8 FORMULATION OF THE RAIWAY MASTER PLAN

8.1 Rail Corridors Analysis

In Section-7 of this report, and under sub-section 7.2: “Approaches”, it was indicated that to enable BR to carry the anticipated traffic in the future, attention would be paid to improve 9-major corridors. Indicated below is a brief description of these corridors with an indication of major projects where investments would be required to carry the projected traffic as indicated in Section-5 of this report. In particular,Table 5.4.

8.1.1 Corridor-1: Dhaka-Chittagong Cox’s Bazar- Deep Sea Port Corridor

8.1.1.1 Current Condition

Dhaka – Chittagong section of Dhaka-Chittagong-Cox’s Bazar corridor is the busiest rail track for passenger and freight transport. Even then, railway infrastructures on the corridor become superannuated and there are many deficiencies. The line carried about 14 crore tonne-km freight in the year 2007 and of them, petroleum (diesel, kerosene and petrol), wheat, rice, marble and stone, fertiliser, sugar, iron and steel, and other grains were the prominent ones. In addition, the line carried 81,235 containers (TEUs) in 2006. The corridor not only serves between Dhaka and Chittagong but also to other destinations. In 2006, the number of passenger, freight and container trains was 68, 18 and 4 respectively on the Dhaka-Chittagong corridor. Therefore, the corridor has immense of potentials for future traffic in terms of passenger, freight and container. In addition, the construction of Dhirassram ICD will open up huge demand for container traffic.

Corridor 1: Dhaka-Chittagong-Cox’s Bazar-Deep Sea Port

However, the passenger traffic volume in the corridor was 5.35 million and 6.28 million in the year 1999 and 2004 respectively. On the other hand, passenger-km also increased from 841 million in 1999 to 962 million in 2004.

However, in both term (volume and passenger-km), passenger traffic has been increasing in the corridor. In addition, the occupancy rate in the corridor is very high in context of rail services.

8.1.1.2 Infrastructure Options

The corridor contains a mixture of single and double tracks and some sections are used beyond capacity. However, the government has taken initiative for double tracking the existing single track sections up to Chittagong. Of these, the work on double tracking of Tongi-Bhairab Bazar (64 km) section is currently underway with ADB funding. Work on double tracking of Laksam-Chinki Astana (61 km) has been also started under JICA funding. The Asian Development Bank will fund the double tracking of the remaining single track section of 71 km (Akhaura-Laksham section). Feasibility Study, Detail Design and Tendering Services are going on under ADB TA Loan. The sections Bhairab Bazar-Ashuganj (3.7 km) and Paghachang-Akhaura (9.3 km) including 2nd Bhairab and 2nd Titas Bridge will also made double track under Indian LOC.

Table 8-1: Dhaka-Chittagong Line Capacity and Train Number by Type

Trains	**Sections**							
	Dhaka -Tongi	Tongi-Bhairab Bazar	Bhairab Bazar-Ashuganj	Ashuganj-Paghachang	Paghachang -Akhaura	Akhaura-Laksam	Laksam-Chinki Astana	Chinki Astana-Chittagong
Intercity	38	16	16	16	16	14	14	14
Mail/Express	28	12	14	14	14	10	10	10
Local	2	0	2	2	2	4	4	4
Freight	18	14	12	12	12	16	16	16
Total	86	42	44	44	44	44	44	44
	Type of track by sections							
Sectional Capacity	Double	Doubling	Single	Double	Single	Single	Doubling	Double
	88	42	42	70	36	36	36	86
Length (km)	22.9	64.0	3.7	20.1	9.3	71.2	60.8	68.8

Source: Bangladesh Working Timetable (2005 and 2006)

The Chittagong-Cox's Bazar section of the corridor, however, needs special consideration. Feasibility Study for Improvement and Rehabilitation of Branch Lines of Bangladesh Railway (2007) suggested for rehabilitation of Chittagong-Dohazari (41km) section of the corridor. Recently, there is another government initiative to find a suitable location for a Deep Sea Port/Mega Port that would a Hub Port for the region. Suitable location of the Deep Sea Port will be around Sonadia Island- 9 square km in area located 7-km north-west of Cox's Bazar. The extension of the railway from Dohazari up to that area (around 102 km) could be easily justified as the government has decided to go for this very potential port. Further extension of the railway up to Cox's Bazar needs urgent construction considering strategies to be adopted to attract tourist traffic.

Initiatives can be taken from the Bangladesh Railway (BR) to extend the railway line from Dohazari to Gundum with a view to link with the railway in Mynmar, in future. Feasibility Study including Detail Design and Tendering Services ADB is going on under ADB funding.

8.1.1.3 Operational Opportunities

It is found from Table 8.1 that most of the single-track's section runs exceeding its sectional capacity and needs doubling the track. However, the corridor dominates intercity, mail/express and goods trains where BR's present businesses are concentrated. The Table 5.4 shows that the BR's future market will be expanded by intercity passenger, carrying of container, petroleum, food grains, fertiliser, and marble and stone. The available data on passengers and goods transport of the corridor shows that there is every potential to increase number of intercity, goods and container trains in the near future. In addition, train

passenger survey data persist that the intercity trains should introduce more Shovan and Shulav passenger class coaches in the train.

8.1.1.4 Market Analysis

The corridor is not homogeneous in respect of train runs because it serves for numbers of peripheral lines before reaching Chittagong. Therefore, the corridor has potential for other destinations, such as Sylhet, Noakhali, Chandpur, Kishoreganj, Mymensingh and West Zone. The corridor carries about 42% share of BR's total passenger traffic and present occupancy is very high, which is 116% and 97% for Shovan and Shulov classes respectively. It is projected that the corridor will carry about 2.2 to 3.3 million tonnes of all commodities at the end 2028. In addition, the construction of Dhirassram ICD will open up huge potential for BR to carry container traffic in near future. However, BR needs efficient train operations to materialise to meet demand both for passenger and freight on the corridor. The projected traffic on the corridor is shown in the following tables by sections.

Table 8-2: Projected Traffic of Dhaka-Tongi section on the corridor

Year	Passenger Train			Freight Train	Container Train
	Intercity	Mail/Express	Local		
2006	38	28	2	18	4
2009	44	29	2	21	4
2013	55	32	2	25	6
2018	74	38	2	31	6
2023	97	43	3	37	6
2028	127	49	3	43	6

Table 8-3: Projected Traffic of Tongi-Bhairab Bazaar section on the corridor

Year	Passenger Train			Freight Train	Container Train
	Intercity	Mail/Express	Local		
2006	16	12	0	14	4
2009	19	12	0	16	4
2013	23	14	0	19	6
2018	31	16	0	24	9
2023	41	18	0	29	13
2028	53	21	0	34	18

Table 8-4: Projected Traffic of Bhairab Bazaar-Akhaura section on the corridor

Year	Passenger Train			Freight Train	Container Train
	Intercity	Mail/Express	Local		
2006	16	14	2	12	4
2009	19	15	2	14	4
2013	23	16	2	17	6
2018	31	19	2	21	9
2023	41	22	3	25	13
2028	53	24	3	29	18

Table 8-5: Projected Traffic of Akhaura-Chittagong section on the corridor

Year	Passenger Train			Freight Train	Container Train
	Intercity	Mail/Express	Local		
2006	14	10	4	16	4
2009	16	10	4	19	4
2013	20	12	4	22	6
2018	27	13	5	28	9
2023	36	15	5	33	13
2028	47	17	6	38	18

8.1.1.5 Major Works on the Corridor to be needed

In order to carry the projected number of passenger, freight and container trains in the year 2028, a number of projects are to be undertaken on the corridor, as presented in Table 8-6. Dhaka-Tongi is a common section for Chittagong, Mymensingh, BMB and Sylhet routes. These will be heavily used under proposals for the above corridors in the Master Plan, and additional capacity will be required. A feasibility study is recommended for adding a 3rd and 4th track to the Tongi-Airport-Kamlapur section.

Table 8-6 : Major Works in the Dhaka-Chittagong Corridor to be needed

Sl	**Works**	**Status**
1.0	Capacity improvement in between Dhaka-Tongi by introducing intermediate block signalling (ADB funded)	On-going
1.1	Construction of double line between Tongi and Bhairab Bazar (ADB funded)	On-going
1.2	Construction of double line between Laksham-Chinki Ashtana (JICA funded)	On-going
1.3	Construction of double line between Akhaura-Laksham (ADB funded)	Study going on
1.4	Rehabilitation of existing line from Akhaura to Laksham (ADB funded)	Study going on
1.5	Construction of double line between Bhairab Bazar-Ashuganj (LOC)	On-going
1.6	Construction of double line between Paghachang-Akhaura(LOC)	On-going
1.7	Doubling of Titas Bridge(LOC)	On-going
1.8	Rehabilitation of Chittagong-Dohazari section(GOB)	On-going
1.9	Construction of railway line between Dohazari and Cox's Bazar/Deep Sea Port(ADB)	Study going on
1.10	Construction of double line between Fouzderhat-Chittagong Port	Proposed under the Plan
1.11	Modernisation of 11 station's signalling system in between Chinkiastana-Chittagong (EDCF)	On-going
1.12	Replacement of Kalurghat rail bridge	Proposed under the plan
1.13	Construction of 3rd and 4th line from Dhaka to Tongi (LOC)	On-going

8.1.2 Corridor-2: Chilahati- Ishurdi- Khulna- Mongla

8.1.2.1 Corridor Descriptions

This corridor is the busiest BG section in the West Zone of BR which connects Khulna River Port (with a road link to Mongla seaport) to Chilahati border point. This route used to be a major corridor before partition in 1947 linking Kolkata to Assam. Presently, there is no opportunity to carry Indian traffic from Mongla/Khulna to Chilahati and beyond because the Indian rail portion up to Haldibari was withdrawn. This corridor consists of five major sections, namely – Khulna-Jessore, Jessore-Abdulpur, Abdulpur-Santahar, Santahar-Parbatipur, and Parbatipur-Chilahati. A new section, Mongla-Khulna has been proposed by the plan.

The traffic volume in terms of goods and passengers varies widely from section to section. However, the corridor carried about 1.2 million tonne freight in the year 2005, which was 37% of total freight carried by BR. The type of goods carried included petroleum (diesel, kerosene and petrol), wheat, sugar, salt, rice, oil seeds, stone and other food grains. Presently, 8 to 10 Intercity trains with different origins and destinations, are running along the corridor. According to traffic projection, the level of freight traffic at the end of the plan would be around 2.1 million tonne per year. To carry the additional freight traffic, about eight more freight trains per day would be required at the end of the year 2028. The present traffic shows that the most of the sections of this corridor have been running under capacity.

However, there is opportunity to use this corridor from Mongla Port to Abdulpur via Rohanpur by Nepalese freight traffic in near future.

Corridor 2: Chilahati-Ishurdi- Khulna-Mongla

8.1.2.2 Infrastructure Options

The Government has taken various initiatives for upgrading the signalling system and extension of loops at different stations along the corridor. The Feasibility Study for Improvement and Rehabilitation of Branch Lines of Bangladesh Railway (2007) recommended the rehabilitation of Saidpur-Chilahati (52km) section of this corridor. In addition, the corridor needs to be extended up to Mongla Port, which is not connected at

present by railway. Presently, the actual port capacity is not being used fully. The government is therefore, taking various operational measures for using of the port both by national ships as well as foreign ships. In addition, the SAARC Regional Multimodal Transport Study (SRMTS) as well as South Asia Sub-regional Economic Cooperation (SASEC) have stressed need for possible use of Mongla Port by Nepal through rail, which needs rail connection from Khulna to Mongla Port to be established.

Table 8-7:Chilahati-Khulna-Mongla Line Capacity and Train Number by Type

Trains	**Sections**								
	Mongla-Khulna	Khulna-Jessore	Jessore-Poradah	Poradah-Ishurdi	Ishurdi-Abdulpur	Abdulpur-Santahar	Santahar-Parbatipur	Parbatipur-Nilphamari	Nilphamari-Chilahati
Intercity	0	8	8	10	10	8	8	8	2
Mail/ Express	0	6	6	4	8	6	4	2	2
Local	0	0	0	2	4	2	2	2	2
Freight	0	6	6	6	6	4	4	0	0
Total	0	20	20	22	28	20	18	12	6
	Type of track by sections								
Sectional Capacity	BG	BG Single	BG Single+ Double	BG Double	DG Single	DG Single	DG Single	DG Single	BG Single
	-	32	28+60	64	56	30	30	28	18
Length (km)	55.00	56.00	112.89	34.90	17.46	60.99	95.95	15.10	32.34

8.1.2.3 Operational Opportunities

It was mentioned in the earlier section that there is no parallel or direct road connection from Mongla/Khulna to Chilahati and therefore, it could be assumed that the efficient train operation will attract the existing and future passenger market. The occupancy of intercity and mail/express train is 89% and 118% respectively, which supports the need for increasing train number. There are many townships and wholesale centres (both for industrial and agricultural products) along the catchments of the corridor. In addition, the proposed line between Khulna and Mongla Port would have potential for increasing the future freight traffic. The passenger demand in 2005 was 572 million km on the route. To carry mixed freight from the catchments area is another opportunity of the corridor, which should be exploited.

8.1.2.4 Market Analysis

The corridor consists of six major sections, namely (a) proposed line between Mongla and Khulna, (b) Khulna-Poradah, (c) Poradah-Ishurdi, (d) Ishurdi-Santahar, (e) Santahar-Parbatipur, and (f) Parbatipur-Nilphamari. It is seen from the analysis, the train numbers are varying section to section, which is shown in the following tables. In addition, an effort was made to project the future traffic on the sections. The traffic projection shows that an efficient train operation including modernised signalling system would be required to meet the need of future passenger as well as freight demand.

