
APPENDIX 8: FREIGHT TRANSPORT SYSTEMS

8.1 General

In the urban transport study, it usually gives strong emphasis on the passenger traffic in the study area, and has been done less or no consideration of the impacts of freight traffic and its impacts on passenger's traffic. It is an obvious fact that passenger traffic (public and private transport) is the dominant factor of contributing traffic congestion in the city.

In the developing countries even in the developed countries, it can be seen that inefficient freight transport system has been a common contributor to the increase of congestion because a freight truck occupies relatively larger area on the road than other transport modes (car, taxi, motorcycle etc.) with less passenger loading.

In terms of the efficiency of passenger transport in the city, it may be one of the ways to alleviate heavy congestion in the city centre by minimizing and streamlining freight traffic; however, freight traffic, in other words "goods movement", is a necessary traffic for the people living in the city to run a business and purchase/sell a goods. With efficient freight system, the people will be able to purchase the consumable commodities with an economical price.

Bangladesh will need to conduct another study to formulate comprehensive freight transport master plan in the country and/or in Dhaka. Currently freight infrastructures exist in and around Dhaka, but the level of performance could be quite low due to lack of proper infrastructure, aging infrastructure, and un-systematic and inefficient traffic movement. As a preliminary study, this study just reviews the past reports and national policies, analyzes current situation and then propose necessary actions for the future in order to achieve better freight transport systems.

8.2 Present Condition on Freight Transport

8.2.1 Intra-City Freight Traffic

(1) **Strict Regulation for Truck Movement in Dhaka City Corporation (DCC)**

Operating a truck in DCC is strictly regulated by the Metropolitan Police Commissioner. Currently, trucks and trailers (large-size trucks) are not allowed to move within DCC between 7:00 in the morning and 20:00 in the evening on weekdays. For covered trucks, however, they can move between 10:00am to 16:00pm and 20:00pm to 7:00am on weekdays. Warehouses, factories and markets will be definitely affected by its regulations since they are not able to carry their goods out

from their properties or vice versa. On the other hand, this regulation has been established to avoid traffic congestion by massive freight traffic by trucks. Especially in the morning and evening peak hours, almost all trucks are prohibited to operate in the city. On the other hand, it could interrupt Bangladesh's economic activities in terms of goods movement.

(2) Freight Traffic Volume in Dhaka CBD

As mentioned in Chapter 4, the Study was conducted the traffic survey in 2009. With the analysis of its survey, the characteristics of truck traffic will be emerged. As a result of screen line survey which was carried out at 51 locations, Figure 8.2-1 shows comparison of truck demand on East-West screen line between 2004 and 2009.

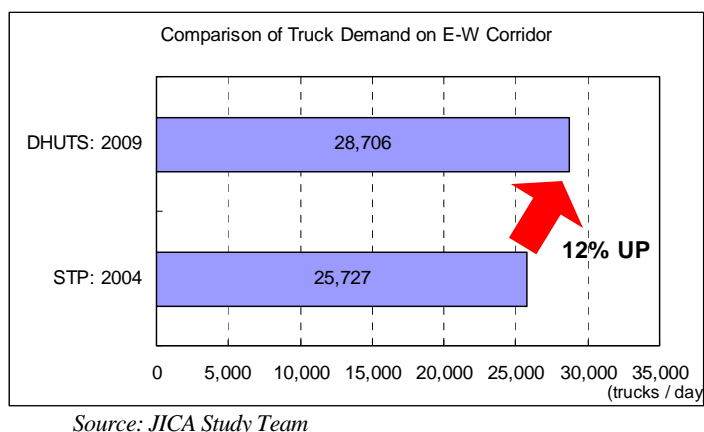
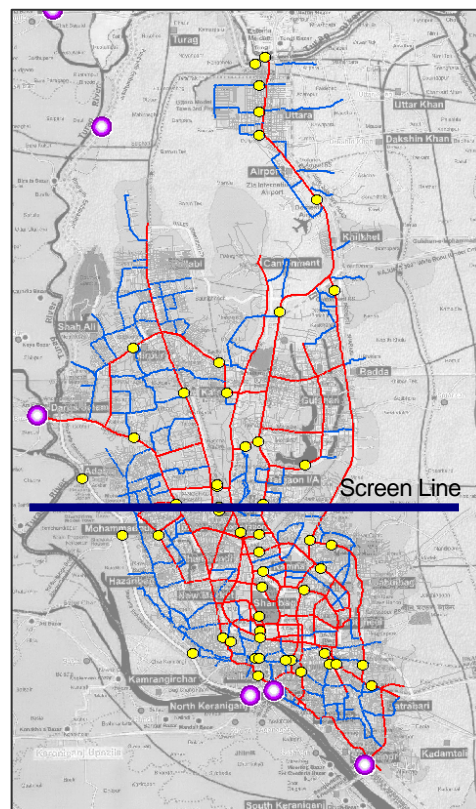


Figure 8.2-1 Comparison of Truck Demand on E-W Corridor



In 5 years after the STP study, the truck traffic had been increased by 12 %; while, total traffic including all types of motorized vehicle was a rise in the percentage of only 2%. Despite the strict truck regulation on moving within DCC, it is likely that the freight traffic has been growing in the central part of Dhaka.

In order to understand the impacts of the truck ban regulation, the share of truck in each hour is shown in Figure 8.2-2. The shaded part during 7:00hrs and 20:00hrs means that the large trucks are not able to enter and operate in the city. It is apparent that the share of truck after 20:00hrs are dramatically increased by 50-90% in most survey points. Some stations indicates relatively higher share of truck in the regulated hours. This is because the survey stations are located in the periphery of DCC.

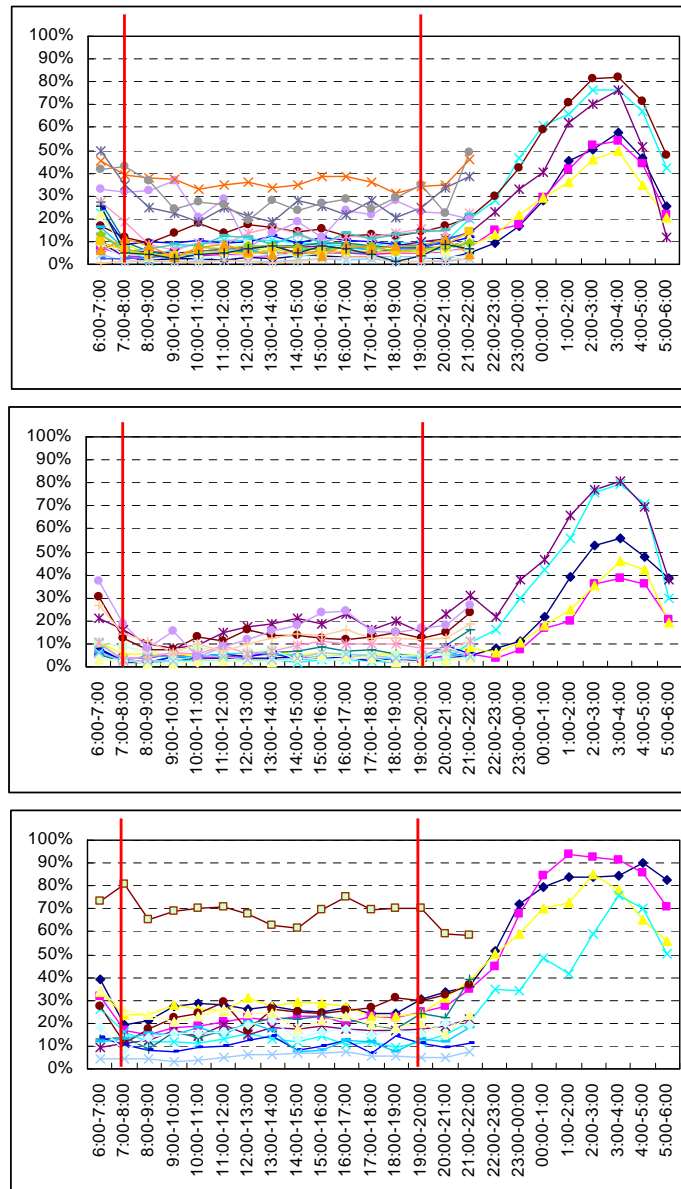


Figure 8.2-2 Hourly Traffic Volume at Screen Line Stations

(3) Goods Transport by Para-transit

Truck movement is strictly prohibited within DCC in the daytime. Though the covered truck can operate during the designated daytime, it is unlikely to perform as an inner-city (or urban) freight transport mode. The photo shown below represents a measure of inner-city freight movement by rickshaw van.



Photo 8.2-1 Freight Transport by Rickshaw Van

It is a usual and changeless scene in Dhaka that people are carrying goods by rickshaw, rickshaw van and auto rickshaw. As they try to carry it as much as possible, total weight is supposed to be heavier, and thus it results in low travel speed and eventually disrupts traffic flow on the road. Such small-scale transport system is quite ineffective and unproductive in terms of transport time and loading capacity as well as their destination could be limited since passing through some arterial roads is banned for rickshaw and rickshaw van.

8.2.2 Freight Traffic between Dhaka and Chittagong

Chittagong Port (sea port), where is located in the south of Bangladesh and about 300km away from Dhaka, is one of the sea gateways for trading goods to/from Bangladesh. Mongla Port, where is situated in the south western part of Bangladesh, is the second sea port though it deals with only 10% of all container and cargo traffic in Bangladesh.

The capital city, Dhaka, has a population of more than 10 million estimated by Bangladesh Bureau of Statistics (BBS) as of 2008. It means that Dhaka would be the largest consumption area in the country. With no doubt, most of cargoes are necessarily concentrated into Dhaka from other part of the country and foreign countries.

As mentioned above, the corridor linked between major consumption area “Dhaka” and main sea gateway “Chittagong” could be a significant economic corridor. Table 8.2-1 shows freight cargo volume transported between Dhaka and Chittagong. Approximately 90% of all cargoes were transported by trucks on the basis of weight (ton); while the transport by railway and IWT was quite limited transport with a rate of less than 10%. Railway has the smallest portion of cargo transport among them.

Table 8.2-1 Freight Cargo Volume between Dhaka and Chittagong

Fiscal Year	Cargo Volume (Tons)				Modal Split (%)			
	Railway	Road	IWT	Total	Railway	Road	IWT	Total
2003/2004	3,473	74,167	4,908	82,548	4.2%	89.9%	5.9%	100.0%
2004/2005	3,206	78,567	5,649	87,422	3.7%	89.8%	6.5%	100.0%

Source; Techno-Economic Feasibility Study of A Deep Sea Port in Bangladesh (June, 2009)

8.2.3 Existing Freight Infrastructure and Its Performance

(1) Rail-based Transport

It has passed about 150 years since the first rail was established in Bangladesh in 1862. Though it still plays an important role in Bangladesh so far, it is also placed in serious situation that rail track, locomotives and rolling stock are relatively aged due to lack of proper maintenance and its budget, and the existence of two gauges system (meter gauge and broad gauge) on the same track exists.

Despite such serious situation, BR plays a part of cargo transport in Bangladesh, specifically between Dhaka and Chittagong. As shown in Table 8.2-2, container volume in tonne transported by railway has a tendency to grow year and year, and it recorded 81,930 TEUs in the fiscal year of 2007-2008.

Table 8.2-2 Container Services between Chittagong and Dhaka

Fiscal Year	Container Volume (in TEUs)	Container Volume (in Tonnes)	Average Weight of TEU (in Tonnes/ TEU)
1989-1999	38,426	303,551	7.9
1999-2000	45,621	355,163	7.8
2000-2001	52,737	387,647	7.4
2001-2002	58,301	419,662	7.2
2002-2003	61,026	447,688	7.3
2003-2004	70,247	541,963	7.7
2004-2005	71,981	529,860	7.4
2005-2006	81,270	577,722	7.1
2006-2007	76,572	573,903	7.5
2007-2008	81,930	651,830	8.0

Source; Information Book 2008 (Bangladesh Railway)

As a container's gateway by railway to Dhaka, Kamalapur ICD (Inland Container Depot) is located next to Kamalapur Railway Station, where is surrounded by busy downtown area and markets (see Figure 8.2-3). Its ICD has an area of 100,000 m² including Container Freight Station (CFS) of 8,182 m². In spite of such a huge area in the central part of Dhaka, some CFS facilities are not used and it is wasted an irreplaceable land in downtown area according to the past study ("Feasibility Study for Construction of A New ICD near Dhirasram Railway Station" funded by IDA in April 2007) (hereinafter called the past F/S study).

The past F/S study estimated the capacity of Kamalapur ICD at 84,000 to 90,000 TEUs per year. As shown in Table 8.2-3, the latest data (2007-2008) indicates that their capacity has already reached approximately 98%. Saturation of container handling will be coming soon. With the time of saturation, container traffic by railway perhaps will remain state or even reduce.



Source: Google Earth

Figure 8.2-3 Satellite Image around Kamalapur ICD

(2) Road-based Transport (Truck)

Focused on the significant economic corridor between Dhaka and Chittagong, a road-based freight transport (truck transport) has dominant portion with approximately 90%. At the same time, it also means that a large number of trucks are moving everyday between them. The past F/S study on Dharasram ICD in 2007 points out that a truck is not allowed by the customs to carry “bonded container” on the road. Their main cargoes, therefore, might be a break-bulk cargo.

According to Bangladesh Truck Malik Samity (BTMS), there are three types of truck operation in Bangladesh.

- Intra-Regional Truck: operating within the city (Approx. 20,000 trucks)
- Inter-Regional Truck: operating between districts (Approx. 20,000 trucks)
- Local Truck: operating outside Dhaka (Approx. 20,000 trucks)

A truck company who owns 20 to 30 trucks accounts for 25% of all companies; while, a company with less than 10 trucks occupies 75%. There might be quite rare case that a company runs their business with only one fleet.

A truck terminal as a node of freight transport by truck will have to play an important role in the city

in order to streamline freight movement and then alleviate freight traffic in urban area. In Dhaka, about 14 truck terminals for inter- and intra-district service had existed in the early 1990's. These terminals were merged into 6 terminals in few decades as shown in Table 8.2-3.

They are mainly operated and managed by BTMS and Truck Workers Association. Though they are regarded as a Truck Terminal, it actually has no function to handle the cargo and goods there, but a function to park a large number of trucks.

Public-operated terminals basically owns the land area with more than 0.5 ha which can be accommodated approximately 500 trucks. On the other hand, most private-operated terminals are located on the roadside. They may illegally occupy roadside space although it needs another investigation on this matter to make it clear.

