

## Ex-Ante Evaluation (for Japanese ODA Loan)

### 1. Name of the Project

Country: The People's Republic of Bangladesh

Project: Dhaka Urban Transport Development Project (I)

Loan Agreement: February 20, 2013

Loan Amount: 10,477 million yen

Borrower: The Government of the People's Republic of Bangladesh

### 2. Background and Necessity of the Project

#### (1) Current State and Issues of the Urban Transport Sector in Bangladesh

Dhaka Metropolitan Area, which includes Dhaka, the capital city of the People's Republic of Bangladesh (hereinafter called Bangladesh), is one of the largest urban areas in the world (the 9<sup>th</sup> largest, according to UN figures) with an estimated population of about 14.64 million as of the middle of 2010. Currently, passenger and cargo transport in the metropolitan area is heavily concentrated on roads. Transport infrastructures are not well developed and the country is behind in development and implementation of transport regulatory systems to control various transport modes on roads including public buses and auto rickshaws. Therefore, chronic traffic congestion is causing economic loss of an estimated amount of about 260 billion yen per year (2010) and is seriously affecting businesses and people's life. Moreover, such traffic pollution as vehicle emission and noise has become a serious problem. Further motorization and increase of traffic volume is expected in the Dhaka Metropolitan Area, where the population is estimated to grow to about 20.9 million by 2025 with population flowing from rural areas against a background of steady economic growth in addition to natural population growth. There is an urgent need to improve such situation through the introduction of a mass transport system.

#### (2) Development Policies for the Urban Transport Sector in Bangladesh and the Priority of the Project

The Sixth Five Year Plan (FY2011-2015), which is the latest state plan of Bangladesh, underlines the importance of the development of the urban transport sector that will contribute to economic growth and poverty reduction, and mentions the introduction of a mass rapid transit (MRT) system as a major action. The Strategic Transport Plan (STP), established and approved by the government of Bangladesh in 2005 as a basic policy for the urban transport sector in Dhaka, summarizes the 20-year urban transport policies and puts priority on the establishment of an organizational framework for urban transport and the development of a mass transport system. The Bangladesh Climate Change Strategy and Action Plan (2008) provides an action guideline for infrastructure development to improve fuel efficiency in the transport sector toward the realization of a low-carbon society. JICA conducted

Preparatory Survey for the Dhaka Urban Transport Development (2009-2011, technical cooperation), the measures for transport network improvement in Dhaka proposed in STP were reviewed, three candidate MRT routes were compared and studied in terms of technology, economy and environment, and the appropriateness of the implementation was confirmed. The Project is for the construction of Line 6, which was selected as a top priority in the survey.

#### (3) Japan and JICA's Policy and Operations in the Urban Transport Sector

One of the priority fields defined in the Country Assistance Policy for Bangladesh (June 2012) is acceleration of economic growth toward a middle-income country that will benefit all the people, and it stated that the inland distribution function should be improved through collaboration of multiple means of transport (multimodal transport). Based on the policy, in the Country Analytical Work, JICA considers "urban development" as a priority and the Project is in line with such policy. Major support activities in the sector conducted in the past include the Chittagong City Outer Ring Road Project (2009, Japanese ODA loan). Putting priority on measures for adoption to climate change in Bangladesh, Japan has actively provided support through such projects as the Programme for Improvement of Solid Waste Management in Dhaka City toward the Low Carbon Society (2009, Program Grant Aid for Environment and Climate Change).

#### (4) Other Donors' Activity

In the urban transportation sector in Bangladesh, JICA and the World Bank have provided support as leading donors. In addition to the assistance for the establishment of the above-mentioned STP, the World Bank has been supporting the Clean Air and Sustainable Environment (CASE) Project since 2009, developing Route 3 of the bus rapid transit (BRT). ADB has also been supporting the Greater Dhaka Sustainable Urban Transport Corridor Project since 2010, to improve roads connecting to BRT Route 3.