Table 8-8: Projected Traffic of Khulna-Poradah section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	8	6	0	6
2009	9	6	0	7
2013	12	7	0	8
2018	15	8	0	10
2023	20	9	0	12
2028	27	10	0	14

Table 8-9: Projected Traffic of Poradah-Ishurdi section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	10	4	2	6
2009	12	4	2	7
2013	14	5	2	8
2018	19	5	2	10
2023	26	2	3	12
2028	33	7	3	14

Table 8-10: Projected Traffic of Ishurdi-Abdulpur section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	10	8	4	6
2009	12	8	4	7
2013	14	9	4	8
2018	19	11	5	10
2023	26	12	5	12
2028	33	14	6	14

Table 8-11: Projected Traffic of Santahar-Parbatipur section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	8	4	2	4
2009	9	4	2	5
2013	12	5	2	6
2018	15	5	2	7
2023	20	6	3	8
2028	27	7	3	10

Table 8-12: Projected Traffic of Parbatipur-Nilphamari section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	8	2	2	0
2009	9	2	2	0
2013	12	2	2	0
2018	15	3	2	0
2023	20	3	3	0
2028	27	3	3	0

8.1.2.5 Major Work on the Corridor to be needed

In order to meet the future demand for both national and regional (mainly Nepalese traffic) traffic along the corridor, the following major works would be required during the plan period.

Table 8-13: Major Works on the Corridor to be needed

Sl	Works	Status
2.1	Upgrade Signalling in 11 Stations between Ishurdi-Darsana (ADB funded)	On-going
2.2	Rehabilitation of Yards and Extension of Loops at different Stations between Khulna and Parbatipur (ADB funded)	On-going
2.3	Feasibility Study and Construction of Khulna-Mongla Port Rail Line (LOC)	On-going
2.4	Rehabilitation of Saidpur-Chilahati section(GOB)	On-going
2.5	Modernisation of 20 station signalling system in between Parbatipur-Abdulpur-Ishurdi	Proposed under the plan
2.6	Modernisation of 17 station signalling system in between Darsana-Khulna	Proposed under the plan
2.7	Feasibility Study for Construction of double line between Parbatipur-Khulna	Proposed under the plan

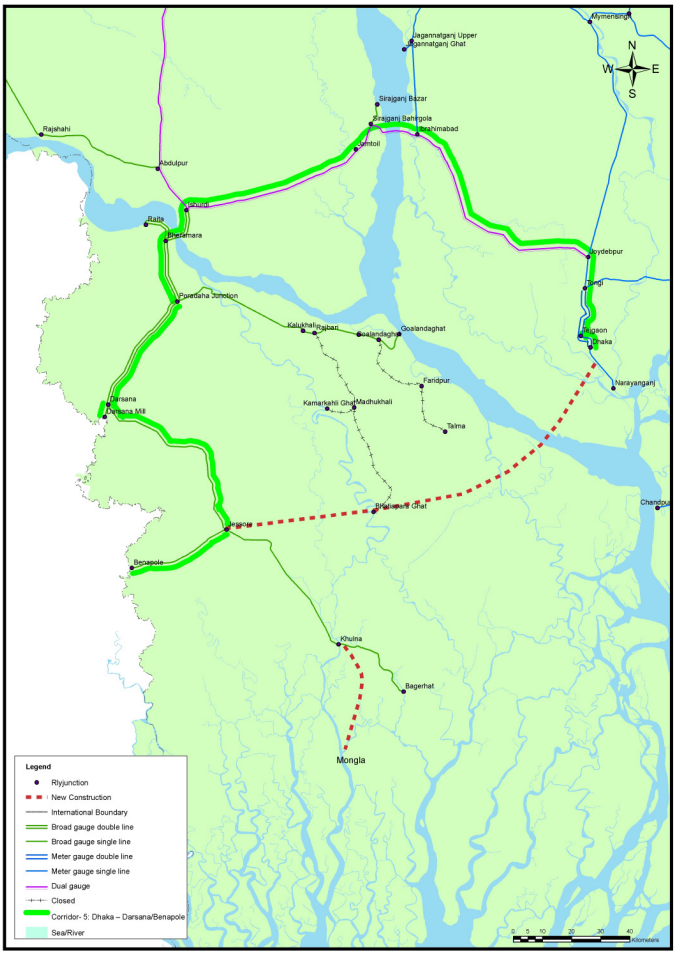
8.1.3 Corridor-3: Dhaka- Bangabandhu Bridge- Darsana/Benapole

8.1.3.1 Current Conditions

This is an important railway corridor in context of national as well as regional freight traffic. The section Dhaka-Tongi is common with Dhaka-Chittagong-Cox's Bazar and Ishurdi – Darsana-Jessore section is common with Mongla-Khulna-Chilahati corridor.

The corridor carried about 0.8 million tonne freight in the year 2005 and of them, wheat, vegetable oil, sugar, salt, rice, stone, petroleum (diesel, kerosene and petrol), and other food grains were the prominent ones. In context of line capacity, the present capacity of Joydebpur-Jamtail line over BMB is very low, about 20 trains per day, due to long block sections.

If these long block sections are split, the line capacity can be enhanced considerably. For further enhancement of the capacity and to overcome the loading restriction of Bangabandhu Bridge, it would be necessary to go for construction of a parallel Bangabandhu Bridge, dedicated to railway, while the existing Bangabandhu Bridge could carry road traffic only. In addition, the capacity of Ishurdi-Jamtoil section of the corridor is getting saturated. However, with the construction Bogra-Jamtoil new MG line, some capacity constraint will reduce.



Corridor 3: Dhaka-Bangabandhu Bridge - Darsana/Benapole

8.1.3.2 Infrastructure Options

The infrastructure options of common sections of the corridor are described in the earlier sections. The section Joydevpur-Ishurdi is newly built. The other sections are Darsana Junction-Darsana and Jessore-Benapole. However, Darsana Junction-Darsana section is in moderate condition, which will be needed only proper maintenance and replacement of unserviceable sleepers.

The section Jessore-Benapole in the corridor is in deplorable condition. The section was laid 90lbs 'BSS' rails and rails were rolled in 1909 and laid in 1910. The section discontinued since partition of India and became abandoned for the long time. Only a few years back, two passenger trains and on an average one goods train is moving daily on the line. The rails need to be replaced and most of the steel trough sleepers are also to be replaced. Most of the level crossings are in vulnerable condition from the point of safety. Safety devices had not been provided according to the requirement. In addition, some unauthorised level crossing gates had been opened in the section. The Feasibility Study for Improvement and Rehabilitation of Branch Line, 2007 reported that there are 58 bridges and of them six are major. One major bridge at Jessore-Jhikargacha and 17 minor bridges are required to be rebuilt. The existing signals are non-interlocked mechanical at all the stations and need to be replaced with colour light non-interlocked system. It is worth to mention here that the frequency of train is still less in the section, which is three trains per day only. The existing scenarios of the corridor are presented in the Table 8-14.

In this corridor there may be potential for a new rail link to be constructed on a second Padma Bridge, with a possible connection to the existing network near Goalandaghat/ Douladia on the west side of the river. A feasibility to study options for rail connections is recommended.

Table 8-14: Dhaka-Bangabandhu Bridge -Darsana-/Benapole Line Capacity and Train Number by Type

Trains	**Sections**				
	Tongi-Joydevpur	Joydevpur-Jamtoil	Jamtoil-Ishurdi	Darsana-Darsana Junction	Jessore-Benapole
Intercity	12	12	12	0	0
Mail/Express	10	2	4	0	2
Local	2	0	2	0	0
Freight	0	0	2	2	1
Total	24	14	20	2	3
	Type of track by sections				
Sectional Capacity	DG Single	DG Single	DG Single	BG Single	BG Single
	44	20	20	10	10
Length (km)	11.27	103.70	69.70	1.01	35.02

8.1.3.3 Operational Opportunities

This is one of the circuitous natures of corridor in the West Zone and needs long travel time to reach destinations. The main destinations of the corridor are Dhaka, Ishurdi, Darsana, Jessore, Beanpole and further extension towards Khulna city. It is mentioned in the Table 8-14 that a total of 12 intercity trains is running on the corridor. In addition, inter-country (India-Bangladesh) freight traffic, mainly from Benapole and Darsana, is transhipped at Noapara (between Jessore and Khulna) from railway to inland waterways towards the destinations Dhaka, Narayanganj, Chittagong and other places. However, both the railway and waterway lack improved facilities at Noapara.

Moreover, the corridor has potential to carry regional container traffic after construction of Dhirassram ICD. However, fewer trains are moving on the track in context of existing track capacity and the corridor has opportunity to accommodate more trains during the plan periods.

8.1.3.4 Market Analysis

The corridor carries domestic as well as regional traffic. The existing growth rate shows that the corridor has opportunity to cater more traffic but it depends on efficient management and train operation both for passenger traffic and container freight up to Dhirassram ICD. However, it could be assumed that traffic scenario on the corridor would be changed after construction Dhaka-Jessore direct rail line over Padma Bridge at Mawa-Jajira point . The projected traffic on the corridor is shown in the following tables by sections.

Table 8-15: Projected Traffic of Tongi-Joydevpur section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	12	10	2	0
2009	14	10	2	0
2013	17	12	2	0
2018	23	13	2	0
2023	31	15	3	0
2028	40	17	3	0

Table 8-16: Projected Traffic of Joydevpur-Jamtoil section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	12	2	0	0
2009	14	2	0	0
2013	17	2	0	0
2018	23	3	0	0
2023	31	3	0	0
2028	40	3	0	0

Table 8-17: Projected Traffic of Jamtoil-Ishurdi section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	12	4	2	2
2009	14	4	2	2
2013	17	5	2	3
2018	23	5	2	3
2023	31	6	3	4
2028	40	7	3	5

8.1.3.5 Major Works on the Corridor to be needed

Once regional traffic is allowed to move across Bangladesh, there could be a major growth in traffic to be travelled by BR. Meanwhile to take care of normal traffic growth the following projects are required to be undertaken.

Table 8-18: Major Works on the Corridor to be needed

SL No	Works	Status
3.1	Construction of Stations between Joydevpur and Jamtoil to decrease the length of long block section	Proposed under the Plan
3.2	Construction of parallel Railway Bangabandhu Bridge(ADB)	Study going on
3.3	Rehabilitation of Darsanahalt-Darsana Border line including yard	Proposed under the Plan
3.4	Feasibility study for the construction of double line between Joydevpur- Bangabandhu Bridge-Ishurdi (ADB)	Study going on
3.5	Construction of double line between Joydevpur-Bangabandhu Bridge-Ishurdi	Proposed under the Plan
3.6	Up-gradation of Jessore – Benapole section	Proposed under the plan

8.1.4 Corridor-4A: Dhaka- Bangabandhu Bridge- Rajshahi-Rohanpur

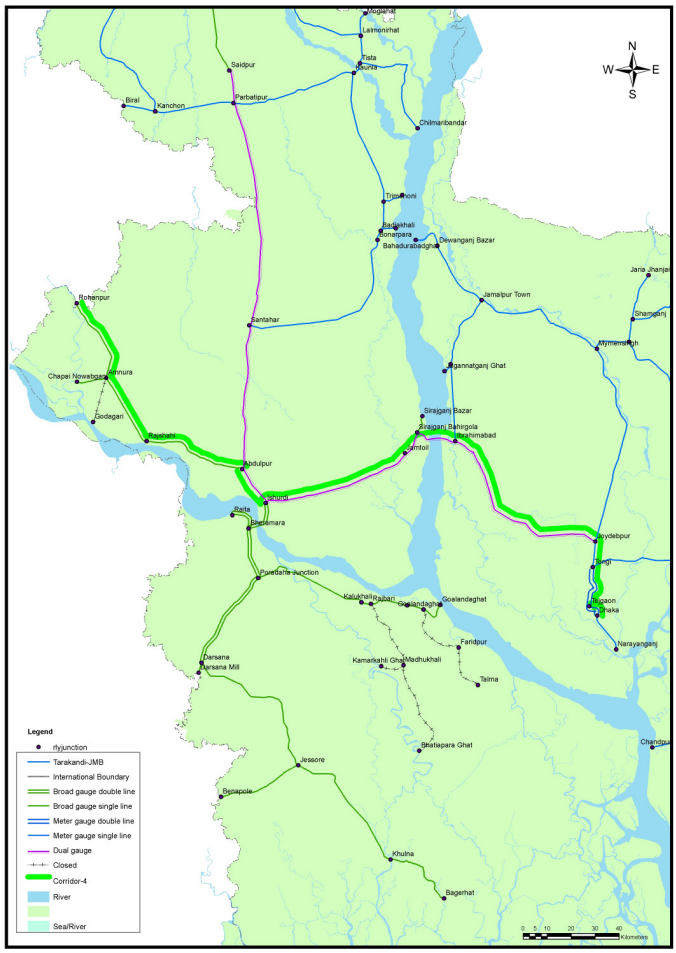
Corridor-4B: Dhaka- Bangabandhu Bridge- Ishurdi- Parbatipur-Chilahati/Birol

8.1.4.1 Current Conditions

Dhaka- Bangabandhu Bridge - Rajshahi - Rohanpur is an important strategic rail corridor through which Bangladesh BG Railway system is connected with Indian Railway. This corridor overlaps with Dhaka-Darsana/Benapole corridor along the section from Abdulpur Junction to Dhaka. In addition, the small section Abdulpur-Ishurdi of Mongla-Khulna-Chilahati/Birol corridor overlaps with the corridor. Presently, 19 trains including 10 Intercity and one goods train ply between Abdulpur and Rajshahi and 9 trains from Rajshahi to Rohanpur/Amnura. It is mostly stone, wheat, rice and other food grains which move along the corridor. Rohonpur a BG border crossing point is fully operational. This corridor is presently carrying only Indo-Bangladesh bilateral traffic, but it has potential of carrying Nepal-Bangladesh regional traffic – as well.