Table 8.2-3 Outline of Truck Terminals

Truck Terminal		Total Area	Terminal Capacity	Parking Charge (BDT./24hr.)
Public	1.Amin Bazar Truck Terminal	2.5ha (250m×100m)	about 500 to 700 trucks	30
	2.Dayagaonj(Saidabad) Truck Terminal	0.5ha (50m×100m))	about 500 trucks	30
Private	1. Tejgoan Truck Terminal	Roadside	about300 to 400 trucks	40
	2. Mohammadpur Tuck Terminal	Roadside	about300 to 400 trucks	N/A
	3. Tongi Truck Terminal	1.5ha	about300 to 400 trucks	30
	4. Pagla Truck Terminal	Roadside	about200 to 300 trucks	30

Source; JICA Study Team

Amin Bazar Truck Terminal (Photo 2) is designated as an inter-district truck terminal; while, other terminals have been operating on an inter-district basis. Over the years, new intra-district terminals have established in Dhaka. These terminals are not officially recognized by the government except for Dayaganj Truck Terminal.



Photo 8.2-2 Amin Bazar Truck Terminal (left & right above)



Photo 8.2-3 Dayagoanj Truck Terminal



Photo 8.2-4 Tejgoan Truck Terminal

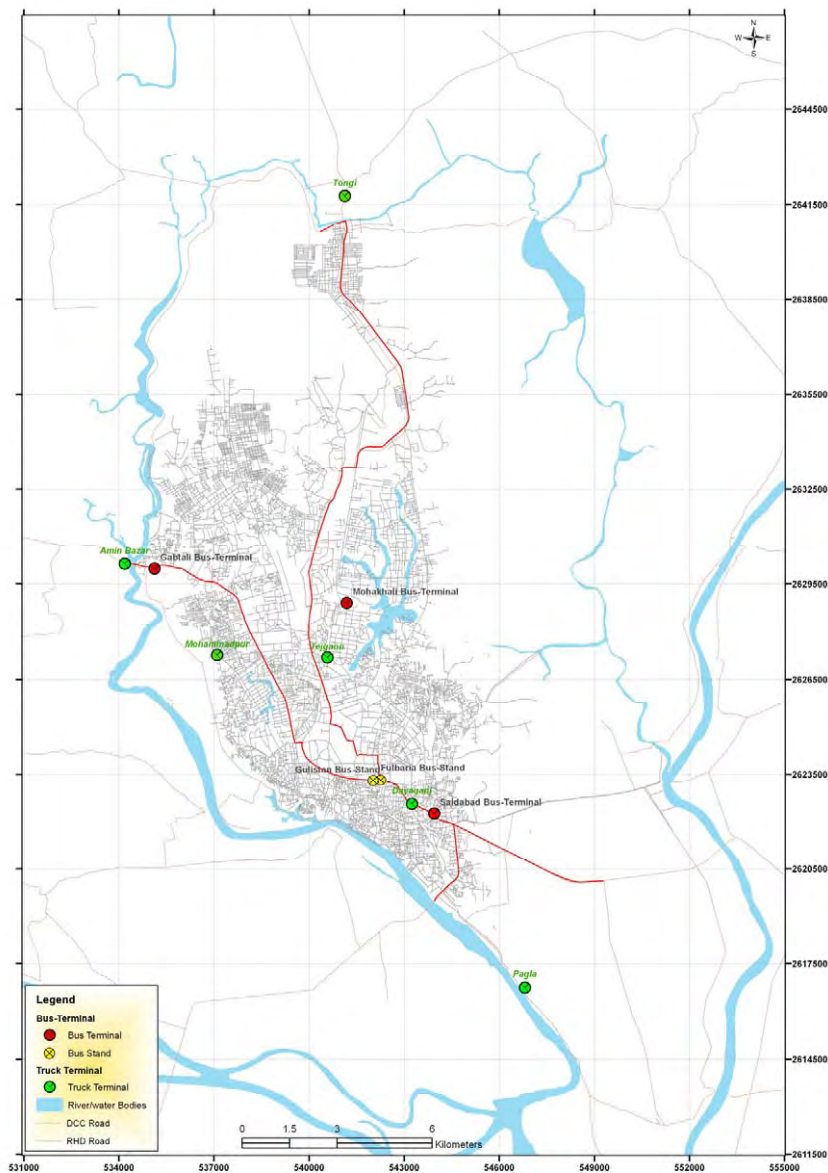


Figure 8.2-4 Bus and Truck Terminal Map

(3) River-based Transport (Inland Waterway Transport [IWT])

Bangladesh has a 24,000km-long inland waterway network, which it seems one of the largest inland waterway networks in the world. Out of 6,000km are under navigable condition by mechanized vessels in monsoon season, and only 3,800km are also navigable in all seasons.

Table 8.2-4 shows cargo volume by IWT in Bangladesh. There are 21 inland ports operated and managed under Bangladesh Inland Waterway Transport Authority (BIWTA). Among these ports, cargo volume with 24 million tons was recorded in fiscal year 2007-2008. Of which 45% are dealt with Dhaka and surrounding area (Dhaka, Tongi and Narayanganj).

Table 8.2-4 Yearly Cargo Volume

Port	2005-2006	2006-2007	2007-2008
	(mil. ton)	(mil. ton)	(mil. ton)
Dhaka	4.12	5.12	7.32
Tongi	0.33	0.37	0.44
Mawa	0.40	0.45	0.54
Charjanajat	0.32	0.36	0.53
Narayanganj	2.27	2.68	3.27
Narsingdi	0.03	0.03	0.07
Mirkadim	0.48	0.55	0.66
Ashuganj-Bhairab	1.08	1.14	1.55
Chatak	0.24	0.27	0.33
Meghnaghat	0.26	0.30	0.36
Khulna	0.44	0.41	0.35
Noapara	2.01	2.03	1.71
Chandpur	0.97	0.98	1.02
Barisal	1.02	1.32	1.56
Bhola	0.21	0.23	0.28
Borguna	0.05	0.06	0.07
Aricha/Paturia	1.15	1.26	1.25
Nagarbari/Notakhola	0.08	0.12	0.15
Daulatdia	0.65	0.68	0.84
Patuakhai	0.48	0.40	0.63
Baghabari	0.71	0.91	0.97
Total	17.53	19.90	24.11

Source: BIWTA

In Dhaka, 13 inland waterway terminals are located on the bank of Buriganga River, Sitalakkhya River and Turag River. Total length of basin covered by ports reaches approximately 40 km.

Table 8.2-5 shows cargo handling facilities of terminals in Dhaka area. Most of terminal has no facilities to handle the cargo. In case of Sadarghat Terminal, there is no facility, but they are handling cargo. The cargo handling area is situated adjacent to the terminal building at Sadargahat Terminal. Trucks to be loaded from a vessel are parked on the carriageway of narrow road on the riverside. Cargo is loaded from head of vessels directly to a truck or at the storage area put at the riverbank due

to no space for loading and unloading of trucks. This type of activities on the narrow road results in heavy traffic congestion in the terminal area. It is definitely due to lack of facilities and inter-modality between modes.

Table 8.2-5 Outline of Inland Water Terminals (Cargo Handling Facilities)

	Cargo Handling Facilities						
	Landing station	Parking Yard	Pontoon	Waiting or Transit shed	Steel Gangway	Steel Jetty	RCC Jetty
1. Pagla Bazar Terminal							
2. Sadarghat Terminal							
3. Swarighat Terminal				10			
4. Kholamora Terminal							
5. Bashila Terminal							
6. Gabtali Terminal			1		1		
7. Amin Bazar Terminal							
8. Shinnirtek Terminal							
9. Ashulia Terminal		1	1		1		
10. Badamtali Terminal			2	3		2	2
11. Fatulla area			1		1		
12. Keraniganj, Lalbagh and Sutrapur areas	1		2	5		5	1 & 3RCC steps
13. Narayanganj Terminal			3	8		3	

Source: BIWTA Annual Report



Photo 8.2-5 Pagla Bazar Terminal

As for Another case in Narayanganj Terminal, it is situated on the bank of Sitalakkhya River. Access road to the port runs along the riverbank from the passenger terminal area to the cargo handling facilities situated nearby. The approach path to the main entrance of passenger terminal penetrates the spacious parking yard; however it is usually observed that parked or idled vehicles occupy its yard, and there is no space for arrived passengers and vehicles for coming passengers such as rickshaws and auto rickshaws. Here, freight vehicles interrupt the passenger's opportunity for good inter-modal systems.

The main commodities handled at the terminals are agricultural products such as rice, betel-leaf,

coconut and green coconut, guava, seasonal fruits, and other commodities are finished products; steel coils, steel bundles, GI sheet, bakery products, plastic goods, and clothes.

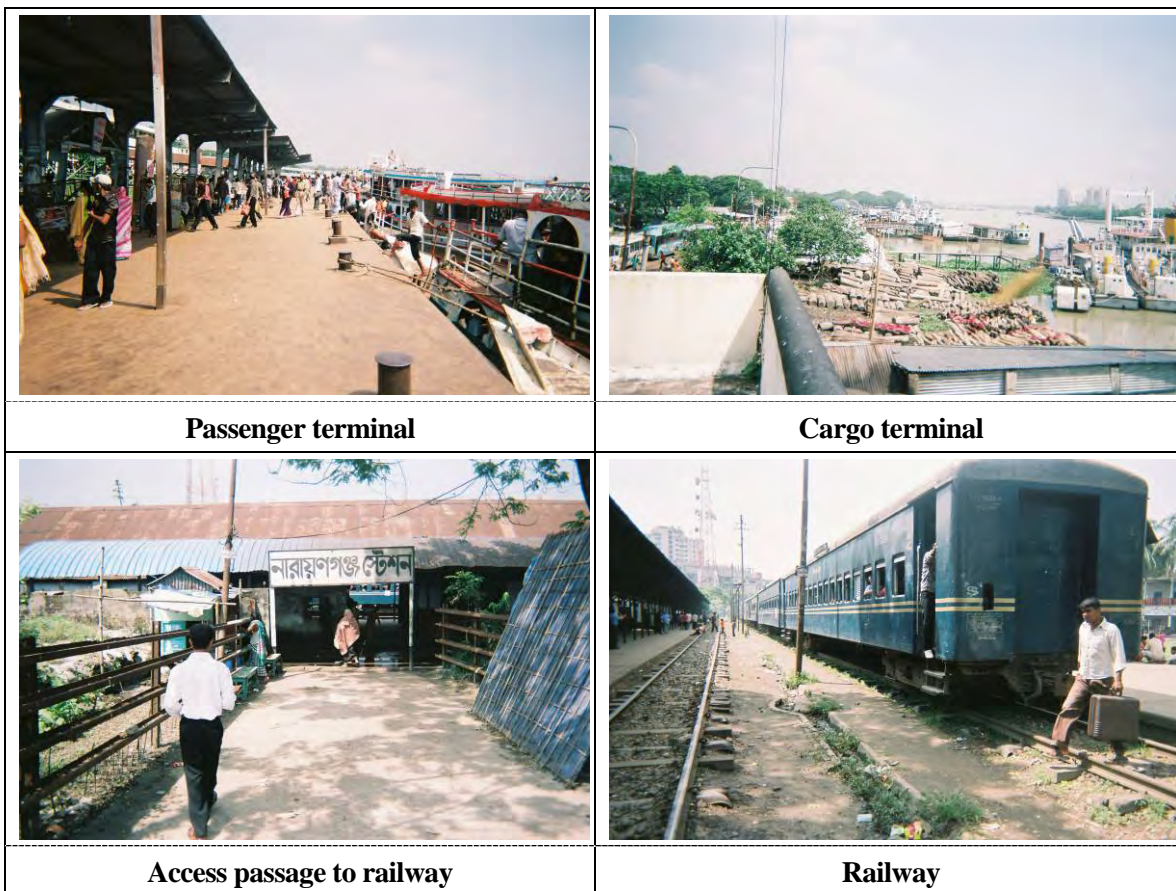


Photo 8.2-6 Narayanganj Terminal

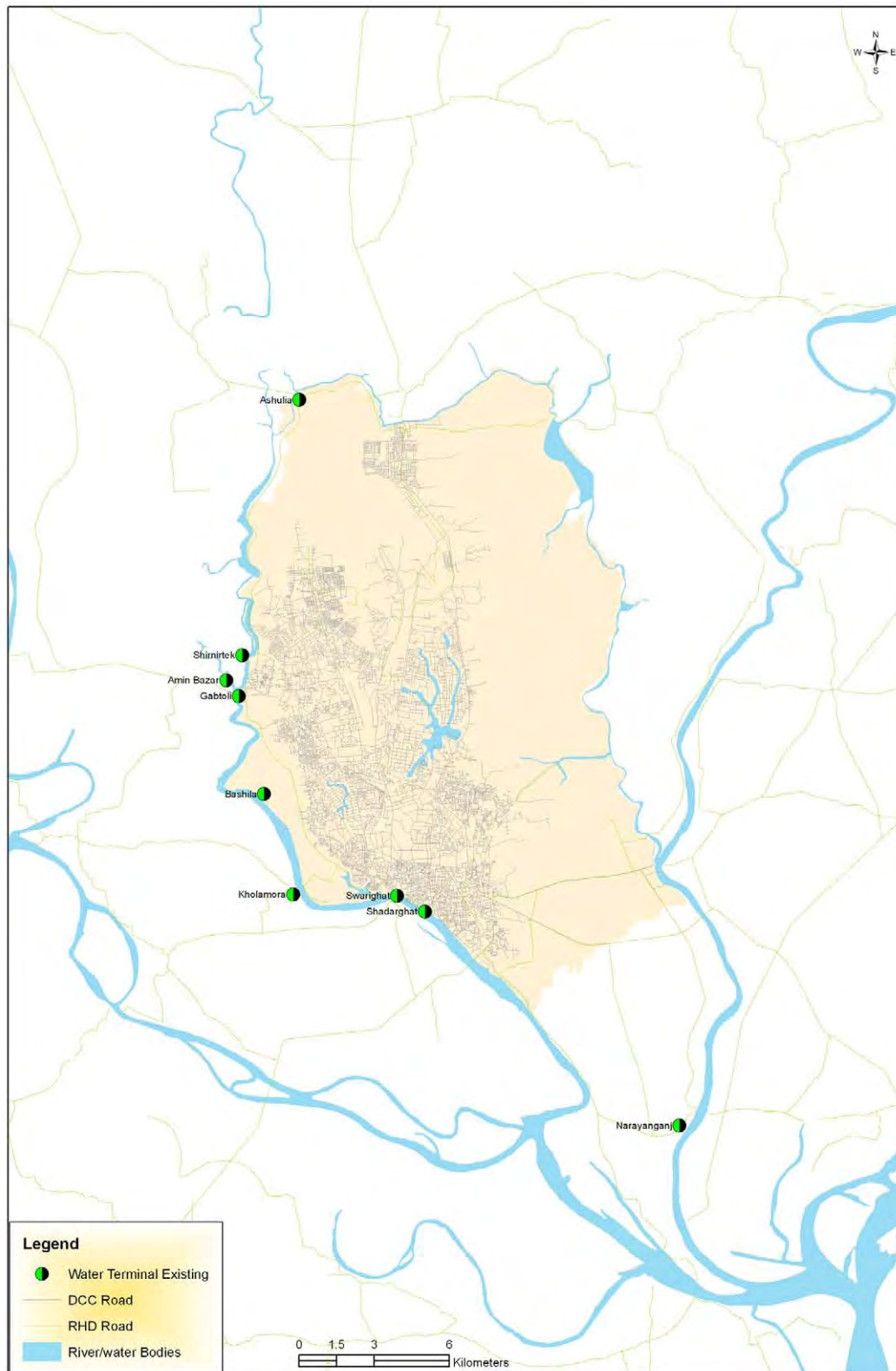


Figure 8.2-5 Water Terminal Map

8.3 Competitive Aspects among Other Modes

Road-based transport has now dominant share for transporting cargoes with approximately 90%, followed by River-based (6.5%) and Rail-based (3.7%). It seems that the shipper prefer to transport their goods and products by truck between Dhaka and Chittagong. In terms of transport cost and time taken, however, the advantage of truck transport cannot be found out. Table 8.3-1 summarizes cargo tariff and transport time between Dhaka and Chittagong by transport mode.

