Japanese ODA Loan

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: India
Project: Bangalore Metro Rail Project (II)
Loan Agreement: June 16, 2011
Loan Amount: 19,832 million yen
Borrower: The President of India

2. Background and Necessity of the Project

(1) Current State and Issues of the Urban Transportation Sector in India

In India, recent rapid urbanization has been resulted in a considerable increase in the number of registered automobiles and motorcycles, while improvement of the public transportation infrastructures has not advanced as much. In particular, in Delhi, Bangalore and other large cities, traffic congestion caused by the increasing demand for road transportation has become a serious problem. Since economic losses and health damage from automobile pollution, such as air contamination and noise, have also become serious, it is necessary to improve public transportation systems to mitigate traffic congestion and improve the urban environment.

(2) Development Policies for the Urban Transportation Sector in India and the Priority of the Project

To deal with these issues, the Indian Government has placed the priority on the development of the urban transportation sector in the 11th Five-Year Plan (April 2007 to March 2012). The plan recommends the establishment of a mass rapid transit system for all cities with a population of more than four million from the viewpoints of safety, energy efficiency and social and environmental sustainability. This Project is in support of efforts being made to achieve this plan.

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

The "Promotion of Economic Growth" is one of the prioritized areas in the Japan's Country Assistance Program for India by the Government of Japan. Accordingly, JICA has set the "Promotion of Sustainable Growth through the Development Assistance to the Infrastructure" as a prioritized area. The Project is categorized under the "Improvement of Transport Networks" program within the said priority area, therefore the assistance for the Project is consistent with Japan and JICA's policy. Japanese ODA loans to India have so far been provided to 20 projects totaling 630.2 billion yen in the urban transportation sector (20% of the total amount of loans).

(4) Other Donors' Activity

The World Bank has provided loans to the urban transportation project in Mumbai and is formulating a project to support the eastern dedicated freight corridor construction plan. The Asian Development Bank (ADB) has been supporting the railway sector, centering on support for the development of software such as the organizational reform of the Indian Railways.

(5) Necessity of the Project

The urban area of Bangalore in the State of Karnataka has the third largest population among cities in India. It is estimated that the population will increase to 8.1 million in 2011 from 5.7 million in 2001. The number of registered automobiles has been rising sharply from 1.56 million in 2001 to 2.56 million in 2006. Because of this, the average speed of motor vehicles is about 13 km per hour on the main urban roads and traffic congestion has become serious. On the other hand, because it is difficult to expand the road networks due to a shortage of available land, it is also hard to improve the transportation capacity of buses, which are the main existing means of public transportation. Therefore, the establishment of a rapid mass transportation system is the main measure being taken by the State of Karnataka to deal with urban traffic and environmental problems.

Although this Project started in 2006, since the total cost increased due to the global rise in equipment prices, the discovery of unpredictable geological conditions and considerations for the environment and passenger safety, which became necessary after the review, the Indian Government and the Government of Karnataka decided to provide additional loans and investments and have been proceeding with fundraising from international institutions and local banks. Since there is a shortage of funds in spite of this, they have made a request to JICA for an additional loan. This additional loan will make it possible to raise all the necessary funds to carry out this Project. The input of additional funds through an ODA loan is therefore required for the smooth implementation of this Project and the prompt provision of its benefits, thus it is essential and appropriate for JICA to provide support.

3. Project Description

(1) Project Objective

The objective of this project is to deal with the increasing demand for transportation in Bangalore, the capital city of the State of Karnataka in southern India, by constructing a mass rapid transit system and thereby contribute to the development of the local economy and the improvement of the urban environment through the mitigation of traffic congestion and the reduction of pollution from motor vehicles.

(2) Project Site/Target Area

Bangalore City, State of Karnataka

(3) Project Components

Construction of the north-south line and the east-west line of a mass rapid transit system with a total length of 42.3 km, including a north-south extension of 9.3 km; ODA loans are provided to the following works:

1) Civil engineering works (underground section of about 9 km (including 7 underground stations)) (* installation of tracks for the whole network of lines; elevated sections are not covered by ODA loans)
2) Works related to electricity and telecommunications
3) Consulting services (bidding assistance, construction monitoring support, etc.)

(4) Estimated Project Cost (Loan Amount)

306,809 million yen (the agreed loan amount this time: 19,832 million yen)

(5) Schedule

Planned for March 2006 – June 2014 (100 months in total); the Project will be completed when use of the facilities begins (June 2013).