In the absence of policy decision to allow regional traffic to use this corridor, traffic projection has been made only for bilateral traffic along this corridor. According to traffic forecast, a maximum of 0.7 millions tonnes of goods traffic could more along this corridor for Rohonpur to Abdullahpur during the year 2025.Analysis shows that enough capacity would be available to cater to this traffic during that year and beyond. However, if regional traffic starts moving along this corridor, the picture may suddenly change, and the projected traffic could be in the order of 1.5 million tonnes by 2025.

Rohanpur has only three yard lines capable of accommodating a freight train of only 30 BCX wagons. As the composition of train loads on Indian Railway is 40 BCX, load-shedding by detaching 10 BCX wagons from every Indian rake is undertaken at Singhabad Yard (in India) opposite Rohonpur, causing delays to the loaded stock.



Corridor 4A: Dhaka-Bangabandhu Bridge-Rajshahi-Rohanpur
4B: Dhaka- Bangabandu Bridge- Ishurdi- Chilahati

These detached wagons are consolidated and moved later as a rake of 30 wagons. The inadequate holding line capacity in BR thus adversely affects through movement of loaded traffic.

8.1.4.2 Infrastructure Options

The Feasibility Study for Improvement and Rehabilitation of Branch Lines of Bangladesh (2007) reported the detail survey of Rajshahi-Rohanpur section. Due to poor condition of track and signalling system, trains are running at a restricted speed of 15 km/hour against the sectional maximum speed 55 km/hour. Moreover, due attention had not been given for maintenance of embankment. Especially from Rohanpur station to the border, at maximum portion of the track, there is no earth below the sleeper ends. However, the entire section from Rajshahi to border point needs earthwork for maintaining as track embankment. The present density of sleepers N-2 to N-3, though sleepers density N+3 is to be provided as per manual. The study also pointed out about 75% unserviceable sleepers is present in the section. In addition, rails need to be replaced.

There are six major and 121 minor bridges in the Rajshahi-Rohonpur section, which were constructed before the year 1909. Most of the bridges need rehabilitation and replacement. The non-interlocked signalling system appears at the stations between Abdulpur and Rohonpur. Only Abdulpur station has interlocking signals with standards in the corridor.

Most of the sections of this corridor except Rajshahi-Rohonpur section is in good condition and has capacity to handle future traffic. The Rajshahi-Rohanpur section up to the border, therefore, needs to be rehabilitated. In addition, the yard at Rohanpur Station needs to be enlarged to accommodate Indian 40 BCX goods train.

In 2009, the Planning Commission determined that the potential of a new rail[3] bridge across the River Padma in the vicinity of Nagabari should be studied with a view to early implementation. New rail links to this bridge should ensure that Pabna is connected to the network, and should be studied in the feasibility phase.

Table 8-19: Dhaka-BMB-Rajshahi-Rohanpur Line Capacity and Train Number by Type

Trains	**Sections**		
	Abdulpur-Rajshahi	Rajshahi-Amnura	Amnura-Rohanpur
Intercity	10	0	0
Mail/Express	6	4	0
Local	2	4 (mixed)	6 (mixed)
Freight	1	1	1
Total	19	9	5
	Type of track by sections		
Sectional Capacity	BG Single	BG Single	BG Single
	30	20	16
Length (km)	40.94	37.80	25.16

8.1.4.3 Operational Opportunities

The corridor is very important to carry domestic as well as regional traffic. Nepal has been pursuing to use Birgunj (Nepal) – Raxaul (India) – Singhabad (India) – Rohanpur

[3] This bridge may include a road component

(Bangladesh) – Mongla Port railway line to overcome captive uses of Kolkata/Haldia port. The ADB funded SAARC Regional Multimodal Transport Study (2006) and BIMSTEC Transport Infrastructure and Logistic Study (2007) have mentioned that this is the only potential rail line for Nepal's international trade. Therefore, the operational capacity of the corridor needs to be increased from existing Level of Service (LOS) to attract regional traffic by the corridor.

8.1.4.4 Market Analysis

This is a significant corridor to serve the domestic as well as regional traffic. It is seen from the table below; this is a low traffic density corridor and has enough capacity for accommodating additional traffic in future. Moreover, some of the fastest growing city and towns lie along this corridor. With the opening of the Bangadandhu Bridge by DG track, there are growing opportunities for running more intercity train. The traffic projections on the corridor by sections are shown in the following tables.

Table 8-20: Projected Traffic of Abdulpur-Rajshahi section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	10	6	2	0
2009	12	6	2	0
2013	14	7	2	0
2018	19	8	2	0
2023	26	9	3	0
2028	33	10	3	0

Table 8-21: Projected Traffic of Rajshahi-Amnura/Rohanpur Section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	0	6	2	2
2009	0	6	2	2
2013	0	7	2	3
2018	0	8	2	3
2023	0	9	3	4
2028	0	10	3	5

8.1.4.5 Major Work on the Corridor to be needed

Based on the above discussion, in context of infrastructure, operation and future traffic, the following projects are required to be undertaken to carry the forecasted traffic efficiently.

Table 8-22 : Projects in the Corridor to be needed

Sl	Works	Status
4.1	Rehabilitation of Rajshahi – Rohanpur – Border section and Amnura Line(GOB)	On-going
4.2	Extension of yard and capacity at Rohanpur	Proposed under the Plan
4.3	Modernisation of 5 station signalling system in between Abdulpur-Rajshahi	Proposed under the Plan
4.4	Construction of Double Line from Tongi-Joydevpur(LOC)	On-going

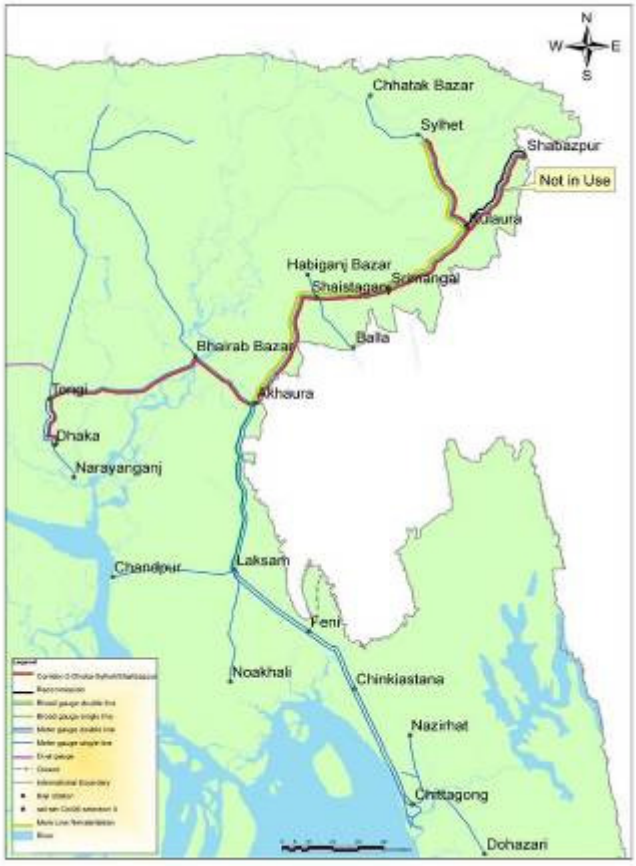
8.1.5 Corridor-5: Dhaka-Sylhet/Shahbazpur Corridor

8.1.5.1 Current Conditions

Dhaka – Sylhet/Shahbazpur corridor is another busy rail track for passenger and freight transport in the East Zone. The corridor overlaps with Dhaka-Chittagong-Cox's Bazar Corridor along the section from Dhaka to Akhaura Junction. The corridor is mainly dominated by the Inter-City passenger trains followed by express and local trains.

The sectional capacity of the line is about 48train/day and at present 26, 20 and 19 number trains are running on the Akhaura-Shaistaganj, Shaistaganj - Kulaura, and Kulaura-Sylhet sections respectively. The corridor carries 16% of freight traffic of entire BR. The damaged girder of Kushiara Bridge reduces the train speed to 16 km/hour at the bridge site.

According to freight traffic forecast, this corridor is expected to carry around a maximum of seven lakh tonnes of cargo by 2025. This traffic would mean additional two-trains a day. Thus, it could be assumed that the corridor would have enough capacity to carry projected traffic during the plan period. This was the main corridor of the Assam-Bengal Railway for connecting Nort-East India with Chittagong port and the then eastern parts of Brahmaputra and Ganges rivers.



Corridor 5: Dhaka-Sylhet/Shahbazpur

The Kulaura-Shahbazpur section is a part of Dhaka-Sylhet corridor, which was in operation until 1995, and since then out of commission.

8.1.5.2 Infrastructure Options

The total length of speed-restricted track is 35 km on the corridor where the speed limit is 50km/hour only. In addition, damaged girder of Kushiara Bridge reduced the train speed at 16 km/hour to cross the bridge. The DI (Double Ware Interlocked with I (Standard of Interlocking) type signalling system maintain 48 km/hour permissible train speed to cross the stations. There is only one non-interlocked signalling system at Shaistaganj Railway Station.

Bangladesh Railway has reconstructed major stations along the corridor to increase the passenger facilities and avoid overcrowding. Moreover, the track and other infrastructure facilities need standard maintenance to run the trains effective and efficiently. The sectional capacity and number of train by type is described in the Table 8-23.

Table 8-23: Dhaka-Sylhet Line Capacity and Train Number by Type

Trains	**Sections**			
	Akhaura-Shaistaganj	Shaistaganj-Kulaura	Kulaura-Sylhet	Kulaura-Shahbazpur
Intercity	10	10	10	0
Mail/Express	6	6	6	0
Local	2	2	2	0
Freight	4	4	4	0
Total	22	22	22	0
	Type of track by sections			
Sectional	Single	Single	Single	Single
Capacity	48	38	34	34
Length (km)	57.51	70.85	48.35	39.46

Another section, Kulaura to Shahbazpur presently is not in operation and needs replacement of signalling and telecommunications system. The present infrastructure condition of the route from Kulaura to Shahbazpur is described in the Table 8-24.

Table 8-24: Infrastructure Condition of Kulaura – Shahbazpur Section

Sections	Permanent way structure	Bridges	Signalling and telecommunication	Remarks
Kulaura-Shahbazpur Distance–39 km Gauge-MG Line-Single	Rail weight-60 lb Sleeper-Wooden, concrete, N+0 Speed-max 30 kmph	MG Main line (ML) standard	Ordinary mechanical signalling.	This section is not in operation since July 2002.

In the section, there are seven stations including Kulaura Junction and Shahbajpur. Numbers of B-Class stations are five and others are D-Class stations. The most of the station buildings were constructed in the British era, around 1896 and all station buildings need to be reconstructed. The entire section was laid with 80lbs IMR 30′-0″ Long and BS 60lbs R rails rolled in 1961 and 1941-42 respectively over oil treated wooden sleepers. Since the rails are quite old, the weight loss of rails could vary from 15% to 20% and sleepers are unserviceable.

8.1.5.3 Operational Opportunities

Shahbazpur border crossing is a part of the Trans Asian Railway (TAR) corridor. If a decision is taken to allow both bilateral and Indian traffic to move along this corridor, it would need attention in the near future for rehabilitation of certain sections. The projected traffic mostly diverted from the current route through the chicken neck would be in the order of 2.5 miilion tonnes by 2025. This new traffic will need around 13 additional goods train to move along Kulaura-Akhaura section. Analysis shows that there would be sufficient traffic capacity available to carry this additional traffic.

To ensure uninterrupted movement of rail traffic from NE-India to Chittagong and Kolkata, there would be a need for conversion of track from Shahbazpur to Tongi via Akhaura, as well as the track from Akhaura to Chittagong from MG to DG. The implementation of the proposals for providing connectivity's through Shahbazpur between NE-India to Kolkata and also access to Chittagong port through Bangladesh Railway system would however, need political commitments and supports of both India and Bangladesh governments.

8.1.5.4 Market Analysis

The passenger share of the corridor is about 11% and freight traffic has been reducing on the corridor. Most of the commodities (e.g. stone and sand) from Sylhet of those areas are carried by waterways and road (e.g. cement). Shahbazpur (of Kuluara- Shahbazpur section) is an interchange station between Bangladesh and India, which remained closed since mid-nineties.

Currently, India is constructing a BG rail track between Assam and Agartala, capital of Tripura. Indian Railway also has a plan to extend this railway track from Agartala to Samrum (a length of 110 km). Once this rail links are built, Sabrum will be only three km from the Bangladesh Rail head of Chinkiastana, which is on Laksam-Chittagong section of Bangladesh Railway. From Bangladesh Railway's point of view, a railway link from Akhaura to Agartala (about eight km) could provide Tripura state of India railway link, and its possible access to Chittagong Port, if political agreement is there. This Agartala link could also provide an opportunity for direct railway connection between Agartala and Kolkata, if political agreement is there.

Table 8-25: Projected Traffic of Akhaura-Sylhet section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	10	6	2	4
2009	12	6	2	5
2013	14	7	2	6
2018	19	8	2	7
2023	26	9	3	8
2028	33	10	3	10

8.1.5.5 Major Works on the Corridor to be needed

The type of investment projects required to be undertaken to ensure efficient train services along the corridor are presented in the Table 8-26.

