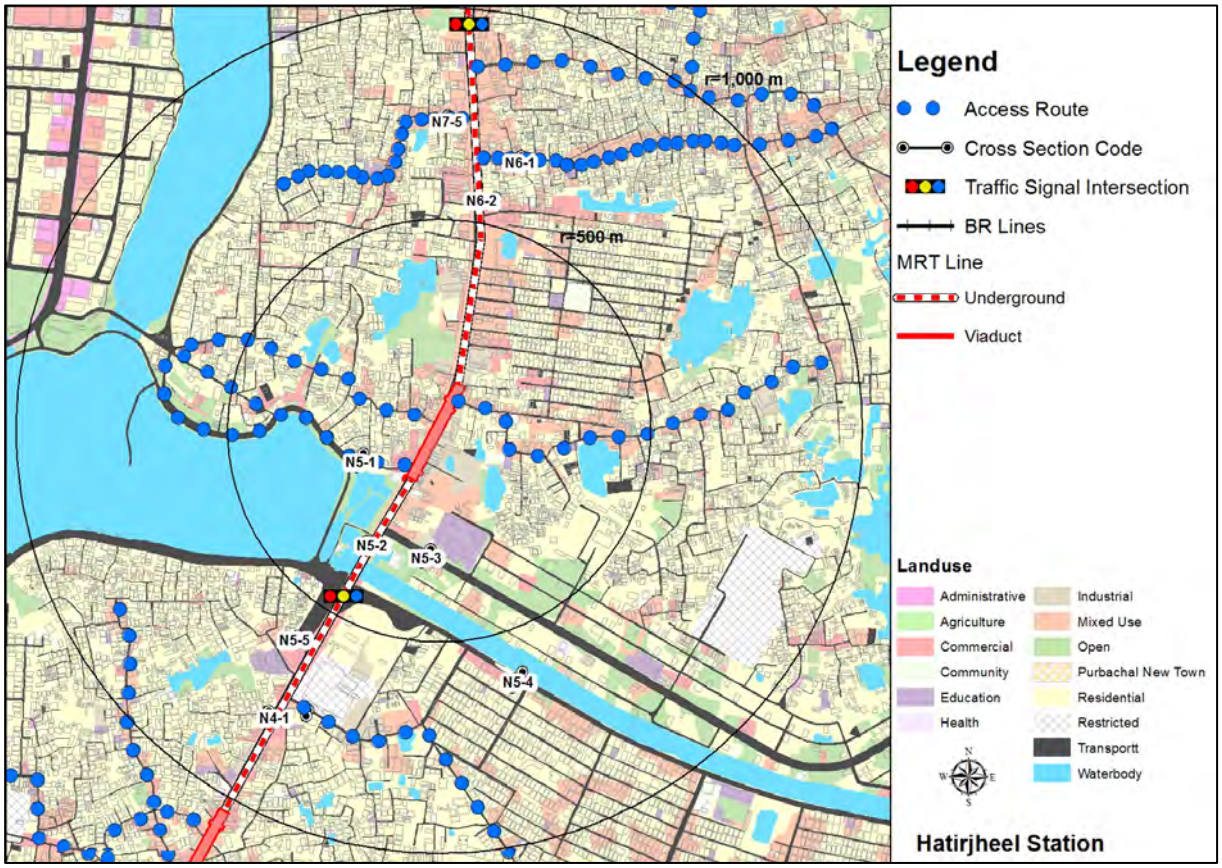
3.36 Features related to traffic conditions around the station are as follows:

(i) Sidewalks are well maintained, especially in the vicinity of Gulshan lake. This area is a promenade with good pedestrian accessibility.

(ii) Access roads from main roads to residential areas are lacking, and sidewalks are not well maintained.

(iii) Buses and cars cause massive congestion. The station is located near a major intersection.

(iv) In recent years, water transportation to Gulshan has been developed.



Source: JICA Study Team

Figure 3.3.22 Transportation Network around Hatir jheel Station

Id	Cross-Section	Photo
N6-2	Sidewalk 1.8 / 1.5 — Carriageway 11.1 — Median 0.6 — Carriageway 11.1 — Sidewalk 1.8 W = 27. 9 m	n/a
N5-2	Sidewalk 1.6 — Carriageway 10.5 — Median 0.7 — Carriageway 10.5 — Sidewalk 1.6 W = 24.9 m	n/a
N5-3	Sidewalk 3.1 — Carriageway 11.4 — Median 2.6 — Carriageway 11.4 — Sidewalk 2.9 W = 31.4	n/a
N5-4	Sidewalk 1.5 — Carriageway 6.6 — Median 0.7 — Carriageway 8.0 — Sidewalk 0.6 W = 19.4 m	n/a
N5-5	Sidewalk 1.5 — Carriageway 6.6 — Median 0.7 — Carriageway 8.0 — Sidewalk 0.6 W = 17.4 m	n/a
N4-1	Sidewalk 2.4 — Carriageway 11.1 — Median 1.2 — Carriageway 10.8 — Sidewalk 2.2 W = 27.2 m	n/a

Source: JICA Study Team

Figure 3.3.23 Main Road Section around Hatir Jheel Station

Id	Cross-Section	Photo
N7-5	Road 4.6	n/a
N6-1	Road 5.2	n/a
N5-1	Sidewalk Road 6.9 2.5 W = 9.4 m	n/a

Source: JICA Study Team

Figure 3.3.24 Minor Road Section around Hatir Jheel Station

(c) MRT Impact on Urban Development

3.37 In terms of MRT impacts on the area, the following can be expected:

(i) Commercial area will be developed mainly along the main roads. (Day population: 151,000 to 163,000 people). There are plans for amusement facilities, and further commercial development will continue around Gulshan Lake.

Table 3.3.5 Socio-economic Indicators around Hatir Jheel Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	151.6	163.0
		Density (No/ha)	482.7	518.7
	Night	No.(000)	217.2	202.0
		Density (No/ha)	691.4	643.1
Daytime Population	Worker (000)		41.2	61.6
	Student (000)		34.4	33.9
	Total		75.6	95.5
Nighttime Population	Worker (000)		77.2	92.5
	Student (000)		64.0	42.1
	Total		141.2	134.6
Population Day/Night Ration (000)			0.7	0.8

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

3.38 Main roads are concentrated around Hatir jheel station, and it is an area with heavy traffic congestion. Meanwhile, in recent years, new initiatives such as improvement of walking paths along Gulshan lake and water transportation have been implemented. Recommended TOD policies for Hatir jheel station are as follows:

(i) **Reconsideration of the station location:** By moving the station location to the south, it would come closer to the university, water transportation a station plaza could be arranged. In order to enhance the possibility of implementing TOD, it is necessary to review the station position.

(ii) **Development of station plazas:** Major traffic routes intersect in the vicinity of Hatir jheel staion and congestion is remarkable. Since it is prospected to concentrate many users, including students, by improving MRT, it is impossible to develop transportation hub facilities such as station plaza and it is also necessary to continually use the construction site for MRT Line 1 and to develop station plaza at an early stage. In addition, it is effective to secure a site by filled ground

(iii) **Development of pedestrian network:** Although students are expected to use the station, access by walking is insufficient. Especially, access to East-west University, planned amusement park and Gulshan lake need to be improved.

(iv) **Improvement of transportation hub by landfill and access to water transportation:** Gresham lake has already been partially landfilled and police boxes are located nearby. Since the land for station plaza is insufficient, it is necessary to expand the land and the filled ground is also effective for improving access with water transportation.

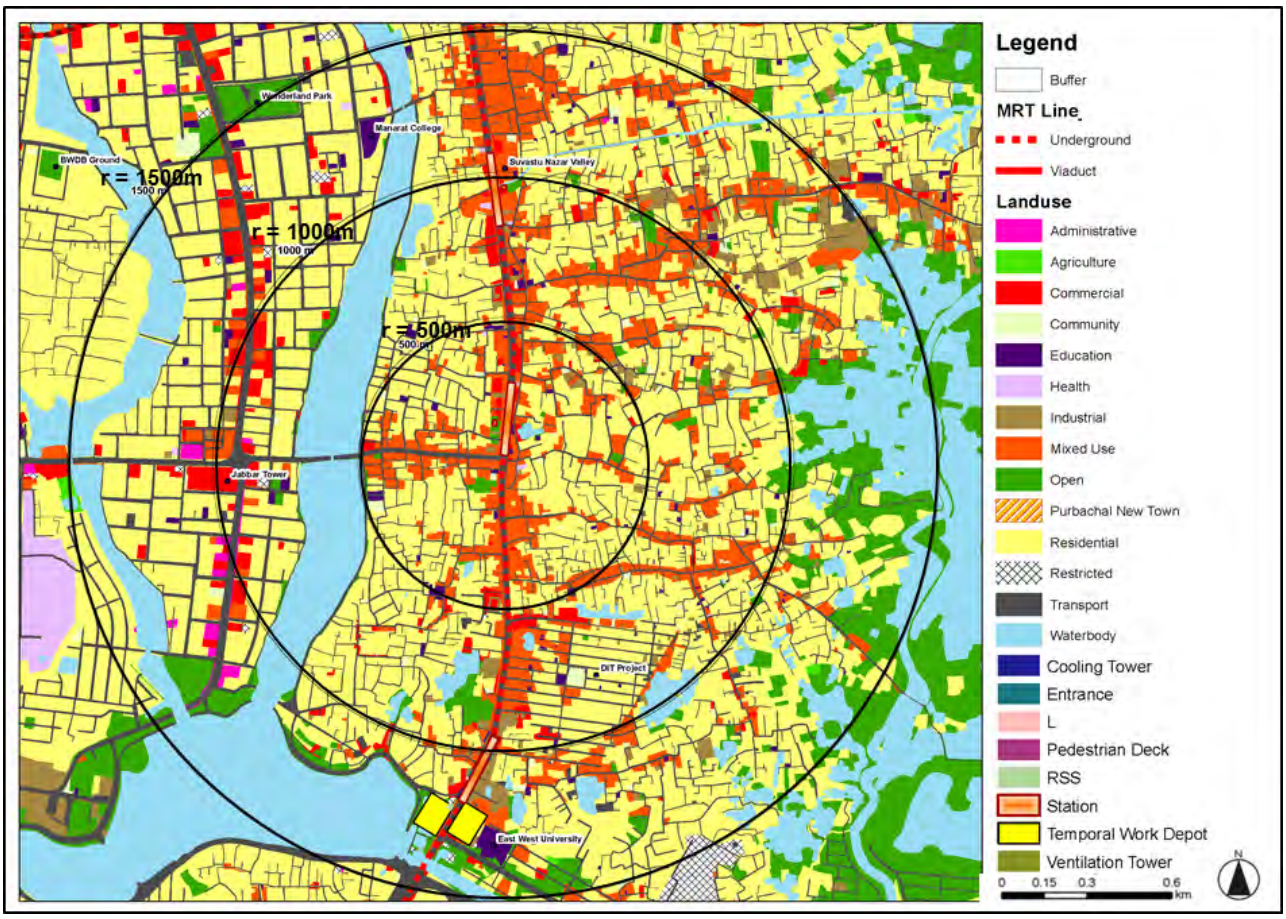
Source: JICA Study Team

Figure 3.3.25 Concept Plan around Hatir Jheel Station

6) Badda Station

(a) Current Land Use of Catchment Area

3.39 Many businessmen are expected to get off at Badda Station and walk to Gulshan because the station is located on the east side of the Gulshan 1 circle which is a CBD area where many foreign companies and offices are located. Along the main roads, there are many mixed-use buildings where the lower floors are used for commercial facilities such as clothes, shoes, restaurants and the upper floors are used as apartment buildings. Dense residential areas are spreading far from the station, along narrow roads. Development along the main road gradually progresses as well towards other areas.



Source: JICA Study Team

Figure 3.3.26 Land use around Badda Station

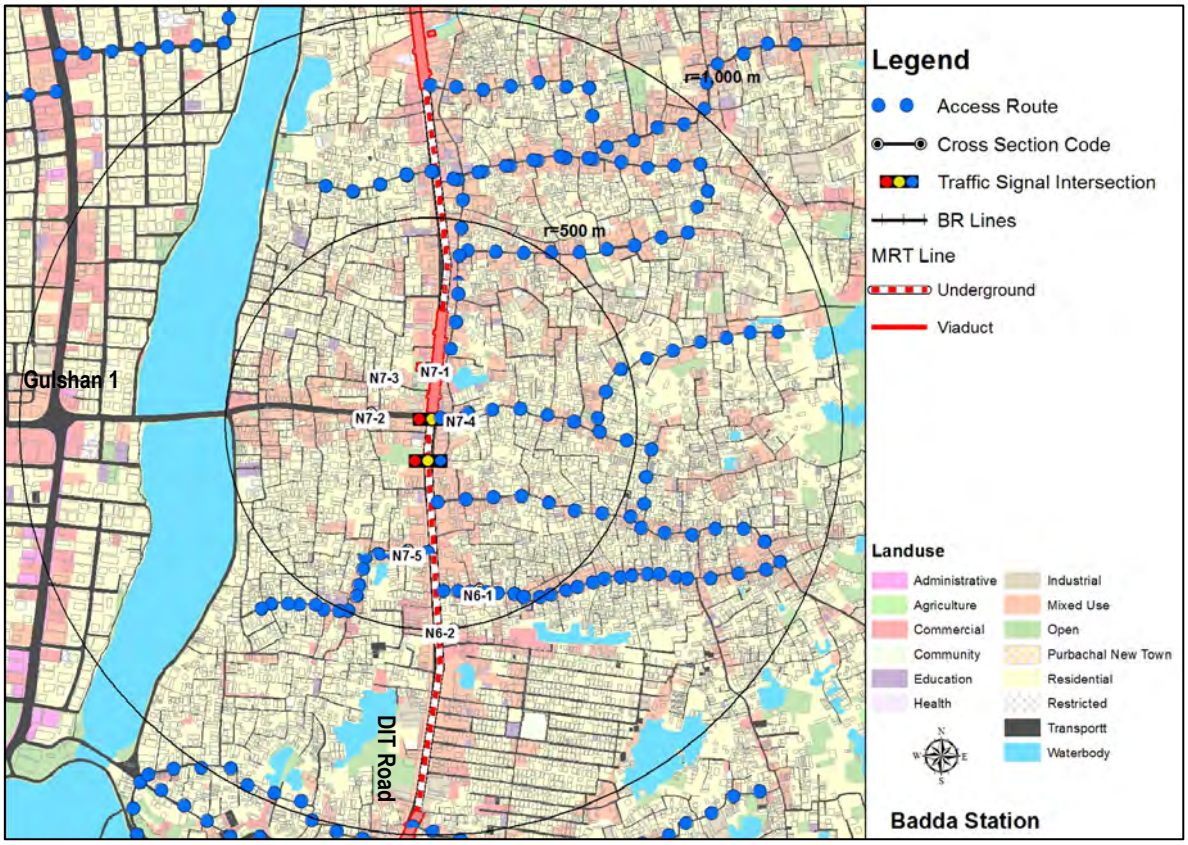
(b) Traffic Situation of Catchment Area

3.40 Features related to traffic conditions around the station are as follows:

(i) Like other stations planned along the DIT road, access roads from the DIT road to residential areas are narrow and sidewalks are not well maintained or unpaved.

(ii) There will be many people walking to Gulshan from the station. However, sidewalks are narrow (1.5-m wide), and people would have to walk in the roadway in the current situation.

(iii) Buses to Gulshan 1 tend to cause traffic congestion as they make U-turns at the intersection with the DIT road.



Source: JICA Study Team

Figure 3.3.27 Transportation Network around Badda Station

Id	Cross-Section	Photo
N6-2	Sidewalk 1.8 | Carriageway 1.5 + 11.1 | Median | Carriageway 11.1 | Sidewalk 1.8 — W = 27.3 m	n/a
N7-1	Sidewalk 1.8 | Carriageway 12.0 | Median 0.8 | Carriageway 10.8 | Drainage 0.4 | Sidewalk 2.2 — W = 28.0 m	n/a
N7-2	Sidewalk 1.5 | Carriageway 7.1 | Median 0.9 | Carriageway 7.1 | Sidewalk 1.5 — W = 17.6 m	n/a

Source: JICA Study Team

Figure 3.3.28 Main Road Section around Badda Station

Id	Cross-Section	Photo
N6-1	Road 5.2	n/a
N7-3	Road 4.4	n/a
N7-4/ N7-5	Road 4.6	n/a

Source: JICA Study Team

Figure 3.3.29 Minor Road Section around Badda Station

(c) MRT Impact on Urban Development

3.41 In terms of MRT impacts on the area, the following can be expected:

(i) Badda Station is close to Gulshan 1 circle, further development is promoted as a commercial area like Gulshan 1 district. (Daytime population of worker 56,000 to 82,000)

(ii) Especially the demand for development along the DIT road increases, the development along railway is promoted and the number of high-rise buildings will be increasing.

