

Ex-Ante Evaluation (for Japanese ODA Loan)

South Asia Division 1, South Asia Department, JICA

1. Name of the Project

Country: India

Project Name: Kolkata East-West Metro Project (III)

Loan Agreement: September 28, 2018

2. Background and Necessity of the Project

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

Rapid urbanization has progressed in India recently and the number of registered automobiles and motorcycles have been increasing rapidly, whereas the development of public transportation has not progressed and traffic jams due to increasing demand for road traffic have been a serious problem in major cities such as in Delhi, Mumbai, etc., aggravating economic losses and health damage due to automobile pollution such as air pollution/noise, etc. For this reason, the development of public transportation systems is essential to mitigate traffic jams and to improve the urban environment.

In order to deal with the above problems, the Government of India emphasizes the development of public transportation systems from the viewpoint of safety/energy efficiency/social environment conservation, in addition to dealing with the demand for transportation due to the recent economic growth. In addition to the overcrowding population in the Kolkata metropolitan area, public transportation depends heavily on road traffic. On the other hand, the extremely small area ratio of the roads in the city intensifies traffic congestion, aggravating air pollution/noise due to automobiles. The West Bengal State Government formulated the Kolkata Integrated Traffic Improvement Plan in 1997 and has developed interchanges and elevated roads in order to improve road traffic conditions. The Integrated Multimodal Public Transport Plan for Calcutta formulated in 2000 points out the importance of comprehensive management of various traffic modes in urban transport. The Master Plan for Traffic and Transportation in KMA formulated in 2004 points out the necessity of developing urban transportation networks by an approach from both users and facilities. In the plan, the state government sets a prioritized policy as mitigating traffic congestion and providing a safe, inexpensive and environmentally friendly transportation network by focusing on developing an arterial network of buses in the surrounding area, shifting from road traffic to rail transit in the central area, and restricting the inflow of vehicles into the central area through traffic demand management. In keeping with such series of state government's traffic policy, the Kolkata Metropolis Traffic Improvement Master Plan formulated by the Kolkata Metropolitan Development Authority (KMDA) in 2001 puts emphasis on the construction of a mass transportation system for the purpose of promoting the shift from road traffic to rail transit, in order to deal with increasing traffic volume and aggravating environmental problems, and accordingly, the East-West Metro Project in Kolkata (hereinafter referred to as "the Project") is positioned as a priority project to realize these plans/policies.

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

In Japan's Country Assistance Policy for India (March 2016) stipulates that the development of railways (including high-speed rail and urban railway) shall be

necessary in order to reinforce the connectivity within and among the major industrial cities/economic zones in India by setting forth “reinforcement of the connectivity” through the development of transportation infrastructure, etc. as the priority area with the aim at resolving the infrastructure bottleneck against investment and growth. Also, in order to eliminate the bottleneck in economic growth, JICA Country Analysis Paper for India (March 2012) provides an analysis that, mainly in the industrial agglomeration areas such as special economic zones and economic corridors located in the six major metropolitan areas in India and the Delhi – Mumbai Industrial Corridor, it is necessary to promote regional economic development facilitation and logistics optimization, and to support infrastructure development including arterial railroad, urban railway, roads, and harbors which contribute to increased investment from the foreign capital; the Project is positioned as “transport network development and maintenance” listed as a subject to be addressed by JICA in the above priority areas and is consistent with these policies and analyses. Among ODA loans to India, there were 59 ODA loan approval cases totaling 2,124.3 billion yen to the transportation sector as of the end of August 2018, including 36 ODA loan approval cases totaling 1,646.7 billion yen as of the end of August 2018 to the railway urban transport sector to provide support for subway projects such as Delhi Metro, etc. Note that the first phase (LA signed in 2008, the approved amount of 6,437 million yen) and the second phase (LA signed in 2010, the approved amount of 23,402 million yen) have already been provided for the Project.

The Project is also expected to contribute to achieving Goal 9 of the SDGs (Build resilient infrastructure, promote sustainable industrialization and foster innovation) and Goal 11.6 of the SDGs (Make cities inclusive, safe, resilient, and sustainable).

(3) Other Donors’ Activity

The World Bank supports the Mumbai Urban Transportation Project (road and suburban railway improvement) and the Eastern Dedicated Freight Corridor project. The Asian Development Bank (ADB) is providing institutional and other assistance to India’s railway sector, especially for organizational reforms of Indian Railways.