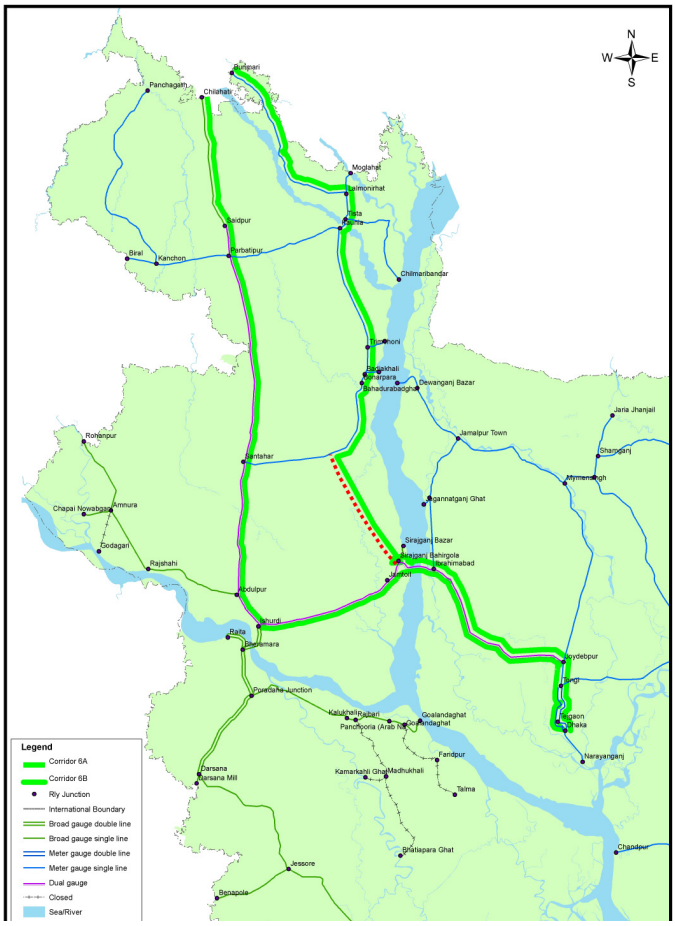
Table 8-26: Major Works on the Corridor to be needed

SL No	Works	Status
5.1	Replacement or improvement of Kushiara Rail Bridge	Proposed under the Plan
5.2	Feasibility Study for Conversion of the track from Tongi via Akhaura to Shahbazpur, from MG to DG	Proposed under the Plan
5.3	Conversion of the track from Tongi via Akhaura to Shahbazpur, and Akhaura to Chittagong from MG to DG	Proposed under the Plan
5.4	Re-commissioning of Kulaura-Shahbazpur-Karimganj (India) Line	Proposed under the Plan
5.5	Feasibility study for construction of Ashuganj-Noapara rail link	Proposed by GOB

8.1.6 Corridor-6: Dhaka-Bangabandhu Bridge-Sirajganj/Roypur-Bogra-Lalmonirhat-Burimari

8.1.6.1 Current Conditions

The corridor 6 also overlaps with corridor 3 up to Shadanandapur (second railway station from western site of Bangabandhu Bridge). In route 6B (Dhaka-Bangabandhu Bridge-Sirajganj-Bogra-Lalmonirhat-Burrimari) the construction of Shadanandapur - Sirajganj (Roypur) - Bogra line as MG standard would reduce the distance between Dhaka and Burimari by 112km. The construction of this missing link was first proposed by the ADB under Railway Sector Improvement Project. The proposed link will open up the shortest possible connection between Dhaka and greater Dinajpur, Rangpur and Bogra districts for movement of goods and passengers. In addition, the proposed route will enhance marketing of agro-products of those districts to Dhaka and Chittagong, and it will also facilitate receiving imported and locally produced goods from Dhaka and Chittagong at lower transport cost.



Corridor 6: Dhaka-Bangabandhu Bridge-Sirajganj(Jamtail)- Bogra- Lalmonirhat-Burimari

Since the direct line between Sirajganj and Bogra will generate sizeable traffic from North-West region of Bangladesh, the present capacity of MG track needs to be augmented along the section Bogra to Kaunia Junction. At present around 22 train/day move along this section. This capacity can be increased by modernising signalling system.

8.1.6.2 Infrastructure Options

This corridor need 66 km new rail track construction. The capacities of Bogra-Trimohini, Trimohini-Kaunia and Lalmonirhat-Burimari sections of the corridor are very low and ranges between 18 to 24 trains. The only section Kaunia-Lalmonirhat has sectional capacity up to 44 trains. The train speeds are also low, which vary from 15 to 50km/hour in most of the sections. Most of the stations are non-interlocked with semaphore type oldest signals, which were installed in the early nineties. Therefore, the corridor needs major rehabilitation of track, signal, reconstruction of station buildings and also earthworks in resulting embankments. The Lalmonirhat-Burimari section of the corridor is in worse condition, which was not properly maintained since independence of Bangladesh. The track of the entire section is on

earth and embankment is not of standard dimensions. Most of the sleepers are unserviceable. There are two major bridges (40 feet and above) and 41 minor bridges, which need proper maintenance and rehabilitation. The signals are mechanical non-interlocked semaphore, which is a very old system.

Table 8-27: Dhaka-Bangabandhu Bridge-Sirajganj (Roypur)/Jamtoil-Burimari Line Capacity and Train Number by Type

Trains	**Sections**				
	Jamtoil-Bogra	Bogra-Trimohini	Trimohini-Kaunia	Kaunia-Lalmonirhat	Lalmonirhat-Burimari
Intercity	0	4	4	2	0
Mail/Express	0	4	2	2	0
Local	0	4	2	14 (mixed)	6 (mixed)
Freight	0	6	6		
Total	0	18	14	18	6
	Type of track by sections				
Sectional Capacity	Proposed MG Single	MG Single	MG Single	MG Single	MG Single
		18	22	44	24
Length (km)	66.0	55.95	55.29	15.75	84.33

8.1.6.3 Operational Opportunities

The corridor 6 covers two routes at Bogra: from Santahar in the west and Lalmonirhat-Kaunia-Bonarpara in the north. The DG line from Parbatipur to Santahar proceeds further to the south and via Ishurdi bypass turns left towards Jamtoil and onwards to Saidabad and the the Jamuna Bridge. The proposed line from Bogra will provide a connection at Sirajganj (Roypur) Station in order to reduce the distance of the present DG link Santahar and Jamtoil via Abdulpur-Ishurdi bypass.

		Distance (km)	Difference (km)
• Dinajpur-Dhaka	via Ishurdi bypass	405.24	
• Dinajpur-Dhaka	via Santahar-Bogra	372.59	32.65
• Dinajpur-Dhaka	via Kaunia-Bogra	303.17	102.07
• Lalmonirhat-Dhaka	via Ishurdi bypass	445.41	112.51
• Lalmonirhat-Dhaka	via Bogra	332.90	

The new line will reduce the distance from Bogra to Sadanandapur via Sirajganj (Roypur) to 74.51 km compared with the present route Bogra-Santahar-Ishurdi-Jamtoil-Sadanandapur which is 187.02 km (Bogra-Santahar 39.93 km; Santahar to ishurdi bypass 74.67 km; Ishurdi bypss to Sadanandapur 72.42 km). Thus the new line will be shorter by 112.51 kn and will become the shortest route for:

- Traffic originating from Burimari-Lalmonirhat-Kaunia and Bonarpara to and from Tongi-Dhaka-Chittagong side
- Traffic originating from east to Parbatipur-Rangpur and
- Traffic originating from east of Santahar on Santahar-Bogra section

8.1.6.4 Market Analysis

Since the corridor 6 will provide a shorter link to Dhaka and beyond, it will be the most advantageous to use this route for passengers and freight trains originating in the north

which are now moving the longer route through Santahar and Ishurdi. It could be assumed that a large share of bus passengers will divert to rail from different originating points because of shorter distance and reduced rail fare. Similarly, due to shorter distance and possible thereby reduced cost of freight, diversion of freight traffic from road to rail could also take place to some extent.

With the opening of new railway section between Bogra-Sirajganj (Roypur) and rehabilitation of other sections' of the corridor 6, it could be assumed that new traffic will be generated in addition to diversion of existing traffic from road. In addition to the above, the existing road traffic between Bogra and Sirajganj (Roypur), Sirajganj (Roypur) and Dhaka could also be diverted to rail, for which marketing efforts and an efficient train operation would be required. Broadly speaking the freight traffic from the following locations could be expected to use the new corridor 6:

- Fertiliser traffic from Jamuna Fertiliser Factory at Tarakandi to Bogra, Bonarpara, Gaibanda, Mahendranagar, Dinajpur and where there are fertiliser storehouses
- Stone traffic from Burimari, Patgram and Panchagarh, to Dhaka and beyond
- Indigenous fertiliser from Chittagong and Ashuganj to Bogra, Gaibanda, Rangpur, Mahendranagar and Dinajpur area
- Imported goods and fertiliser from Chittagong port to the north-western areas
- Oil from Chittagong port to north-western areas
- Coal traffic from Barapukuria Coal Mine and hard rock from Madhyapara for the east zone

Moreover, the projected traffic of corridor 6 based on normal traffic is shown in the following tables:

Table 8-28: Projected Traffic of Bogra-Trimohoni section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	4	4	4	6
2009	5	4	4	7
2013	6	5	4	8
2018	8	5	5	10
2023	10	6	5	12
2028	13	7	6	14

Table 8-29: Projected Traffic of Trimohoni-Kaunia section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	4	2	2	6
2009	5	2	2	7
2013	6	2	2	8
2018	8	3	2	10
2023	10	3	3	12
2028	13	3	3	14

Table 8-30: Projected Traffic of Kaunia-Lalmonirhat section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	2	2	14	0

2009	2	2	15	0
2013	3	2	16	0
2018	4	3	17	0
2023	5	3	19	0
2028	7	3	21	0

Table 8-31: Projected Traffic of Lalmonirhat-Burimari section on the corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	0	0	6	0
2009	0	0	6	0
2013	0	0	7	0
2018	0	0	7	0
2023	0	0	8	0
2028	0	0	9	0

8.1.6.5 Major Works on the Corridor to be needed

The details of works required to be undertaken on the corridor 6 are presented in the following table:

Table 8-32: Major Works on the Corridor to be needed

Sl	Works	Status
6.1	Construction of Metre Gauge Line from Bogra to Sirajganj Roypur (Jamtoil)	Proposedunder the Plan
6.2	Rehabilitation of Lalmonirhat – Burimari section (GOB)	On-going
6.3	Modernisation of Signalling System between Bogra and Kaunia	Proposed under the Plan

8.1.7 Corridor 7A: Dhaka-Mawa-Jajira-Bhanga-Jessore-Khulna-Mongla

7B: Dhaka-Mawa-Jajira- Bhanga-Jessore-Benapole

7C: Dhaka-Mawa-Jajira-Bhanga-Barisal

7D: Dhaka-Mawa-Jajira-Bhanga-Kashiani-Gopalgonj-Tungipara

8.1.7.1 Current Conditions

All of these are new corridors, which have been proposed in this Railway Master Plan. The Government of Bangladesh is constructing the Padma at Mawa-Jajira point over mighty river Padma. The Feasibility Study by the JICA team and recently completed final report on "Preparing the Padma Multipurpose Bridge Project (2006)" emphasised the railway option to the southern part of the country to avoid the existing circuitous railway route via Bangabandhu Bridge. These new corridors consist of four routes, namely Corridor 7A, 7B 7C and 7D as mentioned above. The section, Dhaka-Mawa-Jajira-Bhanga is common to all the four routes.

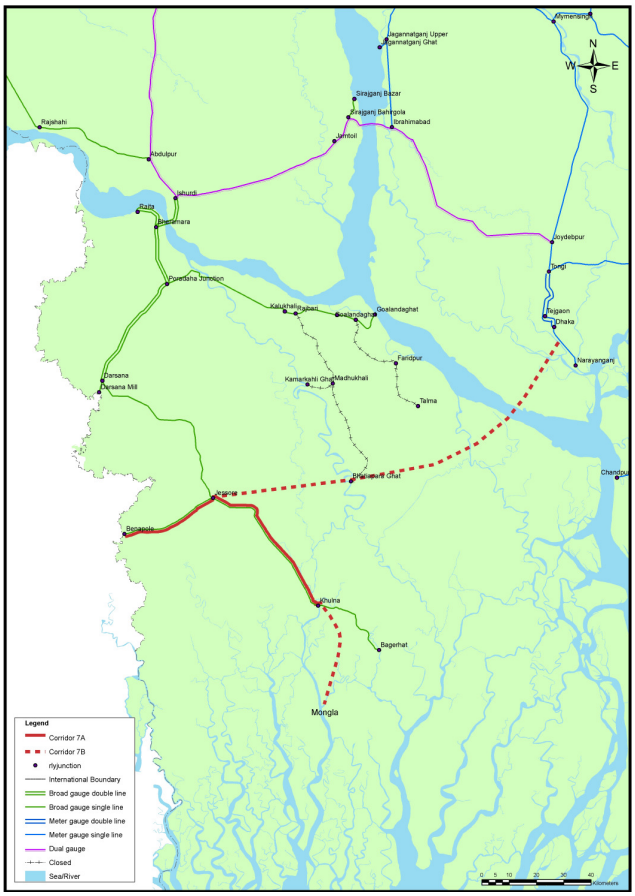
Corridor 7A: Dhaka-Mawa-Jajira-Bhanga-Jessore-Khulna-Mongla

The corridor 7A partly overlaps with Chilahati-Ishurdi-Khulna-Mongla corridor-2 along the section from Jessore to Mongla. The condition of this section, and the improvements necessary have been indicated under corridor Chilahati – Ishurdi-Khulna - Mongla.

7B: Dhaka – Mawa – Jajira-Bhanga - Jessore-Benapole

The Jessore-Benapole section is overlapping with corridor Chilahati-Ishurdi-Jessore-Khulna-Mongla (Corridor – 2) and also with Corridor –7B. The condition of Jessore-Benapole section and improvement necessary has been covered under the corridor Dhaka-Bangabandhu Bridge-Ishurdi-Darsana/ Benapole.

However, the corridors 7A and 7B would attract large volume of both passenger and freight from existing circuitous railway route. There is also scope for diversion of traffic to railway from water transports, because of shorter distance and shorten journey time.



Corridor 7A: Dhaka-Mawa-Jajira-Bhanga-Jessore-Khulna-Mongla
7B: Dhaka-Mawa-Jajira-Bhanga-Jessore-Benapole

Corridor 7C and 7D: These two corridors are completely new and are justified to construct immediately as Padma Bridge is being implement at Mawa-Jajira point over Padma River. The analysis shows that the volume of normal traffic is about 35 lakhs tonnes per annum on corridor 7A and 7B. In addition, there would be great potential for traffic generation from new areas, along the corridor when it is opened to traffic.