Table 8.3-1 Comparison of Cargo Tariffs by Transport Mode

Items	ROAD	RAILWAY	IWT
Distance	264 km	340 km	304 km
Tariff per 5-ton truck	BDT 6,000	--	--
Tariff per ton	--	BDT 930	BDT 300
Tariff / ton-km	BDT 4.50	BDT 2.74	BDT 0.99
Time taken from Dhaka to Chittagong	8-10 hours	16 hours	18 hours
Loading Capacity	Low	High	High

Note: Tariff does not include handling costs and transfer costs.

Time taken and loading capacity are estimated by JICA Study Team.

Source: "Revival of Inland Water Transport: Options and Strategies" (WB, 2007)

From economic point of view, IWT is the best and economical way to transport goods, followed by Railway and Road. IWT can accommodate a large amount of general cargoes and containers with a vessel at one time. It might have no reasons for the shippers to select road-based transport for transporting between Dhaka and Chittagong from its viewpoint.

On the other hand, road transport obtains the advantages of transporting cargoes among three modes in terms of travel time, which time taken from Dhaka to Chittagong is estimated at about 10 hours. This factor is clearly depended on the status of infrastructure. With aging and unmaintained infrastructure, it will not be well-performed. For Road, the condition of road surface on the corridor between Dhaka and Chittagong is not satisfied and under insufficient maintenance. Furthermore, it is too narrow to pass a trailer through such corridor.

Railway shares its track with passenger train, and its capacity is necessarily limited. To maintain the waterway in navigable condition, the dredging work should be taken on a periodic basis. In this way, each transport mode has several constraints to operate cargo transport on the corridor.

With consideration of tariff and time taken, it is highly likely that the shipper emphasizes on transport time rather than transport cost. To reveal actual shipper's preference, however, the other surveys like shipper's interview survey will be required.

8.4 Industrial Development

In general, Land Use has a close relation with transportation plan, and it is largely affected to passenger and freight transport system. For instance, the high-dense resident area may generate a large amount of trips by residents. Industrial area may also have a potential to provide with a number of cargo trips by truck that carry goods into factories. Furthermore, by designating the industrial area on a strategic location in view of transport network and infrastructure, freight transport will have a benefit such as transport cost and time reduction due to the elimination of unnecessary movement within urban area. In this manner, it needs to analyze land use and reflect in the freight transport plan.

(1) Major Industrial Area in Dhaka

“Dhaka Metropolitan Development Plan 2015”, which was funded by UNDP, was issued in December 1995 in order to formulate Structure Plan, Master Plan and Detailed Area Plan in Dhaka Metropolitan Area. In the plan, they proposes future land use plan in view of current situation. Though there is no quantitative area for each criterion of land use, it is estimated through Geographical Information System (GIS). Table 8.4-1 shows quantitative comparison of industrial area by A Zone.

Table 8.4-1 Quantitative Comparison of Industrial Area by A Zone

Ranking	A Zone Code	Area	Area (km ²)	Industrial Area (km ²)	Share of Industrial Area
1	10	RAJUK	10,001	431	4.3%
2	12	RAJUK	8,537	381	4.5%
3	15	RAJUK	42,449	203	0.5%
4	3	DMA	5,304	191	3.6%
5	11	RAJUK	23,893	174	0.7%
6	17	RAJUK	13,258	141	1.1%
7	9	RAJUK	3,273	130	4.0%
8	4	DMA	5,335	94	1.8%
9	5	DMA	4,358	85	2.0%
10	16	RAJUK	15,291	68	0.4%
11	2	DMA	2,724	51	1.9%
12	19	RAJUK	6,151	32	0.5%
13	1	DMA	1,661	32	1.9%
14	18	RAJUK	13,050	20	0.2%
15	8	DMA	3,407	10	0.3%
16	7	DMA	2,665	8	0.3%
17	6	DMA	4,410	2	0.0%
18	13	RAJUK	9,723	1	0.0%
19	14	RAJUK	22,462	-	0.0%
	Total		197,953	2,054	Ave. 1.0%

Source: JICA Study Team

Note: Estimated from DAP plan, and it may not consistent with actual area.

In terms of the size of industrial area, Zone 10 (Narayanganj) has the largest area of 431 km² among 19 zones. Meanwhile, Zone 12 (Rupganj) has a largest share of industrial area (4.5%) against its total

area. In top 5 zones of the size of industrial area, only Zone 3 (Demra) is ranked 4th in Dhaka Metropolitan Area except for DCC.

According to land use plan in DAP, the government put strong emphasis on the following areas as major industrial area in Dhaka.

- Narayanganj
- Demra
- Gazipur
- Tongi
- Savar

As shown in Figure 8.4-1, these areas are located in north, south-east part of Dhaka, specifically at the riverside and by the roadside of major arterial road like Dhaka-Chittagong Highway and Dhaka-Tongi as well as around EPZs in Dhaka.

There is concern that it lies down huge industrial area in Tejigaon area. Unless its area is moved outside DCC, the companies will be affected continuously by truck ban regulation.

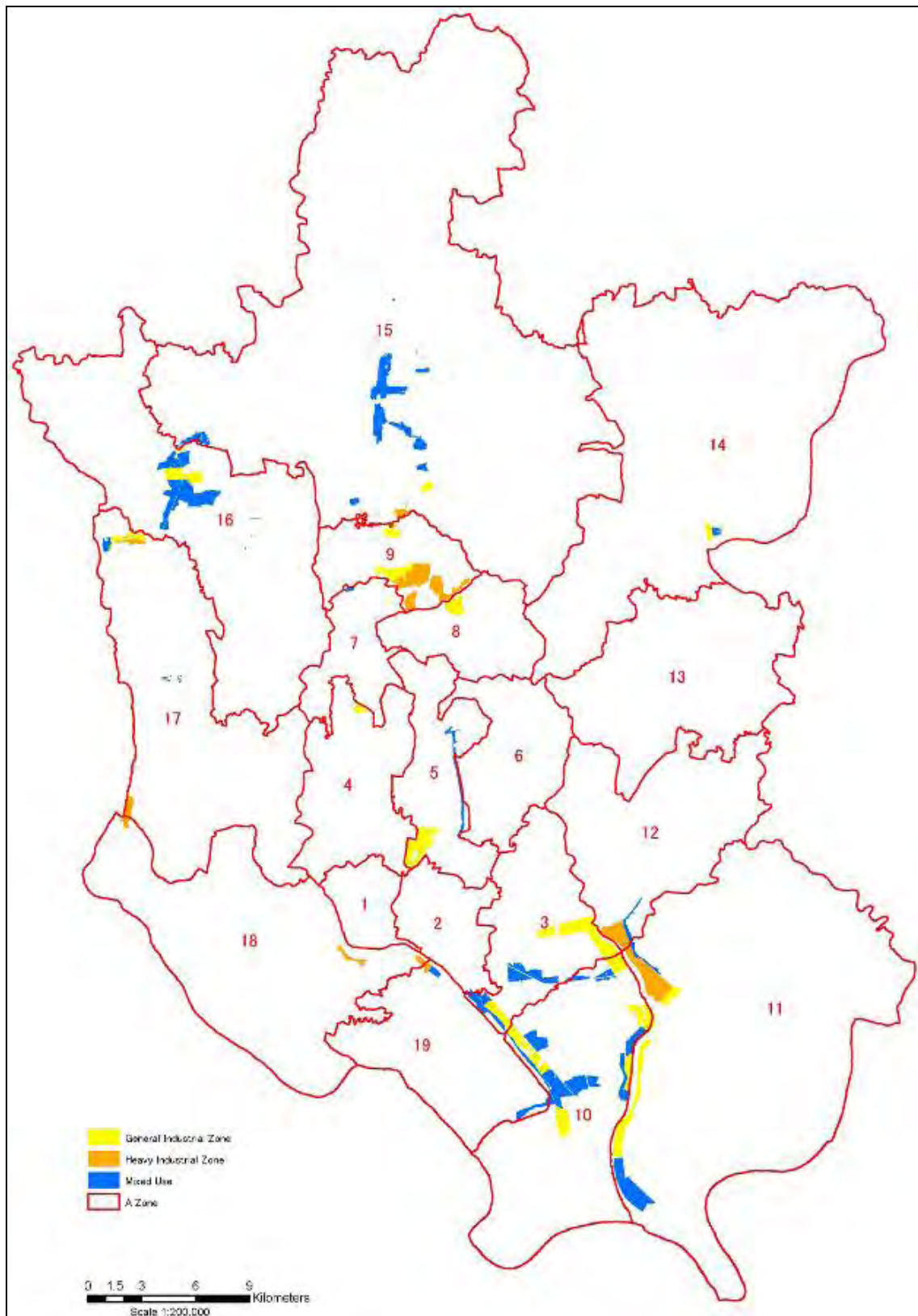


Figure 8.4-1 Industrial Developments in Detailed Area Plan (DAP)

(2) Export Processing Zone (EPZ) Development

For the purpose of rapidly vitalizing the country's economy, the government has employed an "Open Door Policy" to foreign direct investment into Bangladesh. Under such situation, the government established the Bangladesh Export Processing Zone Authority (BEPZA), the official organization in charge of the following missions:

- Promotion of foreign (FDI) & local investment;
- Diversification of export;
- Development of backward & forward linkages;
- Generation of employment;
- Transfer of technology;
- Upgrade of skills; and
- Development of management

According to BEPZA, an export processing zone (EPZ) is defined as a territorial or economic enclave in which goods may be imported and manufactured and reshipped with a reduction in duties and/or minimal intervention by custom officials. And EPZ Provides:

- Plots/factory BLDG in custom bonded area
- Infrastructural facilities
- Administrative facilities
- Fiscal & non-fiscal incentives
- EPZ attracts: foreign & local investment

As of January 2010, the eight EPZs have been established in Bangladesh. Table 8.4-2 summarizes the size of EPZ and performance indicator. Dhaka EPZ ranked 3rd among them in terms of its area; however, it recorded the largest share of export in the fiscal year of 2008-2009 with 46.1%, followed by Chittagong EPZ (46.0%), Comilla EPZ (3.7%). In addition, export in USD from Dhaka plus Chittagong EPZs accounts for 92.1%.

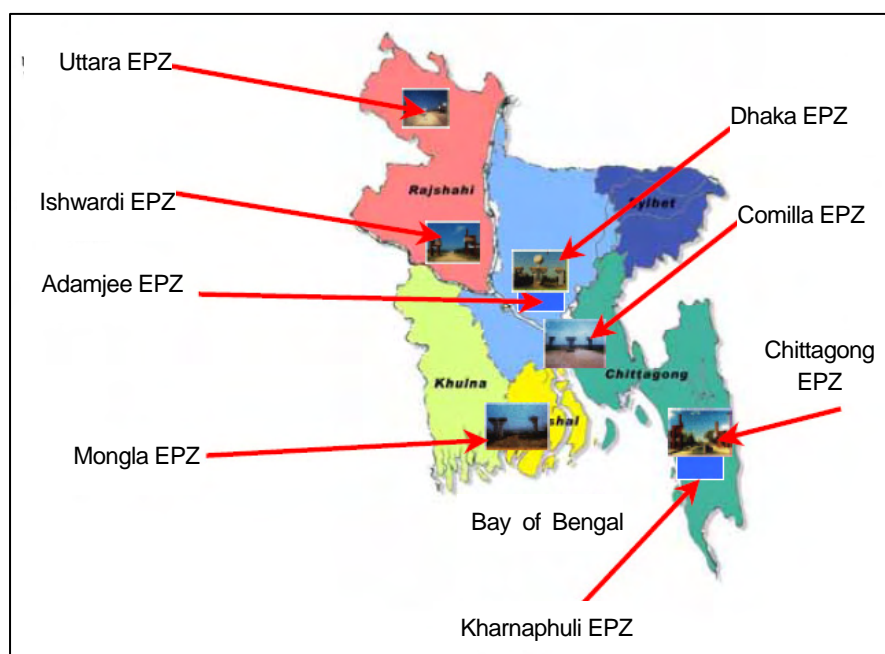
Another EPZ in Dhaka is "Adamjee EPZ" located on the bank of Sitalakhya River in Narayanganj, which has operated since 2005-2006. Compared to Dhaka EPZ opened in 1993-1994, it is likely that Adamjee is quite new and still developing. (Figure 8.4-2)

Though there is no document that mentions the selection of these locations, it is inferred that they were strategically situated in consideration of accessibility to the airports, seaports, river ports, and arterial roads over the country. For instance, the users in Adamjee EPZ can easily access to river transport and Dhaka-Chittagong Highway without passing through DCC area.