Table 3.3.6 Socio-economic Indicators around Badda Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	170.5	198.2
		Density (No/ha)	542.9	630.9
	Night	No.(000)	189.5	210.5
		Density (No/ha)	603.3	670.1
Daytime Population	Worker (000)		56.3	82.8
	Student (000)		46.7	45.1
	Total		103.1	127.9
Nighttime Population	Worker (000)		73.5	96.4
	Student (000)		48.6	43.8
	Total		122.1	140.2
Population Day/Night Ration (000)			0.9	0.9

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

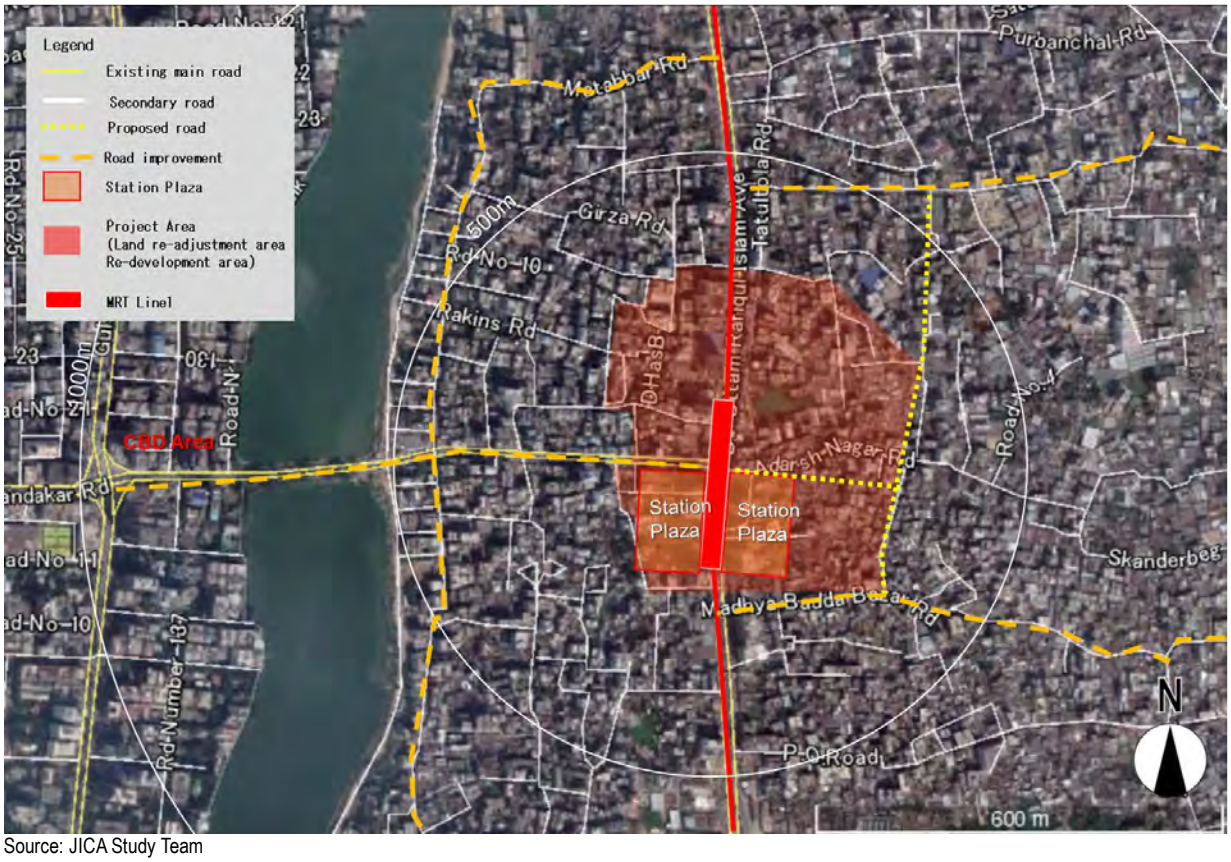
3.42 Badda Station is expected to be used by commuters to Gulshan, development demand is also very high. On the other hand, a dense residential area is left on the east side of the DIT road. Recommended TOD policies for Badda station are as follows:

(i) **Development of station plazas:** It is an area where bus routes intersect, and many buses making a U-turn near the station location, causing traffic congestion. Besides, people get on and off the bus near the intersection, which is dangerous and causes traffic congestion. A station plaza is needed to improve this situation.

(ii) Development of sidewalks towards Gulshan: The width of sidewalks for moving to Gulshan is narrow and people are overflowing in the roadway. Therefore, it is necessary to improve the pedestrian access to the station.

(iii) **Reformulation of urban area by land re-adjustment project and re-development project**: Securing the land for station plaza and sidewalks is a big issue. Long-term efforts by redevelopment and land re-adjustment project are

necessary because it is near Gulshan and high urban development demand is expected.



Source: JICA Study Team

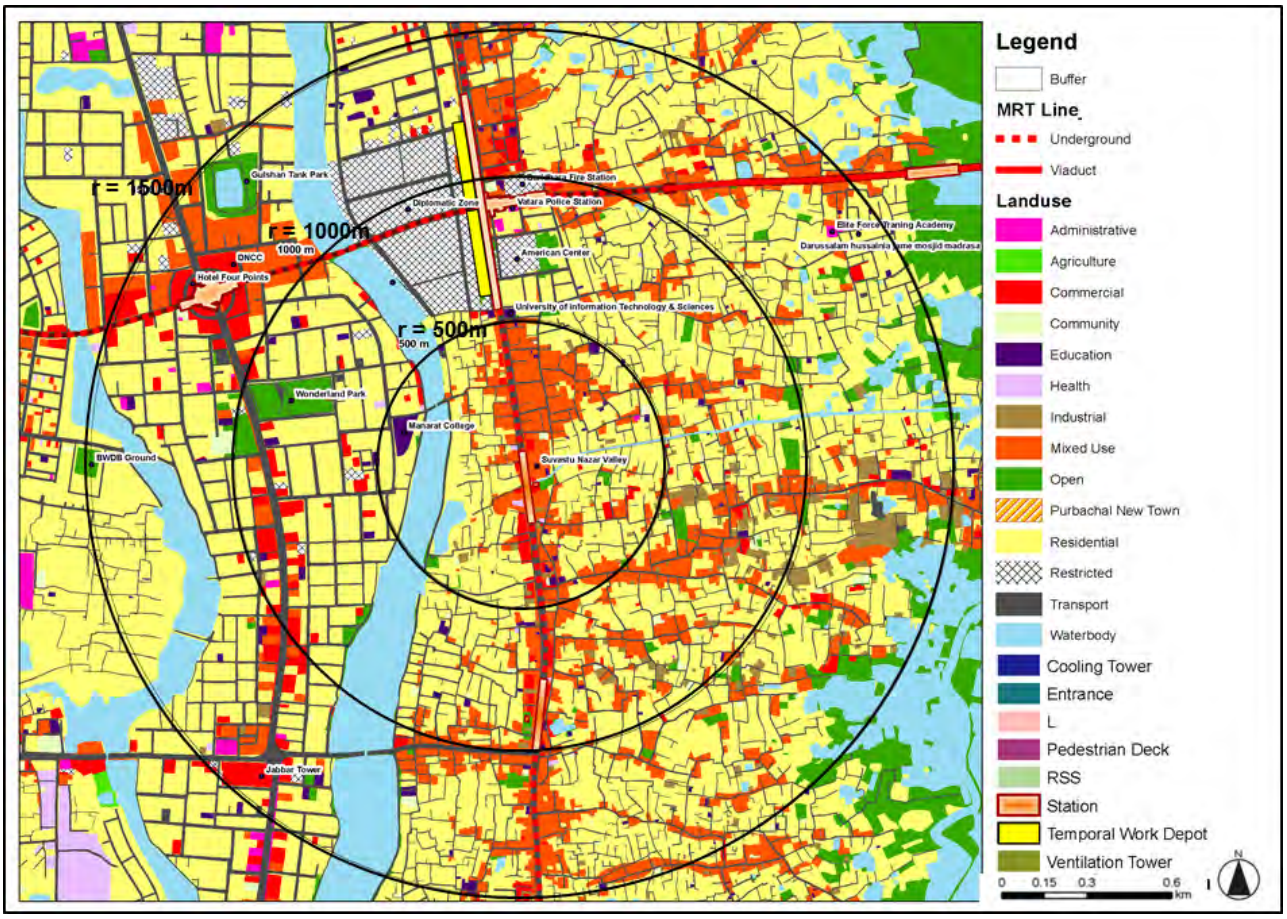
Figure 3.3.30 Concept Plan around Badda Station

7) Uttar Badda Station

(a) Current Land Use of Catchment Area

3.43 Mixed-use buildings including shopping centers and residential apartments are arranged in front of the station, and apartment buildings are also being built in the area. Many of the roadside buildings are high-rise buildings with a height of about 15 stories, and also many cafés and commercial facilities. In addition, the vicinity of the station includes residential areas, and the streets are complicated and narrow. Gulshan, which is also the central business district of Dhaka, is located near the station, but access by car and waking are restricted by narrow bridges and alleyways of inadequate width.

3.44 Development along main roads is remarkable and construction of mixed-use buildings with commercial facilities on the lower levels and apartments on the upper floors is undergoing. Located in between Baridhara and Badda, development demand is high, construction of multiple houses and mixed-use buildings is occurring around the station. Most development consists of redevelopment of low-rise houses into high-rise buildings.



Source: JICA Study Team

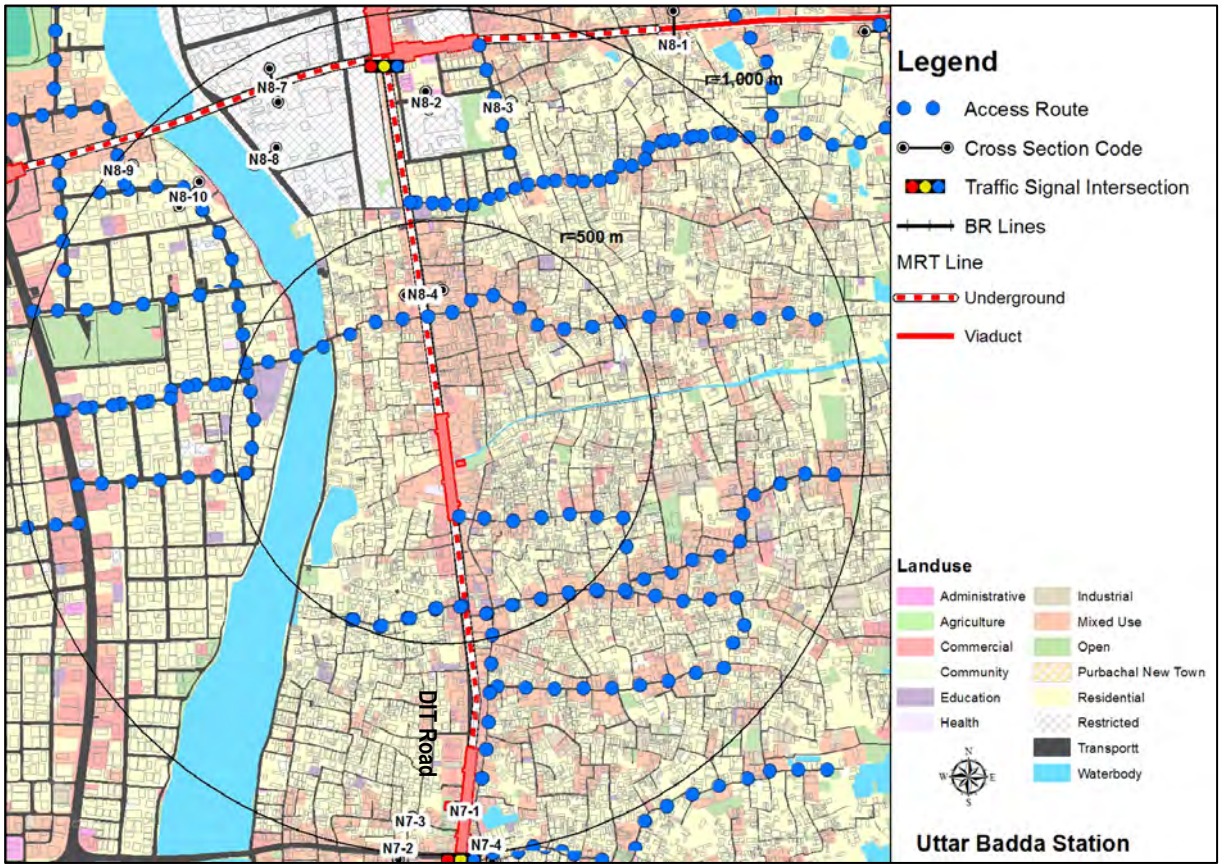
Figure 3.3.31 Land use around Uttar Badda Station

(b) Traffic Situation of Catchment Area

3.45 Features related to traffic conditions around the station are as follows:

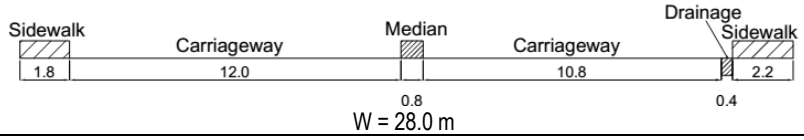
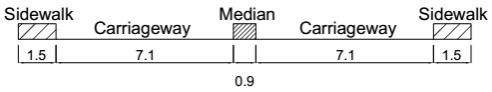
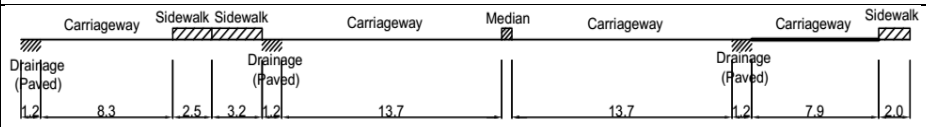
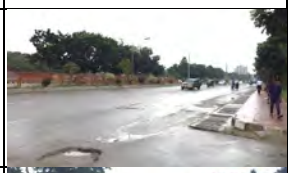
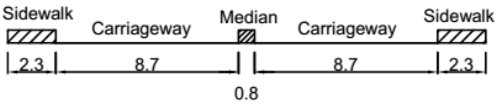
(i) Although the DIT road is wide and sidewalks are well maintained, there are many unattended places and pedestrian access is difficult. Also, there are many shops on the street, occupying the sidewalk.

(ii) On the access road from main roads to residential areas, sidewalks are not well maintained, they are narrow, and cars cannot pass through narrow roads.