On other hand, Corridor 7C and 7D will grasp the major share of passenger and freight that are now being carried by road and inland waterways. Besides, an ample amount of traffic will generate from Faridpur, Barisal and Khulna region because of these new railway corridors.

8.1.7.2 Infrastructure Options

It was mentioned in the earlier section that the corridor 7A overlaps with corridor 2 along the section from Mongla to Khulna and corridor 7B overlaps with corridor 2 and 3 along the section from Jessore to Benapole. However, the corridor needs new construction of railway line from Dhaka to Jessore over Padma Bridge, for which a feasibility study needs to be

undertaken on an urgent basis, so that railway is in place when the Padma Bridge would be opened.

8.1.7.3 Operational Opportunities

The construction of Padma Bridge will open up new opportunities for Bangladesh Railway for linking Dhaka directly with Jessore and Mongla Port as well as southern part of Bangladesh (Barisal area). The Faridpur area will also be within the catchment area of the railway. In addition, the direct connection between Dhaka and Mongla Port over the bridge will provide an alternative for Dhaka bound traffic to and from Mongla port. The new line will reduce the distance between Dhaka and Jessore, Khulna and Mongla by 308 km. It would also reduce the distance between Dhaka and Darsana (168 km) and Benapole by 318 km.

Table 8-33: Railway Distance 'via Bangabandhu Bridge' and 'using Padma Bridge' from Dhaka

Major Traffic Generation Points	Railway Distances 'via Jamuna Bridge' (km)	Railway Distances 'using Padma Bridge' (km)	Distance Savings (km)
Dhaka to Jessore	473	165	308
Dhaka to Khulna	529	221	308
Dhaka to Mongla Port	584	276	308
Dhaka to Darsana	403	245	168
Dhaka to Benapole	518	200	318

The new line (Dhaka-Jessore) will reduce the distance both for corridors 7A and 7B and will become the shorter route for:

- Traffic originating from Jessore, Darsana, Benapole, Khulna and nearby other places to and from Tongi-Dhaka side
- Traffic originating from Faridpur areas and there as well as Rajshahi areas, because BG trains from that area will have no load restriction over proposed Padma Bridge as on Bangabandhu Bridge)
- Traffic originating from Mongla Port
- Traffic originating from Barisal areas (when Bhanga-Barisal railway line will be constructed in the near future)

8.1.7.4 Market Analysis

The travel-time savings compared to the existing route will result in increased passenger traffic from Jessore, Khulna, Darsana and Benapole areas of 44%, 40%, 27% and 42% respectively. In addition, more passengers would be attracted (about 40%) by a reduced fare, due to distance reduction[4]. In addition, the new railway line will generate about 1.1 million additional passengers' traffic per annum. In addition, passengers will be generated from different upazilas along the corridor. The passenger/population ratio shows that about 1.12 passengers will be generated, which is shown in the following Table 8-34.

[4] BR fares are distance-related

Table 8-34: Annual Generation of New Traffic from the Proposed Corridor

Name of Upazila	Population	Passengers
Keraniganj	605180	187606
Serajdikhan	241020	74716
Sreenagar	228720	70903
Nagarkanda	323540	100297
Boalmari	233460	72373
Shibchar	317800	98518
Bhanga	230300	71393
Bagherpara	195020	60456
Alfadanga	93840	29090
Lohagara	218460	67723
Narail	270840	83960
Total	3,594,960	1,114,438

It could be assumed that along with passenger traffic, freight traffic also would get diverted from road, and existing circuitous railway route, and Mongla Port, besides Indian traffic via Benapole and Darsana. In addition, there is a possibility of generated traffic from the areas along the corridor. The proposed corridor will open up new arena for railway connectivity for the southern part of Bangladesh. Combined with other infrastructure, such as the supply of electricity and gas, there would be a vast potential for new industrial development in the southern region.

8.1.7.5 Major Works needed on the Corridor

The details of works required to be undertaken on the corridor to carry new/additional traffic are presented in Table 8-35

Table 8-35: Major Works on the Corridor to be needed

SL No	Works	Status
7.1	Padma Bridge Rail link Project – 1: (Feasibility Study, Detail Design and Tendering Services for construction of Dhaka-Mawa-Janjira-Bhanga rail line (ADB)	going on
7.2	Re-opening of Pachuria – Faridpur – Pukuria section and construction of Pukuria – Bhanga railway line (GOB).	On-going
7.3	Re-opening of Kalukhali–Bhatiapara section and construction of Kashani–Gopalganj– Tungipara new rail line (GOB).	On-going
7.4	Padma Bridge Rail link Phase-II: (Feasibility study for Construction of BG line between Bhanga-Jessore) (ADB)	Study going on
7.5	Construction of new broad gauge line between Bhanga- Barisal including feasibility study	Proposed under the Plan
7.6	Construction of Khulna-Mongla sea port Rail link including feasibility study(LOC)	On-going
7.7	Feasibility study and Construction of Rail line from Navaron to Sundarban (GOB)	Study going on
7.8	Padma Bridge Rail link Project – 1 (Construction of Dhaka-Mawa-Janjira-Bhanga rail line including feasibility study)	Proposed under the Plan
7.9	Padma Bridge Rail link Phase-II (Construction of BG line between Bhanga-Jessore)	Proposed under the Plan

8.1.8 Corridor-8A: Dhaka- Mymensingh – Jamalpur – Tarakandi- Bangabandhu Bridge

Corridor-8B: Dhaka – Bhairab Bazar – Mymensingh

8.1.8.1 Current Condition

The Dhaka-Mymensingh-Jamlapur-Tarakandi-Bangabandhu Bridge corridor is circuitous nature and the Dhaka-Mymensingh section of the corridor is important for passenger traffic. This was one of the busiest MG line before opening of Bangabandhu Multipurpose Bridge (BMB). Presently, most of the trains bound to north-west region have been using the Corridor 6. It is expected that the construction of Sirajganj Roypur – Bogra railway line will open up the opportunity for MG goods trains from Chittagong-Bhairab Bazaar-Mymensingh-Jamalpur-BMB-Bogra and the beyond.

The section Dhaka-Joydebpur is common with Corridor 2, 3, 4 and 6. Though the Dhaka-Tongi section is dual gauge double track, but Tongi to Joydepur section is dual gauge single track.

The corridor carries domestic passenger and there is opportunity to carry commuter passengers between Dhaka and Mymensingh. There are about three lines which connect Mymensingh junction; these lines are Deawnganj-Jamalpur-Mymensingh line, Jaria Janjail-Mymensingh and Mohanganj-Mymensingh line.

Corridor 8A: Dhaka-Mymensingh–Jamalpur - Tarakandi- Bangabandhu Bridge
8B:Dhaka– BhairabBazar – Mymensingh

8.1.8.2 Infrastructure Options

The Government has taken initiative for rehabilitation of Mymensingh-Jamalpur, Gouripur-Jaria Janjail, and Shyamganj-Mohonganj lines and these lines are deplorable in condition. It is expected that after completion of rehabilitation works, the trains will run smoothly and increase its number. However, Joydepur-Mymensingh section of the corridor contains single track and needs only routine maintenance properly.

8.1.8.3 Operational Opportunities

The Dhaka-Mymensingh section of the corridor dominates intercity and mail/express trains. It is expected that the line will serve as passenger commuter service from Dhaka to Mymnensingh in the near future. To serve the commuter trains, it will be needed double DG track from Tongi to Joydevpur and double MG track from Joydevpur to Mymensingh Railway Junction.

8.1.8.4 Market Analysis

The traffic projection shows that an efficient train operation including introduction of commuter train will enhance the passenger traffic on the corridor.

Table 8-36: Total Projected Traffic of Dhaka-Mymensingh Corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	6	6	2	2
2009	7	6	2	2
2013	9	7	2	3
2018	12	8	2	3
2023	15	9	3	4
2028	20	11	3	5

Table 8-37: Projected Traffic of Dhaka-Mymensingh Corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	0	4	0	2
2009	0	4	0	2
2013	0	5	0	3
2018	0	5	0	3
2023	0	6	0	4
2028	0	7	0	5

Table 8-38: Projected Traffic of Dhaka-Tarakandi section on the Corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	4	0	0	0
2009	5	0	0	0
2013	6	0	0	0
2018	8	0	0	0
2023	10	0	0	0
2028	13	0	0	0

Table 8-39: Projected Traffic of Dhaka-Bahadurabad section on the Corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	2	0	0	0
2009	2	0	0	0
2013	3	0	0	0
2018	4	0	0	0
2023	5	0	0	0
2028	7	0	0	0

Table 8-40: Projected Traffic of Dhaka-Dewanganj section on the Corridor

Year	Passenger Train			Freight Train
	Intercity	Mail/Express	Local	
2006	0	2	2	0
2009	0	2	2	0
2013	0	2	2	0
2018	0	3	2	0
2023	0	3	3	0
2028	0	4	3	0

8.1.8.5 Major Works on the Corridor to be needed

The details of works required to be undertaken on the corridor to carry new/additional traffic are presented in Table 8-41.

Table 8-41: Major Works on the Corridor to be needed

SL No	Works	Status
8.1	Feasibility Study for Construction of Double Line from Joydevpur-Mymensingh	Proposed under the plan
8.2	Construction of Double Line from Joydevpur-Mymensingh	Proposed under the Plan
8.3	Construction of 3rd and 4th Dual gauge Railway track between Dhaka-Tongi section and doubling of Dual Gauge track between Tongi-Joydevpur section (LOC)	On-going

8.1.9 Corridor-9A: Dhaka–Mawa–Jajira–Rajbari–Moukuri (Mizanpur) – Bara Durgapur (KhasChar)–Pabna–Ishurdi

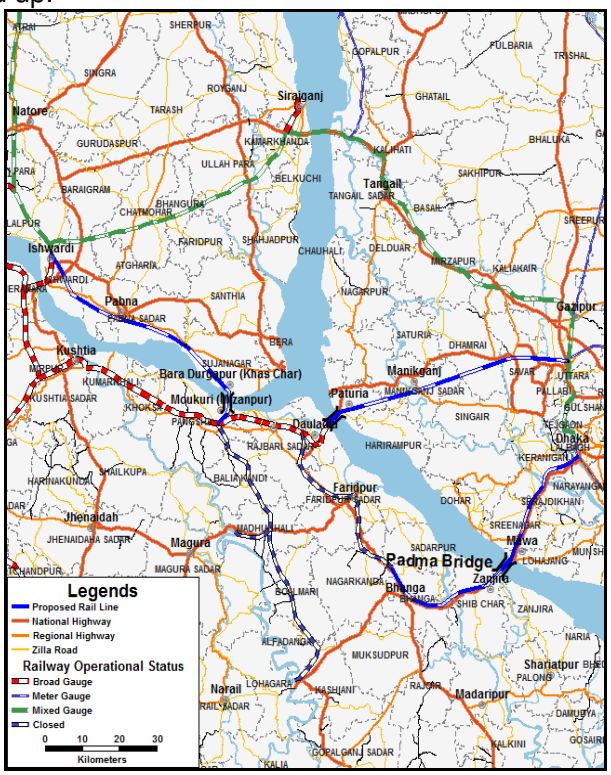
Corridor-9B: Dhaka–Paturia–Douladia- Moukuri (Mizanpur)– Bara Durgapur (Khas Char) – Pabna – Ishurdi

8.1.9.1 Current Condition

These two corridors are new, which have been proposed in this Railway Master Plan. The Government of Bangladesh is constructing the Padma at Mawa-Jajira point over mighty river Padma. The Feasibility Study by the JICA team and recently completed final report on "Preparing the Padma Multipurpose Bridge Project (2006)" strongly emphasised the railway option to the southern part of the country to avoid the existing circuitous railway route via Bangabandhu Bridge. These new corridors consist of two routes, namely Corridor 9A and 9B as mentioned above. The section, Dhaka-Mawa-Jajira-Bhanga is common to 7A, 7B, 7C and 7D corridors.
These two corridors will be very busy rail track for passenger and freight transport once Padma bridges are constructed and opened up.

Corridor 9A: Dhaka–Mawa–Jajira–Rajbari–Moukuri (Mizanpur) – Bara Durgapur (KhasChar)–Pabna–Ishurdi. One railway link from Ishurdi to Dhalacahr through Pabna and a bridge over Padma River at Bara Durgapur (Khaschar) - Moukuri (Mizanpur) Rail Bridge over Padma Riverhave been identified and given priority for immediate construction. On the other hand, Rehabilitation of Rajbari- Pukuria rail link of 54 km that was constructed before the independence of the country and a new link of 06 km to connect Bhanga has also been proposed in the Master Plan. This will ultimately connect Padma Bridge at Mawa-Jajira. Thus this corridor will provide direct connection of Pabna, Rajbari and Rajshahi region with Dhaka.

Corridor 9B: Dhaka–Paturai–Douladia-Moukuri (Mizanpur)– Bara Durgapur (Khas Char) – Pabna – Ishurdi. This corridor connecting the capital Dhaka with Faridpur, Rajbari, Kushtia, Pabna and Rajshahi by the shortest possible railway link. But it dends on construction of Padma Bridge at Paturia-Douladia Point.



Corridor 9A: Dhaka-Mawa-Jajira-Rajbari-Moukuri-Dhalar Char-Pabna-Ishurdi
Corridor 9B: Dhaka-Paturia-Doulodia-Moukuri-Dhalar Char-Pabna-Ishurdi

8.1.9.2 Infrastructure Options

Althogh corridor 9A i.e. Dhaka–Mawa–Jajira–Rajbari–Moukuri (Mizanpur) – Bara Durgapur (KhasChar)–Pabna–Ishurdi is a new construction but a significant portion of this is under construction. The Ishurdi-Dhalar Char link of 78 km long is currently being implemented by Bangladesh Railway with GoB fund. It is expected to be completed by the end of 2015. The old railway link from Rajbari to Pukuria of about 54 km length is also under construction. Besides to connect this railway link another 06 km link is being constructed from Pukiria to Bhanga under the same project. Only the remaining works for this link is to connect Pabna with Rajbari by the proposed Moukuri-KhasChar Rail Bridge over Padma.

