**DEVELOPING TRANSPORTATION AND QUALITY INFRASTRUCTURE TO SUPPORT SUSTAINED RAPID GROWTH AND ECONOMIC TRANSFORMATION**

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**1.0 INTRODUCTION**

An efficient transport system is essential for promoting economic development. It is instrumental in influencing the distribution of economic activities and enhancing productivity. It is particularly helpful in generating economies of scale, fostering competition, reducing cost of production, facilitating systematic urbanization and assisting export-led faster growth. Thus an efficient transport system is part of the enabling environment that facilitates rapid, efficient and sustainable economic growth.

Transport system in Bangladesh comprises a number of distinct modes and services, notably railways, roads, road transport, ports, inland water transport, coastal shipping, airports and airlines. Roads and inland water transport are the dominant means of transport carrying more than 90% of total traffic generated in the country. Although other modes like railway, coastal shipping would play a greater role, roads and IWT would continue to dominate the transport landscape in the foreseeable future. Presently there are about 55,000kms of paved roads; 2,877 route-kilometers of railways, 3,800 km of perennial waterways which increases to about 6,000 km during the monsoon, 2 seaports, 2 international airports (i.e. Dhaka and Chittagong) and 8 domestic airports.

Public sector is mainly responsible for development and maintenance of transport infrastructure in Bangladesh. The public sector is involved in transport operations in road, inland water transport (IWT) and ocean shipping alongside the private sector. In the road transport and IWT sub-sectors, the private sector is dominant. In ocean shipping, however, public sector still predominates, although the private sector has considerably increased its role in recent years. Recently private sector has also become important operator in air transport, both domestic and international. Involvement of the private sector in railway operation, however, is very limited.

**2.0 Present Status of Transport System and Services**

The transport sector plays an important role in the socio-economic development of Bangladesh. Bangladesh witnessed rapid growth of transport sector since independence. The overall annual growth rate was nearly 8.2 percent for freight transport and 8.4 percent for passenger transport. Even then the transport intensity of the Bangladesh is considerably lower than that of many comparable developing countries. The relative roles of transport modes are evolving with road transport expanding at the expense of railways and inland water transport because of its inherent technical and cost advantages.

**2.1 Road Transport**

A good road network is a critical infrastructure requirement for rapid growth. It provides connectivity to remote areas; provides accessibility to markets, schools, and hospitals; and opens up backward regions to trade and investment. Roads also play an important role in inter-modal transport development, establishing links with airports, railway stations, and ports.

There has been tremendous expansion of road network in the country since independence. In 1971 total length of paved roads was 3000 kms which increased to about 55,000 kms. at present. Dhaka is connected with the major urban centres and the sea ports by roads. The Roads and Highways Department (RHD) manages several categories of roads. As recorded in 2012, the total length of road under RHD is 21,462 km. 16.52 percent of these roads are national highways while 19.93 percent and 63.55 percent are regional highways and feeder roads respectively. RHD has under its control a total number of 4,507 bridges and 13,751 culverts. It is currently operating about 153 ferry boats in 60 ferry ghats on its road network throughout the country. The road network under RHD combining different types of roads built over a period from 2001 to 2012 is shown in Table-1 below:

**Table- 1: Various Categories of Roads under RHD**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Year** | **National Highway (km)** | **Regional Highway (km)** | **Feeder Road ‘A’ type (km)** | **Total (km)** |
|  |  |  |  |  |
| 2001 | 3086 | 1751 | 15962 | 20799 |
| 2004 | 33723 | 4832 | 13823 | 22378 |
| 2008 | 3462 | 4128 | 13255 | 20865 |
| 2012 | 3544 | 4278 | 13640 | 21462 |
| 2016 | 3813 | 4247 | 13242 | 21302 |

Source: Ministry of Finance, 2012, 2017

The Local Government Engineering Department (LGED) is also involved in the development of urban and rural roads. Since its inception up to June 2017, LGED has so far constructed, reconstructed and rehabilitated a total of 1,07,910 km. upazila, union and rural roads, as well as 1,335,174 metres of bridges/culverts on these roads (Ministry of Finance, 2017).

There has been significant increase in the number of mechanized vehicles on roads in recent years. Between 2011 and 2016 mechanised vehicles on roads increased by about 14% annually. Growth rates of smaller vehicles, especially, car, auto-rickshaw, motorcycles etc. were higher than the larger vehicles such as bus and truck.Table-2 presents the estimated Number of Motor Vehicles in Bangladesh in different years between 2011 and 2017 registered by Type.

**2.2 Railways**

For many years railways played a significant role as a dominant mode of land transport because of its less hazardous and less expensive transport services. In recent years the railway has been losing its market share to other modes, especially the road because of its flexibility and capability to provide door to door service. Policy shift of the successive governments in favour of road has also been responsible for the decline of railway’s share of passenger and freight traffic.

|  |  |  |
| --- | --- | --- |
| Table-2: Estimated Number of Motor Vehicles in Bangladesh Registered by Type  **(Thousand)** |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TYPE OF VEHICLE** | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
| **Auto Rickshaw** | 147.19 | 170.73 | 186.43 | 206.33 | 226.33 | 237.50 |
| **Bus** | 29.54 | 30.98 | 32.09 | 33.57 | 35.96 | 39.80 |
| **Covered van/pick-up etc.1** | 72.79 | 82.89 | 93.30 | 107.50 | 122.23 | 140.14 |
| **Microbus/jeep etc.2** | 112.52 | 117.85 | 122.09 | 128.49 | 138.46 | 152.64 |
| **Private Passenger Car** | 232.78 | 242.00 | 252.48 | 267.18 | 288.24 | 308.54 |
| **Truck** | 90.20 | 94.53 | 99.66 | 107.80 | 114.13 | 121.40 |
| **Other3** | 124.74 | 129.89 | 134.14 | 139.26 | 145.64 | 155.31 |
| **Total Excluding Motor Cycle** | 809.76 | 868.87 | 920.18 | 990.13 | 1070.99 | 1155.34 |
| **Motor Cycle** | 873.87 | 975.46 | 1061.27 | 1151.95 | 1392.31 | 1724.37 |
| **Total Including Motor Cycle** | 1683.63 | 1844.33 | 1981.45 | 2142.08 | 2463.3 | 2879.71 |

Source: BBS (2016)

1. Covered Van, Pick-Up, Cargo Van, Delivery Van
2. Microbus, Jeep, Human Hauler
3. Ambulance, Auto Tempo, Tanker, Taxicab, Tractor, Minibus and different other vehicles

Bangladesh Railway (BR) provides, environment-friendly less hazardous and less expensive transport services. It has got a total network of 2,877.10 route kilometres (broad gauge 659.33 km, dual gauge 374.83 km and metre gauge-1,842.94 km). After the construction of railway tracks over the Bangabandhu Bridge, railway link between the East and West Zones has been established. Dual gauge rail track constructed from Jamtoil to Joydebpur over Bangabandhu Bridge has established direct rail link between East and West zones (Ministry of Finance, 2012).

The Railway has been involving the private sector in some railway operation during the last few years. These include the leasing out of commercial functions for passenger trains such as development, operation and maintenance of their ticketing reservation and for the maintenance, expansion and provision of telecommunication services to both railway and general public utilizing the railway’s fibre optic network. Bangladesh Railway has also introduced computerized wagon control system (RAILWICS) in 1999-2000. UNESCAP assisted programme, can now be used for tracking and monitoring movement and status of all rolling stock, containers and cargo.

**2.3 Inland Water Transport (IWT)**

Inland Water Transport (IWT) is an extremely energy efficient, environmentally clean and economical mode of transport. But it has not been able to realize its full growth potential partly because of the road bias of the infrastructure development policy of the government. Bangladesh has about 14,000 km of waterways (rivers/canals) of which about 5,968 kms. remain navigable during monsoon and 3865 km of rivers/canals are navigable during the dry season. The water transport network of the country not only caters to the inland movement of freight and passengers but also plays an important role in the transportation of import and export items through the ports of Chittagong and Mongla. During the monsoon season when roads become impassable, riverboats are the only mode of transport for an important part of the Bangladesh’s rural population. The country boat plays significant role and provides for about 50% of the total employment in the transport sector as a whole. They are also the main mode of transport in the south coastal areas where the road network is little developed. Currently, most of these waterways suffer from navigational hazards like shallow water and narrow width of channel during dry weather, siltation, bank erosion, absence of infrastructure constrained by the absence of proper surface road links to facilitate the smooth transit of cargo.

**2.4 Civil Aviation**

The demand for air services has grown substantially during the last two decades because of increase in per capita income exports of worker services and expansion of tourism. Civil Aviation Authority, Bangladesh (CAAB) functions as the regulatory body for all aviation related activities in Bangladesh. This organization is the custodian of all airfields and allied facilities including air navigation facilities. CAAB renders its services to regulate and to develop required aviation facilities for national and international air transportation. It is now maintaining 3 international airports and 7 domestic airports and another 2 Short Take-Off and Landing (STOL) ports. Out of these, 8 airports (3 international and 5 domestic) are in operation. Due to inadequacy of passengers, no flight is operating at 2 other domestic airports and 2 STOL ports.

Hazrat Shahajalal International Airport (HSIA) at Dhaka is the busiest airport in Bangladesh through which 80% of the total air traffic flow takes place. The airport has an area of 1,981acres (802 ha). The airport has a capacity of handling 15 million passengers annually, and is predicted by the CAAB to be enough until 2026. Air traffic volume rapidly is increasing at 9.5% during last 3years. In 2014, it handled 6.1 million passengers, and 248,000 tonnes of cargo. Average aircraft movement per day is around 190 flights. The opening up of air traffic to private domestic carriers has also paid dividends in terms of quality and frequency of air services. With growing income, the demand for international and domestic air services continues to grow. The existing terminal and runway is not A380 or B747-8F compliant. It has become necessary for upgrading and expanding HSIA, to meet the growing air traffic demand and to accommodate Code F Aircraft (A380, B747-8F).

**2.5 Maritime Ports**

The maritime port sector plays an important role in the country’s development, especially growth of GDP through sea borne trade. Total tonnage of sea borne trade is presently over 45 million tons, growing over 10 percent per annum. Chittagong and Mongla are the only two sea borne trade ports in Bangladesh. Chittagong is the main gateway port and handles over 95 percent of total tonnage. The installations of Chittagong Port are situated along the bank of the River Karnafuli, 16 km from its outfall into the Bay of Bengal. The maximum permissible draft ranges from 8.50 m to 9.20 m with length restriction of a vessel being 188 m. The Chittagong port has a total of 41 berths including private and public terminals and lightering operations in the outer anchorage.

At present annual growth of import-export trade conducted through Chittagong is 12 percent to 14 percent on average. A total of 2,136 and 2,294 ships came to the port In FY 2012-13 and 2013-14 respectively. In FY 2012-13 and 2013-14, 433.72 and 472.99 lakh metric tonnes of imported cargo and 14,68,713 and 16,25,509 Twenty- Foot Equivalent Unit (TEUs) containers have been handled through this port. There is an ongoing process of building Chittangong Port as a modern sea port keeping pace with other modern sea ports in the world. CTSM (Computerised Container Terminal Management System) and VTMIS (Vessel Traffic Management Information System) have been introduced to automate the port (Ministry of Finance, 2015).

The installations of Mongla Port are situated along the bank of the River Pussur, 130 km inland from the Bay of Bengal. The maximum permissible draft ranges from 6.00 m to 8.50 m with length restriction of a vessel being 200 m. It has three container yards with a total area of 35,752 sq. metres which can accommodate 2,180 TEUs containers of same heights. In addition, it has got 4 transit sheds and 2 warehouses which can store 33,258 metric tonnes of cargo. *Mongla*port is capable of facilitating trade between north-west part of Bangladesh, Nepal, Bhutan and places adjacent to the Indian border. In FY 2014-15, a total of 45.0 lakh metric tonnes of imported cargo and 42,137 TEUs container have been handled through this port (Ministry of Finance, 2015).

Payra Port as third Sea-port of Bangladesh was inaugurated on 19 November 2013. Scale of operational activities of the port is, however, very limited at present. Only bulk carrier vessels call in at the outer anchorage and discharge the cargo (cement clinker, fertilizer etc.) onto the inland vessels for hinterland transportation. For hassle free inland vessels movement fareway and mooring buoys have been laid to earmark navigational channel. In addition, a VHF Bade station had also been installed with telecommunication equipment. The customs and shipping facilities have also been established. Electric Sub-Station for uninterrupted power supply, water treatment plant for supplying pure drinking water, A Pontoon jetty and two Electric cranes with lifting capacity of 5 tonnes each have also been installed for ship berthing (Ministry of Finance, 2017).