Table 8.4-2 Outline of EPZs in Bangladesh

Name of EPZ	Area	No. of Plot	Export in 2008-2009 (million USD)	% Share
1. Dhaka EPZ	143.84 ha	372	1,190.36	46.1%
2. Chittagong EPZ	183.37 ha	428	1,188.65	46.0%
3. Mongla EPZ	186.21 ha	124	7.06	0.3%
4. Ishwardi EPZ	124.99 ha	166	0.79	0.0%
5. Comilla EPZ	108.28 ha	208	95.85	3.7%
6. Uttara EPZ	93.20 ha	221	0.24	0.0%
7. Adamjee EPZ	118.62 ha	200	60.13	2.3%
8. Karnaphuli EPZ	108.64 ha	260	39.13	1.5%
Total	1,067.15 ha		2,581.70	100.0%

Source: Bangladesh Export Processing Zone (www.epzbangladesh.org.bd), [January 2010]

**Figure 8.4-2 Location of Export Processing Zones in Bangladesh**

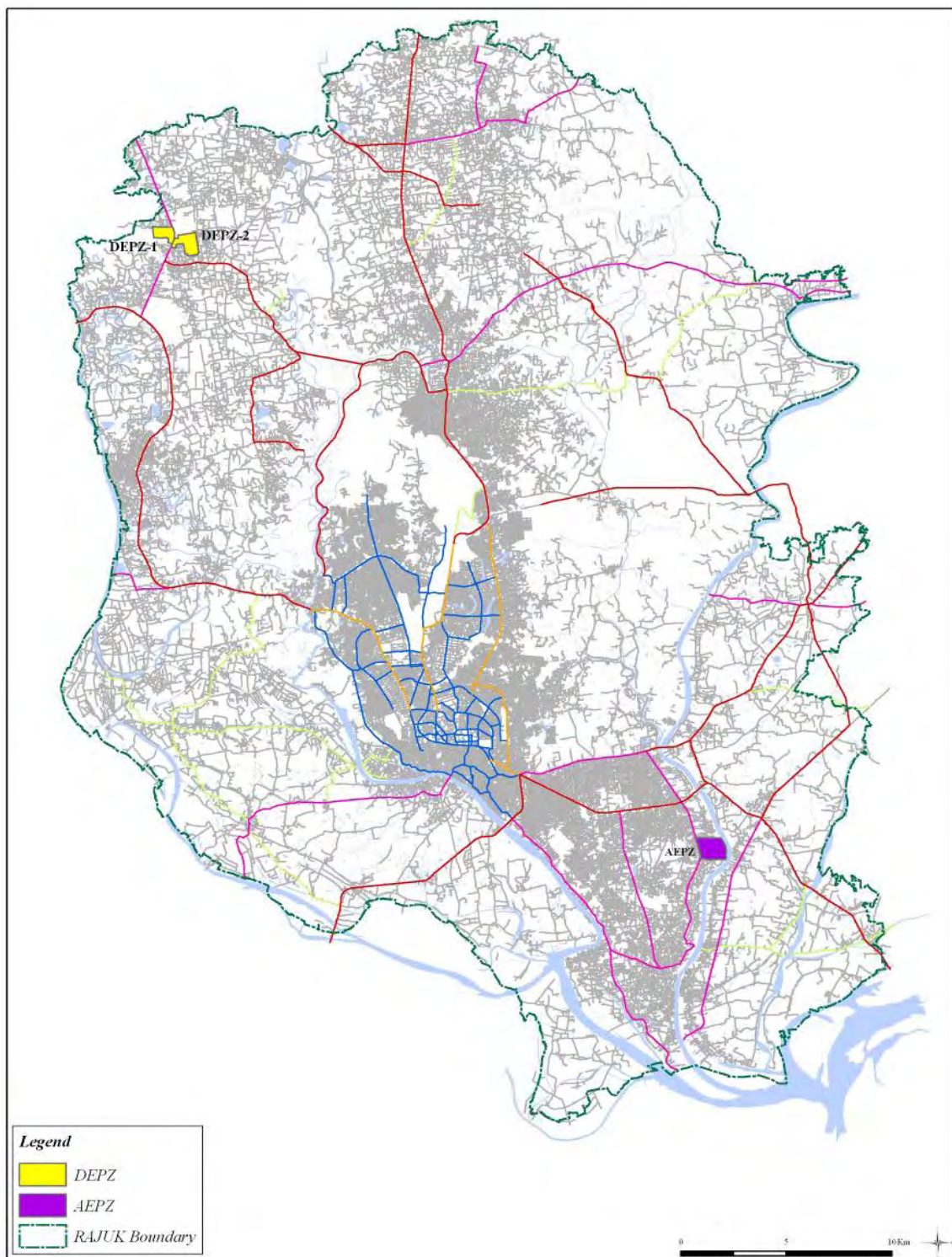


Figure 8.4-3 Location of Export Processing Zones in Dhaka

8.5 National Policy for Freight Transport

(1) National Land Transport Policy

The Government of Bangladesh approved the National Land Transport Policy in April 2004, which covers all types of land transport modes and also mentions passenger & freight transport. The policy is organized from several points of view such as physical, institutional aspects as well as poverty reduction. The followings are the strategic policies indicated in the policy:

[Strategic Policy]

- (1) *Greater private sector participation*
- (2) *Effective co-ordination in transport*
- (3) *Promoting the role of the transport users*
- (4) *Transport users should pay for the costs of services*
- (5) *Subsidies for transport services*
- (6) *Create public awareness for the policy*
- (7) *Encourage proper utilization of transport resources*
- (8) ***Better integration with Inland Water Transport Policy***
- (9) *Increased access to transport and services in rural areas*
- (10) *To integrate transport policy, planning and appraisal across modes*

In the above-mentioned policies, it indicates that the Government will encourage physical integration between Road, Railway and Inland Water Transport modes in order to reduce user's cost and environmental impacts. The Government, specifically, focuses on the integration with "Inland Water Transport" as one of the strategic transport modes in Bangladesh, though it is not a land transport.

Furthermore, the policy strongly emphasizes on railway freight transport compared to road transport by trucks. It plans to remove freight tariff regulations of Bangladesh Railway (BR) so as to ensure the competitive of goods transport in the country even in the world market, and to establish the partnership with Bangladesh Road Transport Corporation (BRTC) for achieving better integration between land transport modes, and eventually obtaining a greater share of the freight market by railway transport.

Regarding to road-based transport by truck, the policy for Dhaka proposes the introduction of off-street facilities for truck in new industrial development and the review of existing truck ban regulation in DCC. Also, the needs of new facility for transshipment of container are recognized in the policy.

(2) Integrated Multi-Modal Transport Policy (Final Draft)

In 2009, the draft Integrated Multi-Modal Transport Policy (IMTP) was prepared by Planning Commission, Ministry of Communication. Yet it has not been approved by the Cabinet and Parliament. It contains all transport modes in Bangladesh including inland water transport sector. As

for land transport modes, it basically follows the policies in the National Land Transport Policy.

It is pointed out that the government will need to take an action for physical integration and informative integration in order to ensure timely delivery by cost-effective way. As listed below, the policy will be achieved through the following integrations:

- Integration within and between different types of transport
- Integration with the environment
- Integration with land use planning
- Integration with policies for education, health, economic growth, gender and social equity and poverty reduction

The primary objective of the IMTP is to emphasize the importance that railway and inland water transport must play a role on the whole transport network. Under such direction, the objectives are to:

[Objectives of the IMTP]

- (1) Reduce cost of transporting goods, so as to make goods and services within Bangladesh less costly**
- (2) Aid export competitiveness, through lower transport costs**
- (3) Improve safety**
- (4) Take advantage of Bangladesh's geographical position to trade in transport services**
- (5) Reduce the worst environmental effects of transport**
- (6) Ensure that transport meets social needs – in terms of its cost and accessibility to all sectors of society**
- (7) Improve integration of the overall transport network and foster measures to make interchange between modes easier**
- (8) Reduce the need for travel by better land use planning**
- (9) Use transport as means to assist poverty reduction**
- (10) Reduce aid dependency**
- (11) Improve fuel and energy security**

In the framework of the IMTP, it proposes the necessary actions and measures for freight transport in each sector.

[Railway]

- ✓ Increasing container movement efficiency and capacity;
- ✓ Establishing more inland container depots;
- ✓ Developing multimodal corridors between major economic centers which give priority to freight and a high-speed network for passengers.

[Inland Water Transport]

- ✓ Investment in existing river ports to improve cargo and passenger handling;
- ✓ Investment in existing river ports to improve interchange between water transport and other

modes;

- ✓ Investment in new ports to better serve increasing passenger and bulk cargo needs;
- ✓ Provide door-to-door services in co-operation with operators of other transport modes;
- ✓ Development of inland container depots served by inland water transport to link both sea ports with major inland destinations;

[Road Transport]

- ✓ Strict enforcement of axle-load restrictions

(3) Strategic Transport Plan for Dhaka (STP)

The latest comprehensive transport plan for Dhaka is the Strategic Transport Plan approved by the Cabinet in 2009. The plan mainly focuses on the passenger traffic in Dhaka City; however, it mentions the urban freight system as little as possible with 4 policies mentioned below.

Policy 32: The Government will encourage small truck operators to organize themselves into larger groups or co-operatives so as to operate the freight industry more efficiently and introduce a communication system between them and truck drivers so that the operations can be made more efficient.

Policy 33: The Government will promote more efficient types of multi-axle trucks for efficient movement of freight traffic and thus also ensure less damage to the city roads due to the movement of trucks.

Policy 34: The Government will enact regulations and rules for establishing the formal status of these and other terminals and will initiate actions for their development in a planned manner.

Policy 35: The Government will authorize further study to encourage the integration of the inland waterways with the city land transport system so that the movement of freight and passenger traffic between motor launch landing stations and the city road network will be made more efficient.

(4) Major Findings

- ✓ The National Land Transport Policy (NLTP) is positioned as an upper stream policy in Bangladesh, and Integrated Multi-Modal Transport Plan (IMTP) is under Land Transport Policy.
- ✓ The NLTP underscore the better integration with inland water transport which has broad network over the country and easily access to river transport even in rural area.
- ✓ The IMTP was formulated to attract rational and balanced investment across transport modes in order to achieve better integration among them.
- ✓ To achieve better integration, IMTP propose the cost reduction on goods transport so as to make Bangladesh competitiveness, the compact freight system in good coordination with land use planning so as to minimize the needs of transport.
- ✓ In the STP, it proposes other regulations for truck such as the formulation of larger truck operator through merger and the introduction of multi-axle trucks for efficient movement.

- ✓ These three policies emphasize the importance of better integration among transport modes; however, they do not mention the next steps or the actions to achieve their objectives.

8.6 Future Infrastructure Development and Its Impacts

Transport network in Bangladesh has become older with the times as a result of inappropriate maintenance works. Bangladesh achieved a high economic growth of 6.2% in 2008. To maintain such a high growth rate, the government needs to attract foreign investment in the country by developing and improving transport infrastructures and networks.

As far as the study team collected the information, several kinds of project funded by WB, ADB, JICA and others (Development of Deep Sea Port, Dhaka-Chittagong Highway, Inland Container Depot for Railway and Inland Water Transport etc.) have been planned and under-construction. Those projects will dramatically change business circumstance in the industrial firms if completed.

Among the planned projects, a Deep Sea Port project will definitely make an increasing impact on the country's trading. Based on the estimation by the feasibility study of Deep Sea Port, the country's expected general cargo and container traffic volume (international traffic) will reach at 11.1 million tons and 2.8 million TEUs in 2020, respectively. Compared to its volume in 2006, those are increased by 40% and 390% respectively.

Under the condition of current infrastructure, it is obvious that no terminals and network can accept such a huge freight volume. Assuming that no actions were taken until 2020, it may happen that the freight demand is naturally decreasing along with the user's disappointment. In other words, Bangladesh will lose its competitiveness in the regional and world market. From a different viewpoint, it will be an unrepeatable opportunity for the country to establish a position in the market.

As indicated in the section of national policy, the apparent policies for modal integration have been formulated; the comprehensive freight transport plan under these policies does not exist until now. To make a strategic master plan for comprehensive freight transport including all types of infrastructure and network development is more significant issue to develop and improve a terminal (or port) itself and network.

8.7 Issues and Problems

(1) Lack of Efficient Terminal Function (TERMINAL)

As described in the above sections, each transport mode (rail-, road- and inland waterway-based transport) has terminals in and around Dhaka. Actually, they have not functioned itself as a terminal. Existing truck terminal has just a function of fleet parking, not loading/unloading, transshipment, storage and warehousing. Inland waterway terminal does not furnish necessary facilities to handle cargoes as well as secure a proper yard in terminal area. Railway terminal is located in one of the

busiest part of Dhaka and in a restricted area for operating large trucks. Therefore, it is likely that a terminal does not have required functions to handle cargoes and then it results in inefficient operations and loss of transport time and cost.

(2) Aging Transport Infrastructure (NETWORK)

Bangladesh's transport network has been well developed. However, due to lack of proper maintenance works, the status of railway and road infrastructure recently falls short on quality, and it has been a serious safety problem on the transport network in the country. These unreliable infrastructures will affect to the shipper's belief on goods transport, which it eventually may be loss of market share and loss of foreign direct investment in the future.

(3) Lack of Intermodalization (INTEGRATION)

In recent years, the intermodal transport systems have been a main stream in the logistics firms. It enables to make freight transport more efficient and economical. It seems that existing cargo terminals is designed as a terminal of single transport mode; it has not taken into consideration a better integration among modes. A terminal will be able to play an important role to connect one transport mode with others: from truck to railway, from inland waterway to truck etc.

(4) Integration with Land Use Planning (INTEGRATION)

In general, transport plan and land use plan is a closely correlated each other. The factories and warehouses (industrial area) generate freight traffic to carry their products to consuming area by trucks. Looked at current land use in Dhaka, some industrial areas are located within DCC, specifically in Tejgaon area where garment and food stuff factories are operating and it is also a busy area in the city. This area is not only affected by truck ban regulation within DCC but also is located far from existing freight terminals like Kamalapur ICD and inland waterway terminal along Buriganga and Sitalakhya River. From viewpoint of the efficiency of freight traffic, the location of industrial area should be determined in consideration of the accessibility to the terminals.

(5) Urban Freight Transport (REGULATION)

Within DCC, most of trucks are prohibited to operate their fleet during daytime hours by the regulation. Its regulation might have been contributed to the decrease of traffic congestion within the city. However, it has been seen that small-sized cargoes are transported by rickshaw, rickshaw van and auto rickshaw, not by small covered trucks that are allowed operation in the daytime. Such small-scale freight transport interrupt traffic flow on major roads; it could be one of the main factors of traffic congestion in the city at some areas. It is necessary to review the regulation on truck prohibition within DCC in view of recent small-scale freight movement.

8.8 Toward a Better Freight Transport Systems

In this Chapter, it mainly elaborates on current freight transport systems based on the information on the economic corridor between Dhaka and Chittagong and the field survey conducted in the Study, especially for terminals in Dhaka. By studying the country's most important corridor and the capital city, several kinds of problem and issue are pointed out.

Figure 8.8-1 describes a vicious cycle in current freight transport systems. Each item represents current problem or issue. Yet, this cycle will not be solved with a single action which is taken for only one problem. To solve them and get out of this cycle, the comprehensive freight plan should be necessary in well-harmonizing with "Land Use", "Intermodal", "Transport Network", "Freight Terminal" and "Stakeholders" (government, industries, forwarder etc.).