The other corridor 9B i.e. Dhaka–Paturia–Douladia- Moukuri (Mizanpur)– Bara Durgapur (Khas Char) – Pabna – Ishurdi is totally new construction. As mentioned above significant portion of this is under construction -the Ishurdi-Dhalar Char link of 78, the remaining works for this corridor are to connect the proposed Moukuri-KhasChar Rail Bridge over Padma, fesibiity study and construction 2nd Padma Bridge at Douladia-Paturia point over Padma River and connect Paturia with Dhaka by the railway link from Dhaka. Though this will take more time but is expected that all of these can be implemented by the Master Plan time horizon. As such this corridor has been included in this Railway Master Plan.

8.1.9.3 Operational Opportunities

These two corridors will be constructed as new railway line. For the railway link will be suitable to construct single BG upto Bhanga whereas Railway Bridge at Moukuri-KhasChar over Padma should double line of BG. From Bhanga to Dhaka it must be double track of BG standard as this portion is common to all corridors that connect Dhaka with South-West part of the country. On the other hand Rail link from Dhaka to Douladia must of double track with BG standard. It is expected that both of the corridors will dominate intercity, mail/express and goods trains where BR's present businesses are concentrated. Opening these corridors the BR's future market will be expanded by a large portion of intercity passenger, carrying of container, petroleum, food grains, fertiliser, and marble and stone that are now fully carried by roads and waterways. The available data on passengers and goods transport of the roads and IWT shows that there is every potential to increase number of intercity, goods and container trains in the near future.

8.1.9.4 Market Analysis

The corridors have great market potentials as these will provide shortest connection of Pabna with Faridpur region. As a result people of Pabna and Faridpur region will be able to reduce their travel distance by about 170 km. Opening up of the Padma Bridge at Mawa - Jajira point will connect Pabna directly with capital Dhaka. This will reduce101 km detour length by road and 72 km detour length by railway for the people of Pabna to enter Dhaka. The existing load and speed restrictions on Bangabadhau Bridge can be solved in an insurmountable amount opening up these corridors. At present no train carrying containers and goods is allowed on Bangbandhu Bridge. After construction of the Padma Bridge at Mawa- Jajira point and the Bara Durgapur (Khaschar) - Moukuri (Mizanpur) Rail Bridge over Padma River will allow not only passengers trains but also containers and goods carrying trains. For passenger train speed limit was 20 km/ hour. But now it is only 10 km/hour. Both

the corridors will be alternatives for most of the North-West trains bound to Dhaka providing opportunity of no speed restriction. Thus these corridors have great market paternities that strongly support immediate construction.

8.1.9.5 Major Works on the Corridor to be needed

In order to carry the passengers, freight and container trains in the year plan period, a number of projects are to be undertaken on the corridor, as presented in Table 8-42.

Table 8-42 : Major Works in the Dhaka–Mawa–Jajira–Rajbari–Moukuri (Mizanpur) – Bara Durgapur (KhasChar)–Pabna–Ishurdi and Dhaka–Paturai–Douladia- Moukuri (Mizanpur)– Bara Durgapur (Khas Char) – Pabna – Ishurdi Corridor to be needed:

Sl	Works	Status
9.1	Construction of BG line between Ishurdi and Dhalar Char(GOB)	On-going
9.2	Construction of Rail Bridge over Padma at Mawa-Jajira point (BBA)	To start very soon
9.3	Rehabilitation of Pachuria-Pukuria rail link (GOB)	On-going
9.4	Construction of rail link from Pukuria to Bhanga(GOB)	On-going
1.8	Construction of Padma Bridge at Paturia-Douladia	Proposed under the Plan
1.9	Feasibility study and construction of double rail line between Dhaka and Aricha	Proposed under the Plan
1.10	Feasibility study and construction of railway stations at Fatullah and Savar.	Proposed under the Plan

8.2 Requirement of Rolling Stocks

8.2.1 Relevance

The existing state of rolling stocks, in terms of age, productivity and its maintenance was discussed in the Sections 3.10 and 3.11 under Chapter 3 of this report. It revealed that unavailability of rolling stocks online (track) accumulated from lack of regular procurement and proper maintenance, and resulted in underutilisation.

Locomotives

BR considers mainly time based utilisation of rolling stocks rather than distance runs. For instance, locomotives which are more than 30 years old are not accounted for, and due for replacement. However, the utilisation of locomotives is another greater concern rather than their age. The average daily runs by MG and BG locomotives are 155 km and 192 km respectively, whereas the desirable utilisation is about 350 km on any given day, and this figure is higher in India. It is argued that a well-managed railway should have above 90 percent of its diesel locomotive fleet available for use online, but it is 80.4 percent for MG and 74.0 percent BG for locomotives. However, availability of rolling stocks and then age profiles are described in the following Table 8-42 and Table 8-43.

A total of 208 MG locomotives is owned by BR of which 182 are available for effective services. On the other hand, there are 77 BG locomotives, out of which 57 locomotives are available for effective service.

Table 8-42: Availability of Rolling Stocks

Rolling Stocks	Stock owned (total)	Stock available for effective service	Ineffective stock
Metre Gauge Locomotive	208	182	26
Broad Gauge Locomotive	77	57	20

Source: Bangladesh Railway Information Book, 2007

In addition, the age profiles of those locomotives are presented in the following Table 8-37. It is found from the table, as per BR's assumption (30 years age limit of a locomotive), 118 numbers of MG locomotives out of 208 and 46 BG locomotives out of 77 are available under BR for active operation.

Table 8-43: Age Profiles of Locomotives

Locomotives	Age Profiles (Years)										Total
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	>45	
Metre Gauge	11	29	10	16	28	23	19	21	0	51	208
Broad Gauge	13	0	0	0	12	21	0	14	17	0	77

Source: Bangladesh Railway Sector Improvement Project (2007)

Passenger Coaches

It seems from the following table that availability of MG and BG passenger coaches are 870 and 228 respectively. In the context of age profile, which is shown in Table 8-39 that only 456 and 73 coaches of MG and BG system respectively are available within the age 25 years. However, the service life can be extended beyond 25 years, which depends on proper maintenance and utilisations. The difference of total number of carriages in the Table 8-44 and Table 8-45 (this table summarises from Table 3-9 and Table 3-10 in this report) may be occurred from different sources of data or accounting problems of data keeping. However, it could be assumed, BR is running with old age passenger coaches and it is worse for BG system.

Table 8-44: Availability of Carriages

Rolling Stocks	Stock owned (total)	Stock available for effective service	Ineffective stock
Metre Gauge Carriages	1,075	870	205
Broad Gauge Carriages	310	228	82

Source: Bangladesh Railway Information Book, 2007

Table 8-45: Age Profiles of Carriages

Age Profile (Years)	Number of MG Carriages	Number of BG Carriages
0-25	456	73
Total	908	324

Source: Bangladesh Railway Sector Improvement Project (2007)

Wagons

As Bangladesh Railway Information Book, there are 8,733 MG and 1,731 BG wagons are available for carrying goods. However, most of the wagons are old age and lacks of air-brake system. The following table shows the existing condition of wagons of BR.

Table 8-46: Availability of Wagons

Rolling Stocks	Stock owned (total)	Stock available for effective service	Ineffective stock
Metre Gauge wagons*	8,902	8,733	169
Broad Gauge Wagons*	2,560	1,731	829

Source: Bangladesh Railway Information Book, 2007
***indicates 4-wheelers**

The details of age profiles are shown in the following Table 8-46 and Table 8-47. It is found that most of the wagons are above 20 years old and after 1990, no BG wagons were procured. In addition, it was tried to segregate the 4-wheel and 8-wheel wagons of BG and MG system. Based on the age profile, the wagons are segregated further as broader age profile (0-45 years), because after 45 years BR declares the wagons beyond their economic age.

Table 8-47: Age Profiles of Wagons

Number of Wagons	Age Profiles (Years)										Total
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46+	
Metre Gauge	100	100	80	61	1468	210	1097	2784	687	700	7270
Broad Gauge	0	0	0	0	33	987	0	97	554	259	1930

Source: Reform of Bangladesh Railway (2008)

Table 8-48: Broader Age Profiles of Wagons

Age Profile (Years)	Number of MG Carriages	Number of BG Carriages
0-40	4900	1117
0-45	6587	1671
All age	7270	**1930**

Note: BR estimates the economic life of wagons up to 45 years old

It is vital that a modern rail system should have 8-wheel wagons with air-brake system in its fleet for smooth train operation. It is found from the available data; BR has only 1,322 eight-wheelers MG wagons out of 4,900 up to 40 years old wagons. If the age limit of wagons extends up to 45 years, the availability of 8-wheelers MG wagons would be 1,770 out of 6,587 wagons. In context of BG system, only 707 wagons are eight-wheelers out of 1,117. Further, the number would 713 out of 1,671, if the age limit up to 45 years.

Train Runs

Total train runs are another important area of rolling stocks utilisation. It was discussed in the earlier section that the average daily runs by MG and BG locomotives are only 155 km and 192km respectively, which means exiting locomotives are not being utilised optimally. However, the total numbers of 306 trains are running on any given day including intercity, mail/express, local/commuter, goods and container. The train numbers are shown in the following Table 8-49.

Table 8-49: Train Runs in Bangladesh

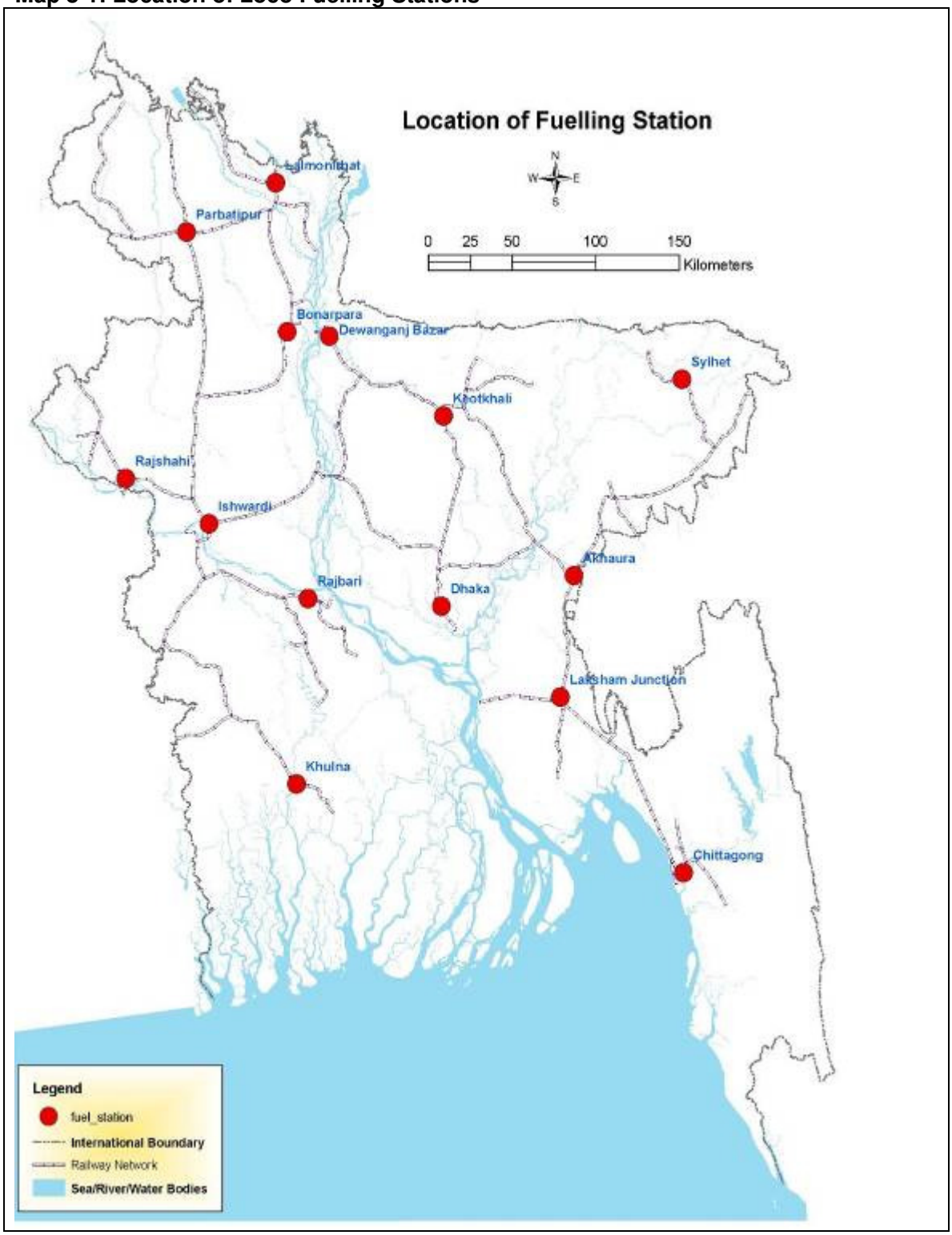
Type of Train	Number
Intercity	58
Mail/Express	48
Commuter	66
Local	82
Goods	48
Container	4
Total	306

Source: Working Timetable of BR, 2005 and 2006

8.2.2 Fuelling Stations and their Coverage:

The location of loco fuelling station is an important aspect to facilitate smooth train operation, as realistic spatial distribution of loco-fuelling station saves unnecessary burning of fuel, runs and loco time. The Map 8.1 shows the location of existing fuelling stations, which are distributed quite homogeneously, and most of the stations are on the proposed corridors.