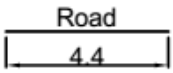
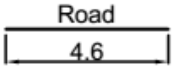
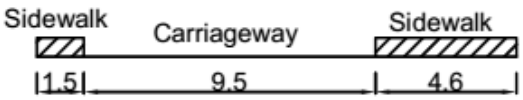
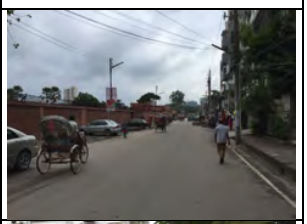
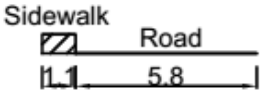
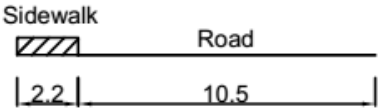
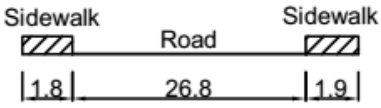
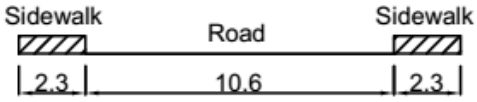
Source: JICA Study Team

Figure 3.3.32 Transportation Network around Uttar Badda Station

Id	Cross-Section	Photo
N7-1	 W = 28.0 m	n/a
N7-2	 W = 18.1 m	n/a
N8-4 Pragati Avenue	 W = 55.6 m	
N8-7 Madani Avenue	 W = 22.8 m	

Source: JICA Study Team

Figure 3.3.33 Main Road Section around Uttar Badda Station

Id	Cross-Section	Photo
N7-3		n/a
N7-4		n/a
N8-2 Road 1, Baridhara J Block	 W = 15.6 m	
N8-3 Road 1/A, Baridhara J Block	 W = 6.9 m	
N8-8 United Nation Road	 W = 12.7 m	
N8-9	 W = 30.5 m	n/a
N8-10 Road 96	 W = 15.2 m	

Source: JICA Study Team

Figure 3.3.34 Minor Road Section around Uttar Badda Station

(c) MRT Impact on Urban Development

3.46 In terms of MRT impacts on the area, the following can be expected:

(i) Many markets and small stores are located around Uttar Badda station, but large-scale shopping centers are being built along with roads. After completion of MRT construction, the development along main roads will further accelerate, there is a high possibility that redevelopment of high-rise building will be promoted. In particular, it is expected that the number of workers will increase due to the progress of commercial development. (Daytime population of worker: 80,000 to 119,000)

(ii) Baridhara is located on the northern side, it is a rather good location, but there is a dense residential area in the vicinity. By developing MRT, redevelopment as a high-rise residential building is expected. (Nighttime population 164,000 to 197,000)

Table 3.3.7 Socio-economic Indicators around Uttar Badda Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	189.4	243.5
		Density (No/ha)	602.8	775.1
	Night	No.(000)	164.4	197.2
		Density (No/ha)	523.2	627.7
Daytime Population	Worker (000)		80.2	119.0
	Student (000)		52.4	58.7
	Total		132.6	177.7
Nighttime Population	Worker (000)		64.4	90.4
	Student (000)		43.2	41.0
	Total		107.6	131.4
Population Day/Night Ration (000)			1.2	1.2

Source: JICA Study Team (Using RSTP Database)

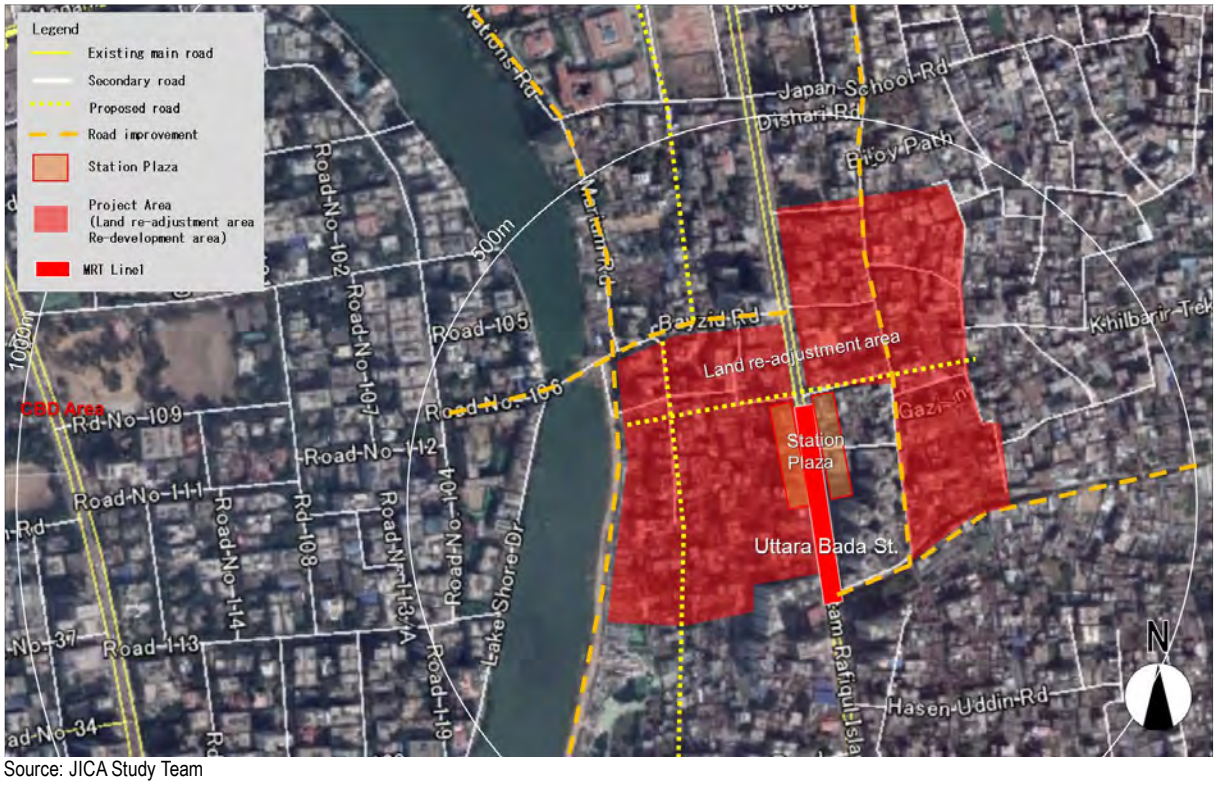
(d) Policies and Directions of TOD

3.47 Recommended TOD policies for Uttar Badda station are as follows:

(i) **Development of transportation hubs:** Development around the station location has already been occurring, and it is difficult to secure land on the site. However, as it faces the main road and there are also many bus lines, it is necessary to secure land for bus bays and waiting spaces for CNG and rickshaws.

(ii) **Improvement of access to Gulshan:** East and west are divided across Gulshan lake, and the access road is also limited to Gulshan 1 circle or Gulshan 2 circle. The bridge is also located on the west side of Uttar Badda Station, but the road in existing residential area is narrow and it is difficult to move by car. Since it is indispensable to improve pedestrian access to Gulshan in order to increase the number of station users, improvement of bridges and roads is necessary.

(iii) **Improvement of the living environment by land re-adjustment project:** The development potential is high, and access to Baridhara and Gulshan is close. However, while private sector development has already been promoted, dense residential areas are scattered, and it is necessary to improve the living environment by land re-adjustment project.



Source: JICA Study Team

Figure 3.3.35 Concept Plan around Uttar Badda Station

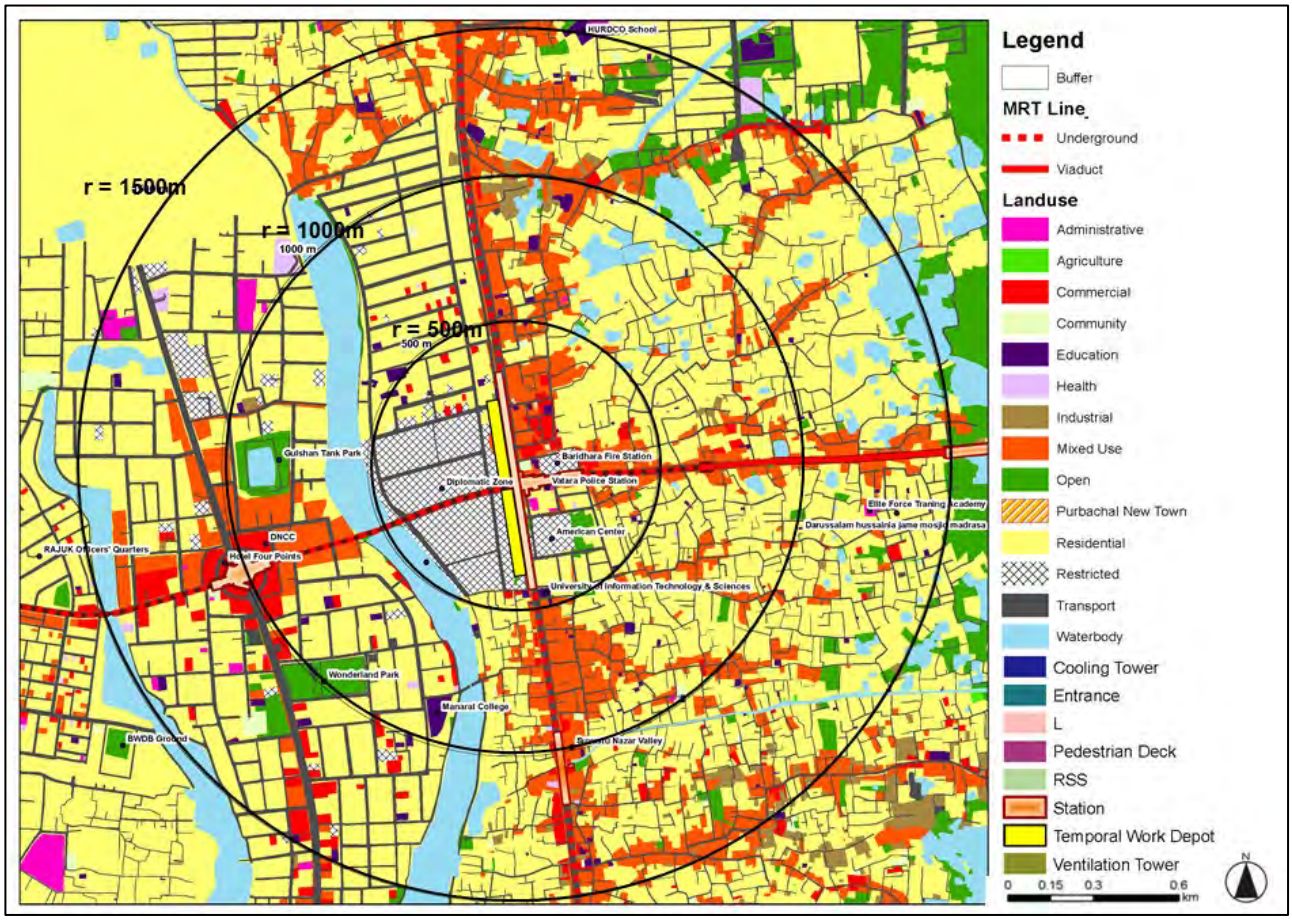
8) Natun Bazar Station

(a) Current Land Use of Catchment Area

3.48 Natun Bazar station is a transit station of both MRT 1 and 5 and is in the proximity of Baridhara Diplomatic Area. RAJUK originally planned the residential model town in Baridhara, Gulshan, Banani with roads and sidewalks and a rather good residential environment. Land prices are the highest area in Dhaka area. Embassies and international schools are located in the Baridhara Diplomatic Area, as well as a highly secured gated community and other non-gated residential areas further away from the embassies and international school. Most residents mainly rely on the automobile for their transportation needs.

3.49 It can be assumed that many local Dhaka residents will not live but commute to the Gulshan 2 circle, hence long queues of bus users around Natun Bazar station. Houses and markets spread on the eastern side of Pragati Avenue. Wealthy people live in the Baridhara Diplomatic Area on the west side across the Pragati avenue and many middle and low-income people live on the east side. In the vicinity of Natun Bazar station, day laborers gather every morning for seeking jobs.

3.50 In Baridhara Diplomatic Area, there are also detached houses owned by embassy officials and wealthy people, but in recent years many low-rise residential buildings have been redeveloped into high-rise residences is proceeding. Originally, Baridhara, Gulshan, Banani were planned according to RAJUK's model town, so the residential plots have been shaped and development regularly everywhere. Large-scale development has not been carried out around this area, but rebuilding to high-rise is progressing rapidly along main roads.



Source: JICA Study Team

Figure 3.3.36 Land use around Natun Bazar Station

a	b	c
		
Traffic Congestion	US Embassy Near Natun Bazar Station	Residential Area development
d	e	f
		
High Rise Commercial Use Building	Thai Embassy near Natun Bazar Station	Baridhara DOHS

Source: JICA Study Team

Figure 3.3.37 Current Conditions around Natun Bazar Station

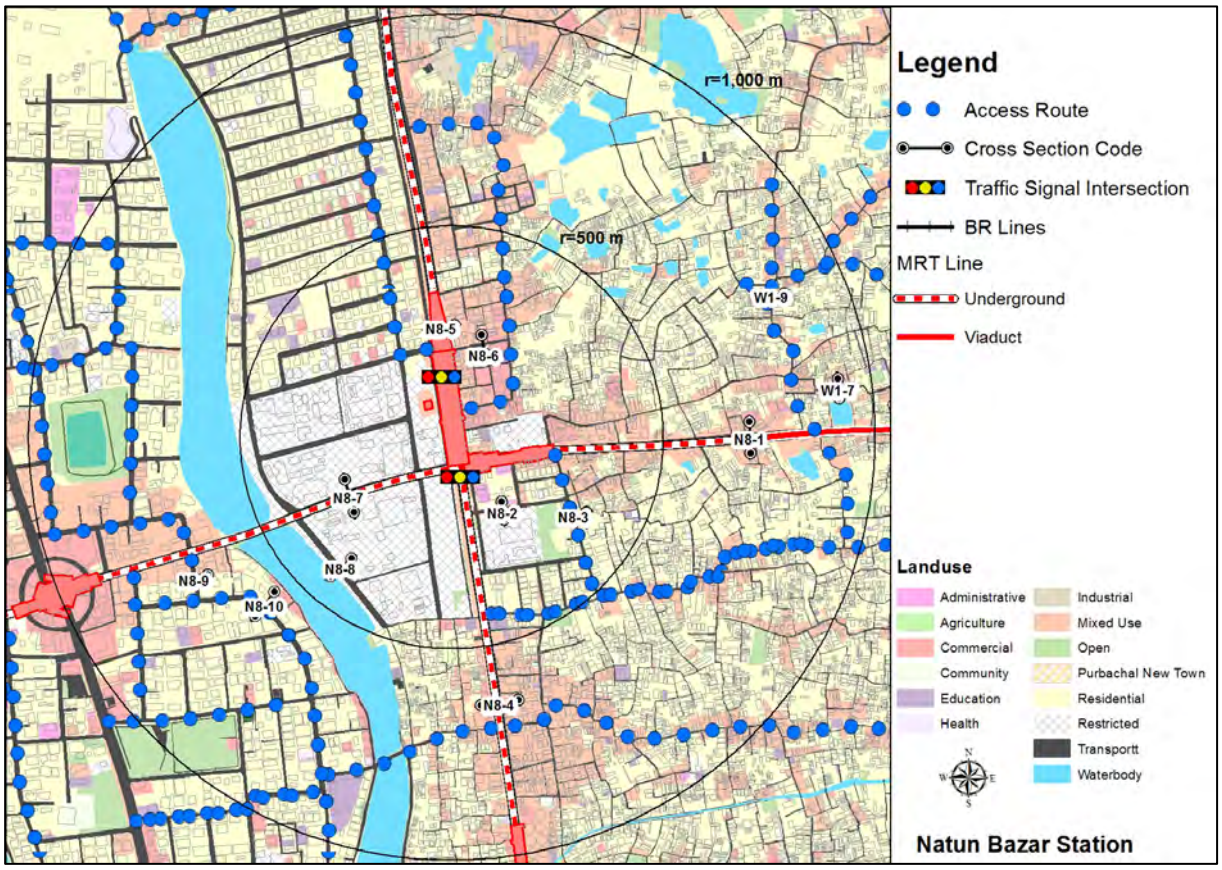
(b) Traffic Situation of Catchment Area

3.51 Features related to traffic conditions around the station are as follows:

(i) Since the land prices are the highest in Dhaka and important institutions are located around Baridhara, most roads in the area have proper sidewalks. However, sidewalks from Pragati avenue to residential areas which are located on the east side of Pragati avenue are not well maintained.

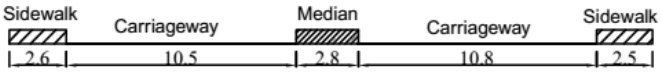
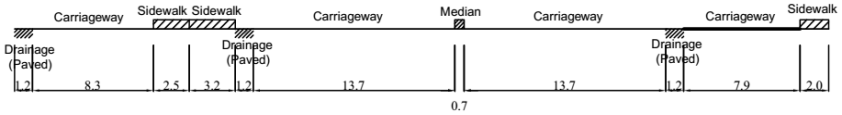
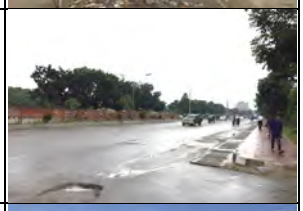
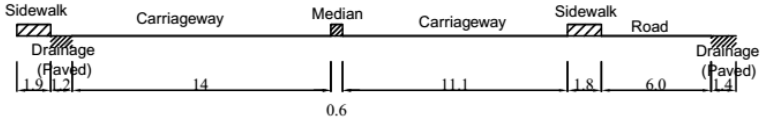
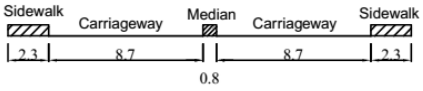
(ii) Buses and rickshaws to Baridhara and Gulshan have restricted access, and only specific buses and rickshaws with special permits have access to the area, such as Dhaka Chaka buses. Therefore, there is a need to organize bus transfers at intersections.