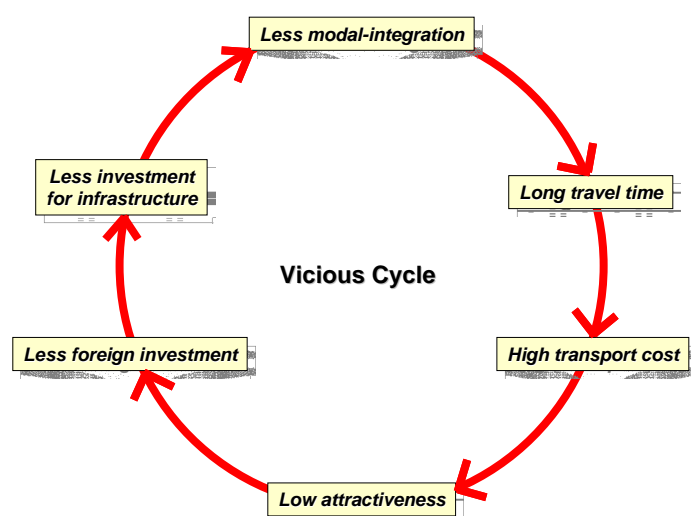


Figure 8.8-1 Vicious Cycle in Freight Transport System in Bangladesh

As far as the study team analyzes the collected information, the following measures are recommended in and around the study area. Needless to say, they should not be implemented separately; but in the first step, formulating the master plan for the strategic freight transport system, which covers all freight transport mode and infrastructure, will be the best way toward the strategic freight system.

Recommendations

Development of Truck Terminal in Dhaka

A terminal strategically designed and equipped with not only parking facility but also loading, packing, bonded, warehousing, and processing facilities will definitely foster intermodal freight system in Bangladesh, and it will contribute to cost and time reduction in a series of supply chain.

New Industrial Development and Relocation of Existing Industrial Area

Under the situation that the urban roads are congested on a daily basis and truck movement is restricted, the efficiency of freight traffic will not be promoted. By developing the large-scale industrial area around DMA where major industries are located in the same area, freight traffic will be able to easily access to the main transport mode: railway, highway and inland waterway. The location of industrial area should be strategically considered with land use, transport network and terminals.

Improvement of existing River Ports, Railway Cargo Terminal from Intermodal Viewpoint

With no doubt, the concept of intermodal system could not be well-recognized in the existing terminals in each transport mode so far. The integration between modes like Truck-Railway, Truck-IWT and IWT-Railway can reduce the transport cost and travel time through promotion of transfer and transshipment. Such improvement should take into account the future cargo and container demand in Bangladesh.

Review of Regulation for Freight Transport

As indicated in the result of traffic survey, current regulation for truck ban shows remarkable results in the daytime. Meanwhile, cargo transport by rickshaw and rickshaw van is often seen in the city and they interrupt traffic flow occasionally. Including verification of the impact of current regulation, the role of freight transport in city area should be reviewed.

Relocation of Market and Bazaar

Current markets and bazaars exist in DCC will not be properly located in terms of consumption, specifically in Old Dhaka area. Inefficient market location could cause unnecessary trips and movements. The relocation will contribute to the efficiency of freight traffic as well as the alleviation of current heavy traffic congestion in the city. Note that future land use and urban development should be considered when it plans.

APPENDIX 9: PASSENGER TERMINAL STUDY

9.1 Review of Previous Inter-modal Transportation Plan

In order to be recommended for Freight Transport Sector and Inland Water Transport Sector in STP, therefore, concept for Bus Sector Recommendations is as follows;

A large majority of people in Dhaka depend upon bus transit.

At present, the operation of buses within the city is in terminal and the service to the public is very poor. It is to be noted that, by making such improvements in the bus systems, congestion for buses will be reduced and the services will move more efficiently thereby increasing the operators' profits.

(1) Bus Operator Consolidation

One of the Primary Recommendation of the STP is a restructuring of the bus industry to transfer ownership from a large number of small operators into a smaller number of large operators.

(2) Bus Operator Competition and Investment

The bus sector in Dhaka is needed to promote healthy competition and continued investment.

And bus operators and drivers in Dhaka are currently paid according to the number of passengers they pick up. Therefore forming a structure of incentives to encourage better bus driver and bus operator behavior while maintaining competition to ensure acceptable service quality at reasonable costs are therefore a key challenge of bus sector reforms in Dhaka.

Beside unfair competition has a significant effect in working against modern bus operation in Dhaka.

- a. It is necessary to the Government take action to enforce minimum environmental, safety and employment conditions for all owners, operators and drivers.
- b. It is to exclude from competition between urban bus operators, which have permits to operate services, and inter-city buses operating within the urban area but without permits.
- c. It is necessary to the Government move toward treatment of BRTC on commercial grounds and set, and enforcement revenue targets and efficiency goals.

(3) Replacement of Small Buses with Larger Buses

Bus frequency survey data indicates that is a strong potential for replacing many smaller buses with larger buses.

(4) Acknowledgment of the special issues Regarding Gender

It is a fact of life in Bangladesh that not all sector of the family require the same consideration when it comes to travel. The role of women is one of particular concern and there should be measures implemented to ensure that this sector is as safe as any other group.

(5) Issues Relating to Ticketing

- a. The current method of ticketing relies on off-board purchase at booths owned and operated by those running individual bus routes. A revision and modernization of the ticketing system is required.
- b. A token system is answer in which a number of tokens can be purchased a specific licensed location valid on all routes.

The bus sector recommendations will be supposed for creating an efficient planning of DHUTS.

And the DCC Plan for New Bus Terminal that was submitted to RAJUK on Nov. 2009 is as below. According to RALUK talks, the Master Plan will be formulated in near future. Concerning the DCC plan, we will consider as one of the next stage problems.

1. Northern area : Around Basan Sharak Naya Bazar along Dhaka By Pass Road
2. Southern area: Around Jihimill in South Keraniganj
3. Eastern area: Around Kanchpur along Dhaka Chittagong Road
4. Western area: Around between Amin Bazar and Modhumoti Model Town along Dhaka Aricha Highway

9.2 Inter-modal Passenger Transport

Now we will discuss bus terminals and station plazas. We will make a proposal for a station plaza plan in “Inter-modal Transport with regard to MRT System”.

9.2.1 What is a bus terminal and what is a station plaza?

(1) What is a bus terminal?

A bus terminal is basically a facility provided separately from roads in order to serve as a terminal for two or more bus routes. A bus terminal is a facility for bus stops.

Bus terminals mostly act like a gateway to a city in a similar way as railway terminals in railway-oriented countries (like Japan, Germany and France). In addition, in some cases a bus terminal is provided at a railway station in order to connect trains with local road routes.

In bus-oriented countries (like Spain and Brazil), in some cases a bus terminal is provided in a city as a bus stop for medium- and long-distance bus routes in order to serve as a traffic base.

(2) What is a station plaza?

A station plaza generally lets passengers transfer to a train, bus, taxi, passenger car, motorcycle, bicycle or auto rickshaw or rickshaw in the case of Dhaka. In other words, it serves as a traffic node. However, it has now become important for a station plaza to function as a plaza and form an urban base, as described below, according to the positioning of a railway station within an urban traffic system.

a) Function as a traffic node

To secure facilities for buses, taxis, and ordinary vehicles, and take measures to improve the circulation of automobiles and other traffic, measures for pedestrians and measures for social welfare

b) Function as a plaza

To secure a pedestrian plaza, improve urban landscapes, and integrate with the surrounding buildings

c) Function as an urban base

a. Function for connection (integration with various urban functions (buildings, etc.) around stations)

b. Function for attracting visitors (as a place to hold various events, etc.)

c. Function for convenience (provision of variety of services such as car and bicycle parking lots, toilets, public phones, and information)

9.2.2 Bus terminals and station plazas in Japan

(1) Bus terminals

According to the Japanese Ministry of Land, Infrastructure, Transport and Tourism, a bus terminal is defined as a facility for two or more commercial buses to stop at one time so that passengers can get on and off the buses. In addition, a bus terminal dedicated for the use of regular bus operators is called an exclusive bus terminal, and all other bus terminals are called general bus terminals.

As of September 2009, there are 175 exclusive bus terminals and 25 general bus terminals in Japan. Long-distance coach terminals usually are general bus terminals.

This is because bus terminals regulated by the Automobile Terminal Business Act (established in 1959) are either exclusive bus terminals or general bus terminals, and bus terminals at railway station plazas are not specifically defined.

The largest bus terminal in Japan is Kumamoto Bus Terminal (a general bus terminal in Kumamoto Prefecture in Kyushu).

It is about twice the size of the largest bus terminal in Dhaka, Saidabad Bus Terminal.

Table 9.2-1 Concept of Kumamoto Bus Terminal

(As of April 2009)

Item	Description
1. Size	About 10 hectares
2. No. of bus companies using bus terminals	16
No. of berths	36
Average number of buses coming to and departing from bus terminals per day	4,600
No. of passengers	40,000
3. No. of taxi companies using bus terminals	6
4. Facilities	Hotels, shopping centers, restaurants, event halls, parking lots, etc.

(2) Station plazas

JR Koriyama Station in Fukushima Prefecture in the Tohoku area is said to be the largest station plaza that was provided as part of an urban redevelopment project, and seven railways use the station.

Table 9.2-2 Concept of JR Koriyama Station

(As of March 2009)

Item	Description
1. Size	About 2 hectares
2. No. of train passengers	35,000
3. No. of bus companies using station plazas	2
4. No. of berths for tour buses	8
5. No. of taxi companies using station plazas	3
6. Facilities	Department stores, shopping centers, restaurants, pedestrian decks, car and bicycle parking lots, etc.

Charges for buses and taxis, for example, to use station plazas are set separately. Charges for general cars and bicycles to use car and bicycle parking facilities are also set separately.

Table 9.2-3 Administrator & Management method

Administrator	Management method
Railway operator that owns and solely manages the entire land related to a station plaza	There are many cases where only businesses that have been authorized by a railway operator can send their buses and taxis to the station plaza, and let them use parking facilities.
Railway operator and autonomous body that cooperate to provide a station plaza	Depends on the agreement reached between the railway operator and the autonomous body
Autonomous body that owns and manages the entire land related to a station plaza	There are many cases where only businesses that have been authorized by an autonomous body based on ordinances can send their buses and taxis

9.2.3 Current status of bus terminals and station plazas in Dhaka

(1) Bus terminals

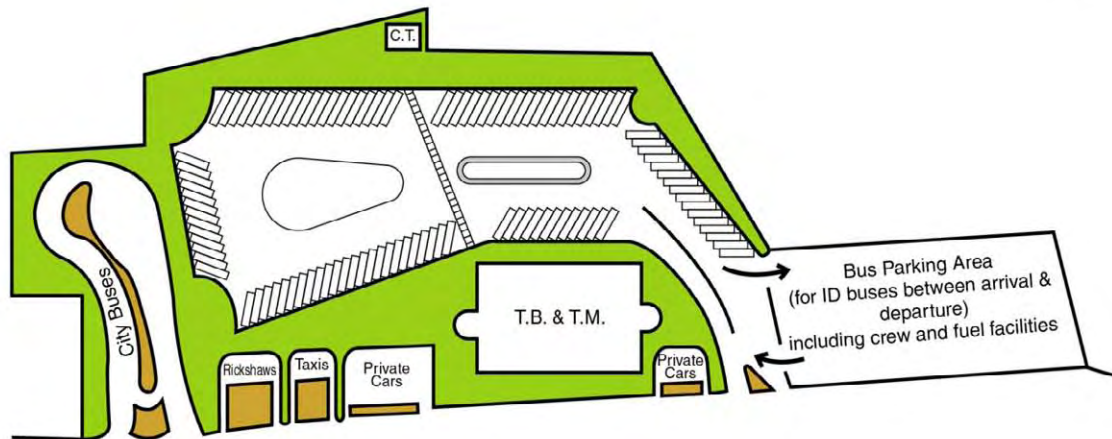
The three existing bus terminals (Gabtoli, Saidabad and Mohakhali) opened in 1984–1985.

In March 1999, DDC proposed that these three existing inter-district bus terminals be rehabilitated (“Rehabilitation of Existing Bus Terminals”) with support from the World Bank under the PROJECT PROFORMA (PP) for Dhaka Urban Transport Project. See the next and following pages for details of the plan layout and present layout.

GABTOLI INTER-DISTRICT BUS TERMINAL

PLAN (March, 1999 by DCC-Development Partner:WB)

0 20m



PRESENT (December, 2009)

0 20m

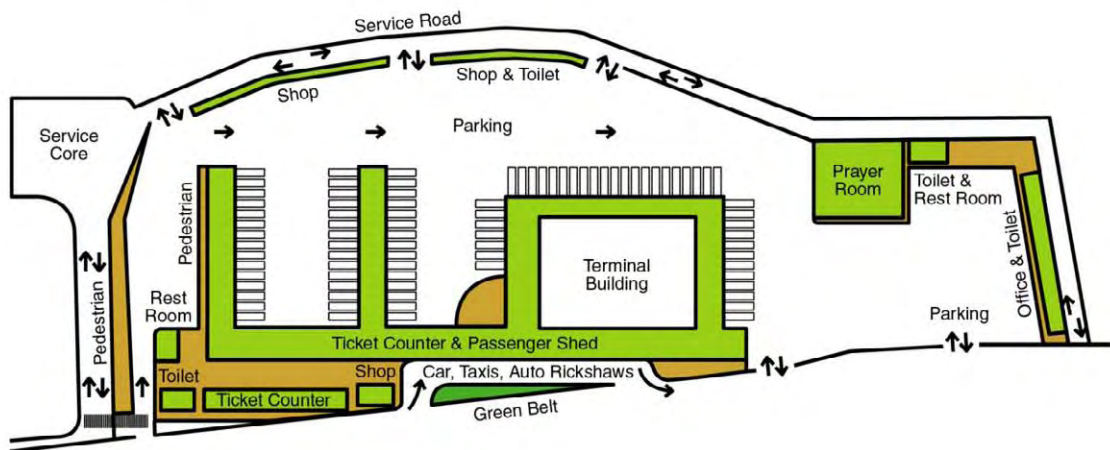
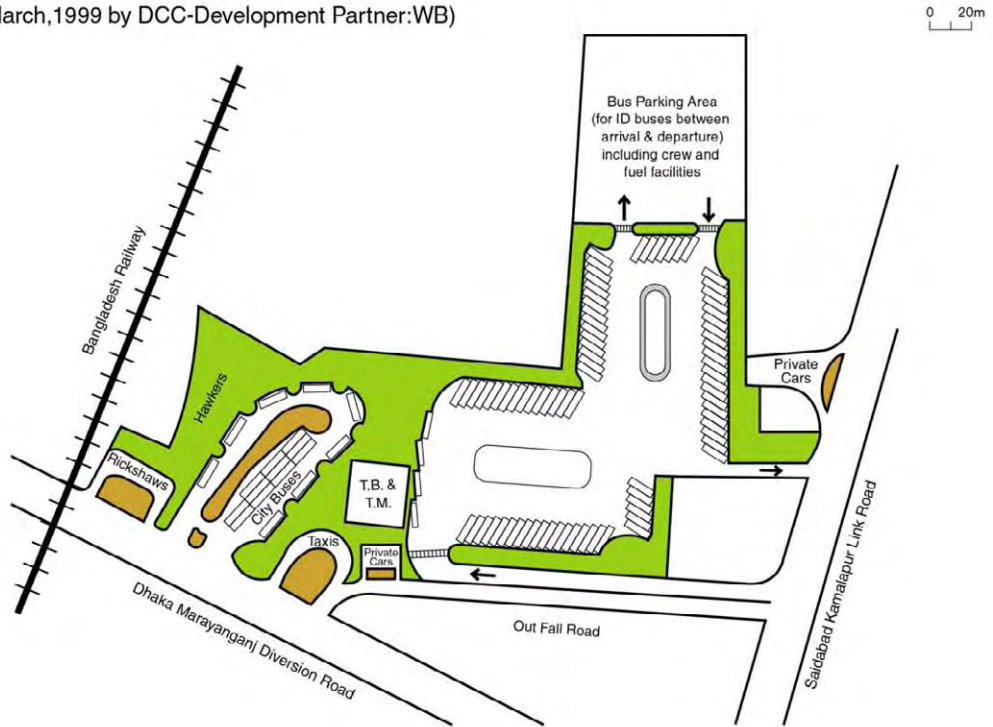