**2.6 Urban Transport**

Rapid urbanization in Bangladesh during the last few decades increased transport demand quite significantly leading to manifold increases in the number of motorized and non-motorized vehicles on city streets. The increase in the number of vehicles relative to road facilities has led to severe congestion on roads and deterioration in urban environment. Such trends are likely to continue as further urbanization takes place.

In urban areas road transport system is the main means for carrying passengers and commodities. Rail and water transport systems are mainly used by commuters and for transporting commodities between urban areas. As of 2007, total length of paved roads in the country was 80,915 kms which is about 30% of the total length of roads in the country. These roads include both urban and rural roads. Data on total length of roads in urban areas, however, is not available.

Table-3 represents the lengths of road and the level of service in six city corporations. Length of metalled (paved) road is highest in Dhaka followed by Rajshahi, Chittagong, Barisal, Sylhet and Khulna. Level of service (LOS) is defined as meter per person which is the most satisfactory condition in Rajshahi and is in worst situation in Chittagong. If all types of roads are considered best level of service is found in Barisal followed by Rajshahi, Sylhet, Khulna, Dhaka and Chittagong. Chittagong performs worst both in terms of paved roads and all types of roads probably due to physical characteristics of the city. Among the six city corporations, Dhaka is confronted with the most serious transportation problems. The transport sector of the city is comprised of many different modes of travel-both motorized and non-motorized-often using the same road space – resulting in a high level of operational disorder, that significantly diminishes the efficiency and effectiveness of the existing transport uses.

**Table-3: Road facilities in different City Corporations**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Division** | **Population** | **Metalled Road**  (Km) | **Semi Metalled Road**  (Km) | **Unmetalled**  **Kacha Road** (Km) | **Total**  **(Km)** | **LOS-**  **Metalled**  **Road**  (m/ person) | **LOS-**  **Total**  **Road**  **(m/ person)** |
| **Barisal** | 328278 | 233 | 36 | 324 | 593 | 0.71 | 1.81 |
| **Chittagong** | 2592439 | 250.80 | 90.5 | 47.39 | 378.35 | 0.10 | 0.15 |
| **Dhaka** | 8906039 | 1594 | 104 | 533 | 2231 | 0.18 | 0.25 |
| **Khulna** | 751230 | 158 | 67 | 18 | 243 | 0.21 | 0.32 |
| **Rajshahi** | 449756 | 346 | 225 | 0 | 571 | 0.77 | 1.27 |
| **Sylhet** | 485138 | 217 | 0 | 12 | 229 | 0.45 | 0.47 |
| **Total** | 13512880 | 2798.8 | 522.5 | 934.39 | 4245.35 | 0.21 | 0.31 |

**Source**: District Statistics, 2011, Bangladesh Bureau o Statistics, Ministry of Planning

Heavy concentration of motorized and non-motorised smaller vehicles with almost 80 per cent of the available road space occupied by private passenger cars and rickshaws is expected to continue in the foreseeable future. Private passenger cars in Dhaka account for only 5% of the total trips (figure-1) and about 25% of the vehicles but occupy about 39% of the road space. Public buses on the other hand, account for about 28% of the total number of trips but occupy only 6% of the road space. Rickshaws’ share of trips and road space is 38% and 40% respectively (DTCB and JICA, 2010).

Continuous and rapid increase in the number of private passenger cars is considered primarily responsible for congestion on urban roads. Cars cause problems not only when they are moving, they also require an inordinate amount of space for parking. Private car ownership in Dhaka has increased steadily from 5.85 vehicles per 10,000 persons in 1971 to 34.6 in 1992, an increase of about 490 percent (Hoque, M.M., Ahsan, H.M &Alam, J.B, 2002). By 2011 car ownership reached 123 per 10,000 persons indicating continuous increase in the number of cars on the roads. Although private cars account for a small proportion of total number of trips in the city, they occupy much larger road space. Car is the most inefficient transport mode in terms of number of passengers and occupation of road space (Bari, M. and Efroymson, D., 2005). In their research, Bari and Efroymson showed that the average number of passengers per vehicle is 1.50 for a car, 1.60 for a rickshaw and 52 for a bus. Such car- dependency results in heavy congestion even in smaller cities and an increasing impact on the environment and the climate through emission of greenhouse gases and particles (Pantzer, M., 2011).

Being a megacity and the capital of the country, Dhaka receives most attention from the policy makers in terms of addressing its transportation problems while major secondary cities like Chittagong, Khulna, Rajshahi, Sylhet, Comilla, Bogra and Mymensing do not receive proper attention despite the fact that these cities also face significant transportation problems. People in these cities mainly depend on non-motorised transport modes which facilitate more than 60% of the trips they make for various purposes. Figure-2 presents the distribution of work trips by modes in urban areas of Bangladesh. 65% of the trips are made through non-motorised means such as rickshaw, bicycles and walking. This proportion is more than 80% in smaller urban centres.

|  |  |
| --- | --- |
| Source: DTCB and JICA (2010)  **Figure-2: Work Trips by Modes in Dhaka city** |  |
|  |  |
| **Source:** World Bank, (2007) “Bangladesh-Transport at a Glance”  **Figure-3: Work Trips by Modes in Urban Areas** |  |
|  |  |

It is unfortunate that despite being a megacity with a large number of residents, Dhaka does not have a Mass Transit (MRT) in any form to move a huge number of people at a time at high frequency. Public transport in Dhaka is road based and consists of non-motorized such as rickshaws and motorized transport such as buses, minibuses, human haulers, taxis and auto-rickshaws. Buses are the only mode which can carry a large number of people at one time and has the potential to cater to all income groups. But the number of operational buses is not more than 20 to 25% of the number required to meet the demand. Moreover bus service in the city is characterized by overcrowding, long waiting time and journey time, lack of comfort, difficulty in transferring from one route to another, long distance to and from bus stop etc.

**3.0 A Comparative Analysis of Transport System Performances**

The transport system of Bangladesh comprising distinct modes such as road, rail, civil aviation, inland water transport and coastal shipping serves a land mass of 144000 square km and a population of about 160 million. The degree of contribution of each of these transportation modes in the economy depends largely on the volume of passenger and freight traffic handled by the mode. It is obvious that land based transportation modes (road and rail) account for largest share of passenger and freight movement within the country compared to water or air-based transportation modes. An idea about the relative contributions of land, inland water and air transportation can be obtained from table-4 which presents the shares of GDP (%) attributable to land, water and air transport at constant prices.

**Table-4: Sectoral Shares of GDP (%) at Constant Prices (Base Year 2005-2006)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Transport Mode** | **2011-12** | **2012-13** | **2013-14** | **2014-15** | **2015-16** | **2016-17** |
| **Land Transport** | 7.32 | 7.31 | 7.27 | 7.24 | 7.18 | 7.17 |
| **Water Transport** | 0.86 | 0.84 | 0.81 | 0.79 | 0.76 | 0.74 |
| **Air Transport** | 0.14 | 0.13 | 0.12 | 0.12 | 0.12 | 0.11 |
| **Total** | **8.32** | **8.28** | **8.20** | **8.15** | **8.06** | **8.02** |

**Source: BBS**

Out of a total contribution of about 8.20 percent on an average during the last 6 years land transport (road and rail together) contributed an average of about 7.25 percent while water and air transport together contributed only about 1.00 percent in the GDP.

Table-5 below compares Bangladesh’s global competitiveness score and quality of different types of infrastructure with those of a number of Asian countries including countries of south Asia. The information is collected from World Economic Forum’s Global Competitiveness Report 2016-17. In terms of overall global competitiveness only Pakistan is behind Bangladesh while all other countries including Nepal, Bhutan and Sri Lanka have higher scores than Bangladesh. In case of overall infrastructure quality only Nepal is behind Bangladesh while all other countries have higher scores than Bangladesh. Similar is the picture with respect to different types of transportation infrastructure such as road, railway, port and air transport. This means that Bangladesh is badly in need of drastic improvements in its transportation infrastructure in order to reach the goal of reaching high-income nation by 2041.

**Table-5: Bangladesh’s Global Competitiveness Index and Infrastructure Quality- An International Comparison (2016-2017)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **Global Competitiveness** | | **Quality of Overall Infra-structure** | | **Quality of Roads** | **Quality of Railway** | **Quality of Port** | **Quality of Air Transport** |
| **Score** | **Country Ranking** | **Score** | **Country Ranking** | **Score** | **Score** | **Score** | **Score** |
| **Bangladesh** | 3.8 | 106 | 2.8 | 120 | 2.9 | 2.7 | 3.5 | 3.2 |
| **Bhutan** | 3.9 | 97 | 3.9 | 78 | 3.8 | N.A | 1.9 | 3.7 |
| **India** | 4.5 | 39 | 4.5 | 51 | 4.4 | 4.5 | 4.5 | 4.5 |
| **Nepal** | 3.9 | 98 | 2.6 | 124 | 2.8 | N.A | 1.3 | 2.6 |
| **Pakistan** | 3.5 | 122 | 3.5 | 93 | 3.8 | 3.1 | 3.7 | 4.0 |
| **Srilanka** | 4.2 | 71 | 4.4 | 55 | 4.7 | 3.6 | 4.3 | 4.6 |
| **Thailand** | 4.6 | 34 | 4.0 | 72 | 4.2 | 2.5 | 4.2 | 5.0 |
| **China** | 5.0 | 28 | 4.5 | 43 | 4.8 | 5.1 | 4.6 | 4.8 |

Table-6 shows Bangladesh’s global competitiveness and infrastructure scores over time. Over a period of 9 years between 2008-09 and 2016-17 some improvements can be observed in global competitiveness, quality of overall infrastructure, quality of railway, port and air transport. The score for port quality increased from 2.6 in 2008-09 to 3.5 in 2016-17, registering an increase of about 46%. Air transport experienced an increase of 36% in its score during this periodfollowed by rail transport which experienced an increase of about 17% in its score. What is important to note is that the score for roads has remained more or less the same during this period indicating that thecountry has not experienced any significant improvement in the quality of road transportation according to the Global Competitiveness Report of the World Economic Forum. Since roads account for largest share of passenger and freight traffic in the country it is extremely important for the government to focus on the qualitative improvement of the road sector for efficient functioning of the economy. The government also need to pay attention to the qualitative improvement of rail, port and air transport facilities to boost the economy. Even to reach the present level of Chinese infrastructure a score close to 5.0 out of 7.00 must be achieved with respect to each mode of transportation.

**Table-6: Bangladesh’s Global Competitiveness and Infrastructure Scores over Time**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Global Competitiveness** | | **Quality of Overall Infra-structure** | | **Quality of Roads** | **Quality of Railway** | **Quality of Port** | **Quality of Air Transport** |
| **Score** | **Country Ranking** | **Score** | **Country Ranking** | **Score** | **Score** | **Score** | **Score** |
| **2016-2017** | 3.8 | 106 | 2.8 | 120 | 2.9 | 2.7 | 3.5 | 3.2 |
| **2015-2016** | 3.8 | 107 | 2.8 | 124 | 2.9 | 2.5 | 3.6 | 3.2 |
| **2014-2015** | 3.7 | 109 | 2.8 | 130 | 2.9 | 2.4 | 3.7 | 3.0 |
| **2013-2014** | 3.7 | 110 | 2.8 | 134 | 2.8 | 2.4 | 3.5 | 3.2 |
| **2012-2013** | 3.6 | 118 | 2.8 | 131 | 2.8 | 2.5 | 3.3 | 3.5 |
| **2011-2012** | 3.7 | 108 | 2.8 | 129 | 2.9 | 2.5 | 3.4 | 3.5 |
| **2010-2011** | 3.6 | 107 | 2.7 | 130 | 3.0 | 2.5 | 3.4 | 3.5 |
| **2009-2010** | 3.6 | 106 | 2.5 | 125 | 2.9 | 2.3 | 3.1 | 3.4 |
| **2008-2009** | 3.5 | 111 | 2.2 | 121 | 2.8 | 2.3 | 2.6 | 3.4 |

**Source: Global Competitiveness Reports of the World Economic Forum**

**4.0 Transport Demand: Status and Trend**

There has been significant expansion in the transport sector since independence. The growth of freight transport averaged about 8.2 percent per year while the passenger traffic grew by 8.4 percent on an average. Even then the transport intensity of Bangladesh is considerably lower than that of many comparable developing countries. The relative roles of transport modes are evolving with road transport expanding at the expense of railways and inland water transport because of its inherent technical and cost advantages. This is clearly evident from figure-3 and figure-4 which show the temporal changes in passenger and freight traffic. What is important to note is that while there has been significant growth in both passenger and freight traffic in road and inland water sectors, no such growth could be observed in case of railway. Railway lost its ground to road and IWT and even experienced decline in its passenger traffic.