3. Project Description

(1) Purpose of the project

The objective of the Project is to cope with the increase of traffic demand in Kolkata metropolitan area by extending the mass rapid transit system, thereby promoting regional economic development and improving urban environment, through mitigation of traffic jams and decrease of pollution caused by increasing motor vehicles.

(2) Project Site/Target Area

Kolkata metropolitan area in West Bengal State

(3) Project Description

1) Civil works [total length of 16.5 km (section: Howrah Maidan Station – Salt Lake Station), underground section of 10.8 km, elevated road section of 5.7 km, 12 stations] (Note that in the Project, the policy to change the train track plan was decided in October 2015 due to a change in the land acquisition plan.) (Total length: 13.9 km, underground section of 8.6 km, elevated section of 5.3 km, 12 stations, according to the plan before modification)

- (Viaduct section: Domestic competitive bidding, Underground section: International competitive bidding) (Contract already signed)
- 2) Railway track construction (International competitive bidding) (Contract already signed)
 - 3) Electrical/Mechanical work (International competitive bidding) (Contract already signed)
 - 4) Signal/Communication work (International competitive bidding) (Contract already signed)
 - 5) Automatic Fare Collection system (International competitive bidding) (Contract already signed)
 - 6) Station equipment-related (International competitive bidding) (Contract already signed)
 - 7) Procurement of Rolling Stock (84 cars: 14 trains, 6 cars/train) (International competitive bidding) (Contract already signed)
 - 8) Depot construction (Domestic competitive bidding) (Contract already signed)
 - 9) Tunnel Ventilation System (International competitive bidding) (In the process of contract procedures)
 - 10) Station Environmental Management System (International competitive bidding) (In the process of contract procedures)
 - 11) Consulting Services: basic design/bidding assistance/construction supervision, etc.) (Shortlist system) (Contract already signed)

The subject fields covered by the ODA loan are the civil work in the underground section, the signal/communication system, the automatic fare collection system, procurement of rolling stocks, the tunnel ventilation system, the station environment management system, and the consulting service.

- (4) Estimated Project Cost
133,143 million yen (of which, the ODA Loan amount is 72,618 million yen and a subsequent loan of 25,903 million yen)
- (5) Schedule
March 2008 – March 2021 (157 months in total). The commencement date of service (March 2021) shall be the time of the Project's completion.
- (6) Project Implementation Structure
 - 1) Borrower: The President of India
 - 2) Guarantor: None
 - 3) Executing agency: Kolkata Metro Rail Corporation Limited: KMRCL
 - 4) Operation/Maintenance Agency: Operation and maintenance after the project completion will be taken over to the Metro Railway, Kolkata (MRK), a part of Ministry of Railways, where some board members are working concurrently with KMRCL.
- (7) Collaboration and Division of Roles with Other Projects and Donors
None
- (8) Environmental and Social Consideration/Poverty Reduction/Social Development
 - 1) Environmental and Social Consideration
 - (i) Category: A
 - (ii) Reason for Categorization
The Project falls into the railway sector and the influential characteristics, both being listed in the "Japan Bank for International Cooperation

Guidelines for Confirmation of Environmental and Social Considerations” (established in April 2002) (“JBIC Guidelines”).

(iii) Environmental Permit

Although preparation of an Environmental Impact Assessment (EIA) Report regarding the Project is not required under the domestic law in India, an EIA Report was prepared by the executing agency and approved by the Environmental Department of West Bengal State in November 2006 based on the provisions of West Bengal State. Thereafter, revised versions of the EIA report were prepared in September 2007 and February 2017. (Approval of revised versions of EIA is unnecessary.)

(iv) Anti-Pollution Measures

As for noise, measures to reduce it such as installing soundproof walls/soundproof pads are planned. Regarding the impact on the ground during construction, no serious influence due to land subsidence is expected, since loose ground and the inflow of groundwater will be prevented by adopting the shield construction method. Note that the environmental management plan has been formulated with the support of consultants hired in the Project.

(v) Natural Environment

The target area of the Project is located in urban areas and it is assumed that the undesirable impact on the natural environment is minimal, since the planned train track passes mostly along existing roads.

(vi) Social Environment

The land area required for the Project is 19.5 ha (private land of 0.75 ha, government-owned land of 18.3 ha, and land owned by the State Corporation of 0.44 ha). 490 homes and structures will have to be relocated due to the Project. The KMRCL has held consultations with those who are subject to land acquisition/resident relocation, and the procedures for land acquisition/resident relocation are to be completed by December 2017 based on the Land Acquisition Law and the resident relocation plan prepared by the KMRCL. Note that during the stakeholder consultations, a dissenting opinion on the project has not been confirmed in particular.