#### (5) Necessity of the Project

The Project is to contribute to the economic growth of Bangladesh by smoothing passenger and cargo transport in the Dhaka Metropolitan Area through the construction of a high speed urban railway using MRT system running south to north in the capital city of Dhaka, where rapid urbanization and increase of traffic volume is causing chronic traffic congestion and traffic pollution. The project is in line with the development policies of the Bangladesh government as well as the assistance policies of the Japanese government and JICA. Therefore, the necessity and relevance of JICA's support for the implementation of the Project is high.

### **3. Project Description**

#### (1) Project Objective(s)

The objectives of the Project are to respond to the increasing transport demand in

the Dhaka Metropolitan Area through the construction of a 20-kilometer high-speed urban railway in the city of Dhaka using MRT system, and to contribute to the economic growth of the whole country of Bangladesh through the reduction of traffic congestion. It will also contribute to air pollution control in the Dhaka Metropolitan Area through the promotion of modal shift from automobiles to public transport.

(2) Project Site/Target Area: Dhaka, Bangladesh

(3) Project Components (Including the Procurement Method)

- 1) Construction of railway structures (about 20 km long) (including construction of station buildings and tracks) (international competitive bidding)
- 2) Construction of a railway car base (including land preparation, construction of a car barn and construction of sidings) (international competitive bidding)
- 3) Procurement of railway cars (international competitive bidding)
- 4) Construction of electricity and signal systems (international competitive bidding)
- 5) General consulting service (including detailed design, bidding assistance and construction supervision) (short-list method)
- 6) Consulting service to support residents' relocation (short-list method)
- 7) Consulting service to support organizational development (short-list method)

(4) Estimated Project Cost (Loan Amount)

Total project cost: 244,470 million yen

Loan amount: 10,477 million yen

(6) Schedule

The project period (cooperation period) will be from February 2013 to August 2022 (a total of 115 months). The Project will be completed at the start of the use of all sections (December 2021).

(6) Project Implementation Structure

- 1) Borrower: The Government of the People's Republic of Bangladesh
- 2) Executing Agency: Dhaka Mass Transit Company (DMTC)
- 3) Operation and Maintenance System: Same as 2)

(7) Environmental and Social Consideration/Poverty Reduction/Social Development

1) Environmental and Social Consideration:

① Category: A

Reason for Categorization: The Project falls into the railway sector (located in a sensitive area and is likely to have significant adverse impact due to its characteristic) under the JICA guidelines for environmental and social considerations (April 2010).

② Environmental Permit: The Environment Impact Assessment (EIA) Report of the Project, prepared by the Dhaka Transport Coordination Board (DTCB), was approved by the Department of Environment, Ministry of Environment and Forest of Bangladesh, on July 11, 2011.

③ Anti-Pollution Measures: Water will be periodically sprinkled to prevent dust

that is expected to be generated during construction. Sound absorbers and sound-insulating walls will be installed for construction equipment to reduce noise and vibration caused during construction. Wastewater discharged from the station and the train depot, when the facilities are in service, will be appropriately treated at wastewater treatment facilities.

- ④ Natural Environment: As the project site is not located in sensitive areas such as a national park or its vicinity, but is located in a well-developed urban area, there are no rare species. Trees will be planted underneath the elevated tracks to compensate the plants removed for the construction of the elevated structure.
  - ⑤ Social Environment: In the Project, most facilities will be constructed within the bound of existing roads. It is estimated that 35.6 ha of land will be acquired and 1,040 people from 219 households will be affected. (Of them, 75 households will have to be relocated.) The procedures of land acquisition and resettlement will be carried out in accordance with the relevant domestic laws and procedures, and the Resettlement Action Plan (RAP) developed by the executing agency. In the stages of scoping and EIA report preparation, there have been constant discussions with local residents concerning the EIA report and RAP. In the meetings with residents, explanation was given concerning outline of the Project, planned routes, countermeasures to the points that may have impacts on natural and social environments, outline of the draft RAP and compensations.
  - ⑥ Other/Monitoring: In the Project, the executing agency will monitor air quality, noise and water quality during construction and after starting operations as well as the progress of land acquisition and resettlement.
  - ⑦ Conclusion: With environmental and social measures described above, it is unlikely that the Project will cause serious adverse impact. The implementation status of following points will have to be checked through a progress report and the others.
    - a) Implementation status of land acquisition and resettlement
    - b) Environmental monitoring (during construction and after starting operation)
- 2) Promotion of Poverty Reduction: None
  - 3) Promotion of Social Development: As part of consulting services of the Project, training on HIV/AIDS prevention will be provided to construction workers during the construction period. Barrier-free design for the handicapped will be adopted for station buildings and facilities, including installation of elevators and tactile tiles for the visually impaired.
- (8) Collaboration with Other Schemes and Donors
- Technical cooperation will be provided to prepare the rules/regulations system for the urban transport including the Project and institutional capacity building of

