

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: Republic of India

Project: Dedicated Freight Corridor Project (Phase I) (III)

Loan Agreement: March 31, 2016

Loan Amount: 103,664 million yen

Borrower: The President of India

2. Background and Necessity of the Project

(1) Present State of Development and Problems of the Railway Sector in India

The volume of freight traffic in India is increasing at an annual rate of 10% to 12%, but existing carrying capacity of rail lines is nearing saturation limits because the freight railway uses the same line with the passenger line of Indian Railway. Moreover, the average running speed of freight railway in India remains to be 24.2 km/h in 2014, facing to frequent remarkable delay and other issues. Due to such issues, the share of freight railway in the freight traffic market has decreased from 80% in the late 1950s to about 30% in 2014. As per demand forecast, rapid growth is expected along the Western Corridor connecting the major cities and the west coast area (the Delhi – Mumbai route) in container transportation of commodities and construction materials, such as cement and iron ore, between the Jawaharlal Nehru Port Trust (JNPT) and other international ports along the west coast and in the inland area of demand. It is also expected along the Eastern Corridor connecting the major cities and the east coast area (the Ludhiana – Delhi – Son Nagar route) in bulk carrier transportation of coal iron ore, cement, compost, grains, etc. Meanwhile, the average capacity of current rail lines in the whole sections accounts for only about a half of the demand of passenger/freight transportation in 2032.

(2) India's Development Policies for the Railway Sector and the Role of the Current Project

Following to its Eleventh Five-Year Plan, the Government of India acknowledged the need to expand routes and introduce high-speed trains with 25-ton axle load in order to facilitate freight transportation along trunk routes as well as improve access to port facilities in the Twelfth Five-Year Plan (April 2012 through March 2017). In particular, the Plan emphasizes the early development of dedicated freight rail lines, and upgrading of passenger/freight trains along the routes between Delhi and Mumbai, and between Ludhiana, Delhi and Kolkata. Of which, the Project is to improve dedicated freight railway along the routes between Delhi and Mumbai.

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

In Japan's Country Assistance Program For India (May 2006), "promotion of economic growth" is set as one of the priority areas and assistance is to be provided to the development of city transportation system (railways, track roads, airports and ports) from the perspectives of realizing effective and efficient development in urban regions and industrial cluster areas. In JICA Country Analysis Paper for India, (March 2012), in order to eliminate the bottleneck of economic growth, JICA intends to support the development of trunk railways (including considerations of high-speed

railway and freight traffic, etc.), roads, ports and other infrastructure mainly in India's six major metropolitan areas, as well as in special economic zones, economic corridors, and other industrial clusters located along the Delhi-Mumbai industrial corridor, with the aim of promoting regional economic development, efficient distribution, and foreign capital, and ultimately contributing to expanding investment in India. The project, therefore, fundamentally conforms to JICA's Japanese ODA Loan assistance policy.

As of the end of February 2016, JICA received authorization to provide ODA loans to India of the amount of 1,391.9 billion yen for 46 projects in the transportation sector; of which amount of 952 billion yen for 22 projects are in the railway sector (which accounts for 68.4% of the transportation sector). Regarding Technical Cooperation relevant to the Project, JICA has implemented the Dedicated Multimodal High Axle Load Freight Corridor with Computerised Control for Delhi-Mumbai and Delhi-Howrah (2006-2007) and the Technical Cooperation Project on the Assistance in Proof Examination for Running Stability of Dedicated Freight Corridor Transportation (2008). Since FY 2015, the Technical Assistance Project on Freight Transportation of Dedicated Freight Corridor has been implemented.

(4) Other Donors' Activity

The World Bank is currently working on to provide approximately 4,361 million USD to the improvement of the route between Ludhina and Mughal Sarai (1,193 km) along the Dedicated Freight Corridor. The Asian Development Bank (ADB) is currently working to assist Indian Railways in improving their organizational reform and other intangible areas. Previously, ADB provided 250 million USD to Bangalore Metro and 176 million USD to Jaipur Metro.

(5) Necessity of the Project

The Project is to realize efficient freight traffic through enhancing freight traffic capacity by constructing new dedicated freight lines, installing automated signal and communication systems, and introducing locomotives capable of high-capacity, high-speed transportation, which is stipulated as one of the priority projects in the Twelfth Five-Year Plan. The Project is also in line with the assistance policy of Japan and JICA in supporting traffic truck network and infrastructures along the Delhi-Mumbai industrial corridor including freight railway. Consequently, JICA's continuous support for this project is highly necessary.