Map 8-1: Location of Loco Fuelling Stations



8.2.3 Working with existing Rolling Stocks Fleets

The details of rolling stocks availability and train runs were discussed in the earlier sections. While the existing rolling stock will continue to be used up to their maximum life, in this context, there is also a need to look at how BR will work to accommodate the new rolling stocks anticipated to meet the passenger and freight demands. The plan also, however, has taken into account the BR's future rolling stock policy, for instance, introduction of Diesel Multiple Units (DMUs)/railcar operation on a route, such as Dhaka-Chittagong in the near future after completion of its double tracking.

Here there is a need to match the physical attributes of the existing rolling stock, such as 4-wheel wagons which are invalid in the modern railway system. It is to be noted that most of the 4-wheel wagons are not fitting with air-braking system. However, a scraping policy would be taken by BR for unused wagons, which are beyond their economic life (45 and above years old). This type of scraping policy should also be taken for unused locomotives and coaches.

Optimal Use of Passenger Seats of a Train

Presently, BR allocates seats of a train by railway stations, based on fixed passenger demand. In this context, it has possibility for not selling fixed seats in a particular station because of variation of travellers' demand. It is noted that BR purchases (one loco and 10-12 coaches) as a train set t a cost Taka 8-9 lakhs. Therefore, it is very crucial to ensure that all seats of a train be sold and in this regards, expansion of existing computerised ticketing system would ease the process created by pre-allocation seats system. In this context, the plan suggested that there is a need for expansion of existing computer ticketing system to cover all stations of BR by phases.

8.2.4 Passenger Demand analysis

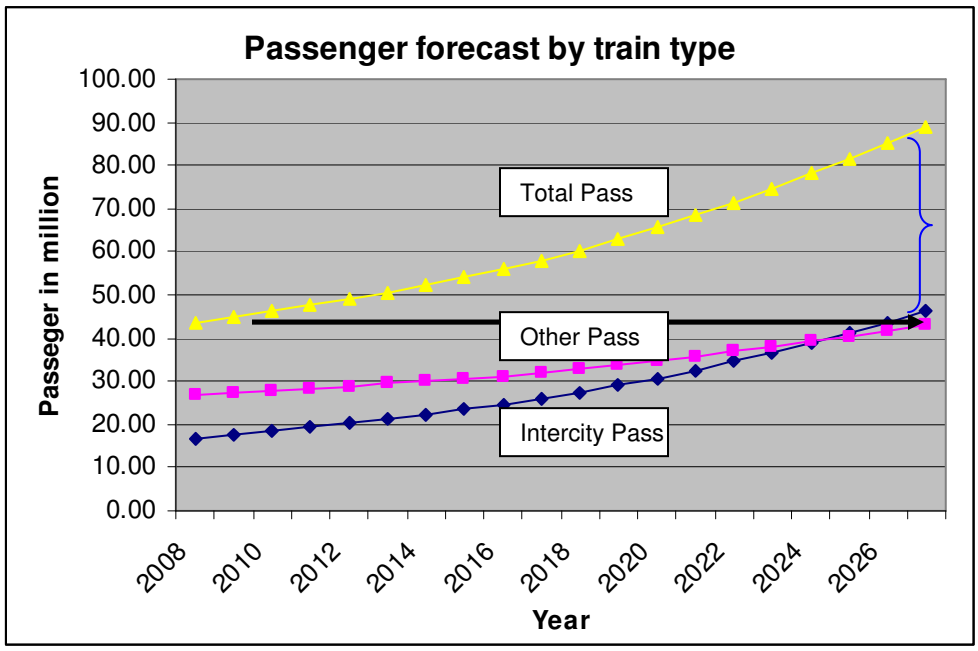
Passengers want safe, reliable, comfortable, accessible, and well managed trains whose facilities cater properly for the journey that they make. It is vital for passenger views to be taken into account in deciding about train timetable and schedule connecting trains as feeder service. Present railway ridership is about 43.32 million and of them, the share of Intercity Train is 16.64 million (39%) and Mail/Express/Local Train's is about 26.68 million (61%). Based on the growth rate of intercity and other train, the ridership will be changed at the end of the plan, which will be 46.21 million (52%) and 42.88 million (48%) for intercity and mail/express/local train respectively.

The plan has also taken care of passenger share by category of passenger classes. It is found from the available passenger data that the share of air-condition class, first class and second class are 0.05%, 1.04% and 98.91% respectively. On the other hand, percentage passenger for intercity train is 0.09%, 1.04%, 57.33% and 40.00% for air-condition class, first class, shovon class and shulov class respectively. Therefore, it could be seen that air-condition class and first class passengers has less demand for total train ridership.

From the above discussion, it is vital to match the right features of passenger coaches where the demand is more. It is found from the above data that about 99% are shovon and shulov class passengers who are dominating the railway ridership. Therefore, the design of coaches is another aspect of passenger demand. Trains for middle-distance routes need to accommodate as many seated passengers as possible with sensibly planned and properly designed standing space for those who cannot be provided

with seats. Longer distance service generally need larger seats and adequate space to store the larger volume of luggage that passengers usually bring with them for these types of journeys. All passengers want better information on the status of the service and even more so when trains are not running on time.

Graph 8-1: Passenger Forecast by Train Type



In addition, the Master Plan estimates passenger demand and projected train number by corridors and by other routes, which has been presented in the following sections. However, for the estimation of additional train, the existing numbers of train runs has been taken as base-case on the routes.

8.2.5 Freight Demand analysis

It was discussed in the earlier chapter that rail still dominates in carrying certain commodities, namely POL, stone, iron & steel, and food grains. However, the Table 8-52 indicates the principal commodities carried and earnings from them. It is found from the table that the share of six commodity comes to about 98% in terms of tonnage and earnings. Therefore, the Master Plan has concentrated on these commodities for future traffic projection and requirement of freight trains.

Table 8-50: Principal Commodities Carried and Earnings (Year 2006-07)

Commodities	Tonnage (thousands)	% of total commodities	Earnings (thousands)	% of earnings of total
Fertiliser	189	6.37	57,073	4.60
POL	610	20.56	207,908	16.73
Marble and Stone	269	9.07	89,844	7.23
Food Grains	920	31.02	259085	20.86
Vegetable Oil	338	11.39	87,803	7.07
Container	574	19.35	523,494	42.15
Total	**2900**	**97.76**	**1,225,207**	**98.64**
Total of all goods	**2967**	**100.00**	**1,241,965**	**100.00**

Source: Bangladesh Railway Information Book, 2007

8.2.6 Demand for Rolling Stocks

The demand of rolling stocks requirement was estimated based on: (a) existing number of rolling stocks available for service and optimal uses of them, (b) coverage of trains on the existing networks and expansion of networks within the plan period, and (c) consideration of future traffic growth. However, intercity train ought to be increased more than other trains. It was assumed that BR will carry selected commodity for long-haul movement, which were identified by the plan. The requirement of flat-wagons would be quite substantial opening of Dhirassram ICD.

However, the plan suggests the following strategy for optimal utilisation of rolling stocks to increase BR's operational performance.

- To introduce distance based utilisation of rolling stocks;
- To ensure online availability of loco up to 90%;
- Procurement of rolling stocks would be based on replacement/scrapping policy of BR and future traffic growth;
- Principal commodities would be the focal point for estimating freight traffic rolling stock requirement;
- Increasing of Workshops productivity after modernisation programme;
- New procurement of rolling stocks can improve exiting utilisation; and
- Locomotives refurbishment policy should be implemented, because it is cost effectiveness and BR loco shed has such type of capacity.

8.2.6.1 Locomotives

Quantity and quality of locomotives are main concern of train runs. Among the rolling stock items, locomotives are very expensive and also it has long service life. Therefore, it is a great concern of train operating organisation to ensure optimal uses of locomotives. In this regards, BR would increase its present daily utilisation up to 350 km to minimise the financial gap between earnings and expenditures. Table 8-53 shows the indicative requirement of locomotives, stock available under BR, locomotives which need for replacement and procurement to be made. In addition, DMUs/Railcars should be procured for introduction along Dhaka-Chittagong rail corridor, after completion of double tracking.

Table 8-51: Indicative Requirement of Locomotives by the Plan Phases

Year	**Locomotives requirement**	Stock available under BR	Need for replacement	Procurement to be needed	
				MG	BG
2009-13	**280**	239	120	119	41
2014-18	**315**	119	40	61	15
2019-23	**346**	79	16	31	16
2024-28	**371**	63	10	25	10

8.2.6.2 Passenger Coaches

Quality and right features of rail coaches are prime factor which attract passengers. It is found from the available study that the qualities of local train coaches are poor and most of these are very old. These need to be replaced as soon as possible. On the other hand, right features of coaches should be consider for Shovan and Shulov class passengers, because the demand is more. However, the requirement of coaches was estimated inconsideration of the projected passenger number by category of trains, which is shown in the Table 4-54.

Table 8-52: Indicative Requirement of Coaches by the Plan Phases

Year	**Coaches requirement**	Stock available under BR	Need for replacement	Procurement to be made	
2009-13	**1492**	1098	309	452	251
2014-18	**1548**	789	394	350	100
2019-23	**1832**	395	215	400	100
2024-28	**2056**	180	177	300	100

8.2.6.3 Freight Wagons and Flat Wagons

The Master Plan has suggested the need for more introductions of more 8-wheel wagons in place of 4-wheel wagons to carry goods. In addition, the plan also suggests for conversion of vacuum brake into air-brake system in the 8-wheel wagons for freight movement. The Tables 8-46, 8-47, and 8-48 show that there are 400 BC and 50 other 8-wheel wagons need to be procured to carry future projected freight traffic. The plan recommended procurement of only 500 flat wagons in the phases to accommodate future demand for container handling. BR has only about 200 flat wagons presently. In addition A total of 531 MG, 259 BG Tank Wagon need to be procured within the plan period.

8.2.7 Rolling Stocks Requirement and Conclusions

Optimal utilisation of rolling stocks is an important aspect of train operation. The more utilisation of rolling stock means less unit overhead cost for a certain time period. Therefore, the procurement of rolling stock need to be harmonised with traffic demand. In addition, right features of passenger coaches could be introduced where demand is more. Moreover, scraping policy for 4-wheel and older wagons need to be introduced. The above figures of rolling stock (Table 8-53, Table 8-54 and sub-section 8.2.6.3) are indicative and will depend on traffic demand and condition of existing rolling stock at the time. Rolling stock procurement shall only be approved subject to detail justification based on traffic demand, efficiency improvement, passenger and freight benefits, and overall economic benefit to the country.

8.3 Regional Linkages and Trade Facilitation

8.3.1 Regional Linkages

There are six rail corridors (3 MG and 3 BG) in Bangladesh which had been providing in the past direct links between Bangladesh and India and connections through India to Bhutan and Nepal. Bangladesh also has a short common border with Myanmar but currently there is no rail links. Bangladesh occupies a strategic position in the North-Eastern part of South Asia. Before partition of British India, the then Eastern Bengal Railway (EBR) was an integral part of the greater Indian network. Most of the rail infrastructure connecting India and Bangladesh still exists, although some of the border crossings and track are not in use. The Bangladesh port of Chittagong was the hub of the Assam-Bengal Railway MG network. Chittagong port is well positioned to meet the import and export requirement of the states in northeast India. Now construction of a deep sea port at Sonadia, an island near Cox's bazar (about 7 km north-west) has been given priority by the Government of Bangladesh. This will serve as the 'Hub Port' for the sub-region (mainly for Bangladesh, India and China)

Connectivity to India

The Bangladesh Railway was originally connected with the Indian BG system at Benapole, Darsana, Rohanpur and Chilahati and the MG system at Birol, Burimari, Mogolhat and Shahbazpur. At present only three BG rail corridors are active, through Benapole, Darsana and Rohanpur. The BG link from Chilahati to Haldibari and the MG connections from Burimari-Chengrabandha and Mogalhat-Gitaldaha have been disconnected, while Shahbazpur-Mahishasan (MG) is not presently in operation. On the other hand, Birol-Radhikapur portion has been converted into BG in India, while Bangladesh connection to Birol in still MG.

The main route from Dhaka-Kolkata uses the Darsana-Gede crossing point. Loaded Indian wagons enter Bangladesh and are pulled a short distance to transhipment points inside the country by Bangladeshi locomotives. Goods are transhipped into MG wagons at Shantaher, to trucks at Ullapara or to barges/trucks at Noapara (located between Jessore and Khulna). Only about 25% of cases, the whole rake move towards a single destination. Marshalling of rakes is a major exercise, which often gets adversely affected due to the non-availability of shunting locomotives and limited holding capacity in the yards. Transhipment is required for goods bound for Dhaka, even though a DG railway network exists up Kamlapur station in Dhaka. This is because of the load restrictions imposed by the Bangabandhu Multipurpose Bridge Authority (recently, renamed as Bangladesh Bridge Authority), which prohibit the movement of fully loaded Indian BG wagons.

Benapole is an alternative entry point for trains from Kolkata. This route was reopened in 2001 and currently caters for only one to two trains per week. Rohanpur is the third BG crossing point that is fully operational. The Rohonpur route would provide a direct BG route for traffic Nepal. Rohanpur has only three yard lines capable of accommodating a freight train consisting of only 30 Water-tight covered high side bogie wagon used on Indian rail system (BCX) wagons. The existing capacity of Rohanpur station being limited, 10 BCX wagons are detached from every rake at Singhabad yard causing delays to the loaded stock. The inadequate holding line capacity of BR thus adversely affects the movement of goods between India and Bangladesh.

Birol used to be a rail crossing point, particularly for Nepal traffic. The MG section to Birol was in operation until April 2005. Most of the Nepalese rail traffic used to be handled through

this point. However, Indian Railways (IR) has already converted the track from MG to BG. Therefore, to reinstate the connection it will be necessary to have a transhipment arrangement or a container transfer station at Birol until such time that a dual gauge line has been built from Birol to Parbatipur.