There are considerable variations in the projection of traffic on road by various studies. Bangladesh Road Master Plan study carried out in 1990-91 estimated that the average annual growth of both freight and passenger traffic would be around 5- 6%. Bangladesh Road Master Plan, on the other hand, estimated that the growth of both freight and passenger traffic would be around 6.4% per year for the period 2010-2015 and 6% over the Master Plan period (2005-25). The Plan indicated that truck traffic will grow 2.5 to 4 times during the plan period while Car traffic will grow at an even faster rate, between 4 and 7 times, depending on the state of the economy. Growth of bus traffic, however, will depend on the implementation of recommended improvements in railway infrastructure and services over the plan period. If such improvements take place, growth of bus traffic will be slightly lower than expected. The Road Master Plan observes that the road network will need to respond to these challenges. Over the next twenty years, many of the major National Highways will require to be widened to accommodate this extra traffic, and this major programme of works needs careful phasing in the plan.

**5.0 Institutional Arrangement**

Both public and private sector institutions are involved in the management and development of the transport sector. Public sector involvement in the transport sector, especially road, rail and IWT consists of ownership and operation of a number of State Owned Enterprises and Authorities that include Roads and Highways Department (RHD), Bangladesh Road Transport Authority (BRTA), Bangladesh Road Transport Corporation (BRTC) and Dhaka Transport Coordination Authority (DTCA) under the Ministry of Transport and Communication; Local Government Engineering Department (LGED) under the Ministry of Local Government, Rural Development and Cooperatives; Bangladesh Inland Water Transport Authority (BIWTA) and Bangladesh Inland Water Transport Corporation (BIWTC) under the Ministry of Shipping, andBangladesh Railway under the Ministry of Transport and Communications. A brief description of each of these organizations is given below.

**Figure-3: Growth of Passenger Traffic by Mode**

**Figure-4: Growth of Freight Traffic by Mode**

***Source (Data for Figure 3&4):*** *Bangladesh Transport Sector Review (The World Bank publications), People's Republic of Bangladesh: Revival of Inland Water Transport-Options and Strategies, 2007, Bangladesh Integrated Transport Sector Study, 1997, Planning Commission*

**5.1 Roads**

**The Roads and Highways Department** (RHD) is a major public sector agency directly responsible for planning, design, construction, improvement and maintenance of primary and secondary road network in the country, which include National and Regional Highways and Zila Roads. RHD is also responsible for the operation, and maintenance of an extensive ferry system in the country. Gradual replacement of ferry system with bridges is another broad dimension of RHD’s regular activities.

**Bangladesh Road Transport Authority (BRTA),** the only regulatory body in road transport sector under the Ministry of Communication, Government of the People’s Republic of Bangladesh is mandated to perform the following activities a) formulation of rules and regulations for control of motor transport as and when required; b) registration of motor vehicles and ownership transfer; c) issuance of motor vehicle driving licenses; d) issuance of fitness certificates for motor vehicles; e) issuance of route permits for transport vehicles; f) inspection of vehicles involved in road accidents; g) ensuring road safety and enforcement; h) registration of driver training schools; i) maintaining accident records and statistics; j) collection of motor vehicles tax and fees etc.

**Bangladesh Road Transport Corporation (BRTC),** the only government organization in road transport sector under the Ministry of Communication is mandated to provide fast, efficient, economic, reliable, comfortable, modern and safe road transport services in the country. The BRTC is charged with the responsibility of running publicly owned buses and it has, in recent years, adopted a policy of leasing out public buses to private operators. BRTC’s share in the transport sector is only 1.2%. With the passage of time and considering the growing demand for BRTC services, BRTC has undertaken several projects for procuring buses and trucks.

**Local Government Engineering Department** (LGED) is the major public sector agency directly responsible for design, construction, improvement and maintenance of rural roads. The LGED made significant contribution towards rapid expansion of the rural transport network resulting in rapid growth of transportation services. LGED has made significant progress in building an extensive rural network of roads with significant impact on ensuring affordable transport services in the transport sector and improving the living conditions of the rural poor.

**Dhaka Transport Co-ordination Authority (DTCA):** The main objectives in establishing Dhaka Transport Co-ordination Authority (DTCA) are: to plan and coordinate transport infrastructure facilities and traffic management, to build institutional capacity of different organisations working in Dhaka Metropolitan Area (DMA) and to prepare a long-term transport development plan

### 5.2 Railway

**Bangladesh Railway (BR):** It is state owned and government managed transportation organization. It provides safe and less expensive mass transport facility. BR also provides critical transport services during natural calamities such as flood and cyclones on an emergency basis. After liberation, like other agencies, BR had to emphasize on rehabilitation and reconstruction of damaged railway system. Till then the bulk of the investment was for replacement, renewal and rehabilitation of track, rolling stock and signaling system. Until recently government resource allocations have had heavy road bias, but there are some important policy signals that things are beginning to change. This particular sub-sector has been losing ground in competition with both water and road transportation.

**5.3 Inland Water Transport**

**Bangladesh Inland Water Transport Corporation (BIWTC):** It is a service-oriented government-owned organisation. It is also the largest inland water transport entity. Currently with a fleet of 210 vessels BIWTC is playing a significant role in the economic activities of the country by carrying passengers and cargo.

**Bangladesh Inland Water Transport Authority (BIWTA):**Bangladesh Inland Water Transport Authority (BIWTA) is mainly responsible for carrying out regulatory functions of the inland water transportation system of the country. Among other responsibilities of the entity include excavation and re-excavation of dying river ways, development and maintenance of navigability of different river routes, ensuring safe movement of water crafts, development of inland river ports, activating the circular waterways around Dhaka, creating infrastructure facilities to carry container goods through inland waterways and preparation of hydrographic charts using digital system.

**5.4 Weaknesses of the Institutional Arrangement**

The institutional set-up for planning, development and management of the transportation sector suffers from a number of serious deficiencies. There is no effective coordination among the institutions that leads to severe competition among the modes thus hindering sustainable development of the transport sector. There is no assessment as to whether a particular mode of transport could undertake a particular task more economically and with less damage to the environment. Consequently, the transport system is characterized by sector bias, inappropriate modal mix and lack of integration within and among various modes of transport.

The institutional set up also handicaps intermodal planning and execution at all levels of government. Fragmentation of responsibilities leads to system inefficiency and the top-down approach to planning fails to take opinions of all stakeholders into account thereby lowering the capacity of the system to respond to demand. Another important weakness of the institutional arrangement is the lack of capacity in terms of knowledge in various fields of transportation. At present knowledge gaps exist in all areas of transport activity, ranging from understanding of actual travel patterns, effi­ciency and performance of different technologies and modes in use, life cycle costs of different modes, management systems needed for large transport networks that are undergoing rapid transformation, the requirements for multimodal transport planning, and the interaction of the transport sector with other sectors of the economy, society and the environment. Consequently the existing institutional arrangement cannot go a long way in fulfilling the goal of a sustainable and inclusive transportation in the country.

**6.0 MACRO\_ECONOMIC GROWTH AND TRANSPORT DEMAND IN BANGLADESH OVER THE NEXT TWENTY FIVE YEARS**

The transport system in Bangladesh comprises distinct modes such as road, rail, civil aviation, inland water transport and coastal shipping. If Bangladesh has to emerge as a high income country by 2041 the transport system must play its role to facilitate it. The macroeconomic framework designed to steer the economy of Bangladesh towards achieving the high-income status envisages a growth path starting with an annual growth of GDP of 7.05% during FY 2015-16 and reaching 7.9% annual growth rate by 2041(figure-5).

As the economy develops demand for transport also increases quite significantly. Although transport demand is influenced by a number of factors, the growth of GDP is considered as the most dominant one for calculating elasticity for both freight and passenger traffic. Thus elasticity of traffic demand with respect to GDP has been taken as the underlying approach for assessment of traffic projections keeping in view the growth of GDP during the next twenty five years.

**6.1 Road Transportation**

The demand for both freight and passenger traffic has been growing rapidly over the years. The modal split between rail and road transport in both freight and passenger traffic is heavily inclined towards road transport. Road transport is estimated to hold 80 and 88 per cent share in case of freight and passenger traffic respectively (World Bank, 2007). As a consequence number of motorized vehicles on road has also increased tremendously. The growth of freight traffic, passenger traffic and motorized vehicles on road has been estimated/projected using the elasticity of traffic demand and demand for vehicles with respect to GDP. On the basis of a general trend in the elasticities both in India and Bangladesh over different time periods, traffic and vehicle projections have been made. Different GDP growth rates for each year as provided in the macro-economic framework have been used for the purpose of projection.

**Passenger Traffic**

As far as freight traffic is concerned, it is assumed that the total freight traffic holds an elasticity of 1.2 with respect to GDP. In case of passenger traffic, the elasticity of road passenger traffic has been assumed 1.8 with respect to GDP, keeping the GDP estimates same as in the macro-economic framework, which appears reasonable given the historical trend. Figure-6 shows the passenger traffic estimates with elasticity 1.8 and base year 2015-16. It is estimated that total passenger traffic is expected to grow at about 16% per annum to reach about 4874 Billion Passenger Kilometre (BPMK) in 2041 from 131 BPKM in 2015-1. Thus total passenger traffic is expected to grow nearly 4 times the current level during the next 10 years and about 37 times during the next 25 years.

**Freight Traffic**

Figure-7 shows the freight traffic estimates with elasticity 1.2 and base year 2015-16. It is estimated that total freight traffic is expected to grow at about 10.83% per annum to reach about 236 Billion Ton Kilometre (BTMK) in 2041 from 20 BTKM in 2015-16. Thus total freight traffic is expected to grow nearly 2.4 times the current level during the next 10 years and about 12 times during the next 25 years.

**Motorised Vehicles**

Continuous increase in the share of road in both freight and passenger traffic during the last few decades has been accompanied by rapid growth of motorized vehicles on roads. Figure below shows the growth rates of motorized vehicles in Bangladesh between 2011 and 2016. Growth of

two and three wheelers has been much higher compared to bus, truck, private cars etc. It is expected that at higher income levels demand for private cars, taxicabs etc. would be higher and increase in freight traffic would also increase demand for trucks and similar vehicles. Projection

**Figure-6: Projected Passenger Traffic by Modes Up-to 2041**

**Figure-7: Projected Freight Traffic by Modes Up-to 2041**

of motorized vehicles is, therefore, based on elasticity of these vehicles with respect to GDP. In India private cars, buses and trucks are projected on the basis of an elasticity of 1.2 with respect to GDP. Similar pattern has also been observed in Bangladesh. Motorised vehicles are, therefore, projected on the basis of an elasticity of 1.2 with respect to GDP.

Table-7 presents the projected number of motorized vehicles up-to 2041. It is estimated that total number of motorized vehicles is expected to grow at about 10.83% per annum to reach about 34 million in 2041 from 2.9 million in 2015-16. Thus total number of motorized vehicles is expected to grow nearly 2.5 times the current level during the next 10 years and about 12 times during the next 25 years.

|  |  |  |
| --- | --- | --- |
| **Figure-8: Annual Growth Rate of Motorised Vehicles Between 2011 and 2016**  **Table-7: Projected Number of Motor Vehicles in Bangladesh Up-to 2041 (Million)** |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TYPE OF VEHICLE** | **2015-16** | **2020-21** | **2025-26** | **2030-31** | **2035-36** | **2040-41** |
| **Auto Rickshaw** | 0.237 | 0.363 | 0.583 | 0.96 | 1.619 | 2.798 |
| **Bus** | 0.04 | 0.061 | 0.098 | 0.162 | 0.273 | 0.472 |
| **Covered van/pick-up etc.1** | 0.14 | 0.214 | 0.344 | 0.567 | 0.956 | 1.652 |
| **Microbus/jeep etc.2** | 0.152 | 0.233 | 0.374 | 0.616 | 1.038 | 1.794 |
| **Private Passenger Car** | 0.308 | 0.472 | 0.758 | 1.248 | 2.105 | 3.636 |
| **Truck** | 0.121 | 0.185 | 0.298 | 0.49 | 0.827 | 1.428 |
| **Other3** | 0.155 | 0.237 | 0.381 | 0.628 | 1.059 | 1.83 |
| **Total Excluding Motor Cycle** | 1.155 | 1.771 | 2.844 | 4.68 | 7.892 | 13.636 |
| **Motor Cycle** | 1.724 | 2.643 | 4.245 | 6.986 | 11.781 | 20.353 |
| **Total Including Motor Cycle** | 2.879 | 4.414 | 7.089 | 11.666 | 19.673 | 33.989 |

1. Covered Van, Pick-Up, Cargo Van, Delivery Van
2. Microbus, Jeep, Human Hauler
3. Ambulance, Auto Tempo, Tanker, Taxicab, Tractor, Minibus and different other vehicles

**6.2 Inland Water Transportation (IWT)**

The current level of passenger traffic of IWT is about 12 Billion Passenger Kilometre (BPKM). With elasticity at 1.8, total passenger traffic is expected to grow at about 16% per annum to reach about 446 Billion Passenger Kilometre (BPMK) in 2041 from the current level (figure-6). Thus total passenger traffic is expected to grow nearly 3.75 times the current level (2015-16 level) during the next 10 years and about 37 times during the next 25 years.