(iii) Natun Bazar station will be a transfer station with MRT 5, where people will be able to catch the MRT 1 Airport branch and Purbachal branch.



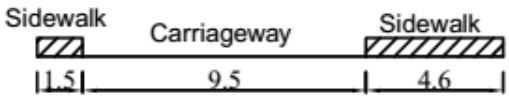
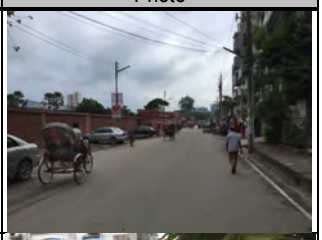
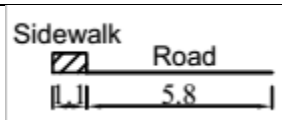
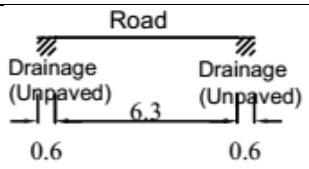
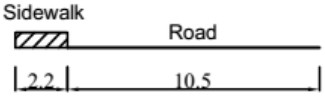
Source: JICA Study Team

Figure 3.3.38 Transportation Network around Natun Bazar Station

Id	Cross-Section	Photo
N8-1 Madani Avenue	 W = 29.2 m	
N8-4 Pragati Avenue	 W = 55.6 m	
N8-5 Pragati Avenue	 W = 43.0 m	
N8-7 Madani Avenue	 W = 24.8 m	

Source: JICA Study Team

Figure 3.3.39 Main Road Section around Natun Bazar Station

Id	Cross-Section	Photo
N8-2 Road 1, Baridhara J Block	 W = 15.6 m	
N8-3 Road 1/A, Baridhara J Block	 W = 6.9 m	
N8-6 Road-5, Baridhara J Block	 W = 7.5 m	
N8-8 United Nation Road		

Id	Cross-Section	Photo
	W = 12.7 m	
N8-10 Road 96	Sidewalk 2.3 / Road 10.6 / Sidewalk 2.3 W = 15.2 m	
W1-7	Road 4.7	n/a
W1-9	Road 5.6	n/a

Source: JICA Study Team

Figure 3.3.40 Minor Road Section around Natun Bazar Station

(c) MRT Impact on Urban Development

3.52 In terms of MRT impacts on the area, the following can be expected:

(i) In the vicinity of Natun Bazar station are the Baridhara Diplomatic Area and Gulshan 2, which is expected to generate commuting trips to work by many workers. The area is also prone to develop as a major commercial area (Population day/night ratio: 1.5 to 1.6)

(ii) In the future, while having a high potential as a transfer station, the Baridhara Diplomatic Area also needs to be promoted as a commercial areal.

(iii) The station development site is limited to the east side of Pragati Avenue. Demand for development of residential areas in that area will further increase in the future, where more houses will be supplied due to MRT construction. (Night population 124,000 to 159,000)

Table 3.3.8 Socio-economic Indicators around Natun Bazar Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	180.5	247.6
		Density (No/ha)	574.5	788.1
	Night	No.(000)	123.8	158.6
		Density (No/ha)	394.0	504.8
Daytime Population	Worker (000)		87.7	131.4
	Student (000)		51.4	63.3
	Total		139.1	194.7
Nighttime Population	Worker (000)		49.0	72.7
	Student (000)		33.4	33.0
	Total		82.4	105.7
Population Day/Night Ration (000)			1.5	1.6

Source: JICA Study Team (Using RSTP Database)

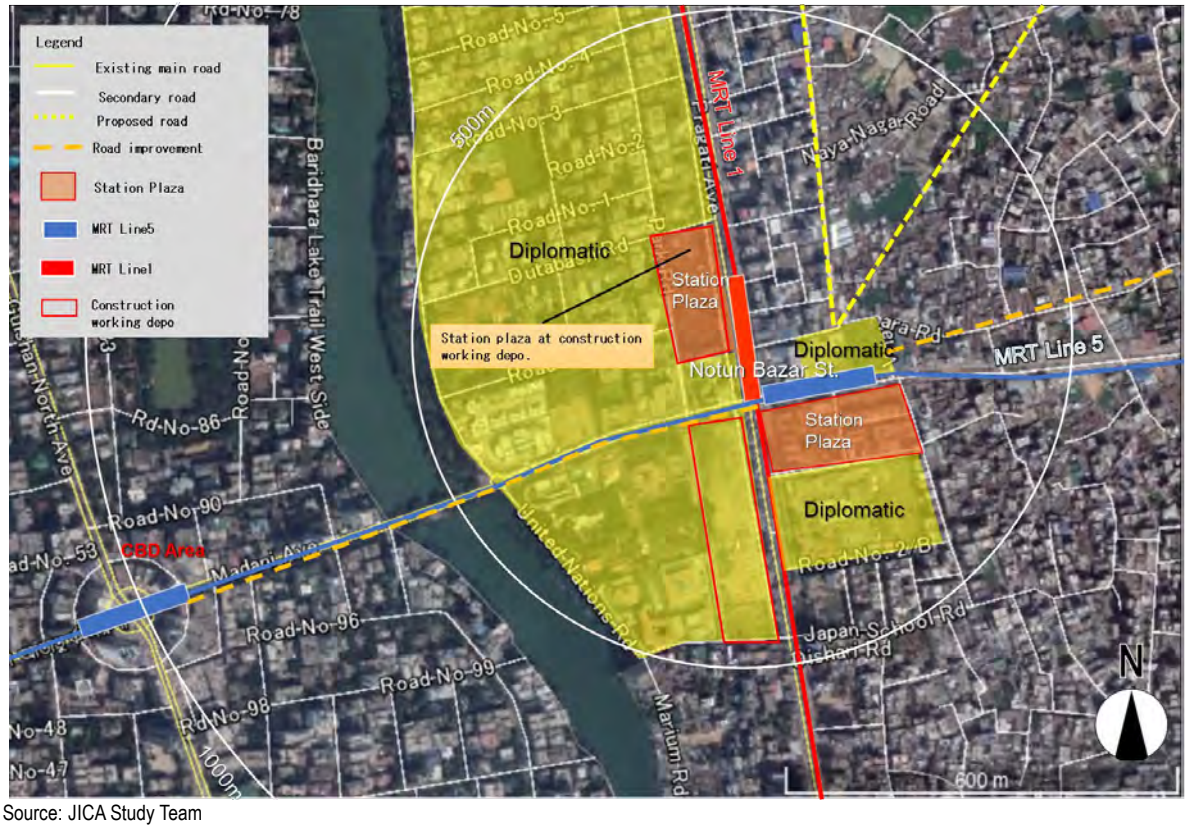
(d) Policies and Directions of TOD

3.53 Baridhara Diplomatic Area is a gated community, therefore it is not possible to

develop a commercial area there, and the redevelopment to high-rise residential buildings has already been occurring. Therefore, it is hard to imagine that there will be major changes in the future. However, the development of land plots still available on the east side of Pragati avenue is promoted. Recommended TOD policies for Natun Bazar station are as follows:

(i) **Development of station plazas:** Bus stops in the vicinity of Natun Bazar station are heavily congested, and development of station plaza is essential to alleviate traffic congestion. Construction sites shall be considered as potential station plaza sites around this area, especially the construction site planned on the northern side. The station plaza should use up to the maximum land area of the construction site to secure enough space for bus bays, CNGs, rickshaws, so that passenger have space to wait for their public transportation mode.

(ii) **Development of pedestrian network:** in the area, most buses are limited to DNCC and cannot enter Gulshan or Baridhara. From Natun Bazar, many bus users are accessing Gulshan on foot. Therefore, it is important to develop a pedestrian network towards Gulshan. In addition, the Baridhara Diplomatic Area is a gated community, and the number of entrances is only two places. As it is difficult to imagine that residents of Baridhara Diplomatic Area will use MRT because many residents of Baridhara Diplomatic Area use private vehicles, a pedestrian network toward the eastern side of Pragati avenue shall be developed to increase the number of MRT users accessing the station on by walking.



Source: JICA Study Team

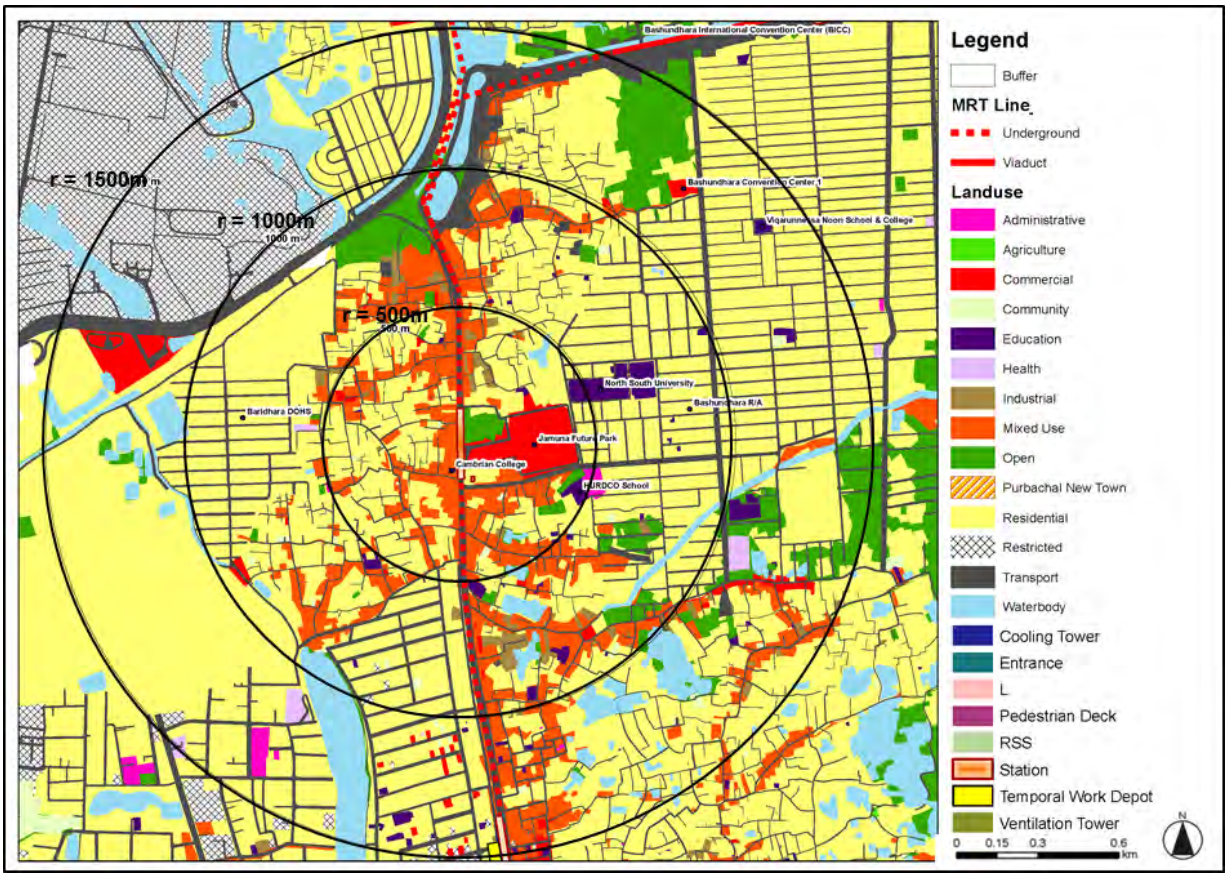
Figure 3.3.41 Concept Plan around Natun Bazar Station

9) Future Park Station

(a) Current Land Use of Catchment Area

3.54 Future Park station is to be built in front of the large commercial facilities of Jamuna Future Park and an amusement park is located on the side of the road. In addition, on the eastern side of Jamuna Future Park, Bashundhara residential area has been developed. North South University is also located in the northeast of the station. Densely populated residential areas spread to the west of the station and Baridhara DOHS is located behind it, but access to Future Park Station is not properly ensured.

3.55 The Bashundhara Group is in charge of planning and developing the Bashundhara residential area as well as the Jamuna Future Park. Altogether, both constitute a large-scale development project of more 3,400 acres that falls under the 2004 Private Residential Land Development Rule. It is one of the largest development plans currently implemented by the private sector and it is part of the plan to promote the development of the eastern part of Dhaka, besides RAJUK's Purbachal New Town. The development plan includes the construction of a 5-star hotel, with 2 underground floors and 10 stories above ground, to be constructed adjacent to Jamuna Future Park.



Source: JICA Study Team

Figure 3.3.42 Land use around Future Park Station

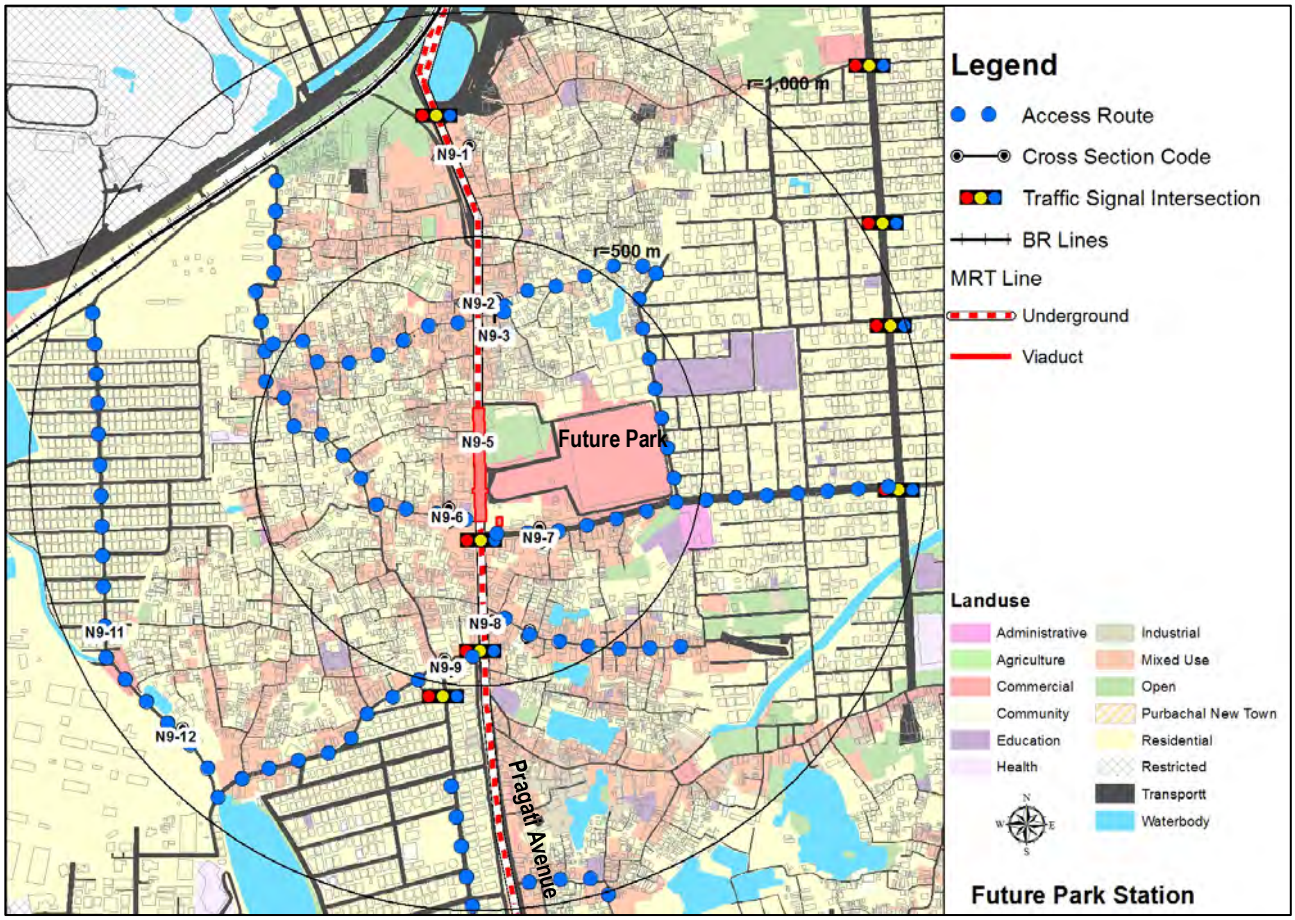
(b) Traffic Situation of Catchment Area

3.56 Features related to traffic conditions around the station are as follows:

(i) Sidewalks along Pragati avenue where MRT will be running are rather well maintained, but too narrow.