Figure 9.2-1 Plan Layout & Present Layout for Gabtoli bus terminal

SAIDABAD INTER-DISTRICT BUS TERMINAL

PLAN (March, 1999 by DCC-Development Partner:WB)



PRESENT (December, 2009)

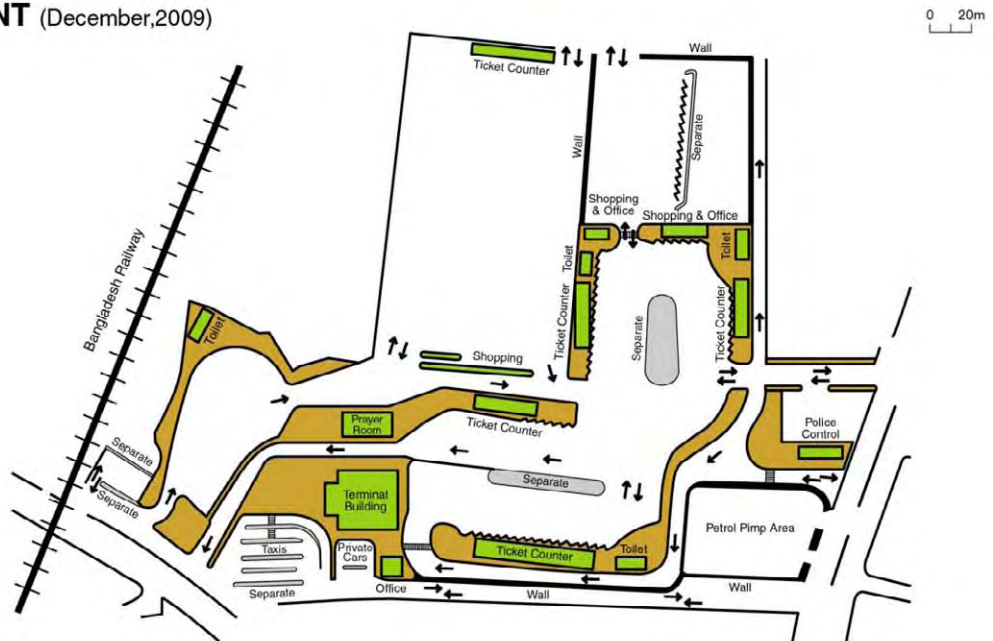
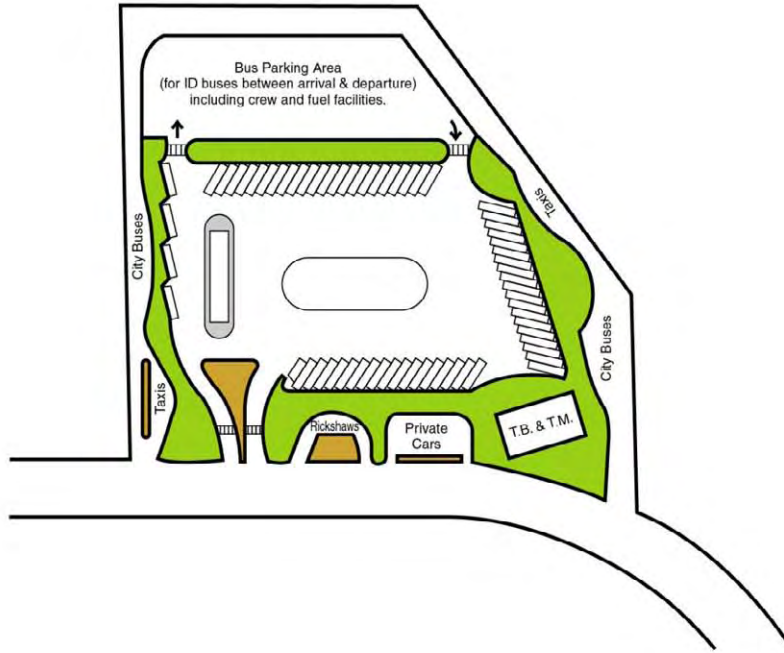


Figure 9.2-2 Plan Layout & Present Layout for Saidabad bus terminal

MOHAKHALI INTER-DISTRICT BUS TERMINAL

PLAN (March, 1999 by DCC-Development Partner:WB)

0 20m



PRESENT (December, 2009)

0 20m

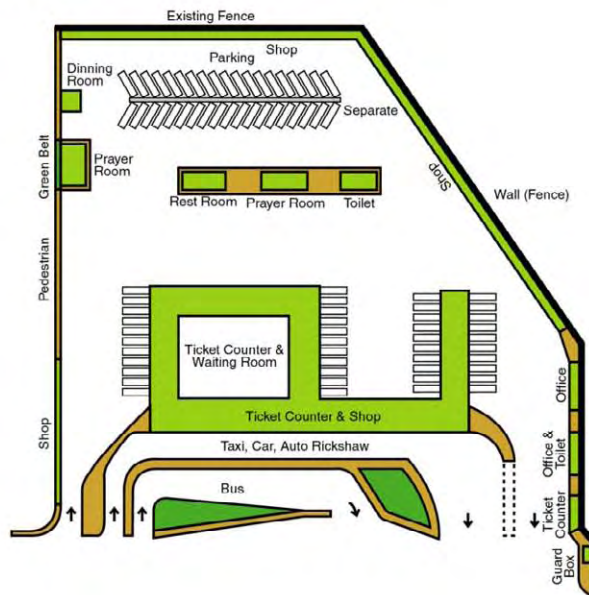


Figure 9.2-3 Plan Layout & Present Layout for Mohakhali bus terminal

This proposal incorporates city buses, and secures spaces for taxis, private cars and rickshaws (including auto rickshaws). The proposal also secures parking areas for inter-district buses. Like this, the proposal offers a function to allow movement between transportation modes (various vehicles in this case) in the bus terminals. In any event, currently buses are mostly used for passenger transportation. However, city buses are mostly concentrated in two places with a bus stand along the roadside (one bus stand in Pallabi and two bus stands in Fulbaria and Gulistan) in the south and north of Dhaka, but it is not set up for bus terminals. So the city buses cannot fulfill their function to be connected with terminal-bound inter-district buses. As a result, it is now inconvenient and dangerous to transfer from one mode to another.

At present, the vehicles described below other than city buses can use the respective bus terminals, and rickshaws can bring in passengers to the bus terminals. However, rickshaws are not allowed to use the facilities of the bus terminals. So we see rickshaws moving to the roadside after dropping off their passengers, and waiting for other passengers.

Though a space is available for taxis and private cars at Saidabad Bus Terminal, it has never been used and remains unoccupied. The reason is assumed to be that service conditions (charges for the use of the station plaza, etc.) are difficult to meet.

Though city buses and inter-district buses belong to the same organization and division in DCC, their bus terminals have not been consolidated. The actual reason for this is assumed to be that the city bus's team in charge is not capable of managing and maintaining them. At any rate, it seems that no one has recognized the need for consolidation, and the benefits obtainable through consolidation have never been comprehended.

Table 9.2-4 Using condition of vehicle in Bus Terminal

Bus Terminal (B.T.)	Vehicle					
	Bus		Taxi	Private Car	Auto rickshaw	Rickshaw
	City	Inter-district				
1. Gabtoli Bus Terminal	×	○	○	○	○	×
2. Saidabad Bus Terminal	×	○	○	○	×	×
			(Not used)			
3. Mohakhali Bus Terminal	×	○	○	○	○	×

(2) Station plazas

There are four railway stations of Bangladesh Railway in Dhaka, and the following describes their station plazas:

a) Gandaria R.S. located in an old urban area in the southern part of Dhaka

There is no station plaza. Vehicles can park along the roadside on both sides of the station but there is only a space for rickshaws along the road on the station building side. On the other hand, all types of vehicles can park alongside Pipe Road that runs parallel to the railway on the opposite side, but passengers need to cross over the railway after getting off the platform.

b) Kamalapur R.S., the largest station in Dhaka, located in the central city area

There is a station plaza that is divided into two. Taxis, private cars and auto rickshaws are haphazardly parked on one side. Mostly rickshaws and some auto rickshaws park on the other side. Buses use a space along the road connected with the station plaza, and there is also a small bus terminal for BRTC adjacent to Kamalapur R.S.

c) Tejgaon R.S. located in the central part of Dhaka

There is no station plaza. A small number of rickshaws and auto rickshaws wait for passengers on the road on one side of the station, in other words, a place connected with an access road running parallel to the railway, and the station building. The access road is about one and a half lanes wide, and taxis and private cars can somehow manage to reach the station. Along the access road, there are establishments such as 12 banana markets, five small cattle markets, a store selling chemical fertilizers, and a store selling eggs.

d) Banani R.S. adjacent to a new residential area to the east, and a golf course to the west in the northern part of Dhaka

There is no station plaza. The station is located parallel to New Airport Road. Though there is a station building, there is no platform. There is a cattle market (including some goats) in a section about 150 meters along the railroad on the south side of the station, and a bus bay for city buses is provided on the front side but it is used by people visiting the market to park their cars. Sidewalks are extremely unsanitary because cattle feces piles up there.

Table 9.2-5 Using condition of vehicle in Station plaza for Railway Station

Railway Station (R.S.)	Station plaza		Vehicle				
	Provided	Not provided	Bus	Taxi	Private Car	Auto rickshaw	Rickshaw
1. Gandaria R.S.		●	△	△	△	△	△
2. Kamalapur R.S.	⊙		△	○	○	○	○
3. Tejgaon R.S.		●	×	×	×	△	△
4. Banani R.S.		●	△	×	×	×	×

○: There is a space for vehicles in the station plaza.

△: There is no space for vehicles in the station plaza but there is a space along the road near the station.

×: Vehicles cannot be used.



Photo 9.2-1 Gandaria R.S.



Photo 9.2-2 Kamalapur R.S.



Photo 9.2-3 Tejgaon R.S.





Photo 9.2-4 Banani R.S.

9.2.4 Dhaka bus terminal plan

(1) Roles of bus terminals

The following are the general items to be considered when reviewing the roles of bus terminals:

- Improve roads for buses
- Improve bus vehicles
- Have a bus route network
- Provide facilities for buses
- Set out a bus operation method
- Set out a policy for transportation charges
- Provide information
- Have traffic control

In addition, the following are often requested by users:

- Have punctual operation according to timetables
- Increase the number of buses
- Increase the length of time that buses operate

In this investigation, we cannot ignore the relationship with the future plan for the MRT System. That is because bus stops for city buses can be integrated with a station plaza to be provided at MRT stations, and a station plaza and an existing bus terminal can be consolidated for inter-district buses. So it is necessary to clarify the relationship.

The chart below indicates a bus route network according to the future plan for the MRT System, and the relationship between the locations of proposed stations for the MRT System, and the locations of the existing city bus terminals (bus stands) and inter-district bus terminals.

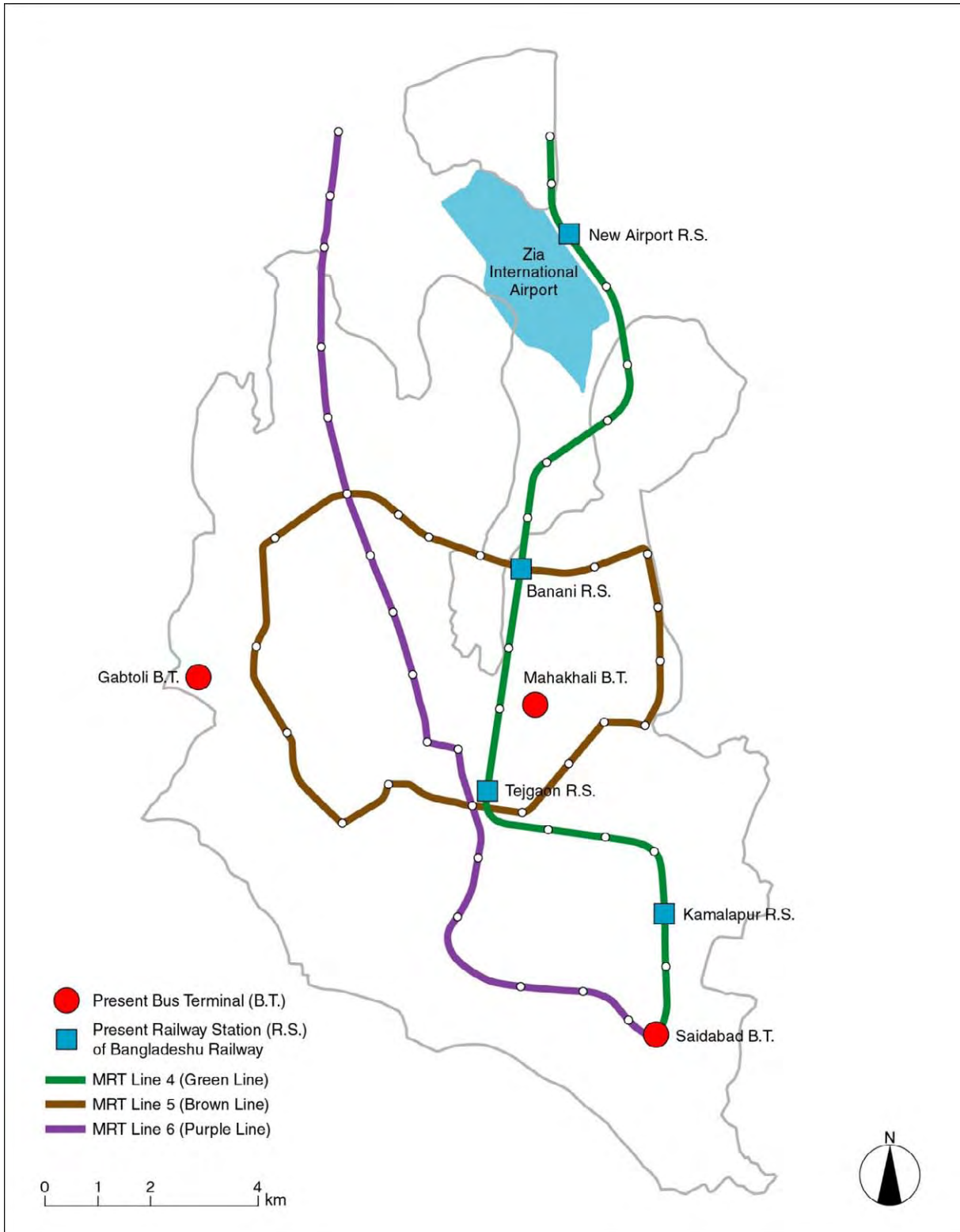


Figure 9.2-4

The chart below indicates a bus route network according to the future plan for the MRT System, and the relationship between the locations of proposed stations for the MRT System, and the locations of the existing city bus terminals (bus stands) and inter-district bus terminals.