The current level of freight traffic of IWT is about 4 Billion Ton Kilometre (BTKM). Figure-7 shows the freight traffic estimates with elasticity 1.2 and base year 2015-16. It is estimated that total freight traffic is expected to grow at about 10.83% per annum to reach about 47.22 Billion Ton Kilometre (BTMK) in 2041 from the current level. Thus total freight traffic is expected to grow nearly 2.46 times the current level during the next 10 years and 11.8 times during the next 25 years.

**6.3 Rail Transportation**

The passenger traffic of Bangladesh Railway as of 2015-16 is about 8 Billion Passenger Kilometre (BPKM). With elasticity at 1.8, total passenger traffic is expected to grow at about 16% per annum to reach about 298 Billion Passenger Kilometre (BPMK) in 2041(figure-6) from the current level. Thus total passenger traffic is expected to grow nearly 3.75 times the current level during the next 10 years and about 37 times during the next 25 years.

The current level of freight traffic of the railway is about 4 Billion Ton Kilometre (BTKM). Figure-7 shows the freight traffic estimates with elasticity 1.2 and base year 2015-16. It is estimated that total freight traffic is expected to grow at about 10.83% per annum to reach about 47.22 Billion Ton Kilometre (BTMK) in 2041 from the current level. Thus total freight traffic is expected to grow nearly 2.46 times the current level during the next 10 years and 11.8 times during the next 25 years.

**6.4 Civil Aviation**

In recent years there has been a significant increase in the number of air passengers in Bangladesh, both domestic and international. Table-8 presents the growth of passenger and freight traffic in different periods during the last 16 years through all the airports in Bangladesh. During last 10 years (between 2006 and 2016 annual average growth rate of air passenger traffic was more than 10%. Based on GDP and air passenger growth rates in Bangladesh and comparable experience in India, air passenger elasticity of 1.30 with respect to GDP can be considered appropriate for projection of air passenger traffic in Bangladesh. Figure-9 presents the projected air passenger traffic up-to 2041. The projection was based on GDP estimates of the macro-economic framework. At present nearly 8 million passengers travel through 3 international and 5 domestic airports. Nearly 77% of the passengers, however, use Shahjalal International Airport of Dhaka for travelling. The projection shows that total passenger traffic is expected to grow at about 12% per annum to reach about 122 Million Passenger Kilometre (BPMK) in 2041 from the current level. Thus total passenger traffic is expected to grow nearly 2.4 times the current level during the next 10 years and about 14 times during the next 25 years.

**Table-8: growth of passenger and freight traffic**

|  |  |  |
| --- | --- | --- |
| Period | Growth of Passengers  (Compound Annual Growth Rate in percent) | Growth of Freight  (Compound Annual Growth Rate in percent) |
| 2001 - 2004 | 05.32 | 08.39 |
| 2006 - 2010 | 17.17 | 11.80 |
| 2010- 2016 | 08.43 | 10.81 |
| 2006 - 2016 | 10.28 | 09.90 |
| 2001 - 2016 | 06.45 | 07.71 |

**Figure-9: Projected air passenger traffic up-to 2041**

Air freight movement has also increased quite significantly during the last 10 years. Table-8 shows that during last 10 years (between 2006 and 2016) annual average growth rate of air passenger traffic was nearly 10%. Based on GDP and air freight growth rates an elasticity of 1.30 with respect to GDP is also considered appropriate for projection of air freight traffic in Bangladesh. Figure-10 presents the projected air freight traffic up-to 2041. The projection was based on GDP estimates of the macro-economic framework. At present nearly 0.3 million Metric Tons of cargo move through 3 international and 5 domestic airports. Nearly 95% of the cargo,however, are moved through Shahjalal International Airport of Dhaka. The projection shows that total freight traffic is expected to grow at about 12% per annum to reach about 4.2Million Metric Ton in 2041 from the current level. Thus total freight traffic is expected to grow nearly 2.64 times the current level during the next 10 years and about 14 times during the next 25 years.

**Figure-10: Projected air freight traffic up-to 2041**

**6.5 Maritime Ports**

Growth of freight handled by seaports, especially the Chittagong Port, during the last ten years has been quite high. Table-9 shows the growth of container and cargo handled by seaports since 2009. Table-9 shows that between 2009 and 2015 annual average growth rates of containers and cargo were nearly 9% and10% respectively. Based on GDP and growth rates of containers and cargo an elasticity of 1.50 with respect to GDP is considered appropriate for projection of containers and cargo through Seaports in Bangladesh. The projection shows that both container and cargo is expected to grow at about 14% per annum. Number of containers is expected to reach about 7 million in 2025-26 and about 48 million in 2040-41 (figure-11). Similarly the amount of cargo is expected to increase three-fold to reach about 222 Million Metric Ton in 2025-26 from the current level (figure-12). By 2041 the amount of cargo is expected to increase by 22 times to reach about 1.6 billion metric ton.

**Table-9: Growth of Freight Handled by Seaports (Container and Cargo)**

|  |  |  |
| --- | --- | --- |
| Period | Growth of Containers  (Compound Annual Growth Rate in percent) | Growth of Cargo  (Compound Annual Growth Rate in percent) |
| 2009 – 2012 | 06.62 | 06.41 |
| 2012 – 2015 | 11.60 | 15.00 |
| 2009 - 2015 | 09.00 | 10.62 |

**Figure-11: Projected container traffic up-to 2041**

**Figure-12: Projected cargo traffic up-to 2041**

The challenge confronting Bangladesh is to take necessary steps for achieving high income status over the next 25 years. Achievement of this would depend on whether the economy grows in accordance with the macro-economic framework as proposed. Growth and development of the transport sector must also be commensurate with the growth as envisaged in the macro-economic framework. What is important to realize is that transport is an important growth driver. Adequate transport provision in terms of quantity and quality is essential to satisfy the projected passenger and freight demand that would be associated with increased GDP growth rates. If the required transport investment is not made, economic growth targets as envisaged in the macro-economic framework will not be achieved.

**7.0 DEVELOPMENT OF SUSTAINABLE AND INCLUSIVE TRANSPORT SYSTEMS: ISSUES AND CHALLENGES**

Bangladesh is one of the most densely populated countries of the world. The population is expected to increase substantially over the next decades and reach about 200 million people by 2020. It is estimated that the projected 7-10% yearly economic growth will generate a transport demand of 8.5 to about 17% per year, or even more on certain corridors, such as on the Dhaka-Chittagong corridor. At the same time Bangladesh has, in comparison with other similar countries, fairly low traffic intensity. Despite the low traffic intensity, however, many national highways are congested, largely due to the large proportion of slow moving vehicles, weak traffic management and enforcement, and inefficient utilization of road space. Whilst capacity constraints exist at sections of most major highways, rail and inland water transport remain underutilized along major transport corridors. As a metropolitan city, Dhaka suffers from extreme congestion, especially during peak hours, causing high economic costs and severe externalities, particularly poor air quality and a high incidence of road accidents. In what follows some of these problems and issues faced by road, railway, inland waterway, civil aviation and maritime ports are discussed.

**7.1 Road**

Despite massive expansion of the road transportation since independence, the services provided to users have not kept up with the demand in terms of quality and safety. The quality of the road network is poor; as roads are often too narrow for the traffic they carry. The road network has been developed mainly on the basis of short term needs rather than long term planning due to the lack of appropriate road sector policy guideline until recently. It is observed that there is large scale deterioration of the network due to lack of proper maintenance, large sections of the network have inadequate structural strength, many of them severely damaged by vehicle overloading. Lack of adequate road safety has already reached an alarming level; faster and smooth movement along the highways is not possible due to the presence of large number of hats and bazaars right on the edge of roads.

Congestion, overloading, air pollution, and safety are major problems faced by the road sector in Bangladesh. It is well recognized that delays in urban areas, especially in Dhaka and main highway corridors, as well as congestion in the Chittagong Port, continue to be major concerns for users. Lack of maintenance and insufficient funding, slow implementation, encroachments on major highways and land resettlement, traffic growth and road safety, climate change, and organizational issues are some of the major challenges that the country will have to address in the coming years. Bangladesh is one of the countries having highest density of road per square kilometer. But the performance of the country is extremely poor in terms of maintenance of roads. If the maintenance is not done on due time, many roads will require costly rebuilding. A large proportion of roads in Bangladesh are of poor, bad, or very bad condition (about 38%), only due to lack of maintenance. This high percentage of bad roads only point to a high amount of money that would be required to fix these roads..

**7.2 Railway**

Despite its usefulness as an efficient, affordable, less accident prone, and more environmentally friendly form of transport, Bangladesh Railway (BR) has been unable to realize its true potential as a result of poor services. The current poor performance of BR is the result of a history of poor operating performance which has been primarily caused by inefficiencies in both physical and human capital as well as insufficient resources and a lack of key institutional reform. The railway network of Bangladesh, which was inherited from a pre-independent India, is unsuitable for present traffic flow requirements; these orientation problems have affected the overall functionality of the railway.

One major constraint in BR is its lack of connectivity between rail networks, usually a result of a difference in rail gauge and the incompatibilities in rolling stock. The railway system comprises of different gauges: meter gauge, broad gauge, and multi-gauge, which require transshipments of traffic at certain points where there is a break of gauge points. Specifically, most of Bangladesh’s inherited railway networks from the pre-Liberation War railway are meter gauge and broad gauge. The east-west railway system over the Bangabandhu Multipurpose Bridge is inter-connected using a dual-gauge track, but the east part of the network consists of meter gauge.

Little investment has been made to re-orient the railway network towards the capital city, shorten distances between major cities and districts, improve district coverage, or connect the railway to other important inter-modal facilities, such as ports and highways. These variations in track types will require reorientation in order to enhance connectivity and overall efficiency in the Bangladesh rail network. To add, Bangladesh is also a riverine country, with approximately 405 rivers flowing throughout the country.54 Therefore, many areas of the country are difficult to reach as they require the building of costly bridges. This makes it even more difficult for BR to adequately serve the needs of the country. Out of a total of 64 districts in Bangladesh, only 44 districts are connected via railway. Some of the existing route lines are also inefficient and time-consuming, for example, Bangladesh’s two largest and economically significant cities, Dhaka and Chittagong, are connected through such a route line. The Dhaka-Chittagong corridor is considered the life-line of the country as it connects its capital city to its port city. This route is currently dominated by road transport because of a less effective railway link between the two cities. This is an example of how the BR’s rail track orientation problems cause issues with the efficiency of operations and connectivity. In order for the railway to adequately compete with a sector such as road, connectivity must be greatly enhanced.

A major reason why Bangladesh Railway has suffered steady decline in its share of freight and passenger transportation is that its network is plagued by infrastructural and carrying capacity constraints. Traffic flows on BR are highly uneven and imbalanced with Dhaka-Chittagong corridor accounting for largest share of freight and passenger traffic. Lack of full and proper maintenance of BR’s permanent ways, bridges, signals and other ancillary facilities over a number of decades has contributed to its poor performance. Bangladesh Railway has its own workshops for maintenance of its rolling stocks. These workshops had not been maintained or overhauled for a long time to get the maximum productivity. Aging of rolling stocks, such as locomotives, coaches and wagons together with lack of maintenance on a timely manner, decreases the availability of rolling stock on line on any given day. As a consequence, weight restrictions, speed limit, safety issues have become matter of great concern for train operations. In addition, employee productivity, relating to infrastructure maintenance and train operation in Bangladesh Railway is low compared to other Asian countries, although it is a crucial issue for proper utilisation of public fund and to get optimal output from human resources.

**7.3 Inland Water Transport**

One of the main causes of declining trend of inland water transport is the deteriorating condition of the river system in Bangladesh caused by both morphological and natural processes, and withdrawal of water beyond the border and within the country and continuous lacking of investment. In 2013-14, BIWTA recorded 87.40 million of passenger and 35.18 million tons of cargo throughput the nine major river ports. IWT is mainly used for transport of bulk, dry bulk and liquid bulk of construction materials, food grains, fertilizer, clinker, petroleum product etc. A large fleet of about 10,000 inland vessels is engaged in the carriage of goods and passengers. Besides there are approximately 750,000 country boats powered by the pump engines operating mainly in the rural waterways.