(6) Project Implementation Structure

1) Borrower: The President of India
2) Guarantor: Bangalore Metro Rail Corporation Limited
3) Operation and Maintenance System: Same as 2)

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

1) Environmental and Social Considerations
   (1) Category: A
   (2) Reason for the Categorization: This project is classified as Category A because it falls under the railway sector according to the “Japan Bank for International Cooperation Guidelines for the Confirmation of Environmental and Social Considerations” (established in April 2002) and has characteristics that may have an impact.

(3) Environmental Permit: Although no environmental permit is required for railway business operations under India's domestic laws, environmental impact assessments (EIA) have been carried out and reports have been prepared under this Project (excluding the extended portions); the EIA of the extended portions was carried out with the use of funds from ADB.

(4) Pollution control: Measures, such as the appropriate management of pollutants and construction vehicles and heavy machinery, will be taken when performing the works. Once the Project is in operation, soundproof walls and pads will be installed to reduce noise.

(5) Natural Environment: Because the project area and its surroundings are not in any protected natural area, there are no particular foreseeable impacts on the natural environment.

(6) Social Environment: This Project requires the acquisition of sites amounting to a total area of about 127 ha and the relocation of about 1,000 houses and structures. Both the acquisition of the sites and the relocation of the residents have already been completed according to the Karnataka Industrial Area Development Board Act and the national policy on the resettlement and rehabilitation for project-affected families. No particular objections have been lodged against the Project in consultation meetings with persons involved in the acquisition of sites and the resettlement of residents. All the slum residents have been moved to free housing nearby. The executing agency has been monitoring their living situation since the resettlement.

(7) Other (Monitoring): In this Project, the executing agency monitors noise and air quality during the construction period and also monitors the living conditions of the residents for three years after their relocation. In addition, the executing agency is planning to monitor water quality, the level of groundwater, etc., after the start of the use of the facilities.

2) Promotion of Poverty Reduction
None

3) Promotion of Social Development (gender perspective, measures for infectious diseases including HIV/AIDS, participatory development, consideration for persons with disabilities, etc.)
The executing agency intends to contract with an NGO to carry out HIV prevention activities for itinerant workers. At present, the executing agency is carrying out the procedures for employing the NGO.

(8) Collaboration with Other Donors

The ADB also is considering providing loans for this Project.

(9) Other Important Issues

It can be considered that this Project will contribute to the mitigation of climate change since a modal shift to a rapid transportation system and the mitigation of traffic congestion are expected and lead to a reduction in greenhouse gas emissions. The executing agency is actively considering registering this Project under the CDM system.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicator)

Indicator	Target (2015) [2 years after project completion]
Operation rate (%/year)	92
Running distance (thousand km/day)	48.3
Number of runs (number of one-way	190

runs per day) – east-west line	
Number of runs (number of one-way runs per day) – north-south line	200
Volume of transportation (million passenger kilometers /day)	10.12
Passenger income (million rupee/day)	17.0

2) Internal Rates of Return
Based on the preconditions that this Project's economic internal rate of return (EIRR) is 8.66% and the financial internal rate of return (FIRR) is 2.89%.

EIRR
Costs: Project costs (excluding taxes), operation and maintenance costs
Benefits: Reduction in the cost of managing and maintaining existing transportation facilities and roads; reduction in the travel time for users of these lines and other transportation facilities; reduction in the cost of managing and maintaining bus and other transportation systems due to the mitigation of traffic congestion; a decrease in the number of traffic accidents; and the mitigation of pollution levels
Project life: 30 years

FIRR
Costs: Project costs, operation and maintenance costs
Benefits: Fare income, advertising income, real-estate development income
Project life: 30 years

(2) Qualitative Effects

Mitigation of traffic congestion; development of the local economy through a reduction in traffic pollution; improvements in the urban environment; improvements in convenience through punctuality in scheduled travel times

5. External Factors and Risk Control

Change in passenger demand

6. Lessons Learned from Past Projects

Based on past projects accompanied by the resettlement of residents, it has been pointed out that it is necessary to take measures to secure the livelihoods and standard of living of those who have to resettle. In this project, the necessary measures were carried out, including explanation meetings for the residents, and the acquisition of sites and the resettlement of residents have been completed. In the future, the executing agency will continue to submit regular reports concerning the results of monitoring surveys on the living conditions of the slum residents after their resettlement.

7. Plan for Future Evaluation

(1) Indicators to be Used

1) Operation rate (%/year)
2) Running distance (thousand km/day)
3) Number of runs (number of one-way runs per day) – east-west line
4) Number of runs (number of one-way runs per day) – north-south line
5) Volume of transportation (million passenger kilometers /day)
6) Passenger income (million rupees/day)
7) Economic internal rate of return (EIRR) (%)
8) Financial internal rate of return (FIRR) (%)

(2) Timing

Two years after project completion