According to the plan for the MRT System, three MRT Lines (4, 5 and 6) will be provided. To set the roles of bus terminals and station plazas, we will first examine the relationship with MRT Line 6 (between Saidabad and Uttara Model Town Planning) that has a high priority for construction, and also consider the locations of MRT Lines 4 and 5.

The roles of bus terminals, in other words, conditions for the plan are outlined below.

See “Inter-modal Transport with regard to MRT System” for details of the roles of station plazas.

- i) As indicated in ii), iii) and iv) below, city buses will be introduced to the existing bus terminals, and newly planned bus terminals and MRT’s station plazas, and existing bus stands will be removed.
- ii) Farmgate (Tejgaon) (an area where MRT Line 6 and MRT Lines 4 and 5 cross) and Mirpur (an area where MRT Line 6 and MRT 5 cross) should be planned as a transportation hub at the early stage. In addition, a space for city buses should be provided in the station plazas in consideration of the operation described in i) above.
- iii) Because two bus stands (Fulbaria and Gulistan) for city buses near DCC are located on the road along MRT Line 6, an alternative space should be secured in a station plaza adjacent to a nearby station (Kaptan Bazar to Dhaka University Areas).
- iv) Because inter-district buses are currently operated in three places (Gabtoli, Saidabad and Mohakhali), and MRT Lines 4 and 6 start from Saidabad Bus Terminal, the terminal should be planned as a transportation hub representing Dhaka. In addition, because there is currently a bus stand for city buses at the last stop in the Uttara Model Town Planning Area, a space for city buses should be provided in the station plaza.
- v) Because Gabtoli Bus Terminal is located near the station of MRT Line 5, the bus terminal should be improved by consolidating with the station plaza in the end.
- vi) New bus terminals should be planned in light of efficient operation so that inter-district buses will not be operated heavily in the central part of Dhaka. Mohakhali is located in the center of the three existing bus terminals, and buses to the inter-district area cause congestion in the city and are not operated efficiently. Therefore, other functions such as those of city buses and depots should be strengthened.

We propose the following three plans for new bus terminals for northbound and eastbound bus services:

Plan 1: Judging from the current road network and the proposed future road network, a new bus terminal should be planned in an area where the existing New Airport Railway Station, a proposed station for MRT Line 4 (New Airport Area), and the New Airport can be used integrally so that the bus terminal can serve both the northern district and eastern district. It will become a traffic node where three types of transportation modes (roads, railways and the airport) will be related with each other.

Plan 2: A new bus terminal should be planned in the Uttara Model Town Area, where MRT Line 4 terminates, and should be provided at the time of opening MRT Line 6.

Plan 3: Judging from the proposed future road network, the Uttara Model Town Planning Area along MRT Line 6 can have the function of a new bus terminal. Because the MRT System will be completed here earlier than other places, the bus terminal will be provided earlier. In this plan, the bus terminal will be provided as a station plaza at the time of opening MRT Line 6.

vii) In order to respond to DCC' problems like the shortage of depots and personnel, space and training facilities will be provided in the bus terminals.

viii) These plans should be provided so that vehicles other than buses (city buses and inter-district buses) can also utilize the bus terminals.

Based on the conditions of the above plans, the bus terminals and station plazas are outlined below (with a circle indicating complete introduction and use, a triangle indicating partial introduction and use, and a dash indicating no introduction or use). Functional improvement means the selection and introduction of city buses, inter-district buses and the functions of depots for the bus terminals, and the improvement of functions and facilities includes functional improvement and facility improvement.

Table 9.2-6 Plan for period from now until the opening of MRT Line 6

	Bus			Function	
	City	Inter-district	Depot	Bus terminal	Station plaza
<input type="checkbox"/> Gabtoli B.T.	△/○	○	—	○/△ (Functional improvement)	—
<input type="checkbox"/> Saidabad B.T.	○/△	○	—	○/△ (Functional improvement)	—
<input type="checkbox"/> Mohakhali B.T.	○/△	—	○/△	○/△ (Functional improvement)	—
<input type="checkbox"/> Northern Dhaka B.T.					
Plan 1 New Airport B.T.	○/△	○/△	—	○/△ (Newly provided)	—
Plan 2 Uttara Model Town Area B.T.	○/△	○/△	—	○/△ (Newly provided)	—
Plan 3 Uttara Model Town Planning Area B.T.	○/△	○/△	—	○/△ (Newly provided)	—
<input type="checkbox"/> Kaptan Bazar to Dhaka University Areas	—	—	—	—	—
<input type="checkbox"/> Farmgate Area (Tejgaon)	—	—	—	—	—
<input type="checkbox"/> Mirpur Area	—	—	—	—	—

Table 9.2-7 Plan for at the time of opening MRT Line 6

	Bus			Function	
	City	Inter-district	Depot	Bus terminal	Station plaza
<input type="checkbox"/> Gabtoli B.T.	○	○	—	○ (Functional improvement)	—
<input type="checkbox"/> Saidabad B.T.	○	○	—	—	○ (Improvement of functions and facilities)
<input type="checkbox"/> Mohakhali B.T.	○	—	○	○ (Functional improvement)	—
<input type="checkbox"/> Northern Dhaka B.T. <input type="checkbox"/> Plan 1 New Airport B.T. <input type="checkbox"/> Plan 2 Uttara Model Town Area B.T.	○	○	—	○ (Newly provided) ○ (Newly provided)	— —
<input type="checkbox"/> Kaptan Bazar to Dhaka University Areas	○	—	—	—	○ (Newly provided)
<input type="checkbox"/> Farmgate Area (Tejgaon)	○	—	—	—	○ (Newly provided)
<input type="checkbox"/> Mirpur Area	○	—	—	—	○ (Newly provided)
<input type="checkbox"/> <input type="checkbox"/> Plan 3 Uttara, Phase III Area (Model Town Planning Area)	○	○	—	—	○ (Newly provided)

PLAN 1

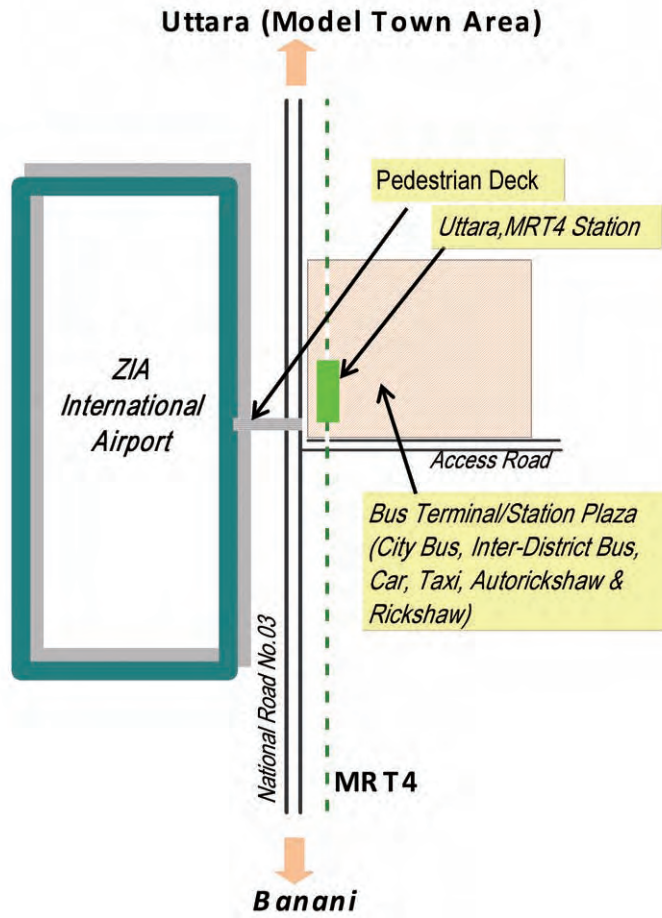


Figure 9.2-5 Plan 1

PLAN 2

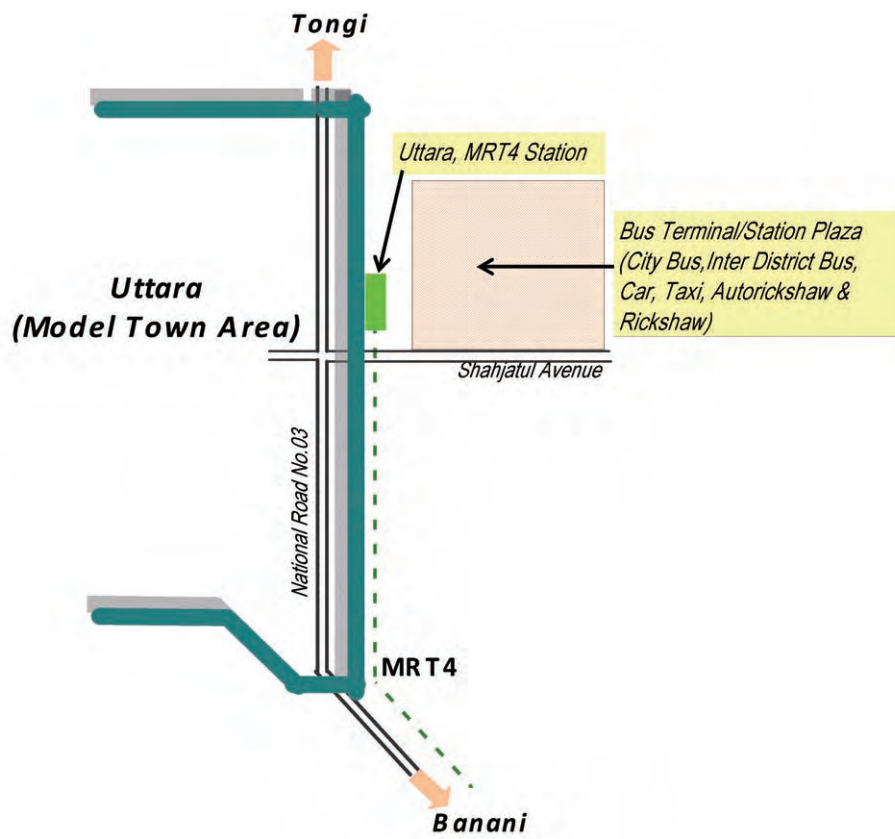


Figure 9.2-6 Plan 2

PLAN 3

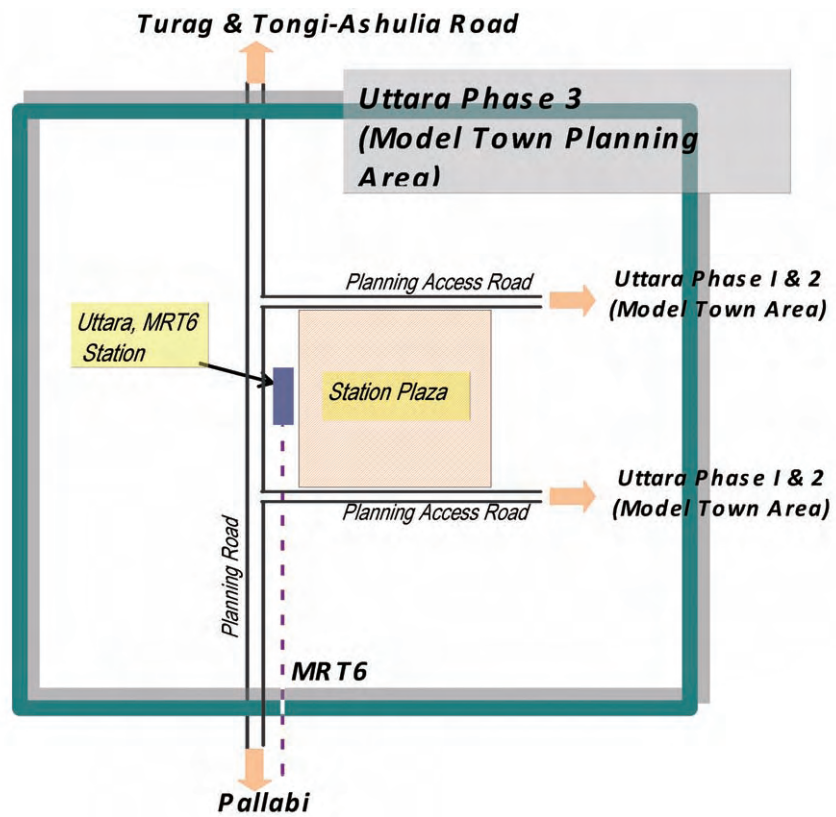


Figure 9.2-7 Plan 3

And Proposed Bus Depot in Uttara Model Town Planning Area by RAJUK shows as reference below.