Rivers are deteriorating and the dredging demand is increasing every year. Annual demand of dredging of 8.9 million m3 as determined by expert committee in 1990s increased to the volume of 18 million m3 in 2009 as recommended by the IWT Master Plan Study Report. As opposed to this, the IWT has not been able to capture the rightful place in budget allocation as it has never been a popular political choice for development in Bangladesh. Against the modal share of 8.9% and 16% respectively in passenger and freight movement, the IWT received on average less than 5% of the total ADP allocation for surface transport.

Poor governance and inadequate institutional capacity and inefficiency are very much evident in the case of construction and registration of inland vessels in terms of ship safety and in case of management and operations of inland ports and inland waterways.

Poor or no intermodal connectivity at inland river ports and landing stations manifests the inherent inefficiency of transportation by inland waterways. At present there are about 380 landing stations developed by BIWTA in the country. Of these, two-third was developed in the rural areas with about 90 percent with no road link. All 21 inland river ports (except Chandpur) do have road links. Only Narayanganj, Chandpur and Khulna do have a railway link. But landing points and stages in these river ports are established in such a way that cargo transfer between vessel and truck is not possible except one point at Dhaka, as well as at Narayanganj and Khulna. The method of transshipment is only by means of head load what prevailed in the last centuries. This causes increase of transportation time and cost in case of inland waterways. Consequently, IWT has lost its efficiency and competitiveness compared to other modes**.** Against such a backdrop some major challenges identified in the IWT sector are as follows:

* incremental dredging demand to maintain navigability;
* lack of infrastructure, non-compliance of guidelines for construction of bridge over the rivers, encroachment in the rivers,
* lack of safe vessels and skilled workforce,
* lack of policy guidelines, poor governance,
* inadequate budget allocation,
* lack of intermodal coordination,
* Inadequate progress with regional cooperation.

Road, inland waterways and rail are components of surface transport sector of Bangladesh.  
Coordination and connectivity among these modes could provide a multimodal transport  
system to establish an uninterrupted transport chain for door to door services.

**7.4 Civil Aviation**

Movement of passenger and cargo by air is expected to increase significantly in the coming years. Projection of air traffic indicates that if GDP growth rates as envisaged by the macro-economic framework are maintained both passenger and freight traffic would reach 2.4 times the current level (2016 level) by 2026 and about 14 times by 2041. This has important implications for the aviation sector. The capacity of the air transport network will have to be augmented which depends on each of the following component elements:

* the capacity of airport terminals to process arriving and departing passengers, and to provide gates for aircraft;
* the ability of airlines to deploy more or larger aircraft at higher frequencies; and the efficiency of support provided by other transport networks, importantly roads.

In turn these are dependent on more fundamental factors, including the productivity of the capital invested and of human resources, and on new technologies such as radar or navigation systems that permit aircraft to fly with narrower separations or in difficult weather conditions. At present, a major limiting factor is the capacity of airports, especially the Hajrat Shahjalal International Airport (HSIA). There is a shortage of landing gates and areas for processing passengers are crowded.

Some development activities are however going on at HSIA. A new Terminal Building (T3), Cargo Village, Rapid Exit taxiways and Runway Extension are being undertaken under HSIA Expansion Project in different phases. The third terminal (T3) at Hazrat Shahjalal International Airport, when completed will have 24 Boarding Bridges for wide body aircraft and would be able to accommodate 1,85, 000 passengers per year. It is expected that corresponding to the future passenger growth HSIA would be able to handle 24 million passengers annually by 2035. However, projection of air traffic indicates that by 2030-31 and 2035-36 number of passengers would increase to about 30 million and 51 million respectively. This would require the construction of new international airports. The Government has planned the construction of a new airport away from the Capital. Work for selection of site for the airport is going on.

Land acquisition is a major challenge for construction of airports in Bangladesh. In a fast growing economy like Bangladesh pressure on land has been increasing due to urbanization, industrialization and infrastructure development. Since a large majority of people are dependent on agriculture, acquiring land is a complex process. Moreover, people who forego land are given poor compensation and an undervalued market price of land. This gives rise to dissension among the affected people, thereby impacting land acquisition. Infrastructure projects in Bangladesh thus get affected and delayed due to problems of land acquisition.

Another important challenge is the connectivity of the airport with the region served by it. Airports cannot function well as terminals if good land transport networks are not available to quickly distribute passenger and cargo traffic to and from the region served by the airport. Depending on the size of the airport and the economic and demographic characteristics of the passenger traffic, these transport links may also include mass rapid transit options. The great advantages of air travel in terms of the savings in time that it offers will diminish if the air network does not cohere well with land-based transport. This is especially true for time-sensitive cargo.

**7.5 Maritime Ports**

Chittagong and Mongla are the two major sea borne trade ports in Bangladesh. Although Pyra Port has been inaugurated recently, it will take some more time to make it operational as a sea port of any significance. Total tonnage of sea borne trade in the country is presently over 45 million tons, growing over 10 percent per annum. Also the trend towards containerization persists and container traffic is growing over 12 percent per annum. Chittagong being the main gateway port of sea borne trade is handling over 95 percent of total tonnage.

The main challenge of two maritime ports is the condition of fairways between the sea and the jetty berths. The Chittagong Port (CP) installations are situated along the bank of the River Karnafuli 16 km from its outfall into the Bay of Bengal. The maximum permissible draft ranges from 8.50 to 9.20 m with length restriction of vessels being 188 m. As such vessels with more than 1,200 TEU cannot berth at Chittagong port, while the average capacity of the vessels calling at the South Asian ports is 3,500TEU. The Mongla is located on the Pussur River about 130 km inland from the Bay and its permissible draft ranges from 7.00 to 8.50 m with length restriction of vessels being 225 m. In the context of regional standard, maritime ports in Bangladesh also suffer from inefficiency. The average handling of boxes per crane hour at CP is 12-15 as against 25 of South Asian standard. The Study also found that dwell time at CP is 6-8 days while it is 3-4 days in the South Asian ports.

Traffic at Chittagong Port is growing rapidly, faster than growth of Bangladesh GDP. Faster growth rate is projected for foreseeable future. Chittagong Port has not responded as yet to this demand effectively, resulting in congestions and delays at the port, as well as high costs to port users. Delays and uncertainties in port services seriously undermine economy’s productivity and international trading links. A recent study of the World Bank (KCT Pre-Feasibility Study, September, 2014) identified a number of challenges that must be addressed to improve performance of the ports:

**Maritime Access:** Navigational restrictions prevent large (deeper draft) vessels from trading to its ports thereby increasing freight and generalized costs.

**Port Operations:** Current services are inefficient, often lacking equipment and advanced operational practices related to container handling, container yard (CY) and gate management. Independent private sector concessions are not in place nor are recognized International Terminal Operators (ITO) presence.

**Inland Connectivity:** Inefficient services and poor infrastructure across all modes result in very little container penetration inland and additional handling costs.

**Customs and Clearance:** Tend to be bureaucratic and lacking transparency adding cost and time.

**7.6 Urban Transport**

Extreme traffic congestion is the main problem of urban road space of big cities and secondary towns in Bangladesh. As the urban hierarchy of Bangladesh is strongly dominated by Dhaka, this problem is acute in this city. Due to traffic jam a substantial portion of working hours have to be left on streets. Traffic congestion also causes serious air and noise pollution and thus worsens the overall environmental condition. Non-existence of transport planning and inefficient traffic engineering result in low quality traffic management. Public transport systems are poorly organized and there is lack of integration with non-motorized vehicles. Buses are in short supply and there is inadequate metro or rail system to handle day-to-day commuter traffic. Moreover, the growing dependence on private vehicles for intra-metropolitan trips, is currently a crucial component in the debate on sustainable urban development, given the economic, social and environmental impact for which it is responsible. Considering all these factors, it has become a challenging task for the government as well as transport planners and engineers to cater the demand of mobility for the ever increasing urban people in a more sustainable way.

Road accidents, air pollution due to vehicle emissions, hazardous vehicle driving/operations, overloading, etc are some of the most common phenomena in transport sector, particularly in the urban areas. These phenomena have actually developed due to lack of enforcement of existing rules and regulations with regard to transport operation in the country. Some of the major problems in urban transportation also include:

* fragmentation of organizational responsibilities,
* inefficient use and overcrowding of major roads by low capacity vehicles,
* inadequate road space,
* poor traffic control and management,
* absence of a reliable and dependable mass transit system, and
* absence of adequate pedestrian and bicycling facilities.

In addition, the rapid urbanization had led to unplanned land development in the fringe areas of major urban centers including Dhaka. Although some efforts have been made by the government to address these major problems especially those of the big cities including Dhaka, they appear to be far less than what is required to bring in an acceptable condition. In the national context, the transport system is not fully integrated, and there is road bias. If this trend continues the transport sector development would become unsustainable from economical, social and environmental points of view.

**8.0 WAY FORWARD**

**8.1 Transport Development: Vision 2041**

By 2041, investment in the transport sector will ensure development of a transport network of such an extent and quality that it will serve as a key driver in empowering Bangladesh and its people, enabling:

* Greater mobility of people and goods through transport alternatives that is commensurate with supporting the desired pace of Bangladesh’s economic transition
* Improved access to economic, educational, health and various other socio-economic services through transport alternatives that are affordable, reliable and safe
* Economic Development, by supporting the movement of goods from points of production to where they are consumed, facilitating regional and international trade.

**8.2 Strategy for Transport Development**

During the last few decades transport sector, especially the road transportation has played an important role in the growth of the industrial sector in the country. Improvement in transport infrastructure may lead to reduction in transport cost and travel time as well as provision of better services. Improvement in freight transportation that reduces the costs of moving goods (and services) to and from markets is critical to economic expansion. Thus, investments that reduce the cost of moving goods and people to and from markets (via improvements in reliability, transit times, service levels, etc.) can help to increase and sustain economic growth. As productivity is the most important determinant of economic performance, the efficiency and reliability of the transportation system that affects economic productivity is crucial for growth and development of the economy. This chapter provides major strategies for development of the transportation system of the country to achieve the growth targets as envisaged in the macro-economic framework. Annex-A presents sector-wise benchmarks, milestones and targets of some of the major indicators of transport development in the country. Transport development strategies have been formulated keeping these milestones and targets in view.

**8.2.1 Strategy for Road Transport**

Density of road (defined as length of road per unit area) in Bangladesh is one of the highest in the world. Over the last few decades construction of new roads and development of existing roads have improved both accessibility and mobility tremendously throughout the country. Despite such improvements, our roads suffer from a litany of ills. These are low capacity, congestion, overloading, air pollution, poor maintenance, lack of safety and so on. Projection of road traffic indicates that if the economy follows the growth path as envisaged in the macro-economic framework, passenger traffic will increase nearly 4 times and freight traffic will increase nearly 2.4 times the current (2016) level in 2026.It is, therefore, necessary to formulate strategies to meet the expected traffic demand and improve transport productivity. Strategies to deal with the emerging situation are described below:

**Consolidating and Upgrading National Highway Networks**

1. **Multi-lanes and Access Control:** The main functions of the National and Regional Highway Systems are mobility and enhanced productivity of transport. Emphasis should be laid on consolidation of National and Regional Highways in terms of capacity augmentation through multi-laning of existing highways and provision of access controlled expressway facilities.
2. **Expressway Corridor:** Investment friendly Expressway Network that provides unhindered movement of traffic should be given special consideration. An example is the Indian access controlled ‘Golden Quadrilateral National Multilane Expressway System’. Following such an example an access controlled ‘Backbone Network’ should be developed considering strategically important highways connecting the capital city, Dhaka with regional cities such as Chittagong, Sylhet, Barisal, Khulna, Rajshahi, Rangpur and Mymensing. These highways should be developed into six-lane highways by 2035 and should have two-tiered access controlled layout configuration for segregating mobility and accessibility functions.
3. **Service Lanes:** In order to improve transport efficiency and enhancement of safety, all National Highways need to have service lanes to cater to the requirements of local (both motorised and non-motorised) traffic so as to bring in an element of partial access control on such facilities. Provision of wayside amenities along the highways is becoming an integral part of the road projects. Such facilities should be provided by the private sector.
4. **Axle Load Control:** Strict axle load control policy is needed to reduce road damages caused by overloading. In this respect, besides installation of weighing stations, another good strategy could be immediate stopping of vehicle size increasing or modification practice that is commonly followed by the truck owners, and is recognized as one of the main source of overloading problem. The overloading and drainage issues should be addressed seriously to prevent quick erosion of costly road investments.
5. **High-Speed Mobility Facility:** Focus needs to be given to develop quality infrastructures with hallmark attribute of high-speed mobility facilities. Target should be 80-110 km/ph for important highway corridors, which is now operating merely at 25-35 km/ph. It is worth to note here that though we have so far been trying to develop very capital-intensive quality infrastructures structurally, unfortunately we have not been getting the required mobility mainly due to poor operational condition of the structures. As such, strategically main investment emphasis should be given to build necessary access control infrastructures as well as to enforce policies for controlling roadside land use development and conflicting usages of right of way (r.o.w.) throughout the transport corridor.
6. **Bypasses:** While preparing projects for capacity augmentation, the need arises for planning of bypasses around towns to ensure smooth movement of through traffic. In most cases, these bypasses also serve as vehicle for development of the town along or on the other side of the bypass. Therefore, the alignment for such bypasses should be planned jointly by the road agency and the urban development agency. Further, these bypasses should be planned and provided as access-controlled expressway type facilities with entry/exit at predetermined locations.