Akhaura junction is proposed by India as a connection point to Indian Railways. There is a missing link between Akhaura and Agartala in India. An MOU was signed between Indian and Bangladesh Government on 16-02-2013 to construct this link under Indian grant.

Connectivity with Bhutan and Nepal:
Rail traffic between Bangladesh and Bhutan or Nepal must cross through India. For Nepal, trains originating on BG can use the route Rohanpur. For Bhutan, to get a direct BG connection, the route via Chilahati/Haldibari could be opened.

There is a Protocol between Nepal and Bangladesh for the movement of transit traffic by rail to Nepal. There is also an MOU between Bangladesh and India signed on 06-09-2011 to facilitate overland transit traffic between Bangladesh and Nepal .

Connectivity with Myanmar:
There is no current rail connection to Myanmar. However, Bangladesh Railway is conducting a feasibility study under ADB TA Loan to construct railway link between Dohazari to Gundum near Myanmar border with a view to establish railway connectivity with Myanmar.

8.3.2 Trade Facilitation

The export and import structure of Bangladesh with neighbouring countries is presented in the following tables. The major trade flows are with India, and followed by Myanmar, Bhutan and Nepal. The major voluminous exportable items to the neighbouring countries are dominated by jute and jute products, chemical, consumable items, textiles, fertiliser, sacks and bags, cement, and machinery and mechanical appliances. The most voluminous Imports are dominated by rice, wheat, food products, stones, wood and wood products, coal, chemicals, and textiles. Presently, most of the freights are carried by road transport. The only larger share of stones and food grains are carried by rail. However, most of the voluminous items could be carried by rail, depending on good connectivity and location of final origins and destinations.

Table 8-53: Bangladesh's Export to Neighbouring Countries by Category and Value (2004)

Figure in USD' 000

Country	Raw materials	Intermediate goods	Consumer goods	Capital goods	Total
Bhutan	2464.28	923.09	4627.62	96.53	8111.52
India	28,042.70	55,820.72	16,925.06	2,434.23	103,222.72
Myanmar	69.31	1,910.89	1,660.69	0.99	3,641.88
Nepal	0.70	131.08	484.09	45.73	661.60

Table 8-54: Bangladesh's Import from Neighbouring Countries by Category and Value (2004)

Figure in USD' 000

Neighbouring Countries	Raw materials	Intermediate goods	Consumer goods	Capital goods	Total
Bhutan	1399.17	220.86	3819.97	0.00	5440.00
India	375,714.19	717,026.85	403,563.94	166,133.63	1,662,438.61
Myanmar	19,243.17	369.76	6,611.07	0.00	26,224.00
Nepal	59.17	5,362.65	684.77	0.00	6,106.60

In the context of this trade "trade facilitation" in the region has been cited as a significant problem in almost all studies. Though efficient and effective customs procedure and administration are the key for trade facilitation, but improved infrastructure facilities at border crossings including multimodal integration and services are also important. In order to develop trade facilitation, the Government of Bangladesh has taken initiatives for development of road and rail networks, and port facilities. Bangladesh has also been a member of World Trade Organisation (WTO) since its inception, where GATT Article V, VIII and X focuses on trade facilitation. In this respect, Bangladesh has been taking initiative in line with the WTO and WCO articles for harmonisation of customs procedures and development of border infrastructure for trade facilitation. In addition, Bangladesh has transit agreement with Bhutan and Nepal and with India by IWT and rail and gives priority to landlocked countries for transit.

In the regional context, and considering the type of commodity being traded, rail could be the main mode to carry less expensive but bulk products. As assessment of the existing rail linkages and facilities revealed that except for Darsana and Benapole other rail linkages are suffering from several constraints in terms of trade facilitation among the neighbouring countries. The facilities to be improved include extension of loop lines, harmonisation of gauge and establishment of transhipment yards with equipment for smooth handing of freights. In addition, the plan has considered two some historical links with India for trade facilitation, which depends on trade volume.

Table 8-55: Major Works to be undertaken for Trade Facilitation with Neighbouring Countries

Ref	Sl	Programme	Status
	8.1	Conversion of track into DG from Tongi via Akhaura to Shahbazpur	Considered under the Plan
4.2	8.3	Extension of yard and capacity at Rohanpur	Proposed under the Plan
	8.4	Re-commissioning of Kulaura-Shahbazpur-Karimganj (India) Line	Considered under the Plan
	8.5	Construction of DG line from Parbatipur-Birol and BG line from Birol-Birol Border	Considered under the Plan
	8.6	Construction of Railway line from Chilahati-Chilahati Border	Considered under the Plan

8.4 Rail based Inland Container Depots (ICDs)

It was mentioned in the earlier section that there is a need for expansion Inland Container Depot (ICD) facilities at convenient locations to overcome the exiting transhipment problems. An ICD was established in Kamlapur (Dhaka) in April 1987 under the joint ownership of the Bangladesh Railway and the Chittagong Port Authority (CPA). Presently, four dedicated container trains (two up and two down) are running between Kamlapur ICD and Chittagong Port. The actual timetable was made for eight dedicated container trains, but the existing capacity of Kamlapur ICD does not allow for more container trains, because it has a capacity to handle about 1,000 TEU at any one time. The total capacity of the ICD is about 90,000TEUs. In 2006, a total of 77,567TEUs were handled by Kamlapur ICD.

Since there is no scope for expansion of Kamlapur ICD, a new ICD at Dhirasram has been planned, which needs to be constructed as early as possible, to attract the increasing container traffic to rail. It is found from the feasibility study of Dhirasram ICD that the capacity of the ICD is expected to be saturated at the end of the year 2025; therefore, the Railway Master Plan has proposed feasibility study for a few more new ICDs in the Dhaka area (Nimtoli area of Sirajdikhan Upazila to avoid through movement of freight trains to Kamlapur and Dhirasram ICDs by using Dhaka city), as well as in the western region of Bangladesh.

8.5 Unit Costs Analysis

8.5.1 Introduction

A number of recent feasibility studies for railway projects have been carried out under Government or Development Partner funding. The cost estimates contained in each study were compared, along with Government procurement programmes for rolling stock, signals, and maintenance and rehabilitation of infrastructure. As part of Master Plan preparation, unit costs of the following were determined:

- Unit cost of metre gauge construction
- Unit cost of broad gauge construction
- Unit cost of dual gauge construction
- Unit cost of double track construction
- Unit cost of dual gauge conversion on existing track
- Unit construction cost of bridge
- Installation cost of signal
- Procurement of rolling stocks
- Unit cost of Improvement/rehabilitation and maintenance

Detailed construction costs will depend on standards of track, topography, soil condition and ancillary facilities of proposed infrastructure. The Plan has taken indicative costs, as set out below, in order to assess the investment envelope required.

The basis of estimating projects/programme costs i.e. unit cost is based on the approved schedule of rates of BR- 2013 and rates of on-going projects under implementation.

8.6 Environmental and Social Issues

The transport system has a large environmental impact. Railways are habitually regarded as an environmentally preferable mean of transport, mainly because trains often are driven by electricity and consumption of diesel per ton-km or per passenger km are also low. This view is also true when the operation phase alone is considered; at least if the electricity is derived from renewable sources. However, in Bangladesh, all locomotives are diesel powered. Therefore, there are environmental consequences of railway operations, but no guidelines have yet been prepared for Bangladesh Railway to adhere to.

The environmental issues relate to rail operations are at industry and yard level, and train operation level. The industry and yard level environmental issues are (a) workshops and material storage yards-hazardous and solid waste management, industrial water discharge, storage tanks, and used oil and batteries, (b) maintenance of way (MOW)-appropriate handling and disposal of scrape or retired materials, used crosstie reuse or disposal, and scrape or reuse materials, (c) signal batteries-because of chemical natures, and (d) cleaning of yard as well as yard cleaning wastes, as these are produced while cleaning up or collecting excess ballast, brake shoes, and broken hoses. The train operation level environmental issues are (a) air pollution from diesel engine and (b) noise pollution.

In the past, Bangladesh railway did not pay emphasis on social issues in their project documents. However, in GOB funded studies the issue was addressed but limited to the project area only. Donor funded studies incorporate social issues as per their individual guidelines. The first attempt to assess the social impact of BR as a whole was made in the Feasibility Study for Improvement and Rehabilitation of Branch Line of Bangladesh Railway (2007) based on TSC Wing's draft PAF of Bangladesh Railway. In future, all the infrastructure projects proposed under the plan should be subjected to a full Environmental Impact Assessment (EIA), as already required under existing Bangladesh law, accompanied by social impact assessments, which are not yet a legal requirement.

8.7 Dhaka Rail

8.7.1 Introduction

Railway has been playing an important role in maintaining connectivity of the capital city Dhaka with rest of the country. Dhaka is served virtually by one rail line running south to north, which after Tongi bifurcates into two lines- one goes to Mymenshing/Bangabandhu Bridge and the other to Sylhet/Chittagong. The Dhaka Strategic Transport Plan, finalized in June, 2006 did not cover development of Dhaka Rail, and left it to be studied as part of the overall railway Master Plan.

8.7.2 Developments which impact on rail operations in Dhaka

The following components of the Railway Master Plan will have significant impact on railway operations in Dhaka:

Dhaka-Comilla Chord Line will shorten the distance between Chittagong and Dhaka by 82 km;
Dhaka-Jessore line over Padma Bridge, also likely to terminate near Fatullah;

Double tracking of Dhaka-Narayanganj section.
Construction of 3rd and 4 th line between Dhaka-Tongi.
Double tracking of Tongi-Joydevpur section.
Procurement of 20 DEMUs for introducing commuter trains.

Development of ICD at Dhirasram, 25km north of Dhaka is proposed to be constructed by 2010-2011. This ICD, when fully operational will have the capacity of handling 775,000 TEUs per year. This has the potential to remove trains passing through Dhaka, if it is more attractive than Kamalpur. However, capacity at Kamalpur should be utilized.

The following issues should also be taken into account:

Commuter rail system development in Dhaka. The Dhaka Metropolitan Development Plan (1995-2015) recommended that commuter train services be developed to meet the travel needs of passengers' from towns and districts around Dhaka. A policy for BR to operate commuter trains between Joydebpur and Narayanganj was adopted by the Government in 2004.

Development of rail based metro system in Dhaka. The Strategic Transport Plan (STP) for Greater Dhaka recommended development of metro systems along 3-corriodrs. Since the recent approval of STP, it is crucial to ensure integration of metro development with that of the Dhaka rail, so that appropriate transfer points could be built for the benefit of passengers, and duplication is avoided.

8.7.3 Dealing with Road Traffic at the Level Crossings

Another major impact of the rail line passing through the city of Dhaka is the delay caused to road traffic at the level- crossings. There are 29 level crossings in Dhaka of which nine are major ones. All the 29 level- crossings are protected with manually operated gates and provided with signaling and approach warning protection system. With regards to the delays caused to road traffic moving across the busy level-crossings in Dhaka, it was observed that around 72 trains (up and down) including 2 container trains pass through the city in a day. A traffic survey revealed that average waiting time for the road traffic at the level -crossings is about 3 minutes, and occasionally a maximum of 5 minutes. This is quite comparable with the average waiting needed in any major road inter-section in the city. In order to overcome the problems of waiting at busy level-crossings, a number of options, as suggested by STP were evaluated. An evaluation of the various options (alternatives) has been provided in the main report. The options which were examined were as follows:

- Relocating the railway to the eastern side of Dhaka,
- Elevating the railway along the existing alignment,
- Putting the Kamlapur-Tongi rail section underground, and
- Terminating the BR rail lines at appropriate northern and southern points, and establishing suitable station facilities (for both passengers and freight)

and relying upon intra-urban modes to distribute and collect passengers and goods throughout the Dhaka area,

The summary recommendation is that providing grade separation in the form of road over-bridges is the responsibility of the relevant road agencies. New road over bridges have been identified at 33 locations. These are programmed for implementation under the RHD road master plan.

8.7.4 Coordinated Development of Railway and other Modes within Dhaka

With regard to the existing Dhaka railway track (Kamlapur -Tongi), the analysis showed that it would be most cost effective to keep the railway at-grade, and build a number of over-bridges for road traffic at busy level-crossings. Most of the new passenger traffic travelling along the above mentioned tracks are expected to terminate in Kamlapur station. In case of container traffic, these will be handled by Kamlapur ICD, until Dhirasram ICD is operational. In fact, all containers coming from Chittagong and destined for northern part of Dhaka City would in the future be handled at Dhirasram. All containers coming from India, and southern District of Bangladesh could be handled by Kamlapur ICD, and subsequently by Adamji Nagar ICD to be established in southern part of Dhaka, to handle additional traffic after Kamlapur is saturated. The above development has been planned to keep the traffic in Kamlapur- Tongi section at the minimum. However, in case, the proposed new developments indicated above, generate considerable traffic, initiative could be taken to further modernize the signaling system in Kamlapur - Tongi section to accommodate up to150 trains per day both directions.

With regard to the development of Mass Rapid Transit (MRT), the Government of Bangladesh is already in the process of going for a feasibility study, in line with the recommendations of STP. Once MRT is established and operational, it would be highly important to look into the possibility of extending it up to Joydevpur and Narayanganj to serve the destinations which the commuter trains were expected to serve. In line with other country's experience, MRT extension would be more cost effective, rather than establishing a new entity, like commuter services, having limited network to serve.

Development of MRT should again be closely coordinated with the railway (BR) system in Dhaka city. Transfer points between major BR stations in Dhaka and the MRT should be effectively coordinated and designed for the convenience of passengers. Effective coordination would also be necessary between different MRT lines as well as between MRT, Bus Rapid Transit (BRT) and major bus routes, to decide about transfer points and work out proper designs for them.

The Government of Bangladesh has created Ministry of Railways to prioritize railway sector. So any development activities and organization such as Dhaka Mass Transit Company (DMTC) relating to railway should be under the Ministry of Railways.

Figure 8.1 Dhaka City Metro Systems