DMTC.

(9) Other Important Issues

The Project will contribute to the mitigation of climate change as reduction of global-warming emissions is expected through modal shift to mass high-speed transit system and reduction of traffic congestion. The effect of climate change mitigation through the Project (estimated GHG reduction) will be about 180,000 tons of CO<sub>2</sub> per year (estimation for 2025). Japanese companies may be selected as contractors because STRASYA (Japanese railway technologies and knowhow) is used in all components of construction of railway structures, construction of a train depot, procurement of trains, construction of electricity and signal systems, and consulting services.

<b>4. Targeted Outcomes</b>
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(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicator)

Indicator (unit)	Baseline (Actual Value in 2009)	Target (2023) 【Expected value 2 years after project completion】
Number of passengers (1,000 passenger kilometers per day)	NA	4,193
Distance of train operation (kilometers per day)	NA	6,528
Travel time (min)*	110.4	46.2
Car operating ratio (no. of train services)	NA	80

\*Travel time from Uttara in the north to Saidabad in the south

2) Internal Rate of Return

Based on the conditions indicated below, the economic internal rate of return (EIRR) of the Project will be 25.4% and the financial internal rate of return (FIRR) will be 1.7%.

**【EIRR】**

Cost: Project cost (excluding tax), operation and maintenance cost  
Benefit: Reduction of operation cost, reduction of travel time, and the others.

Project Life: 40 years

**【FIRR】**

Cost: Project cost, operation and maintenance cost

Benefit: Fare revenue

Project Life: 40 years

## (2) Qualitative Effects

The qualitative effects of the Project include facilitation of smooth passenger and cargo transport, reduction of air pollution, mitigation of climate change through promotion of modal shift to public transportation in the Dhaka Metropolitan Area.

## **5. External Factors and Risk Control**

Delay in civil engineering works caused by natural disasters such as floods, and lack of fare setting necessary enough to secure financial health of the executing agency

## **6. Evaluation Results and Lessons Learned from Past Projects**

### (1) Results of Evaluation of Similar Past Projects

From the result of ex-post evaluation of the Metro Manila Strategic Mass Rail Transit Development Project, etc., we have learned lessons that it is difficult to operate urban transport business with fare revenue only and that funding and subsidies from the government are needed because it requires large initial investment, and that a detailed financial plan and an action plan of the government support should be developed in the phase of project planning so that the financial health of the executing agency will be ensured.

### (2) Lessons for the Project

As the Project requires large initial investment and therefore financial health needs to be secured, based on the lessons above, appropriate fare setting will be conducted, and part of the Japanese ODA loan will not be subleased but will be funded by the government of Bangladesh. Moreover, as part of the consulting service to support organizational development, support will be provided to DMTC for the development and implementation of a financial plan.

## **7. Plan for Future Evaluation**

### (1) Indicators to be Used

- 1) Number of passengers (1,000 passenger kilometers per day), distance of train operation (kilometers per day), travel time (minutes) and car operating ratio (number of train services)
- 2) Economic Internal Rate of Return (EIRR) (%), and Financial Internal Rate of Return (FIRR) (%)

### (2) Timing of Next Evaluation: 2 years after the completion of the Project

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