**Establishing Connectivity**

1. **Economic Zones and Corridors:** About 100 Special Economic Zones (EZs) have been set up throughout the country while work is in progress for planning and development of Economic Corridors (EC). These zones and corridors will require road connectivity both within the various lands they are developed over, and also to the rail and road network more generally. These green field roads must necessarily be built well in advance of actual demand.
2. **Connectivity to ports, airports, tourism areas, power plants, etc.:** The efficacy of airports, and especially of ports, is greatly diminished when the quality of the connecting road network is poor. It is important to ensure that each major port has at least four-lane road connectivity. Special needs of connectivity to ports, airports, mining areas, tourism areas and development of power plants should be given special attention in development of the road programmes. In certain cases of power plants, movement of Over Dimensioned Cargos (ODCs) will be involved and this will require advance planning particularly for strengthening of bridges involved.
3. **Container Freight Stations and Railway Stations:** Similarly, there is a need to ensure good connectivity by road to railway stations and container freight stations while formulating plans for development of road network in cities and towns.
4. **Inland Waterways and Water Fronts:** Another area that requires attention would be the road connectivity to identified water fronts on the inland waterway network to facilitate smooth cargo entry to and evacuation from the IWT terminal stations.

**Creating Highway Facilities:**

1. A well-developed road network is also one that is easy and comfortable to use. Depending on traffic volumes, roads should variously offer opportunities for rest breaks, refuelling and meal purchase. Each of these can also be expected to contribute to the overall safety of the network by preventing driver fatigue and timely assistance to vehicle breakdowns. Facilities like parking lots, drinking water stations, snack bars and restaurants, rest rooms, kiosks, information facilities, petrol pumps with service and repair facilities and communication systems should be developed.

**Upgrading Regional Highways:**

1. For these roads also, the focus should be on consolidating the existing network, with minimal expansion as needed, due to economic and geographic considerations. The program for development of regional highways may comprise schemes of capacity augmentation by two laning, four laning, construction and rehabilitation of bridges, bypasses, replacement of railway crossings and safety engineering measures. When developing these highways, priority ought to be given to:

* Providing links to minor ports, special economic zones, industrial towns, and tourist centres
* Connecting remaining towns (not yet connected) with population exceeding 5,000
* Connecting remaining Upazila/District headquarters (not yet connected) with national capital
* Construction of missing bridges and reconstruction/widening of existing weak and narrow bridges

**Upgrading Zila and Upazila Roads**:

1. These roads run within the districts connecting areas of production with markets and serve as connecting links between rural roads and the primary road network and are thus equally vital for agricultural and industrial development of the landscape. However, these roads have not received the desired level of attention and investments in the past. This gap has to be filled to ensure balanced development of all classes of roads and in all parts of the country. Here too, the strategyshould be on consolidation of the road network. Currently, these roads are mostly single-lane with weak road pavement and bridges that are in need of immediate strengthening. A large percentage of these roads are reported to be in bad shape. The situation is further aggravated due to movement of overloaded vehicles. Therefore, the stress should be to accelerate the programme of widening of these roads to regular two lanes, including bridges, and provision of rail over/under bridges on heavily trafficked stretches. Priorities may be governed by the traffic—current and projected. Some limited stretches may be requiring four-laning also in later years depending upon the traffic growth witnessed.

**Strengthening Village Roads**:

1. For the vast majority of villages, the village road is the only avenue in and out for people, animals and goods. By connecting the village with a district road or highway, the rural road provides faster and better access to markets for the agricultural output of the hinterland, and provides access to social infrastructure including a wider array of education, employment and healthcare opportunities. These roads can stay as single-lane roads in view of low volume of traffic likely to prevail. However, some roads under this category could witness volumes that may justify widening to intermediate or two lanes.

**Ensuring Road Safety**

1. The issue of road safety is of major concern for policy makers in view of the rapid rise in accident related deaths on roads in recent years. The average number of accident related deaths has been estimated as 57 per 10 thousand vehicles by Mahmud*et al.* (2013). If the number remains more or less the same the number of fatalities will continue to increase with the increase in traffic volume. Road safety is, therefore, increasingly being recognized as a priority national agenda. Significant reduction in the number of road accidents and casualties is possible by implementing an effective and coordinated safety policy and actions. The 7th National Road Safety Strategic Action Plan (2014-2016) identifies nine priority sectors for improvement. These are: i) planning, management and coordination ii) accident data system iii) road safety engineering iv) road and traffic legislation v) traffic enforcement vi) driver training and testing vii) vehicle safety viii) road safety education and publicity and ix) medical services for road accident victims. The objective of the action plan is to achieve 50% reduction in road accident fatalities within next 10 years and to reduce the number of road accidents by 30%. Road safety engineering, however, assumes special significance and should focus on geometric standard, intersection design, grade separation, access control on highways, pedestrian facilities, regular maintenance and adoption of road safety audit approach. Special importance should also be given on integrating different organizations both at public and private sectors, civil societies, communities and individuals towards identifying their specific roles and responsibilities and thereby developing effective measures to tackle road safety problems in Bangladesh.

**8.2.2 Strategy for Railway Development**

To sustain the pace of economic growth, Bangladesh needs an efficient and sustainable transport infrastructure. Rapid urbanization, rising per capita income and the ongoing structural transformation of the economy would give rise to increased demand for travel in general and high-speed, high-quality of rail travel in particular. This represents good opportunity which Bangladesh Railway (BR) can seize by easing capacity constraints, upgrading speeds, and improving quality of service and reengineering the business for sustained viability. BR can also play a critical role in integrating markets and connecting communities throughout the length and breadth of the country and in transportation of passengers and freight. It is uniquely placed to serve the needs of the rapidly expanding and modernizing Bangladesh economy and meet the aspirations of the country.

**Strategic Plan**

A strategic planning process would need to be institutionalized taking a forward view over the next 25 years. It shall comprise a multi-year investment plan fully supported by a credible funding plan. The plan must provide for the following as envisaged in the Railway Master Plan (2013):

* Augmentation of supply (more trains and longer trains) to ensure full satisfaction of demand.
* Upgradation of speeds up to 200 Km/ph on the identified corridors.
* Redevelopment of stations for smooth flow and comfortable experience of passengers as also to ensure clean and hygienic environment.
* Redesign of coaches to enhance travel comfort.
* Lower port turnaround, loading and unloading times
* Competitive pricing
* Increased capacity on key corridors
* Increase new train service
* Development of new Inland Container Depots
* Development of Rahway Links with all ports including proposed Deep Sea
* Improved custom clearance arrangements
* Quality transfer facilities to road transport
* BR to act as a multi-modal transport (MMT) operator

**Developing Railway Corridors**

Based on an analysis of railway traffic, the commodity carried, their volume and origin-destination revealed that most passenger and freight movement takes place on a limited number of key corridors. BR identified these nine corridors in its Master Plan which account for about 90% of all traffic movement. These corridors are as follows:

* Corridor 1: Dhaka – Chittagong –- Cox’s Bazar – Deep sea port
* Corridor 2: Chilahati – Ishurdi – Khulna – Mongla
* Corridor 3: Dhaka – Bangabandhu Bridge – Darsana/Benapole
* Corridor 4A: Dhaka – Bangabandhu Bridge – Rajshahi – Rohanpur  
   4B: Dhaka – Bangabandhu Bridge – Ishurdi – Parbatipur-Chilahati/Biro
* Corridor 5: Dhaka – Sylhet/Shahbazpur
* Corridor 6: Dhaka – Bangabandhu Bridge– Sirajganj/Roypur(Jamtoil) – Burimari
* Corridor 7A: Dhaka – Mawa – Bhanga – Jessore – Khulna – Mongla  
   7B: Dhaka – Mawa – Bhanga – Jessore – Benapole  
   7C: Dhaka – Mawa – Bhanga – Barisal  
   7D: Dhaka – Mawa – Bhanga – Kashiani – Gopalganj – Tungipara
* Corridor 8A: Dhaka – Mymensingh – Jamalpur – Tarakandi- Bangabandhu Bridge  
   8B: Dhaka – Bhairab Bazar – Mymensingh
* Corridor 9A: Dhaka – Mawa – Jajira – Rajbari – Moukuri (Mizanpur) – Pabna – Ishurdi  
   9B: Dhaka – Paturia – Douladia - Moukuri (Mizanpur) – Pabna – Ishurdi

Development of these corridors would require infrastructural interventions that would be necessary to attract long-distance passenger and freight traffic. In this regard Investment should be focused on total capacity creation including rolling stock, asset renewal, technology induction, Information Technology and investments in modernization etc.

**High-Speed Rail in Selected Corridors**

Some of these corridors, especially those connecting the capital city Dhaka with the regional cities- Chittagong, Sylhet, Barisal, Khulna, Rajshahi, Rangpur and Mymensing should have provision for high-speed rail. For maximizing benefits there should be segregation of freight and passenger lines in these corridors and passenger lines should have provision of speed between 160 to 200 km/ph. Dhaka-Chittagong corridor should have the potential to raise speed upto 350 km/ph similar to bullet trains in Japan.

**Gauge Rationalization**

Bangladesh Railway network consists of MG (64%) and BG (24%) lines and newly  
introduced Dual Gauge (DG) (12%) lines. So, it is obvious that uniformity in Gauge  
rationalisation leading to uniform gauge across the whole country must be one of top priority development activities of Bangladesh Railway. Considering both passenger and freight traffic carrying capacity, future national and regional connectivity requirement, and taking into account the connectivity issue of neighbouring countries, Bangladesh Railway must convert its network into Broad Gauge all over the country. Though this conversion will require a huge amount of investment for replacing the track, rolling stocks and ancillary facilities, but phase-wise conversion will be feasible and in next 25 years this can be accomplished.

**Maintenance and rehabilitation of infrastructure**

Highest priority must be given to ensure unconstrained maintenance of the existing infrastructure. A substantial portion of the Annual Development Programme (ADP) in the early years needs to be targeted at track rehabilitation and signalling to improve safety and reliability. Adequate resources for maintenance need to be guaranteed annually for the strategic corridors for improving the quality and reliability of service and thus competing effectively with road transport. Programme for outsourcing maintenance will be encouraged. In this respect, training of supervisor and labour gang would be required.

**Marketing and Business Plan**

Strategic plan also must include a marketing and business plan listing sequential steps on gaining market share in bulk and non-bulk cargo segments by providing mix of cost efficient services and premium value added service.

**8.2.3 Strategy for Developing Inland Water Transport**

The geography of Bangladesh connects almost all 64 districts to each other by an inter-connected system of major and minor rivers. The major rivers in turn provide a convenient access to sea. This massive internet of water connectivity if properly harnessed and nurtured can provide a major development advantage for Bangladesh. In recent years, given the rapid GDP growth and associated demand for passenger and cargo services along with constraints in developing road and railway transport (owing to land and financial scarcity), the prospects for inland waterway look brighter. There is now a growing appreciation that with proper investments, policies, regulations and institutional development the IWT can be a major low-cost transport alternative to the high-cost of land transport. The positive effects of this strategy for income, employment and poverty reduction are large,

IWT has the potential to become a major actor in the transport of container between Dhaka and Chittagong. With the strong growth of container traffic in the port of Chittagong, the port throughput will soon reach one million TEUs per year. At present, railways are congested and the road does not have the bearing capacity to carry container trailers. The government has already taken steps to promote container transport by IWT. ICD has already been developed near Dhaka jointly by BIWTA and the Chittagong Port Authority (CPA). BIWTC is also acquiring two 100-TEU container vessels. While the Government may continue to play a role in the future development of IWT infrastructure, further development of container transport by IWT should be left to the private sector.