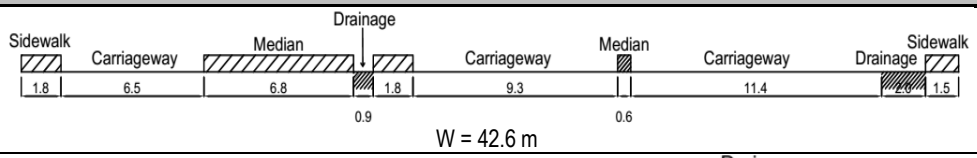
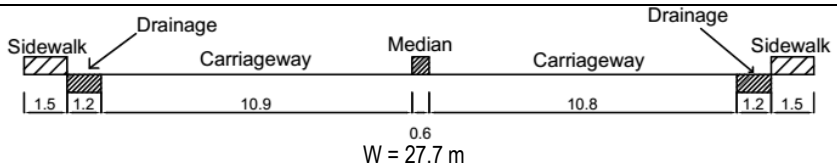
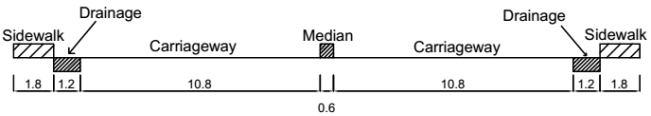
(ii) Access roads to Baridhara DOHS located on the western side of the station, and Bashundhara residential area located on the eastern side are not well maintained.

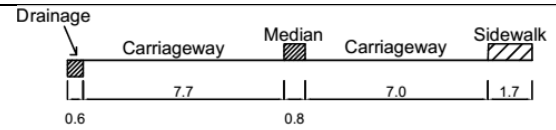
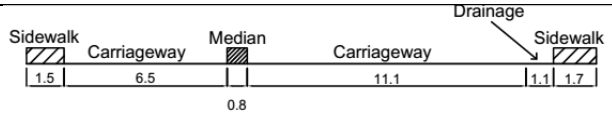
(iii) Bus passengers get on and off near Jamuna Future Park's entrance, which causes a traffic congestion.



Source: JICA Study Team

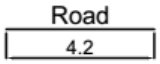
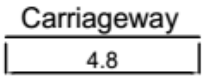
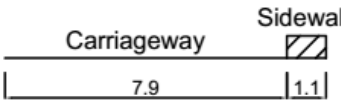
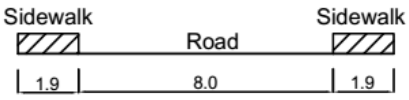
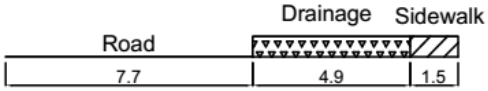
Figure 3.3.43 Transportation Network around Future Park Station

Id	Cross-Section	Photo
N9-1		n/a
N9-2		n/a
N9-5		n/a

Id	Cross-Section	Photo
	W = 28.2 m	
N9-7	 W = 17.8 m	n/a
N9-8	 W = 22.7 m	n/a

Source: JICA Study Team

Figure 3.3.44 Main Road Section around Future Park Station

Id	Cross-Section	Photo
N9-3		n/a
N9-6		n/a
N9-9	 W = 9.0 m	n/a
N9-10	 W = 11.8 m	n/a
N9-11	 W = 14.1 m	n/a

Source: JICA Study Team

Figure 3.3.45 Minor Road Section around Future Park Station

(c) MRT Impact on Urban Development

3.57 In terms of MRT impacts on the area, the following can be expected:

(i) MRT development should result in an increase of the number of visitors to Jamuna Future Park. As the Bashundhara residential area is located within the catchment area of the Future Park station, the population near MRT will also increase rapidly. (Night population 83,000 to 138,000)

(ii) By 2035, the hotels planned to be developed adjacent to Jamuna Future Park should be completed as well as the Bashundhara residential area. Both residential and commercial development will increase, especially on the western side of Pragati avenue, which is not highly developed currently (Daytime Population 113,000 to 177,000).

Table 3.3.9 Socio-economic Indicators around Future Park Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	113.6	177.3
		Density (No/ha)	361.5	564.2
	Night	No.(000)	83.0	138.5
		Density (No/ha)	264.2	441.0
Daytime Population	Worker (000)		51.9	86.5
	Student (000)		32.9	44.5
	Total		84.8	131.1
Nighttime Population	Worker (000)		33.4	63.5
	Student (000)		20.9	28.8
	Total		54.2	92.3
Population Day/Night Ration (000)			1.4	1.3

Source: JICA Study Team (Using RSTP Database)

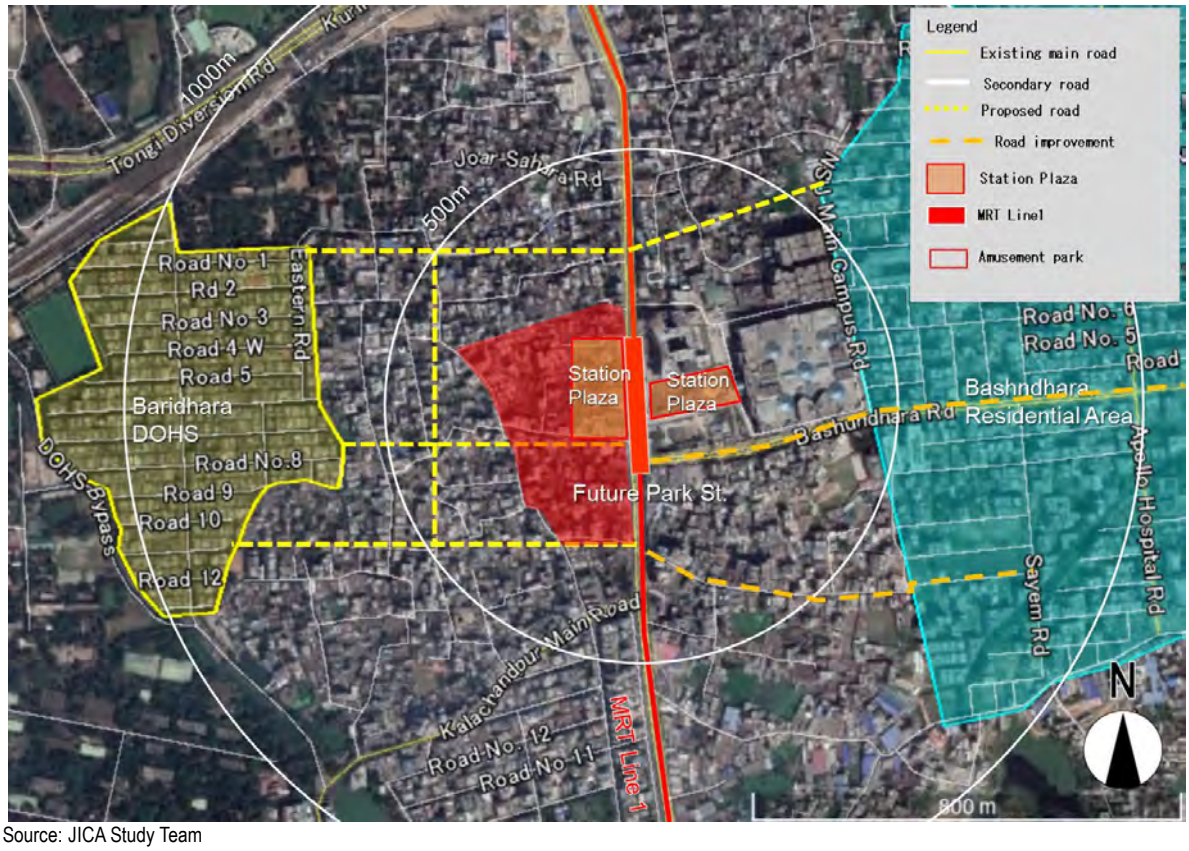
(d) Policies and Directions of TOD

3.58 The station area encompasses large-scale developments like Jamuna Future Park and Bashundhara residential area. It is important to development a plan that anticipates future population growth in the area. TOD guidelines for the Future Park station area include:

(i) **Development of station plazas:** It is important to secure a development site for a station plaza, but it is difficult as land not publicly owned. However, the amusement park Jamuna Future Park attracts a lot of visitors, and access to commercial facilities would improved by converting the site into a station plaza, which can be beneficial to the private companies that currently own the land. On the western side of the station, there is an existing urban area with many old buildings. When the buildings will be redeveloped, the land for the station plaza should be secured by land re-adjustment project.

(ii) **Improvement of pedestrian access:** Pedestrian space from the Bashundhara residential area to the station is inadequate, sidewalks are too narrow, and fences separate Jamuna Future Park from the sidewalks. Therefore, it is necessary to convert private land into pedestrian space and to improve pedestrian access. In addition, the east of Pragati avenue is densely populated, existing building are old, and the roads are narrow. Therefore, improvement of sidewalks is important due to land re-adjustment project. Baridhara DOHS is located in the back of the station, improving pedestrian access would increase the number of visitors.

(iii) **Promotion of development around the station by land re-adjustment project:** Existing sidewalks are too narrow or not well maintained. Developed by the private sectors, Baridhara DOHS and Baridhara Diplomatic Area are located in the vicinity of the station. Development demand is high in the area. Therefore, it is important to promote development around the station in accordance with improvement of living environment.



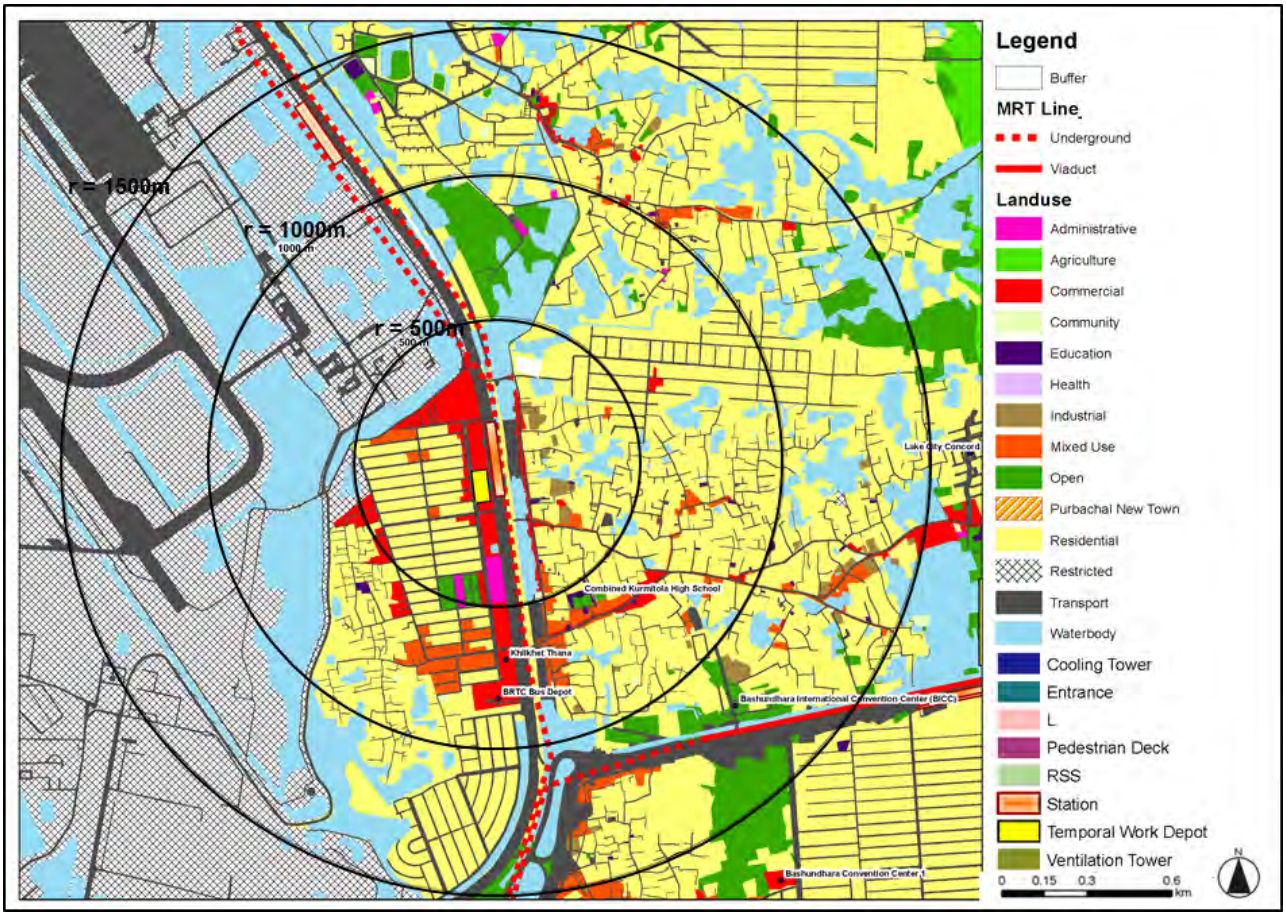
Source: JICA Study Team

Figure 3.3.46 Concept Plan around Future Park Station

10) Khilkhet Station

(a) Current Land Use of Catchment Area

3.59 The station will be constructed under Dhaka-Mymensingh highway heading towards Uttar, Tongi, Gazipur in the northern part of Dhaka. On the western side of the station, there is a residential area including 6- and 7-story middle-class apartment buildings. Furthermore, there is the CAAB site and some land owned by the Army. The railway line of BR is located on the east side. To the east of the BR railway, there is a road leading to the eastern area, but it is a narrow dirt road. In addition, there is a lot of wetland in the residential area on the east side, and many areas are surrounded by water in the rainy season. The residential area on the east side has many low-rise houses.



Source: JICA Study Team

Figure 3.3.47 Land use around Khilkhet Station

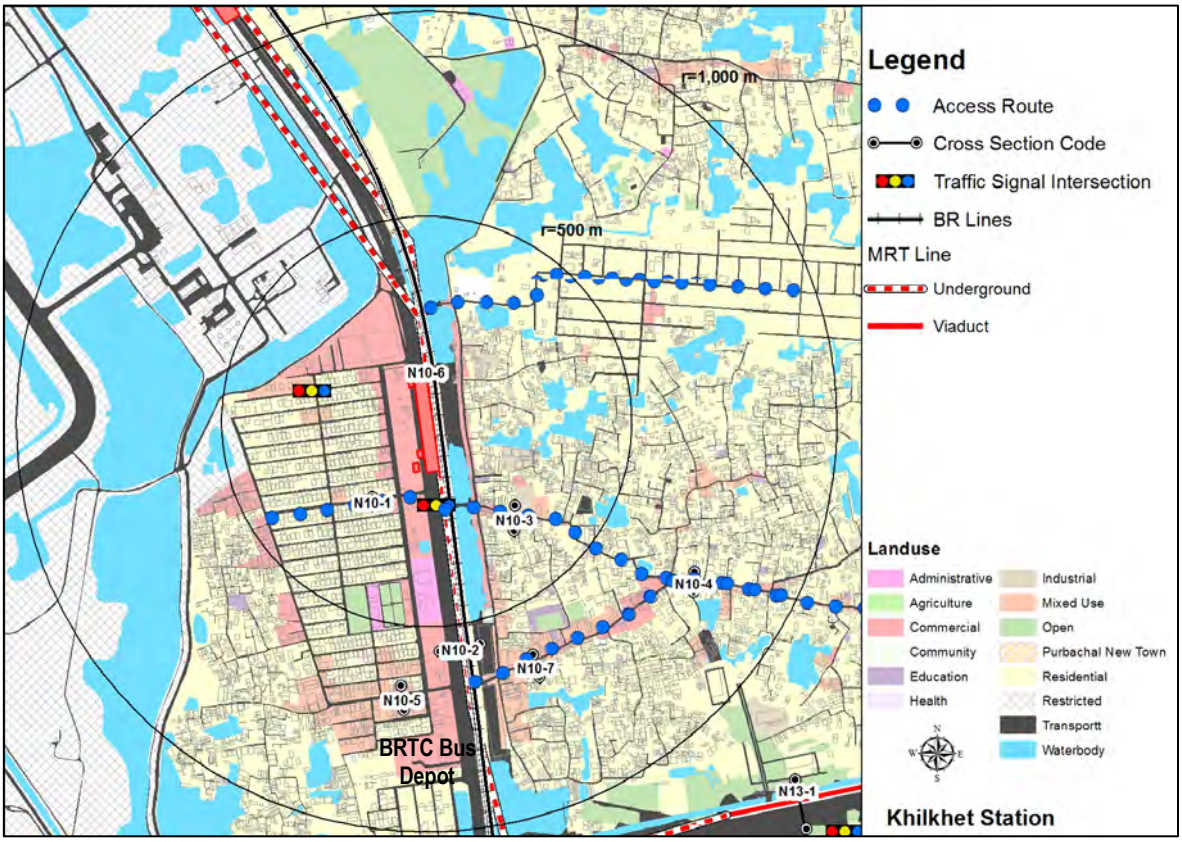
(b) Traffic Situation of Catchment Area

3.60 Features related to traffic conditions around the station are as follows:

(i) The Dhaka-Mymensingh Highway is one of the main roads connecting the center and the suburbs, and the roadway is wide. Sidewalks are well maintained with bus-bay on the west side of the road, but they are narrow, and occasionally blocked by people getting on and off buses.