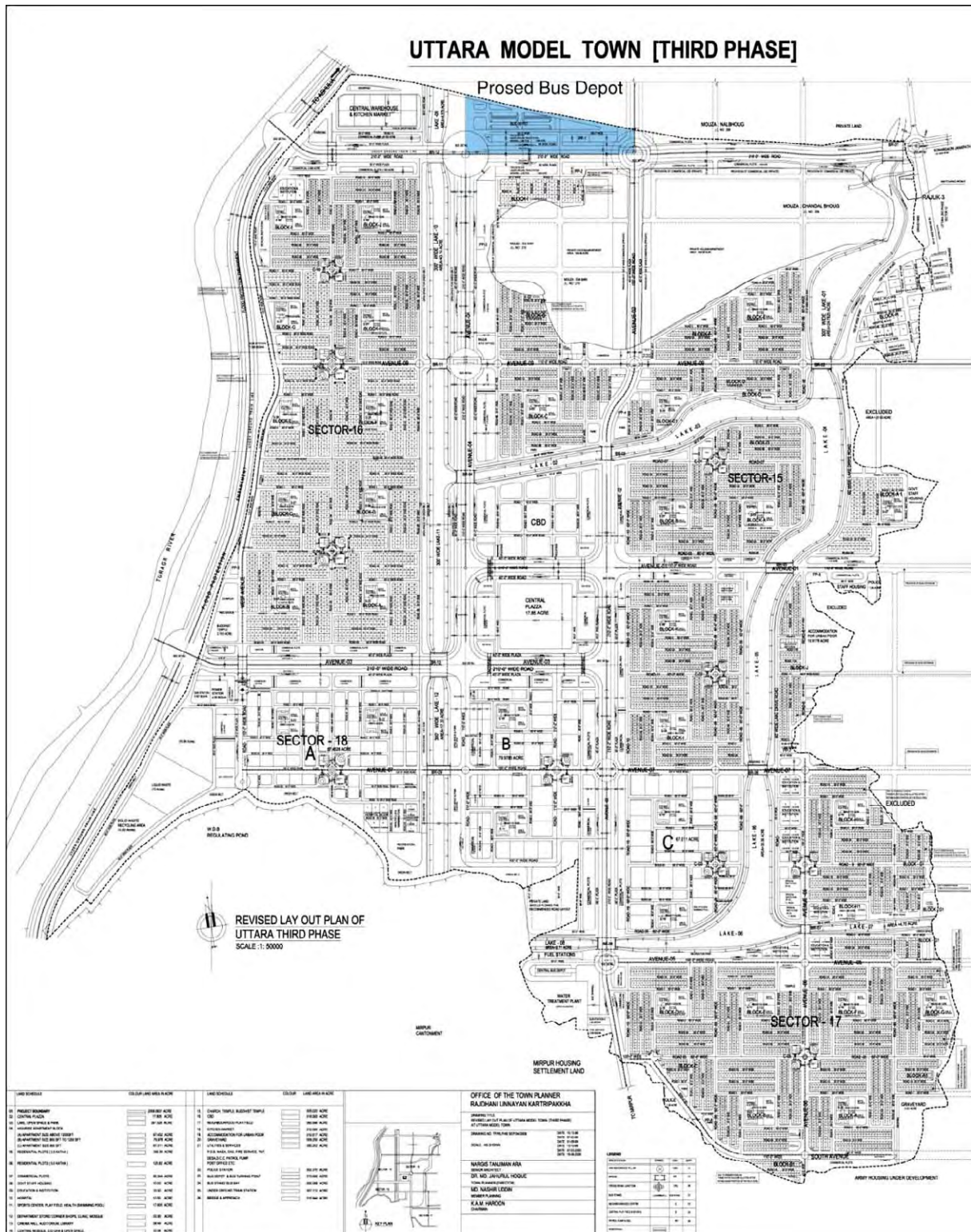


Figure 9.2-8 Proposed Bus Depot in Uttara Model Town Planning Area by RAJUK

(2) Plan for Bus terminal

This plan aims to improve places or areas for the bus terminals that are to be provided at the time of opening MRT Line 6, as described in Table 9.2-8, and the plan is outlined below.

Table 9.2-8 Plan for Bus terminal

Bus Terminal	Description of the plan
Gabtohi B.T.	<ul style="list-style-type: none"> As originally planned, city buses that can be connected with the inter-district buses running westwards from Gabtohi B.T. will be introduced. At the same time, the extent of maintenance necessary for each vehicle should be adjusted. Because bus terminals are now used haphazardly and function as a space for parking or as a maintenance shop, a system for using bus terminals should be established, and a space for a depot should be provided in consideration of the respective functions. Because this bus terminal will be located in an area along the planned MRT Line 5 in the farthest long run, the bus terminal should be provided as a base having the function of a traffic node as a station plaza.
Mohakhali B.T.	<ul style="list-style-type: none"> This bus terminal should be provided as a base to secure a space for city buses and a depot, and to control their functions. And the inter-district bus service, causing congestion in the city, should be terminated, and its function should be delegated to other newly provided bus terminals.
<div style="border: 1px solid black; padding: 2px;">Plan 1</div> New Airport B.T.	<ul style="list-style-type: none"> This bus terminal will take over the function of the inter-district bus of the existing Mohakhali B.T. The bus terminal should be provided so that city buses that can be connected with the northbound and eastbound inter-district buses and other vehicles can also be introduced. This bus terminal also has a function as a traffic node connected with airport facilities. Because this bus terminal will be located in an area along the existing railway and planned MRT Line 4 in the farthest long run, the bus terminal should be provided as a base having the function of a traffic node as a station plaza, integrated with the above-said airport facilities in the end.
<div style="border: 1px solid black; padding: 2px;">Plan 2</div> Uttara Model Town Area B.T.	<ul style="list-style-type: none"> Like Plan 1, this bus terminal will take over the function of the inter-district bus of the existing Mohakhali B.T. The bus terminal should be provided so that city buses that can be connected with the northbound and eastbound inter-district buses, and other vehicles can also be introduced. Because MRT Line 4 terminates at this bus terminal, the bus terminal should be provided as a base having the function of a traffic node as a station plaza in the farthest long run.

9.3 Inland Water Transportation Terminal

9.3.1 What is inland water transportation?

Inland water transportation is an environmentally friendly means of transport because it is highly energy-efficient, and it emits 1/13 of the CO₂ emissions of truck transportation. Inland water transportation can be a comfortable means of transport in a heavily congested city, and also a means of transporting emergency relief supplies in the event of a disaster. Inland water transportation also plays an important role in the recreation and tourism industry. It aids the long-distance transportation of bulk cargo through main trunk lines, and functions as a means of transportation for people living in remote areas.

The following issues remain for the development of inland water transportation:

- Lack of understanding about making contributions in various fields including economic, environmental and social issues
- Insufficient infrastructure, technology and funds
- Underestimated comprehensive water resource management
- Inadequate organization, legislation and policy
- Limited information shared
- Insufficient recognition among the general public, and weak political opinions

9.3.2 What is inter-modal transportation?

Inter-modal transportation is a system to transport cargo from one place to another via a combination of seaway (marine), railway and road transportation, or via a combination of seaway and air transportation. Inter-modal transportation has developed because conventional transportation methods could not respond fully to the needs of the market due to the advanced needs of shippers as described below:

1. In order to meet the extremely strong needs of shippers for shorter transit times from the point of departure to the destination, a method of reducing such time is selected.
2. Shippers think much of the just-in-time method as a means of inventory reduction, and are demanding qualitative improvement of transportation services.
3. As a result, they are seeking to have improved added-value of products.

As a prerequisite for achieving the above, carriers need to cooperate with each other.

However, the international physical distribution circle aims at developing logistics through inter-modal transportation, and Asian, European and U.S. shipping companies have formed a global alliance to develop logistics.

Inter-modal transportation is a method of transporting items by using two or more different ways

(modes) of transportation with the emphasis on efficient transshipment with the use of containers between modes.

Container cargo is sealed and delivered to its destination collectively. So if information that there is no security problem for shippers and cargo is shared among relevant parties, customs and other procedures for crossing borders can be simplified. In addition, though using container cargo is an efficient and environmentally friendly method of door-to-door transportation, it will become necessary to consolidate production and distribution bases.

9.3.3 Inland water transportation in Dhaka

STP has accepted the concept of a Circular Waterways System around Dhaka in future for the transport of people and goods that was proposed by BIWTA. But site of landing station were selected 8 points: Harbaid, Trimukh, Hadri, Isapura, Beraid, Kayetpara, Demra and Kachpur by results (mainly drainage problems) of “Final Report for Expert Consultancy Services of Feasibility Study for Development of Circular Around Dhaka City, phase-2” on April 2008.

Proposed Inland Water Terminal shows below:

And, MOP proposed Inland Container River Terminals at Pangaon, Dhaka and Khanpur, Narayanganj by Inland Water Transport Master plan on Feb. 2009

Due to the small size of Khanpur, and its access problems the site is not recommended for container use.

But Pangaon is under construction now, and physical construction works of First phase is expected to be completed by June 2010.

Objectives of the project: The main objective of the is to construct a Container River Terminal for handling containers to be transported by inland waterways from/to the maritime ports of Chittagon and Mongola.

The concept of terminal facilities for Pangaon shows below:

(Terminal facilities)

• RCC jetty upstream	1,411sqm
• RCC Jetty(down stream)	1,411sqm
• Container freight station	2,800sqm
• Paved area (marshalling yard, etc.)	60,000sqm
• Bank protection work and revetment	60,250sqm
• Administrative office building	1no.
• Workshop (repair/maintenance facilities)	1no.

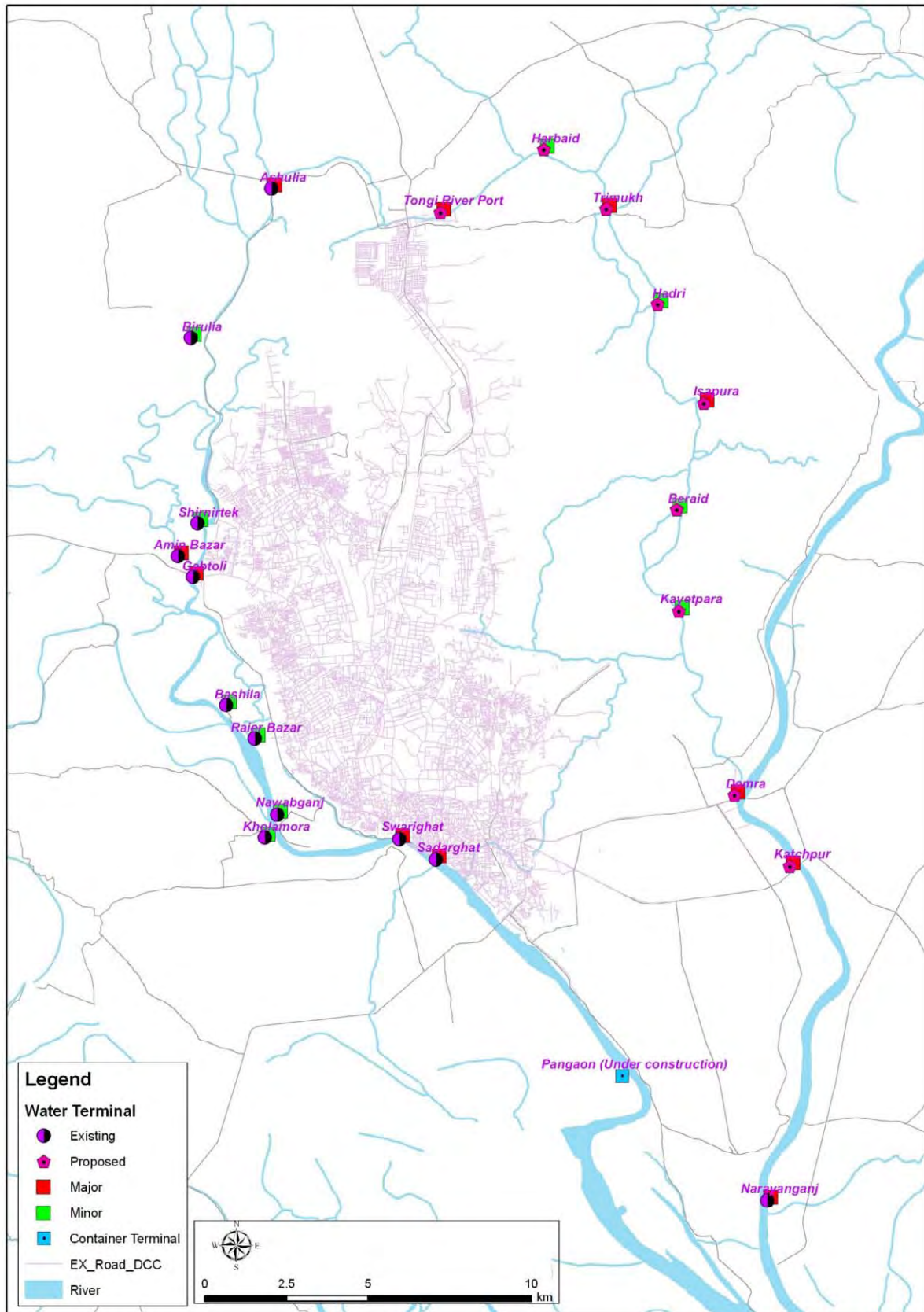


Figure 9.3-1 Proposed Inland Water Terminal



Photo 9.3-1 Pangaon(under construction)

9.4 Inter-modal Transport with Regard to MRT System

9.4.1 Plan for Station plazas in Dhaka

(1) Roles of station plazas

A station plaza is an important facility for increasing the attractiveness of public transportation, promoting the use of public transportation, and securing the continuity of traveling. Therefore, the necessary functions should be set in consideration of the characteristics of each station with regard to the three functions indicated in 2) of 17.2.1.

(2) Plan for station plazas

This plan aims to improve places or areas that are to be positioned as a station plaza at the time of opening MRT Line 6, as described in Table 9.2-7. The plan is outlined below.

Table 9.4-1 Plan for Station plazas

Station plaza	Description of the plan
Saidabad B.T. Area	<ul style="list-style-type: none"> • As originally planned, various types of vehicles including city buses that can be connected with the southbound inter-district buses should also be introduced. • At the same time, the extent of maintenance necessary for each vehicle should be adjusted. Because bus terminals are now used haphazardly and function as a space for parking or as a maintenance shop, a system for the use of bus terminals should be established, and a depot should be provided in consideration of the respective functions. • This bus terminal will be located at the starting point of planned MRT Line 6 that will be provided preferentially. Therefore, the bus terminal should be provided as a base for the biggest traffic node in Dhaka with all the functions of a station plaza. <p>Proposed Railway Station with Draw up Tracks shows Figure 5.2.1-1.</p>
Kaptan Bazar to Dhaka University Areas	<ul style="list-style-type: none"> • Two bus stands (Fulbaria and Gulistan) for city buses near DCC should be consolidated with a station plaza along the station for MRT Line 6 in the area described on the left, and improvements should be made. In addition, various types of vehicles except the inter-district bus should also be introduced.
Farmgate Area (Tejgaon)	<ul style="list-style-type: none"> • Three MRT Lines (6, 4 and 5) will be connected in the Farmgate Area in the farthest long run. Therefore, in order to finalize the location of a station for MRT Line 6, its function for connection should be taken into account for a station plaza. • Various types of vehicles except inter-district buses should be introduced to the station plaza.
Mirpur Area	<ul style="list-style-type: none"> • Two MRT Lines (6 and 5) will be connected in the Mirpur Area in the farthest long run. Therefore, in order to finalize the location of a station for MRT Line 6, its function for connection should be taken into account for a station plaza. • Various types of vehicles except the inter-district bus should be introduced to the station plaza.
Uttara, Model Town Planning Area Plan 3	<ul style="list-style-type: none"> • Like Plans 1 and 2, the function of the inter-district bus for existing Mohakhali B.T. should be provided, and other vehicles including city buses should also be introduced, and improvements should be made. Because MRT Line 4 terminates here, a base having the function of a traffic node as a station plaza should be provided. • In addition, a space for city buses should be provided in the station plaza, because a bus stand for city buses is now provided in the Uttara, Phase III Area.