Development of adequate depth (LAD):

Efforts should be made to develop deeper stretches of the rivers for IWT/navigational purposes (at least 2.5 m, preferably 3.0 m LAD) for round the year navigation. Given that the available draft in the waterways is low, the appropriate strategy would be to focus on development and maintenance of the waterways linking three maritime ports, Chittagong and Mongla, and Dhaka/Narayanganj area and routes under Bangladesh-India Protocol on IWT. The river corridors between Dhaka and Chittagong and between Dhaka and Ashuganj (with extensions to Narayanganj and Barisal) are identified as high priority routes for domestic trade and bilateral trade with India. About 80% of country’s IWT is routed through these corridors and daily about 200,000 passengers use these routes. Inland river terminals at Dhaka, Narayanganj, Chandpur and Barisal along these routes play very important role in transporting and handling passenger and cargo.

Morphological and hydraulic problems of inland waterways demand maintenance and improvement strategies and methods. Development of shoals in navigable waterways need to be monitored regularly by sounding followed by dredging of fairways and where feasible by application of river training. For this financial and logistics resources are required. Logistics resources include hydrographic survey equipment and apparatus and dredging apparatus. Proper maintenance and development of navigability in waterways management and functions involve the following: i) Hydrographic survey; ii) Dredging; iii) Bandalling; iv) Aids to navigation; and v) Pilotage and dissemination of navigational information. Large scale investment is needed for Capital Dredging Project in all major rivers for sustainable river management through extensive dredging programs to control river bed siltation and aggradations, reclaim land, and improve inland navigation**.** Network development and dredging strategy should be  
prepared in line with the National Water Management Plan. It will be justified to provide more resources for the development and maintenance of waterways. The new dredging strategy should coordinate and integrate programs of BIWTA and Water Development Board.

**Modal integration:**

IWT has to be integrated with other transport modes. Due to lack of appropriate intermodal distribution system of containers, further traffic growth is restricted. Road, inland waterways and rail are components of surface transport sector of Bangladesh. Coordination and connectivity among these modes could provide a multimodal transport system to establish an uninterrupted transport chain for door to door services.

IWT terminals need to have sufficient connectivity with road and preferably with rail for last mile connectivity, on lines of bi-modal and tri-modal concept of developed waterways of other countries. Steps should be taken to set up terminals and cargo handling facilities at strategic locations and provide adequate connectivity to road and rail. Provide support at concessional terms for setting up cargo handling facilities and for the acquisition of vessels

**Identification of potential multimodal corridors:**

This requires detailed mapping of waterways and industrial clusters and analysis of origin and destination cargo to undertake development of suitable waterways as well as multimodal transport hubs in IWT Corridors. In many stretches, IWT and coastal shipping operations could be integrated to accommodate hinterland, coastal and international traffic.

**Development of IWT feeder routes:**

There is need to develop the feeder routes to National waterways so that the entire channel can be developed on the ‘fish bone structure’. **Class-II:** Routes (IWT Master Plan) in the north-west and north-east with a total length of 1,000km and **Class-III:**Routes in the south-west/central region with a total length of 1,885km can be used for this purpose.

**Improving IWT Safety Standards**

Navigational safety is an important issue for the development of IWT. Boosting the role of IWT will depend significantly on better safety standards and track record. In the light of the National Integrated Multimodal Transport Policy (NIMTP) following measures should be taken to improve safety in Inland waterway sector :

* Set up Deck Engine Personnel Training Center (DEPTC) for training of engine and deck hands;
* Ensure that water vessels are designed and built following correct design through modernization of design checking and involvement of naval architects;
* Reform and improve of vessel registration system;
* Improve regulations and enforcement to prevent overloading of vessels;
* Ensure that vessels are provided with sufficient life saving devices;
* Ensure adequate vertical clearance in inland waterways for safe passage of vessels and providing Low Tension Lines and High Tension Lines to safe heights;
* Ensure addition of necessary equipment including Differential Global Positioning System to use electronic hydrographic chart;
* Ensure use of Digital Mobile Radio and wireless technology to ensure uninterrupted communication from bank to bank, vessel to bank and vessel to vessel; and
* Strengthen marine guards/marine police and establishing police station for waterways to ensure security of passengers and freight.

**Improving IWT Governance**

Poor governance of the IWT sector stands in the way of proper implementation of the policies of the government. So, in order to improve safety, the governance has to be improved significantly, involving implementation of the above regulations and better management of the sector. Furthermore, there should be clear guidelines and their implementation with regards to approval of ship design, construction of inland ships, issuance of registration and survey certificates in favor of inland ships, port management, enforcing rules and regulations of navigation and issue of competency certificates to master and engine drivers.

Poor inter-departmental coordination is also a major problem for better functioning of the system. Currently, approval of ship design, supervision of construction of inland ships, issue of registration and periodical fitness survey certificates, awarding competency certificates to members of crew and enforcing rules and regulations are responsibilities of DOS. BIWTA is responsible for providing services to users. Inland ports and landing stations are administered by BIWTA. Actual handling operations are performed by the lessees appointed by BIWTA. These processes should be streamlined through better coordination among various departments of the concerned ministry.

**Involving Private Sector in IWT Development**

Involvement of the private sector is essential for development of IWT. Steps should be taken to ensure participation of the private sector in the field of port management and operations, development of IWT infrastructure, dredging and maintenance of waterways, mechanization of cargo handling, development of inland container terminals and container traffic in the waterways. To this end, new guidelines and procedures should be prepared. The existing lease arrangement should be replaced by a mid-term and long-term concession arrangement to private stevedores and terminal operators to encourage investment for better services to users and maintenance of facilities. Infrastructure at commercially attractive places should be developed and operated by private sectors or on a PPP basis. BIWTA should continue to develop landing stations in rural and coastal areas. Installation of navigation aids and maintenance in core waterways should be awarded to private sector. Pilotage service should also be awarded to private sector. Appropriate support should be given to private sector for construction of inland container terminals for container traffic.

**8.2.4 Strategy for Aviation Sector Development**

Air transport is a vital element of the country’s transport infrastructure. Its contribution to the the process of development in terms of enhancing productivity and efficiency in the movement of goods and services, facilitating the growth of business, trade and tourism and generating employment opportunities directly and indirectly can hardly be over-emphasized. In fact Civil Aviation is a key infrastructure sector that facilitates rapid growth of international trade by offering a reliable and faster mode of transport services to move products and personnel across long distances. Countries with higher connectivity in general are stated to be more successful at attracting Foreign Direct Investment. This underlines the need for developing a viable aviation industry that is vital for the future growth in foreign trade and investment.

It has already been mentioned that Bangladesh has been experiencing tremendous increase in air passengers, both domestic and international in recent years. Air freight movement has also increased quite significantly during the last ten years. Responding to this surge in air passenger and cargo traffic would require significant investments in terms of construction of new airports, expansion and modernization of existing airports, improvement in connecting infrastructure (road, metro, sea link, etc.) and better airspace management. Following strategies are recommended to deal with the emerging situation in the aviation sector:

**Building New Airports**

The Hajrat Shahjalal International Airport at Dhaka through which 80% of the total air traffic flow take place is undergoing expansion for facilitating movement of growing number of passengers. But the number of passengers in this airport will reach saturation point by 2026. A new green field airport will have to be created to address the needs of the projected number of passengers beyond 2026. The government has already planned the construction of a new airport with most modern facilities away from the capital. This airport should t have a capacity of handling 80 – 100 million passengers and 5 – 6 million tons of cargo annually at full development stage to deal with projected passenger and freight traffic in 2041 and beyond.

**Upgrading and Modernising Existing Airports**

Existing international and domestic airports must undergo massive development to handle the situation arising out of expected surge in air traffic during the next decade. Some development activities are, however, going on to upgrade three international airports and two domestic airport (Cox’s Bazar and Saidpur). Augmented capacity of these airports would reach the point of saturation in about ten years. In order to cater to the needs of the passenger and freight traffic beyond 2026 further improvement would be required to:

* Create additional runways and taxiways
* Augment gate and apron capacity to accommodate more aircraft;
* Increase terminal capacity to accommodate more passengers;
* Improve ground traffic management and ancillary aviation processes to ensure quick aircraft turnarounds.
* Improve air traffic and air space management practices, and new radar technology
* Provide complementary services such as fuel supply, passenger and luggage handling, warehousing, workshop facilities, hangars etc.

**Upgrading Non-Operational air-strips**:

Non-operational air strips need to be upgraded in places of economic significance such as ports, tourist places and industrial clusters. These need to be done at the lowest possible cost without compromising on safety. The air-strip may attract a small number of flights initially and if it has a strong business case, it may ultimately lead to full scale operations in future, with significant benefits to the local economy.

**Connectivity to the Airports**

Good land transport networks should be available to quickly distribute passenger and cargo traffic to and from the region served by an airport. The great advantages of air travel in terms of the savings in time that it offers will diminish if the air network does not cohere well with land-based transport. This is especially true for time-sensitive cargo. There is therefore a need for effective coordination between road development agencies with the Railway authorities to enable seamless intermodal connectivity for passengers and cargo to and from the airports.

**Specialised Cargo Terminal**

Surge in air freight is expected in future. This would necessitate investment in specialised cargo terminal and equipment for carrying out cargo operations in the airports, especially the international airports. There is also a pressing need to augment Off-Airport cargo processing facilities on the lines of Container Freight Stations/ICD so that congestion and delays in cargo terminals at airports can be reduced. This would require investment for upgrading/expansion of capacity and modernization of processes in the airports. Good performance of air cargo terminal would obviously enhance the image of Bangladesh as a reliable supplier in the international market.

**Air Navigation Services (ANS)**

Constant upgrading of the systems and equipment that are the part of the Air Navigation Services is needed for building seamless air space with augmented capacity and safety. Broadly, it involves deployment of equipment relating to CNS (Communication Navigation and Surveillance) and Air Traffic Management Systems. For enhancing capacity and safety levels in the face of higher air traffic movements in future ANS infrastructure should move towards greater integration and automation with implementation of state-of-the-art technologies.

**Maintenance, Repair and Overhaul (MRO)**

Expected rapid growth of aviation in Bangladesh underlines the need to encourage MRO infrastructure to support the growth in the sector. Low cost carriers would also prefer servicing of aircrafts locally to save cost and time in a highly competitive market. For proper maintenance of aircraft, adequate facilities are needed which include trained personnel, tools, equipment, spares, consumables and proper working conditions. Increased requirement for maintenance of aircraft would need additional hangar spaces, engine run-up areas, rest facilities maintenance personnel etc. MRO zones can be created with working environments which are conducive to proper maintenance. Particular effort is also needed to encourage component overhaul facilities

**Human Resource Development**

Human resource development is a vital element and should not be overlooked. A well-functioning airport infrastructure in future will require a well-trained workforce to operate it--one that integrates effectively the management of airport and safety systems. The Civil Aviation Authority, therefore, should focus on augmenting skilled manpower including adequate number of air traffic controllers (ATC). Unless concerted efforts are made to develop and retain adequate number of skilled manpower, sustaining the air traffic growth without having safety implications will be extremely difficult. Training facilities should be developed both in the public and private sectors for various categories of aviation personal including pilots, engineers, ground staff, cabin crew, and aviation management specialists. Creation of simulator training facilities both for flying and maintenance training will help airlines to carry out meaningful skill tests within the country.

**Private Sector Participation in Airport Development**

In view of the requirements of huge investments for building new airports and upgrading existing ones participation of the private sector in such activities should be encouraged. The objective should be to create an investment climate to facilitate time bound creation of world-class infrastructure to cater to the growing demand for air traffic. Policy should be formulated for private sector participation in creation, operation and management of airports through induction of private capital and management skills. PPP model that facilitates flow of loans from banks and financial institutions should be adopted.

**8.2.5 Strategy for Maritime Port Development**

Bangladesh has been striving hard to emerge as a modern economy. The Government is committed to ensure that the economy grows at 7 to 10% or more per year in a sustained manner over the next 25 years. The international sea borne traffic in maritime ports is growing faster than the GDP growth in Bangladesh, the growth of tonnage is 10%per annum while the growth of container traffic is 12% per annum. In order to realize this growth potential, and to become globally competitive, utmost importance should be placed on the development of physical infrastructure like roads, airports, seaports, railways in general and Port Sector in particular.

**Challenges ahead for the Ports**

In order to meet the challenges resulting from intense global competition, advancement in Information & Communication Technology, technological changes in shipping and related sectors coupled with stiff demands from trade, ports in Bangladesh, especially the Chittagong and Mongla Ports are required to gear-up themselves by modernizing the port infrastructure, enhancing the quality of service and increasing the productivity level at par with International standards. Particular attention should be given to the following:

**Immediate Requirements**

* Each Port should pay more attention in improvement of productivity – both ship berth-day and gang-shift output further through modernisation, induction of more sophisticated equipment in handling cargo, etc.
* Handling operations in selected areas may gradually be outsourced / privatised for injecting more competition and increasing output.
* Efforts should be made for full mechanization of cargo handling operation and movement in Major Ports
* Development of adequate storage area in the Ports
* Allied infrastructure being more vital and the same may be encouraged, if needed be, through private participation for operation.
* All out efforts should be made to reduce Pre-berthing Detention and improve Turn Round Time of vessels through minimization of both Port and non-Port related factors.