(ii) Access to the east side is limited because of BR and the expressway which is under construction on the eastern side. Many people cross the railway on foot, which is dangerous.

(iii) A bus depot operated by BRTC is located along the Dhaka-Mymensingh Highway.



Source: JICA Study Team

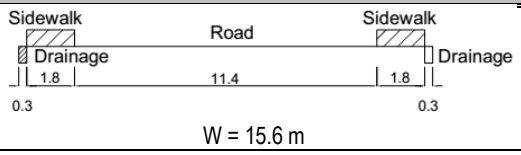
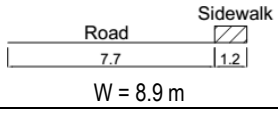
Figure 3.3.48 Transportation Network around Khilkhet Station

Id	Cross-Section	Photo
N10-2	Carriageway 8.6 | Median 1.8 | Carriageway 17.6 | Median 1.5 | Service road 0.3 — W = 29.8 m	n/a
N10-6	Carriageway 9.0 | Median 2.1 | Carriageway 18.1 | 2.0 | 0.5 — W = 31.7 m	n/a

Source: JICA Study Team

Figure 3.3.49 Main Road Section around Khilkhet Station

Id	Cross-Section	Photo
N10-1	Road 10.8 | Sidewalk 0.9 — W = 12. 7 m	n/a
N10-3	Road 6.2 | Sidewalk 2.0 — W = 8.2 m	n/a
N10-4	Road 7.4	n/a

Id	Cross-Section	Photo
N10-5		n/a
N10-7		n/a

Source: JICA Study Team

Figure 3.3.50 Minor Road Section around Khilket Station

(c) MRT Impact on Urban Development

3.61 In terms of MRT impacts on the area, the following can be expected:

(i) It is unlikely that the western side of the station is developed due to the presence of CAAB and some Army land, but there are some vacant lots behind the BR line on the east side. Development demand is increasing due to MRT construction and housing supply is promoted. (Night population 45,000 to 87,000)

(ii) Development of offices or commercial area will occur in the future. (Day population: 45,000 to 74,000)

Table 3.3.10 Socio-economic Indicators around Khilkhet Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	44.9	73.8
		Density (No/ha)	142.8	234.9
	Night	No.(000)	45.3	86.6
		Density (No/ha)	144.1	275.7
Daytime Population	Worker (000)		17.5	30.2
	Student (000)		10.7	14.7
	Total		28.2	44.9
Nighttime Population	Worker (000)		18.6	39.7
	Student (000)		10.1	18.0
	Total		28.6	57.7
Population Day/Night Ration (000)			1.0	0.9

Source: JICA Study Team (Using RSTP Database)

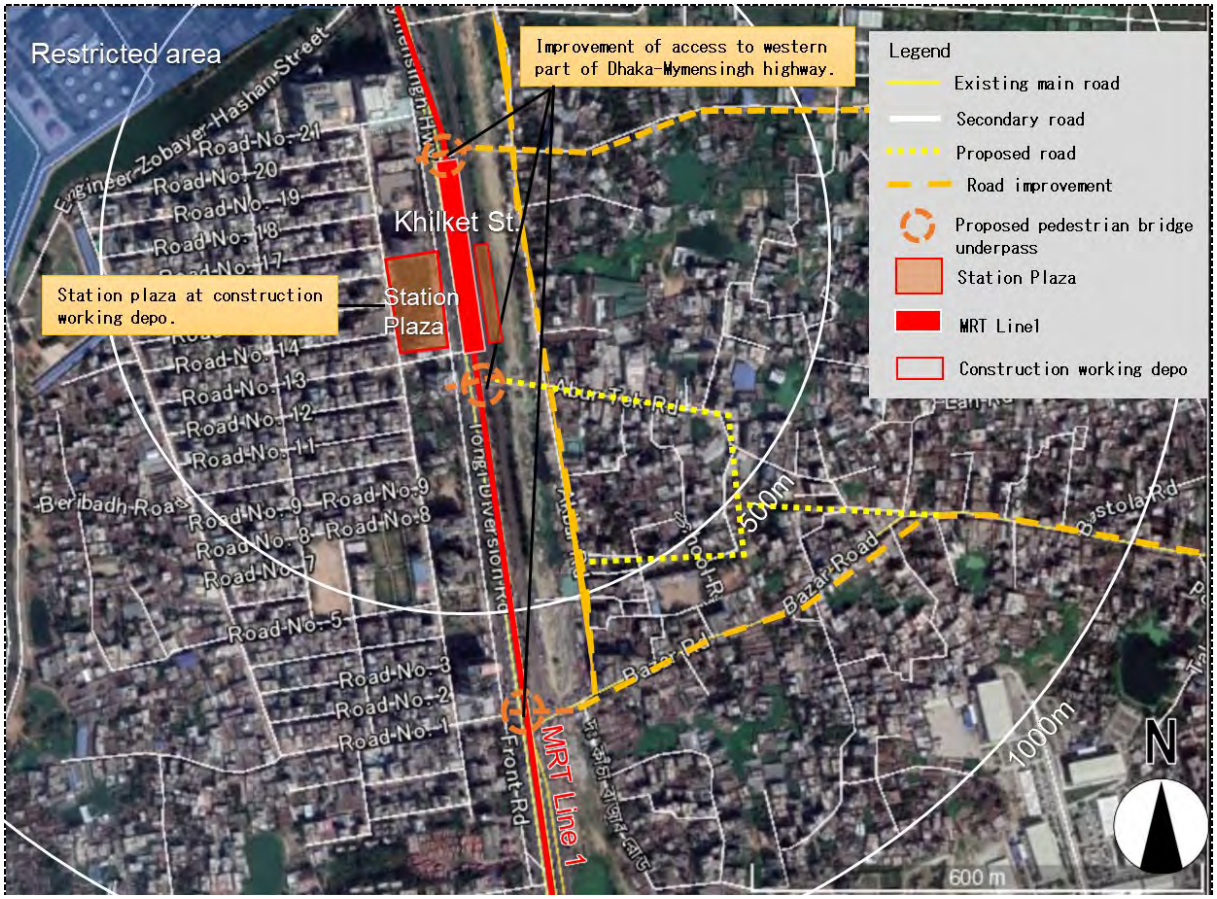
(d) Policies and Directions of TOD

3.62 Most of the western part of the Khilkhet station is occupied by the site of CAAB. Since the BR line intersects the area, it is necessary to develop access to the east side and expand the development area. Recommended TOD policies for Khilkhet station include:

(i) **Development of station plazas:** Since the construction site of DEE is located close to the station, it is desirable to use it to develop as a station plaza. Currently, passengers get on and off buses on service roads along the Dhaka-Mymensingh highway, but passengers are overflowing on the roadway due to the narrow sidewalks. Likewise, rickshaws and CNGs are also lined up along the service road, and it is unsafe for the users. It is necessary to develop bus bays and waiting space for CNGs, rickshaws, and open space for passengers of MRT to improve the environment.

(ii) **Improvement to access from the eastern part of the station:** Army golf courses and CAAB occupy most of the land on the western side of the station, and users are limited due to few residential areas and commercial areas. As on the eastern

side of the station are Dhaka-Mymensingh Highway and BR line. Safe access to the eastern area is not ensured. Therefore, many people across BR line dangerously. Moreover, sidewalks and roads are narrow and difficult to access. It is necessary to secure and improve access with secured crosswalks.



Source: JICA Study Team

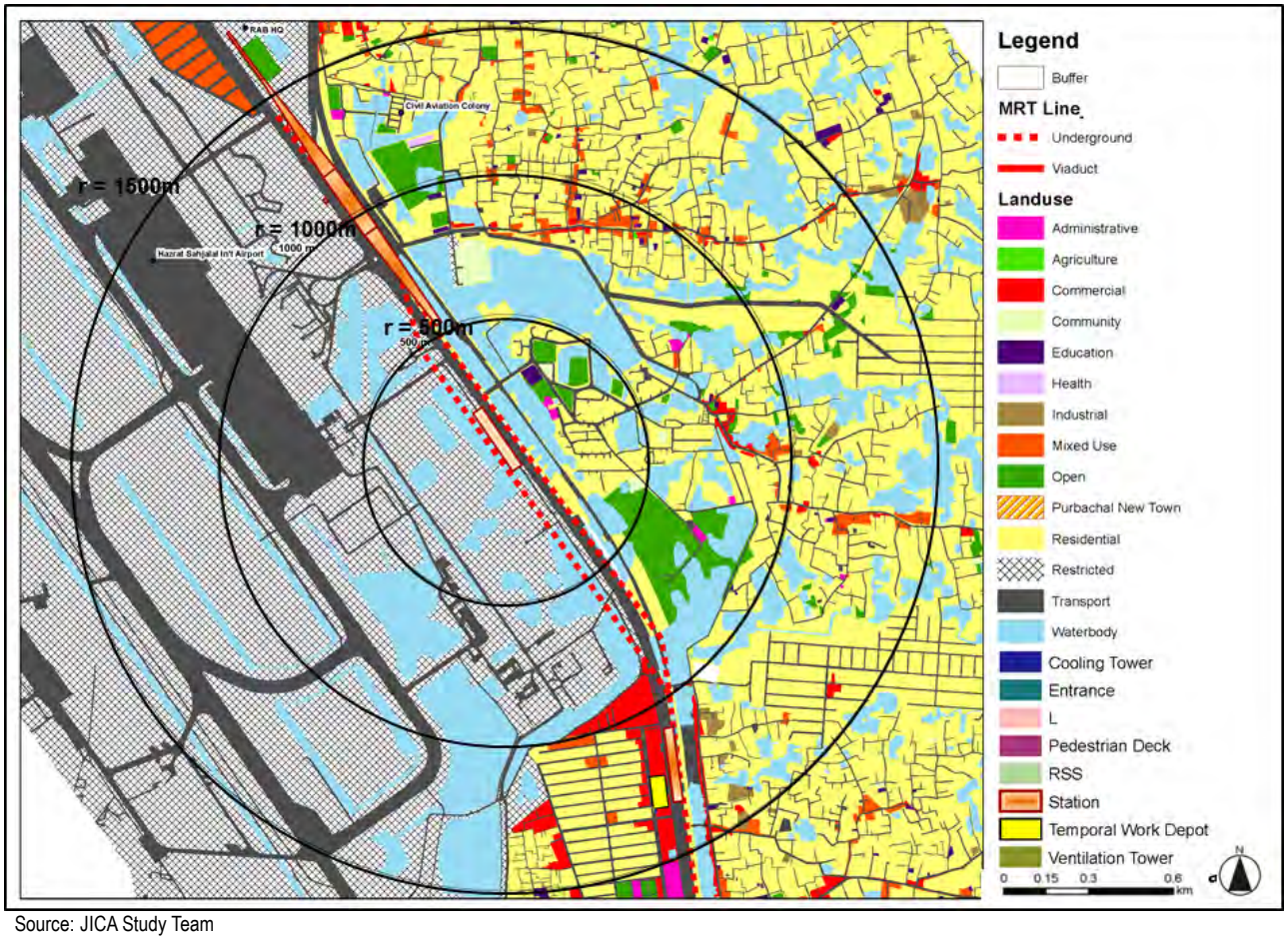
Figure 3.3.51 Concept Plan around Khilkhet Station

11) Airport Terminal 3 Station

(a) Current Land Use of Catchment Area

3.63 Adjacent to the new international airport, access to the airport by an underpass is being considered. The construction of DEE is ongoing between BR line and Dhaka-Mymensingh Highway and the land around the station is being used as a construction site for DEE.

3.64 Access to the east side from the MRT station was not secured due to the construction of DEE, and now houses and farmlands are located in the east side of the station.



Source: JICA Study Team

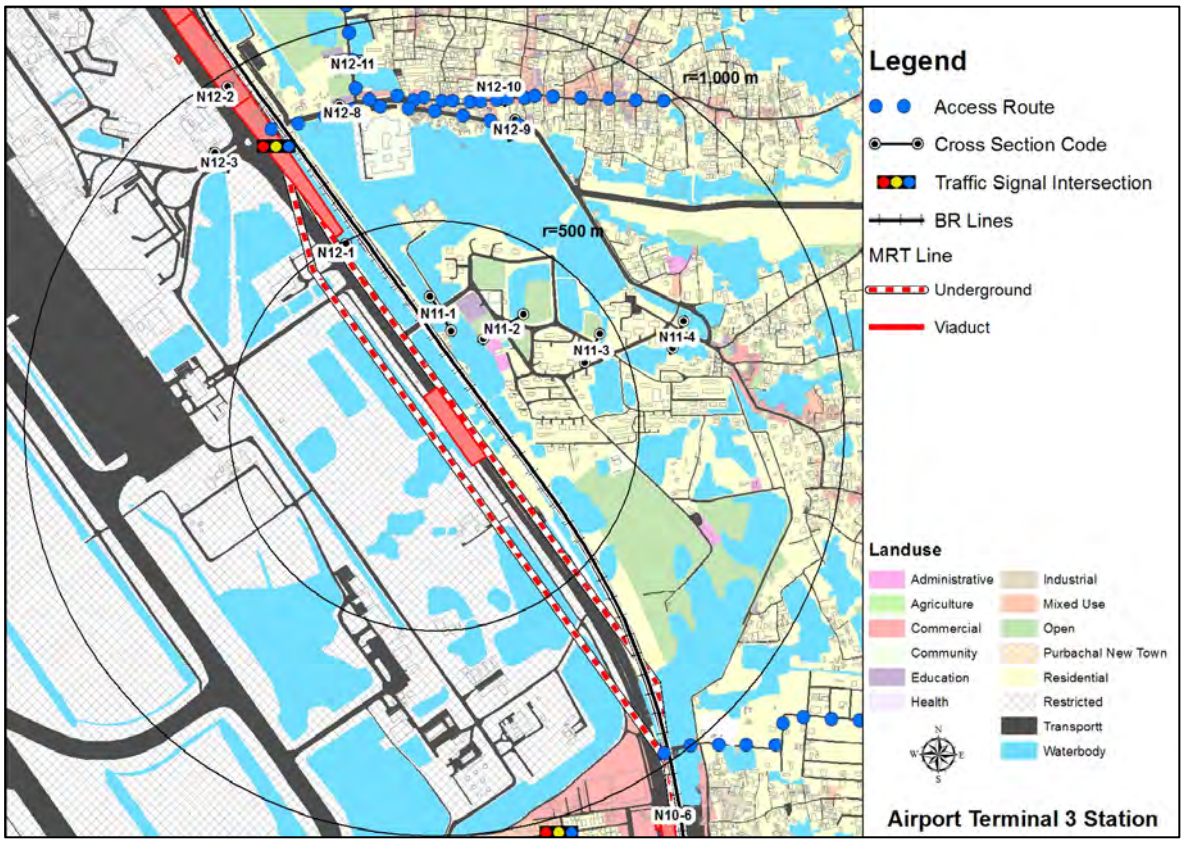
Figure 3.3.52 Land use around Airport Terminal 3 Station

(b) Traffic Situation of Catchment Area

3.65 Features related to traffic conditions around the station are as follows:

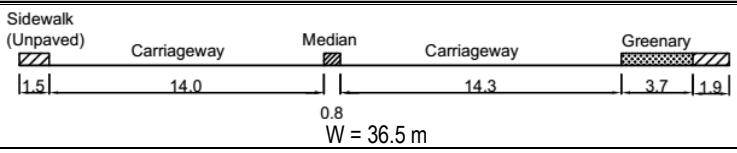
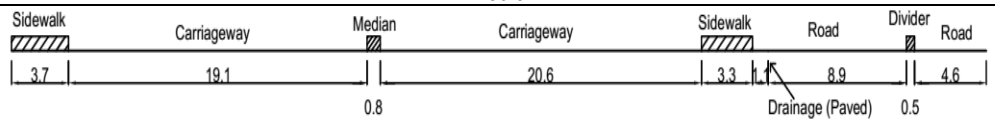
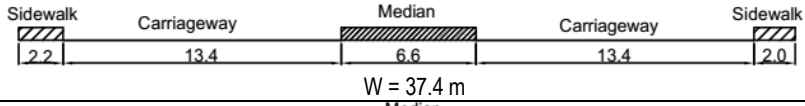
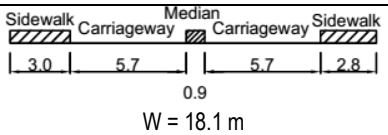
(i) Dhaka-Mymensingh Highway is wide, but it does not have sidewalks, and access to the east side of BR is not secured.

