

1. Name of the Project

Country:	India
Project:	Mumbai Metro Line III Project
Loan Agreement:	September 17, 2013
Loan Amount:	71,000 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**

India is experiencing rapid urbanization. While the registered number of automobiles and motorcycles are surging, the development of public transportation infrastructure is much lagging. As a result, traffic congestion due to the increased number of automobiles and motorcycles is becoming a serious problem in urban areas. Particularly, in metropolitan cities such as Delhi, Mumbai and Chennai, traffic congestion accompanying the rise in road traffic demand is becoming a critical issue. Since this is causing economic loss and health hazards due to air, noise and other forms of vehicle-related pollution, there is an urgent need to introduce a public transportation system to alleviate traffic congestion and vehicle-related pollution.

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

To address the above problem, through the Working Group on Urban Transportation for the 12th Five-Year Plan (April 2012 to March 2017), the Government of India recommended the establishment of metro construction plans in cities with a population of more than two million and the beginning of construction in cities with a population of more than three million from the viewpoint of safety, energy efficiency, and social environment conservation, to develop the urban transportation sector. This project supports the plan.

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

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. JICA has so far approved yen loans to the urban transportation sector in 23 cases. The total amount of the yen loans is 826.7 billion yen (71.8% of the approved amount of yen loans to the transportation sector).

(4) Other Donors' Activities

In the urban transportation sector, the World Bank is supporting Mumbai's urban transportation project (development of roads and suburban railways) and the development of the Eastern Corridor under the freight railway construction plan. The Asian Development Bank is supporting the railway sector, focusing on support of "soft (non-physical)" aspects, such as organizational reform of the Indian Railway.

(5) Necessity of the Project

The Mumbai metropolitan region, the capital of the State of Maharashtra, has a population of 20.75 million as of 2011, making it the largest among India's urban areas. Mumbai City, the center of the region, has a population density of 20,694 persons/km² and is one of the densest cities in the world. The number of registered automobiles has sharply increased from 1.03 million in 2000 to 1.77 million in

2011. Because of this, the average speed on the main roads in the city is about 15 km/hour, resulting in serious traffic jams. Because it is difficult to expand the road networks due to lack of sites and to improve the transportation capacity of buses, the existing public transportation, it is imminently necessary to develop a mass rapid transit system as a measure for mitigating traffic jams and coping with auto pollution. The Project is the main pillars of the urban transport policy and urban environmental measures to ease traffic congestion in the metropolitan region; JICA's assistance for the Project is highly necessary and relevant.

3. Project Description

(1) Project Objective

The objective of the Project is to cope with the increase of traffic demand in Mumbai, the capital of the State of Maharashtra, by constructing a mass rapid transportation system, thereby promoting regional economic development and improving the urban environment through mitigation of traffic jams and reduction of traffic pollution.

(2) Project Site / Target Area

The Mumbai metropolitan region in the State of Maharashtra

(3) Project Components

Construction of the whole Line III among the Urban Railway Development Plan Phase I in Mumbai (total length of Lines I to III: 77.7 km)

- 1) Civil works, electrical and signaling & telecommunication system (total length of metro: 33.5 km (including 27 metro stations))
- 2) Procurement of rolling stocks
- 3) Consulting service (design review, bidding assistance, construction supervision, management improvement, etc.)

(4) Estimated Project Cost

346,659 million yen (loan amount this tranche: 71,000 million yen)

(5) Schedule

Planned for the period between June 2013 and December 2019 (79 months in total). The Project will be completed at the service opening of the facilities (December 2019).

(6) Project Implementation Structure

- 1) Borrower: The President of India
- 2) Executing Agency: Mumbai Metro Rail Corporation (hereinafter referred to as "MMRC")
- 3) Operation and Maintenance System: MMRC is planning to choose a private operating company by bidding instead of directly operating and maintaining the metro business.

(7) Environmental and Social Considerations

- 1) Environmental and Social Considerations: as described in the Annex
- 2) Promotion of Poverty Reduction: MMRC is planning to set fares with consideration for the low-income class; the Project takes into consideration the poor people in the Mumbai urban area.
- 3) Promotion of Social Development (gender issues, measures against AIDS and other infectious diseases, participatory development, consideration for the disabled, etc.): The executing agency hires an NGO to carry out HIV prevention activities for itinerant workers and local

people.

(8) Other schemes, cooperation with other donors: None in particular

(9) Other Important Issues: None in particular

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators

Indicator	Target (2021) [2 years after project completion]
Operating rate (%/year)	87
Running distance (thousand km/day)	73
Number of running trains (number of trains/day, one direction)	676
Volume of transportation (million persons-km/day)	12.9
Passenger revenue (million rupees/day)	26.3

2) Internal Rates of Return

Based on the assumptions below, the economic internal rate of return (EIRR) for the Project will be 13.00% and the financial internal rate of return (FIRR) will be 0.24%.