**Dredging**

* The draft in most of our ports is not adequate for dealing with bigger ships, the use of which is an important component of reducing costs. Deepening of selected ports and also intermediate off-loading terminals offer solutions that should be carried forward in the course of the Perspective Plan. The pace of dredging has been inadequate and needs to be greatly expanded.
* The capacity for dredging of ports in the private sector needs to be further augmented and full operational flexibility given to the ports to use it. While capital dredging of ports will lead to further deepening and larger size ships will be able to use the ports, maintenance dredging will ensure a continued efficient operation of current port capacity.

**Container transportation**

With the world entering the information age and with the globalisation of the world economy and trade, container transportation, as one of today’s most advanced cargo transportation modes is growing rapidly. In order to be able to stay abreast with the globalization of the world economy and meet the transportation requirements of foreign trade, it is a matter of great urgency to construct deep water container hub port. Access to the existing major container handling ports is limited by the depth of water of the approach channels restricting calling of large container vessels. Main line container vessels are progressively getting larger and faster. Today’s large container vessels draw 14.5 meters draft and move at speeds of 25 knots. To accommodate such vessels, container hub port must have access channels of sufficient depth i.e. draft of 17 metres, along with advanced and highly efficient terminal facilities and large cranes.

**Connectivity**

Another constraint that has emerged is the lack of capacity / availability of rail and road networks linking ports. Connectivity projects should be identified on a priority basis and implemented using private participation wherever possible. In such cases the projects will need to be facilitated including in the matter of land acquisition.

**Rail Transportation**

Port traffic within Bangladesh is carried largely by railways and road transport. Alternative modes such as inland waterways have remained largely undeveloped and the situation is unlikely to change substantially in the medium term.

The main reason for the railways declining share has been inadequate investments in capacity, particularly for freight, the poor quality of service and slow response to various segments of the growing freight demand. The non-availability of wagons, even when line capacity is available is a common problem hurting both bulk and containerized cargo.

* Ministry of Railways should undertake the construction of a Dedicated Freight Corridor (DFC) between Dhaka and Chittagong. It will be a high speed rail connection with multi modal linkages. The focus of the DFC is to ensure high impact developments on either side of alignment of DFC. Feeder lines to DFC from the ports need to be planned /carried out by Railways to compliment the capacity and efficiency of DFC.
* A coordinating body should be created jointly by three public sector organizations- Roads and Highways Department, Bangladesh Railway and the Department of Shipping for providing integrated transport services as an integrated entity. Such an entity should be able to resolve the problems in ensuring seamless movement of cargo, and to provide an ‘end-to-end transport solution.”

**Road Transportation**

Road transport is now the predominant mode of inland transport for port cargo. As the economy grows and diversifies into higher value manufacturing goods the option of road transport share of port traffic will grow. The other factor favoring road transport is the convenience of door-to-door transport for high value goods which are increasing as trade in finished and intermediate goods increases. For developing hinterland connectivity and improving the efficiency of services to shippers, following facilities should be ensured

* Each Major port should have at least four lane road connectivity and double line  
  rail connectivity.
* Roads and Highways Authority should undertake port connectivity (less than 50 km) projects on a BOT basis, and hinterland connectivity highway projects on a BOT basis where possible.

**Inland Water Transportation**

Steps should be taken to:

* Provide better connectivity with other modes of transport
* Develop all BIWTA terminals with passenger transfer infrastructure
* Construct more inland container terminal (ICT) at strategic locations
* Provide fairway with 3m/2m/1.5m depth in core river network to make it fully functional
* Provide fixed and floating terminals with access and egress by road/rail.
* Develop facilities for day and night navigation; and
* Dredgers/vessels for channel development works

**Modernization of Ports**

The potential for increasing output performance and handling capacity through the introduction of improved handling techniques varies by cargo type. In addition to modernisation of existing port facilities, new operational procedures and practices need to be developed coupled with simplified documentation and communication/information systems.

**Mechanisation of Cargo Handling**

Modern cargo handling techniques must be introduced to improve port performance in the Major ports, particularly in the dry bulk cargo, conventional and unitized general cargo trades. There must be a greater dependence on the use of mechanical plant and equipment in cargo handling activities, which will speed up operations and make better use of storage space and other resources. These actions should be accompanied by new regulations, tariff amendments and other policies to induce ship owners to deploy modern vessels equipped with appropriate lifting equipment on the major shipping routes. Ship owners should also be encouraged to use advanced cargo handling techniques and make the most efficient use of berths and other facilities through appropriate regulations and effective tariffs.

**Information and Communication Technology (ICT)**

Ports deal with a wide range of activities like movement of ships, passengers, cargo/containers through different modes of transport, loading and unloading of ships and interaction/clearance from different statutory bodies and port users. In addition, allocation and management of physical resources like berths, anchorages, channels, tugs, equipment (both port-owned and private), warehouses, storage space, human resources, etc. are also to be considered. Therefore, management of a port involves efficient deployment and utilization of all resources, backed-up by timely and accurate information, which can be successfully achieved only by efficient deployment of state-of-the-art Information Technology.

**Computerization at the Ports**

Ports are now rapidly moving towards application of state-of the-art technology / internet to implement integrated Port Operations System and to move towards paperless regime so as to reduce dwell time as also transaction cost to the users. The major areas where such automation is aimed at, include :

•*Vessel Traffic Management System (VTMS)*•*Information Technology in Scientific Application, the Cargo/Container  
handling operations and non-operation areas*•*Surveillance System and Safety & Security System*•*Electronic Commerce (EC)/Electronic Data Interchange (EDI)*

**8.2.6 Strategies for Urban Transport Development**

The strategy for urban transport should aim at improving transport and traffic infrastructure so as to meet existing and potential demands, and developing an integrated and balanced system in which all modes (motorized and non-motorized) can perform efficiently and each mode can fulfil its appropriate role in the system. The main objective of urban transport strategy will be to support sustainable urban development. Urban transportation strategies will focus on developing an integrated and balanced transportation system taking into consideration the needs of the road system, non-motorized transport, public passenger transport and mass transit issues such as a city’s balance in the locations of employment and housing, demand management, and the roles for the public and private sectors.

**Developing Public Transport Alternatives**

**Provision of rail-based mass rapid transit (R-MRT)**

Rail-based mass transit systems should be considered as parts of a long-term integrated transport strategy for Dhaka and Chittagong Metropolitan Areas. A wide spectrum of urban public transport modes (including metros, suburban railways, and light rail transit) that either use fixed tracks or have exclusive and segregated use of potentially common-user roadways (World Bank 2002) come under this category. Operating capacity and performance of these modes are better than road-based public transport (such as buses, taxis, and paratransit). Metro is the most expensive form of mass rapid transport per kilometre, but has the highest theoretical capacity. Metros can be elevated, underground or a combination of both depending on density of development in the urban area. Implementation of a metro rail project is going on in Dhaka. Chittagong City also needs a metro system to deal with its traffic congestion.

**Provision of Bus Rapid Transit (BRT)**

Bus Rapid Transit (BRT) is a system that is characterized by dedicated lanes for rapid movement of buses. The extent of dedicated infrastructure and the level of sophistication of different systems vary considerably depending on the technology used. Well-planned BRTs have high capacities to carry passengers and can provide comfortable, rapid, and low-cost public transport alternatives. Implementation of a BRT system is also going on in Dhaka.Introduction of Rapid Bus Transit through the use of high capacity dedicated bus lanes should also be given due consideration in different Divisional Headquarters to deal with traffic congestion in those cities.

**Non-Motorized Transport**

**Creating special lanes for pedestrians and cyclists**

Walking and cycling are viable options by which to meet the basic mobility needs of all groups in a sustainable way. In some higher-income countries (Sweeden, Netherlands, Germany etc.) walking and cycling have become two major modes of non-motorised transport (NMT). Many people also walk or cycle for exercise and pleasure. Pedestrians, cyclists, and cycle rickshaw passengers, generate no air pollution, no greenhouse gases, and little noise pollution. Furthermore, they are more efficient users of scarce road space to combat congestion. Walking is a main way of transport for a significant percentage of urban dwellers including the urban poor, suggesting significant investments in walkways and rearrangements of public space in favour of pedestrians. Bicycles should be considered as forming part and parcel of a long term urban transport solution and therefore investments should be oriented towards this way of transport. Rickshaws will continue to be the main transport mode in small and medium towns in the foreseeable future. Traffic rules and management in these towns, therefore, should focus on rickshaws.

**Promoting high efficiency and alternative fuel vehicles**

Vehicles that have higher efficiency compared with conventional gasoline and diesel vehicles, and lower emissions need to be promoted in view of the danger of future energy crisis. Some high efficiency gasoline and diesel vehicles, equipped with emission control devices have fuel efficiency of less than 3 litres per 100 kilometres. Vehicles that run on fuels such as compressed natural gas (CNG), Liquefied petroleum gas (LPG) - methanol (methyl alcohol), denatured ethanol (ethyl alcohol) and other alcohol, Bio-diesel - Electricity (stored in batteries) - Hydrogen (fuel-cell) - Solar Alternative fuels etc. are generally cleaner than gasoline and offers the potential to reduce both regulated and greenhouse gas emissions, reduce the transportation sector’s reliance on petroleum, and provide a boost to the alternative fuel vehicle industry.

**Intelligent Transportation Systems**

The use of intelligent transport systems, or ITS is an important mark of transport development in cities with relatively advanced systems of transportation. The major application areas of ITS technology include electronic road pricing, traffic management, integrated ticketing systems for different public transport modes, and traveller information. Typical applications like en-route traffic information systems using Variable Message Sign (VMS), traffic surveillance and incidence management are quite common, especially for the management of expressways. Intelligent transport systems assist travelers in making informed choices about public transport, telecommuting or driving outside peak hours. They enable commuters to plan their trips and avoid unnecessary journeys and congested routes. They also allow for the better coordination of public transport modes and online timetables, thereby enhancing the operations and services. Common ticketing systems and prepaid cards can make travelling more convenient as well as reduce travel time by facilitating transferring between modes.ITS have also helped to improve safety on highways in many countries. In South Korea, for example, the application of an automatic traffic enforcement on its entire highway network has resulted in a reduction in road traffic crashes significantly. By 2031, all the major cities and the national highway networks of Bangladesh should be brought under Intelligent Transportation Systems.

**Strengthening Linkages with Cities and Towns around Metropolitan Areas**

Investment should be made to strengthen transportation linkages of metropolitan centers with surrounding urban centers through bus and rail-based commuter services.

**Coordinated Development of Land Use and Transportation**

Emphasis should also be given to coordinated land-use and transport planning in order to facilitate access to such basic necessities as workplaces and socio-economic facilities. Such development should also emphasize decentralization of job centres and activity areas, and development of multiple centres

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| **9.0 Concluding Remarks: Developing Multimodal Transport**  The economic expansion and social development witnessed in Bangladesh since independence was accompanied by rapid growth in transport demand. Much of this growth was met by road transport, which emerged as a dominant mode of transport over the years. Development of a ‘Multimodal Transport System’ which has now become a major issue in modern sustainable transport development, has particular significance for Bangladesh with her acute resource scarcity (CPD, 2001). Thus there is an urgent need for an optimum mix of modes and minimization of consumption of resources. In order to improve overall efficiency of transportation systems each mode should be used for what it does best in an overall transport chain. In Bangladesh, each mode of transport operates on its own without any initiative to establish efficient logistic chains between O-D involving different modes as necessary. Thus an integrated system involving different modes, as appropriate from the origin to ultimate destination is needed.  To move towards an integrated transportation system, there is a need in Bangladesh to strengthen legislation and regulation by adopting (i) a multimodal transport act or similar (viz. US, EU countries, India, etc.), (ii) an appropriate pricing regime, and (iii) appropriate regulation of transport services for rail, bus and IWT (covering fair competition, customer protection, safety and service quality, etc.). Resource allocation under the annual development programme (ADP) should be decided based on the role that each mode is expected to perform within the guiding framework of the MMT policy. Transport interventions in urban and national contexts should aim at improving transport and traffic infrastructure so as to meet existing and potential demands, and developing an integrated and balanced system in which all modes can perform efficiently and each mode can fulfill its appropriate role in the system. |
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