(ii) New international airport is scheduled in the future, but access roads from residential area in the east side of Dhaka-Mymensingh Highway is not secured.



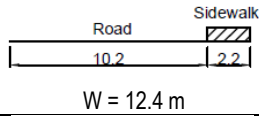
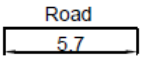
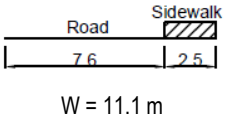
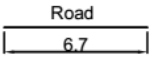
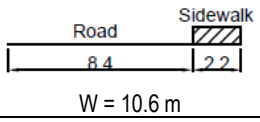
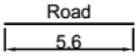
Source: JICA Study Team

Figure 3.3.53 Transportation Network around Airport Terminal 3 Station

Id	Cross-Section	Photo
N12-1		n/a
N12-2		n/a
N12-3		n/a
N12-8		n/a

Source: JICA Study Team

Figure 3.3.54 Main Road Section around Airport Terminal 3 Station

Id	Cross-Section	Id	Cross-Section
N11-1		N11-4	
N11-2		N12-9	
N11-3		N12-10	

Source: JICA Study Team

Figure 3.3.55 Minor Road Section around Airport Terminal 3 Station

(c) MRT Impact on Urban Development

3.66 In terms of MRT impacts on the area, the following can be expected:

(i) Wetlands and agricultural lands on the east side of the station may be converted into residential areas. Access to this area is not secured at the moment, but MRT development is expected to promote housing development. Meanwhile, improvement of living environments of this densely areas will be promoted (Night population density: 209,000 to 128,000).

(ii) New international airport and MRT will create new employment (Daytime Population: 143,000 to 171,000).

Table 3.3.11 Socio-economic Indicators around Airport Terminal 3 Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	279.5	267.4
		Density (No/ha)	889.6	851.2
	Night	No.(000)	208.8	127.7
		Density (No/ha)	664.7	406.6
Daytime Population	Worker (000)		142.8	170.7
	Student (000)		66.6	54.1
	Total		209.4	224.8
Nighttime Population	Worker (000)		83.0	58.6
	Student (000)		55.8	26.6
	Total		138.8	85.2
Population Day/Night Ration (000)			1.3	2.1

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

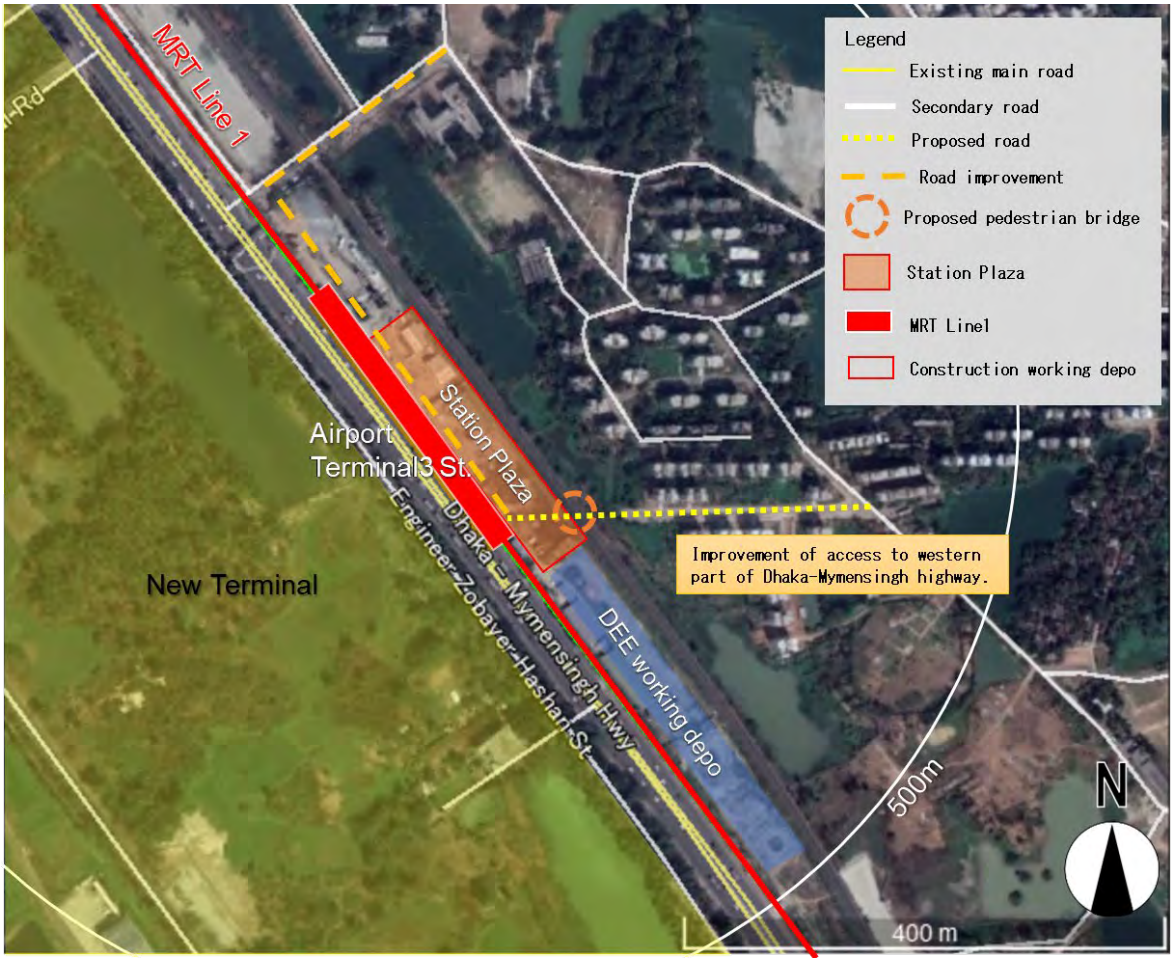
3.67 The development potential at the current stage around the Airport Terminal 3 station is not high, but due the new international airport and MRT, there is a high possibility that development demand on the eastern side of the station will increase. Recommended TOD policies for Airport Terminal 3 station are as follows:

(i) **Development of station plazas:** Construction of DEE is progressing, and the east side of the station is used as a construction site. The land under DEE viaduct should be used for the station plaza's development.

(ii) **Access improvement on the east side of the station:** Pedestrian bridges and underpasses can promote the use of MRT and improve access from the east side to the MRT station.

(iii) **Utilization of the land under DEE viaduct:** Various uses such as shops and administrative facilities, station plazas can be considered by utilizing the space under DEE viaduct.

(iv) **Implementation of *Ekinaka* development in underpass:** There is no large development site in the vicinity, but in order to ensure access from the International airport to the station, an underpass will be constructed and users of both MRT and the airport will go through the underpass. Therefore, the space for commercial area should be consider in the planning stage.



Source: JICA Study Team

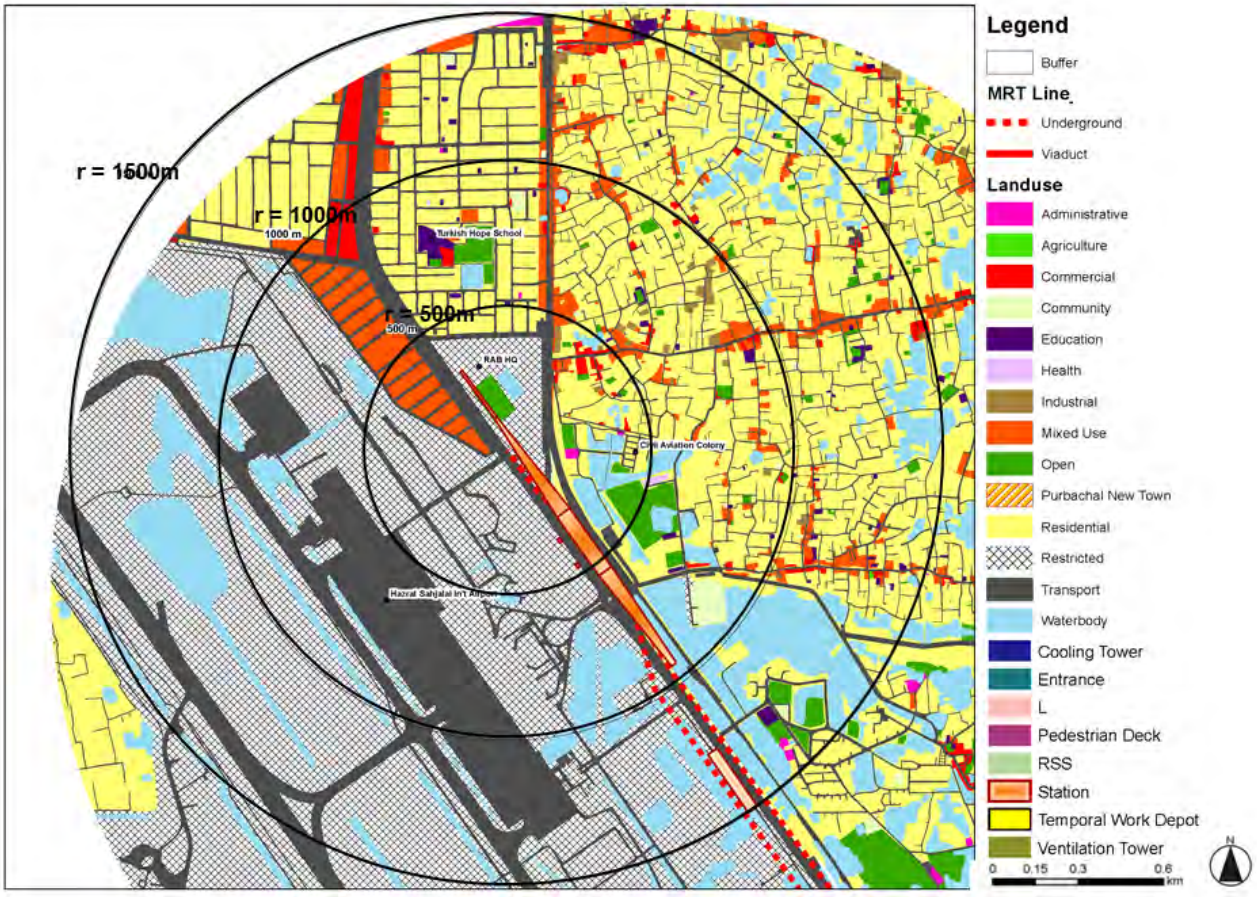
Figure 3.3.56 Concept Plan around Airport Terminal 3 Station

12) Airport Station

(a) Current Land Use of Catchment Area

3.68 This station is adjacent to Shahjalal International Airport, and it will become the gateway to Dhaka City. In terms of public transport, the BR airport station and bus facilities are currently under development but access by public transit is not convenient yet, therefore most users access the airport by car. Uttar's residential area is located in the north of the airport, as well as many residential areas.

3.69 At present, the development of an Airport village is proceeding near the international airport entrance. It will include CAAB headquarters, shopping malls, hotels currently under construction. In addition, this is where the new international airport will be located in the future. BRT 3 is also planned in the north of the airport, and it is the area where BRT, BR, MRT, buses and other transportation will be concentrated.



Source: JICA Study Team

Figure 3.3.57 Land use around Airport Station

a	b	c
		
Traffic Congestion at proposed Station	Shopping Complex Under Construction near Proposed Station	Traffic Congestion at proposed station
d	e	f
		
Hazrat Sahjalal Int'l Airport	Rapid Action Battalion (RAB) Camp Area	Railway Station Near Proposed Station

Source: JICA Study Team

Figure 3.3.58 Current Conditions around Kamalapur Station

(b) Traffic Situation of Catchment Area

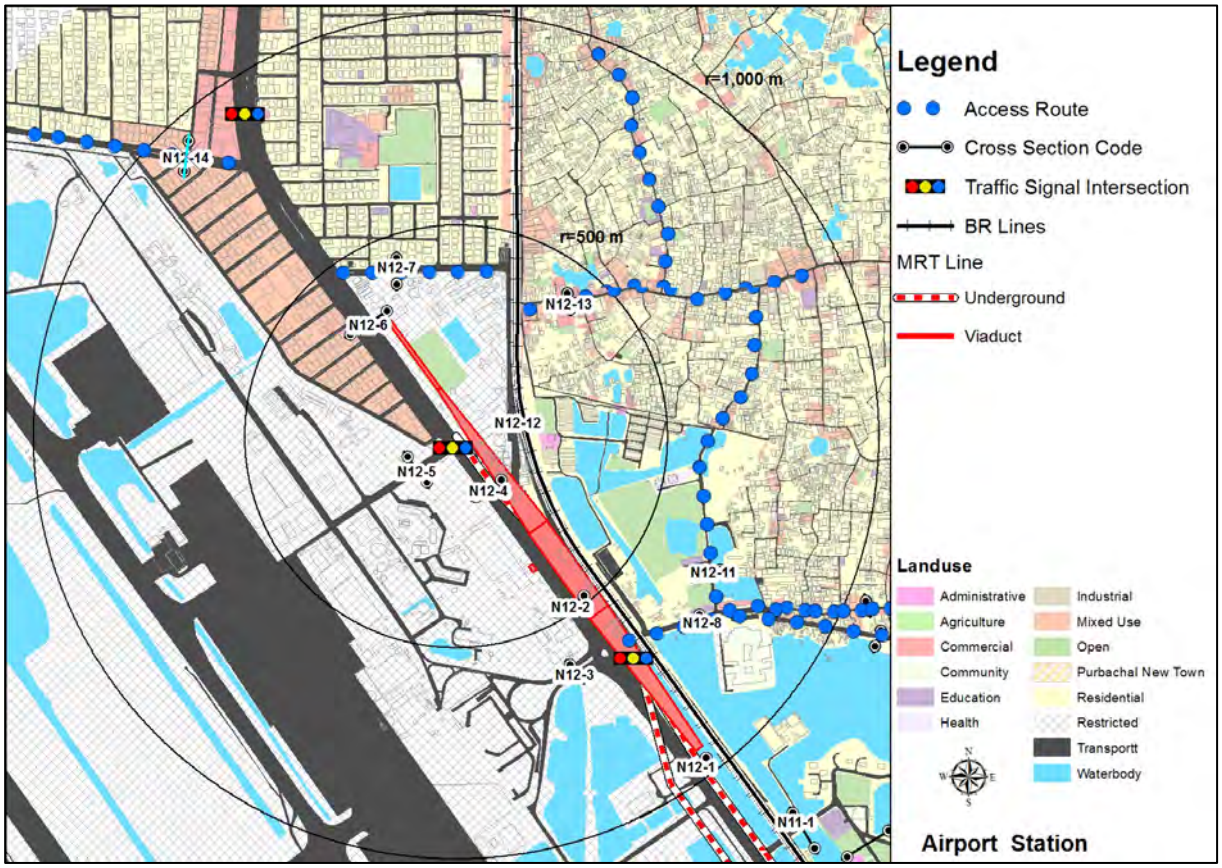
3.70 Features related to traffic conditions around the station are as follows:

(i) Although sidewalks exist along the Dhaka-Mymensingh Highway, the pavement is inadequate, and it is difficult to access the airport on foot.

(ii) Access to the airport from the BR airport station is provided with sidewalks and pedestrian deck with an escalator, but the walking environment is not efficient and there are few airport users who access the airport by walking from the station. Therefore, access by a car is most common.