[EIRR]

Costs: Project costs (excluding tax); operation, maintenance, and management costs

Benefits: Reduction in operation, maintenance, and management costs related to transportation facilities and roads; reduction in transportation time for users of this line and other transportation facilities; reduction in the operation, maintenance, and management costs of bus and other transportation systems because of mitigation of traffic jams; mitigation of pollution; and decrease in the number of traffic accidents

Project life: 30 years

[FIRR]

Costs: Project costs (excluding tax); operation, maintenance, and management costs

Benefits: Fare revenue; advertising revenue; real estate development revenue

Project life: 30 years

(2) Qualitative Effects

Improvement of the traffic conditions in the Mumbai metropolitan region; mitigation of traffic pollution; mitigation of climate change; improvement of convenience by securing the timeliness of transportation; economic development in the Mumbai urban area

5. External Factors and Risk Control

Worsening of the political and economic situations and occurrence of natural disasters in India and in the areas around the target area

6. Results of Evaluations and Lessons Learned from Past Projects

(1) Results of Evaluations of Similar Past Projects

The ex-post evaluations of the past urban railway projects in India has given the lesson that it is important to establish a financially independent project implementation system. Moreover, in the ex-post evaluations of projects where removal of local residents frequently occurred, it is pointed out that it is necessary to take measures for securing the livelihoods and standard of living of the residents to be removed, such as the establishment of a livelihood improvement program.

(2) Lessons for the Project

Based on the foregoing lessons, in the Project, relevant programs for advertising, real estate development, etc. are planned to be carried out to improve the financial standing of the executing agency. For the benefit of the residents to be removed, necessary procedures have been carried out, including the holding of explanation meetings, and the acquisition of sites and the removal of residents have been gradually carried out. In addition, the results of monitoring surveys on the living conditions of slum residents after removal will be reported regularly from MMRC.

7. Plan for Future Evaluation

(1) Indicators to Be Used

- 1) Operating rate (%/year)
- 2) Running distance (100km/day)
- 3) Number of running trains (trains/day, one direction)
- 4) Volume of transportation (million persons-km/day)
- 5) Income from Passengers (million rupees/day)
- 6) Internal rate of return: FIRR (%), EIRR (%)

(2) Timing

Two years after project completion

India “Mumbai Metro Line III Project”
Environmental and Social Considerations

(1) Category: A

(2) Reason for Categorization

The Project falls under the railway sector in the JICA Guidelines for Environmental and Social Considerations (promulgated in April 2010; hereinafter referred to as the “JICA Guidelines”) and has influential characteristics.

(3) Environmental Permit

Although no domestic law in India obliges the preparation of an environmental impact assessment (EIA) report, it was prepared in September 2012.

(4) Anti-Pollution Measures

During the construction, measures will be taken to control pollutants and properly manage construction vehicles and heavy machines. With regard to the impact of the construction on the ground, because adoption of the shield method prevents the loosening of the ground and the inflow of groundwater, no serious impact of subsidence was anticipated. After the beginning of the service, soundproof walls will be used for noise reduction, elastic rubber will be used under the line for vibration reduction, and measures for mitigating water pollution, such as the installation of drainage facilities in the vehicle base, will be taken. In addition, because, at the consultation with local people about the EIA report on the Project, the local people expressed anxiety about how to dispose of construction waste soil and requested the restriction of construction during the nighttime, the executing agency made a definite promise to carry out and monitor mitigation measures. The local people did not make any special objection against the Project.

(5) Natural Environment

Because the target area is not susceptible to the influence of any national park and is not located around any national park, undesirable impact on the natural environment is supposed to be minimal.

(6) Social Environment

The area of sites to be acquired for the Project is about 45.81 ha (including about 4.72 ha of private land). It is estimated that 1,442 households and 5,335 residents will have to move involuntarily. MMRC has begun to consult with the site owners and the residents. It will follow the procedures according to the resident removal plan (based on the Site Acquisition Act and the Government of the State of Maharashtra’s resident removal policy) that has been established so as to fulfill the requirements specified in the JICA Guidelines and is planning to

complete the procedures for site acquisition, resident removal, and compensation in December 2013. In addition, illegal residents will be given ownership of a lot of land for public housing in the suburbs of Mumbai or removal expenses. Because, at the consultation about resident removal, the participating residents demanded proper payment of compensation, provision of new residences with good living conditions, and provision of job opportunities related to the Project, the executing agency gave explanations about the resident removal procedure that reflected the influenced residents' requests and about the compensation policy. The local people did not make any special objection against the Project.

(7) Others/Monitoring

In the project, MMRC will monitor site acquisition and resident removal during the construction. Moreover, under the supervision of MMRC, the contractor will monitor noise, vibration, soil, air quality, water quality, waste, etc. After the beginning of the service, MMRC will monitor noise, vibration, air quality, water quality, etc. In addition, MMRC will hire an outside consultant by its own funds to monitor site acquisition, resident removal, and living conditions after removal.

(8) Conclusion

It is unlikely that the above-mentioned environmental and social considerations will cause the Project to have serious and undesirable impact. However, after the signing of the loan agreement, it is necessary to check the following regularly during the implementation stage of the Project:

1. Site acquisition and involuntary resident removal
2. Implementation and monitoring of mitigation measures during the construction (especially, influence of air quality, noise, waste, etc.)
3. Implementation and monitoring of mitigation measures during the provision of the service (especially, influence of vibration)