(vii) Other/Monitoring

In the Project, the contractors monitor noise, air quality, water quality, groundwater levels, and the KMRCL monitors land acquisition/resident relocation during construction. MRK will monitor all of these after the commencement of the service.

2) Cross-cutting Issues:

(Climate change)

The Project aims at mitigating traffic congestion and heavy traffic due to volume of vehicles by constructing a mass transportation system and facilitating the utilization of automobiles, thereby contributing to the reduction of greenhouse gas (GHG) emissions. The mitigation effect of the Project on the climate change (rough estimate of GHG emission reduction) is about 42,000 tons/year of CO₂ equivalent.

(Consideration for persons with disabilities)

In accordance with the domestic laws in India, consideration for usability for the elderly and persons with disabilities will be adopted for the station

buildings/passenger cars (elevators, toilets, station announcement, braille blocks, wheelchair space, etc.), and customer care training for all frontline staff including station staff and members of the train crew is planned.

3) Gender Category:

[Gender Category]: GI(S) (Gender Activity Integration Project)

<Description of activities and reason for classification>

In the Project, measures such as setting priority seats for passengers needing assistance, installing CCTV cameras in station buildings/trains, and introducing low hand straps are planned so that women can use the subway safely and comfortably. Therefore, it is categorized as a Gender Activity Integration Project.

(9) Other Important Issues

None in particular

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Fiscal 2007)	Target (Fiscal 2023) [Expected value 2 years after project completion]
Operating rate (%/year)	—	89.4
Running distance (1,000 km/day)	—	27.6
Number of running train (number/day-direction)	—	213
Volume of transportation (million passengers-km/day)	—	3.27
Income from passenger (million rupees/day)	—	9.37

(Section: Howrah Maidan Station – Salt Lake Station)

(2) Qualitative Effects

Mitigation of traffic congestion in the Kolkata metropolitan area, mitigation of traffic pollution (reduction of global warming gas emissions, etc.), improvement in convenience by securing the scheduled mobility of the area, and economic development of the Kolkata metropolitan area

(3) Internal Rate of Return

Under the conditions indicated below, the economic internal rate of return (EIRR) and the financial internal rate of return (FIRR) will be 12.96% and 1.00%, respectively.

[EIRR]

Cost: Project cost (excluding tax), operation and maintenance expenses

Benefits: Operational maintenance and management cost reduction effect on the roads of the conventional transportation (bus, etc.), shortening effect on the traveling time for the users of the main line and other transportation, and traffic accident decline and the pollution mitigation effect

Project Life: 30 years

[FIRR]

Cost: Project cost, operation and maintenance expenses

Benefits: Fare income, advertisement revenue, and real estate development revenue

Project Life: 30 years

5. Prerequisites / External Factors

- (1) Prerequisites: Land acquisition/resident relocation in accordance with the schedule of India
- (2) External Factors: None in particular

6. Lessons Learned from Past Projects

From the ex-post evaluation of the “Delhi Mass Rapid Transport System Project Phase 3 (III)” for India, important lessons are acquired that it is desirable to promote efficiently operating public transportation systems as a whole by mutual cooperation of public transportation systems to construct systematic urban transport rather than the competing relationship among them and that it is important to establish a financially independent implementation system of projects from the viewpoint of ensuring proper operation and maintenance.

Also, in the Project, an increase in the utilization rate is indispensable for reinforcing the financial aspect, and coordination with the West Bengal State Transportation Bureau will take place so that the subway line is not competing with the bus route. In addition, MRK is engaged in strengthening its financial structure by implementing relevant businesses such as advertisement/real estate development.

7. Evaluation Results

In addition to Kolkata, JICA has supported urban railway construction projects in other metropolitan areas (Delhi, Bangalore, Mumbai, Chennai, Ahmedabad), and continuously supporting the Project, which is required as a measure against serious traffic jams in Kolkata, based on its experiences and knowledge along with the first and second phases that have already been supported, is consistent with the development issues/policies of India and the support policies/analysis of Japan and JICA. Also, since it is considered to contribute to achieving Goal 9 of the SDGs (building resilient infrastructure) and Goal 11.6 (inclusive, safe, resilient, and sustainable cities), it is highly necessary for JICA to support the implementation of the Project.

8. Plan for Future Evaluation

- (1) Indicators to be Used
Same as 4. (1) - (3)
- (2) Timing of the Next Evaluation
Ex-post evaluation: 2 years after project completion

END