(iii) Although the walking environment of the Uttar residential area planned by RAJUK is relatively good, some sidewalks are not paved.

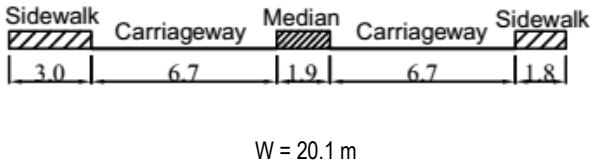
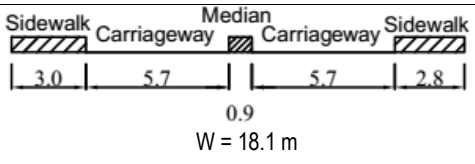
(iv) A densely urban area spreads to the east side of the planned station. It is difficult to move because the road is narrow, and the pavement condition is poor.



Source: JICA Study Team

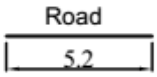
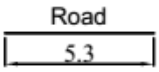
Figure 3.3.59 Transportation Network around Airport Station

Id	Cross-Section	Photo
N12-1 Dhaka-Mymensingh Highway	Sidewalk (Unpaved) 1.5 / Carriageway 14.0 / Median 0.8 / Carriageway 14.3 / Greenary 3.7 / 1.9 W = 36.2 m	
N12-2 Dhaka-Mymensingh Highway	Sidewalk 3.7 / Carriageway 19.1 / Median 0.8 / Carriageway 20.6 / Sidewalk 3.3 / Road 8.9 / Drainage (Paved) / Divider 0.5 / Road 4.6 W = 62.6 m	
N12-3 Entrance of Airport	Sidewalk 2.2 / Carriageway 13.4 / Median 6.6 / Carriageway 13.4 / Sidewalk 2.0 W = 37.6 m	
N12-4 Dhaka-Mymensingh Highway	Sidewalk 5.5 / Carriageway 1.8 / 19.1 / Median / Carriageway 12.2 / Sidewalk 3.4 / Road 5.6 W = 48.4 m	
N12-6 Dhaka-Mymen-singh Highway	Sidewalk 1.8 / Carriageway 13.2 / Drainage / Sidewalk 5.8 / Carriageway 19.1 / Median 0.8 / Carriageway 12.2 / Sidewalk 3.4 / Road 5.6 W = 63.0 m	

Id	Cross-Section	Photo
N12-7 Sahesta Kha Road		
N12-8 Hazi camp Road		

Source: JICA Study Team

Figure 3.3.60 Main Road Section around Airport Station

Id	Cross-Section	Photo
N12-11 Bangamata Fajilatunessa Road		
N12-13 Mozameel Haque Road		

Source: JICA Study Team

Figure 3.3.61 Minor Road Section around Airport Station

(c) MRT Impact on Urban Development

3.71 In terms of MRT impacts on the area, the following can be expected:

(i) Most airport users access by car and there are limited number of airport users to access by Bangladesh Railway. After MRT construction, it is possible to access from the airport to center of city. In order to improve access, the development around the airport is promoted (Daytime worker population: 2,500 to 29,400).

(ii) As the station is located in the future, the development of residential areas on the east side of the station will continue and the population will increase. (Nighttime population: 5,900 to 71,700)

Table 3.3.12 Socio-economic Indicators around Airport Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	6.4	68.7
		Density (No/ha)	20.3	218.7
	Night	No.(000)	5.9	71.7
		Density (No/ha)	18.8	228.1
Daytime Population	Worker (000)		2.5	29.4
	Student (000)		1.8	15.4
	Total		4.3	44.8
Nighttime Population	Worker (000)		2.4	32.8
	Student (000)		1.4	14.9
	Total		3.8	47.7
Population Day/Night Ration (000)			1.1	1.0

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

3.72 Many airport users access by car, and access by walking and from the bus stop is not safe. In addition, it is difficult to carry luggage due to bad condition of roads and sidewalks. If the situation remains the same, users of MRT Line 1, BRT Line 3, BR, bus, CNG and rickshaws can be expected to agglomerate in front of the airport in the future. To avoid such situation, the following TOD policies are encouraged for Airport Station.

(i) **Development of multimodal hub:** Without such development, various transportation facilities such as BR, BRT 3, bus, CNG, rickshaw and so on would agglomerate in front of the airport station, causing great traffic congestion. It is desirable to develop a multimodal hub with transportation nodes of each transportation system and to use the land of the airport station and service roads of Dhaka-Mymensingh Highway. As traffic demand is very high, it is necessary to secure sufficient space including the surrounding site and to develop it.

(ii) **Improvement of walking environment around stations and the airport:** The walking environment around the airport is not well developed, escalators are installed in pedestrian bridges but not well maintained, and sidewalks exist but are not well paved. Therefore, walking with baggage is difficult. In addition, pedestrian access from the Uttar residential area located in the north is also inadequate, and additional maintenance is needed.

(iii) **Access to commercial facilities:** Construction of hotels and commercial facilities is undergoing in the vicinity of the airport. Access to the commercial facility will be improved together with access to the airport and the development of the pedestrian network should be implemented.

Source: JICA Study Team

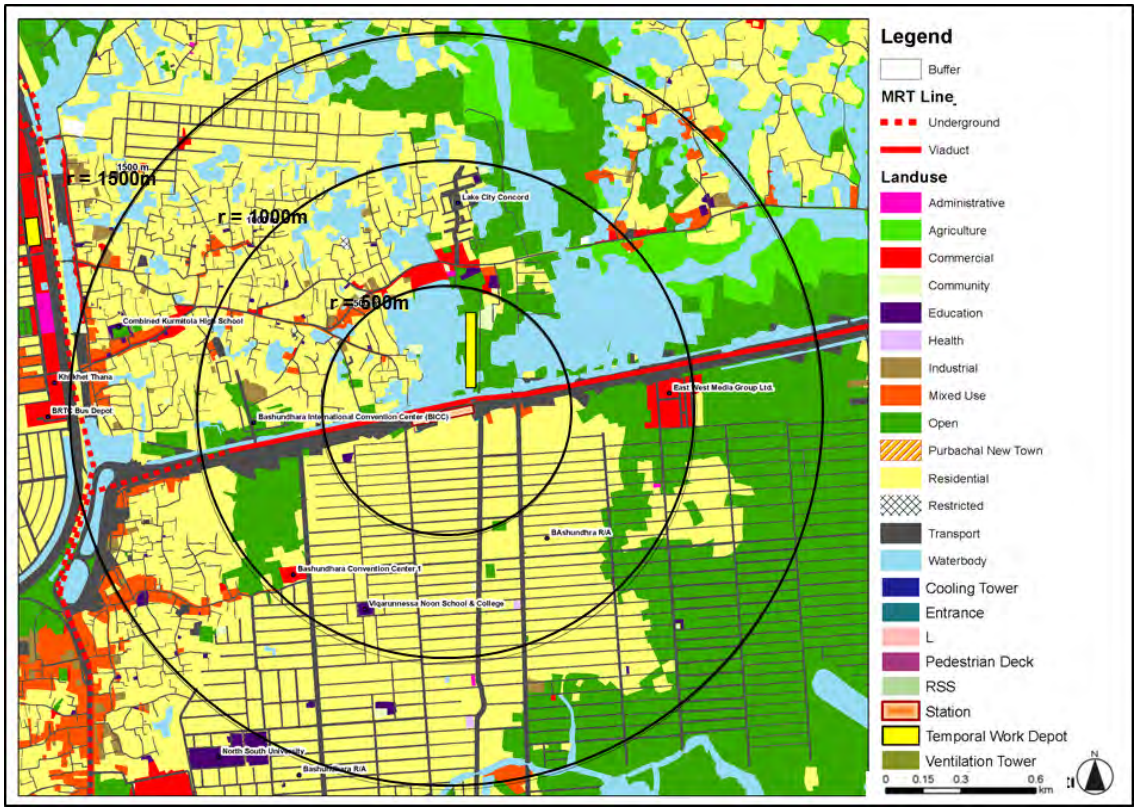
Figure 3.3.62 Concept Plan around Airport Station

13) Bashundhara Station

(a) Current Land Use of Catchment Area

3.73 This station will be built as an elevated station on the Purbachal express highway, which is the main road in Dhaka Eastern Development District, where the development of Purbachal new town and Bashundhara residential area is progressing. The BICC (Bashundhara International Convention Center) and the middle- to high-rise apartments are located on the northern side, but most of the land within 500 m radius of the station consists of wetlands. In addition, the Bashundhara residential area spreads to the southern side of the Purbachal express highway and construction work is going on at the moment.

3.74 Purbachal express highway is planned as a 300 feet wide road, with four lanes in the center, four lanes as a service road, vacant lots as transportation and commercial land on both sides. Lake city which has 16 stories high-raise apartments is located about 500 m north of Purbachal express highway, but the majority of the surrounding areas are wetlands, and in the rainy season the area is vulnerable to flooding. In addition, the Bashundhara residential area spreads to the south side of Purbachal express highway and large-scale development is proceeding.



Source: JICA Study Team

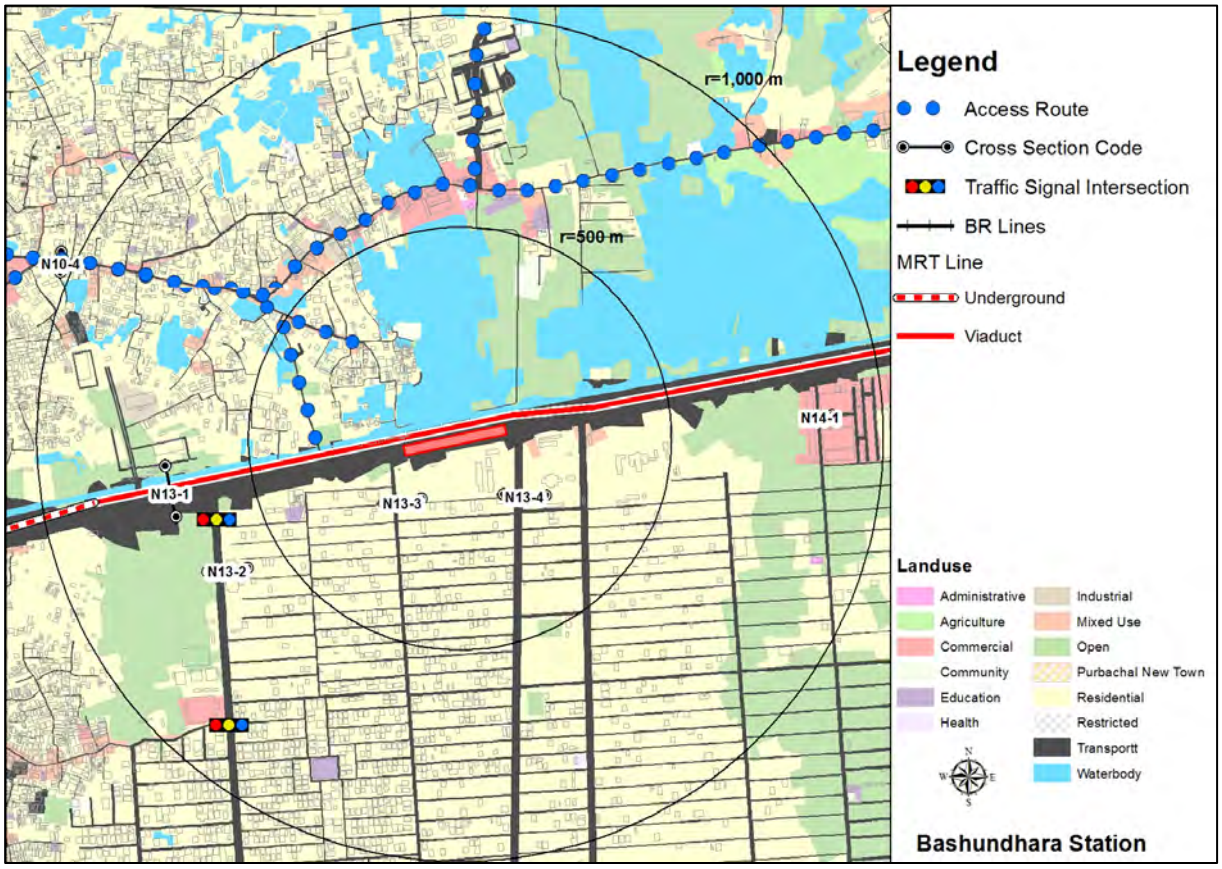
Figure 3.3.63 Land use around Bashundhara Station

(b) Traffic Situation of Catchment Area

3.75 Features related to traffic conditions around the station include:

(i) On the Purbachal express highway currently under construction, four lanes in the center, four lanes as service roads are planned. Canal and sidewalks are planned on the both sides of the road.

(ii) The number of roads with sidewalks in the Bashundhara residential area is limited, but they are wide and residential areas are developing.



Source: JICA Study Team

Figure 3.3.64 Transportation Network around Bashundhara Station

Id	Cross-Section	Photo
N13-1	Service road 12.2 | Greenary 7.1 | Carriageway 10.5 | Median 3.0 | Carriageway 10.5 | Greenary 10.8 | Service road 8.6 | Sidewalk 6.3 W = 69.0 m	n/a

Source: JICA Study Team

Figure 3.3.65 Main Road Section around Bashundhara Station

Id	Cross-Section	Photo
N13-2	Road 16.4	n/a
N13-3	Road 8.2	n/a
N13-4	Road 16.4	n/a
N14-1	Road 7.9	n/a

Source: JICA Study Team

Figure 3.3.66 Minor Road Section around Bashndhara Station

(c) MRT Impact on Urban Development

3.76 In terms of MRT impacts on the area, the following can be expected:

(i) Bashundhara residential area is located near the station. Most areas around the station are residential, it is conceivable that MRT will facilitate commutes for people who work or live in the area.

(ii) As MRT will improve access to Gulshan and Banani and shorten of trip times, MRT development will promote residential development around the station.

Table 3.3.13 Socio-economic Indicators around Bashundhara Station (Radius 1 km area)

			2015	2035
Population	Day	No.(000)	72.1	87.4
		Density (No/ha)	229.4	278.2
	Night	No.(000)	75.1	111.3
		Density (No/ha)	239.1	354.2
Daytime Population	Worker (000)		27.3	32.2
	Student (000)		16.7	18.1
	Total		43.9	50.2
Nighttime Population	Worker (000)		30.4	50.9
	Student (000)		16.6	23.2
	Total		47.0	74.1
Population Day/Night Ration (000)			1.0	0.8

Source: JICA Study Team (Using RSTP Database)

(d) Policies and Directions of TOD

3.77 It is expected that development in the Bashundhara residential area and of the northern side of the station will further continue in the future. The area will become increasingly residentia, but since the area along the Purbachal express highway is planned as a commercial area, commercial facilities will also be located around the station. Recommended TOD policies for Bashundhara station include:

(i) **Development of station plazas:** In accordance with the Private Residential Land Development Rules, Bashundhara residential area, which got a development permission, is not a plan to be integrated with MRT development, so changing the land use by replotting is necessary to implement TOD. Construction of a huge private residence has already been completed near the station, but since there is still a site as a park, it is necessary to implement replot and change the land use, and to develop a station plaza. In addition, since there are many residential areas around the station, it is possible for residents and private companies to get a lot of benefits by developing commercial area around the station and as there is a planned construction site on the north side of Purbachal express highway, it is necessary to use continuously as a station plaza.

(ii) **Improvement of North-South access:** The Purbachal express highway, which is under construction, may divide the area between north and south. Therefore, pedestrian decks and underpasses shall be constructed to secure the access.

(iii) **Promotion of urban development by changing the land use:** Bashundhara residential area has already been approved by RAJUK, but it is appropriate to locate the commercial area around the station and promote mixed uses to facilitate TOD.

Source: JICA Study Team

Figure 3.3.67 Concept Plan around Bashundhara Station

14) POHS Station

(a) Current Land Use of Catchment Area

3.78 Elevated stations on the Purbachal express highway are planned. POHS (Police Officers Housing Society) and Bashundhara residential area are located in the north of the road. A commercial area is planned in the south of the road, and the southern part is occupied by the residential areas of POHS.

3.79 The surrounding area was originally designated as agricultural land, but it has been converted into residential area by the development of POHS and Bashundhara residential area. Like the area around Bashundhara station, many wetlands occupy the area in the north side of Purbachal express highway, and it often gets submerged in the rainy season. For new development, embankments are necessary.