3. Project Description

(1) Project Objective

The Project is to respond to freight transportation needs, high growth rate of which is expected in future, and streamline logistic networks by constructing new lines connecting major cities in the states of Gujarat, Rajasthan, and Haryana where the priority of improvement is particularly high among those areas along the planned section of dedicated freight railway between Delhi and Mumbai as well as Ludhiana, Delhi and Son Nagar, thereby contributing to economic development in a broad area of India.

(2) Project Site/Target Area

The Rewari-Vadodara route across the states of Haryana, Rajasthan, and Gujarat located along

the Delhi-Mumbai route

(3) Project Components

- 1) Civil and construction works: track board improvement, construction of buildings such as bridges, freight station, branch station, etc. (Japan-tide)
- 2) Track construction: installation of rails, etc. (Japan-tide)
- 3) Electrical and mechanical works: improvement of wire, substation, etc. (Japan-tide)
- 4) Signal and telecommunication works: improvement of signal and telecommunication system, construction of automated crossing system (Japan-tide)
- 5) Procurement of train cars, etc.: electric locomotive (9,000h.p./3 axle), maintenance and inspection cars, etc. (Japan-tide)
- 6) Consulting services: construction supervision, quality and safety management, assistance for trial run, review of manuals related to operation and maintenance, planning and implementation support for operation and maintenance (including implementation of training program), implementation management of environmental management plan and monitoring plan for resettlement, social development (PA/raising residents' awareness, HIV prevention activities, etc.) and others (Short list)

(4) Project Cost (planned)

555,542 million yen (Loan amount: 457,856 million yen)

(5) Project Implementation Schedule/Cooperation Period

October 2009 – November 2025 (194 months in total). The project completion is defined as the commencement of the service (January 2014).

(6) Project Implementation Structure

- 1) Borrower: The President of India
- 2) Guarantor: none
- 3) Executing Agency: Ministry of Railways (MOR) and Dedicated Freight Corridor Corporation of India Limited (DFCCIL)
- 4) Operation and Maintenance System: the DFCCIL is responsible for operation and maintenance of tracks and signal/telecommunication system while the MOR is in charge of freight traffic operation including locomotive maintenance.

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

1) Environmental and Social Considerations

- ① Category: A
- ② Reason for Categorization:
The Project falls into the railway sector under the JICA guidelines for environmental and social considerations (April 2010) and is likely to have significant adverse impact due to its characteristics.
- ③ Environmental Permit:
Preparation of an Environmental Impact Assessment (EIA) report for this project is not required under Indian law. However, an EIA report was completed in August 2009 and

approved by the MOR on August 13, 2009.

④ Anti-Pollution Measures:

In accordance with the environmental management plan, measures for dust, proper storage of construction materials, measures for noise by using low noise machinery, etc. are taken by the contractor during the construction. As for noise during the service, mitigation measures were considered including installation of soundproof wall in residence density areas as needed. Measures considered in detailed design were reflected to detailed environmental management plan and the contractor is expected to take necessary measures in accordance with the plan.

⑤ Natural Environment:

The project site is located mainly in an agricultural land and unused land, and the route is planned not crossing all reserves for wild animals. Thus, adverse effects of the project is expected to be minimal.

⑥ Social Environment:

The Project will require approximately 3,714 ha of land to be acquired and the DFCCIL convenes discussions on land acquisition and resettlement. Based on the resettlement plan approved by the MOR, the DFCCIL will compensate at reacquisition price and necessary support for recovering livelihood of residents. An entitlement matrix was created in May 2015 based on a new law concerning land acquisition. Of land acquisition and resettlement carried out in the Project, the compensation and support in line with the new entitlement matrix will be provided to approximately 214 ha (56 households). The procedures of land acquisition and resettlement will be completed by September 201.

⑦ Other/Monitoring:

In the Project, the executing agency will monitor noise, vibration, soil, air quality, water quality, soil pit, vegetation, land acquisition, resettlement and other items via a contractor. When in service, the executing agency will monitor noise, vibration, soil and water quality.

2) Promotion of Poverty Reduction

None in particular

3) Promotion of Social Development (e.g. Gender Perspective, Measures to Prevent Infectious Diseases Including AIDS, Participatory Development, Consideration for Handicapped, etc.)

Many of the migrant workers employed by the Project live alone, and the risk of HIV/AIDS infection is considered high. For this reason, MEGA in cooperation with local NGOs has been implementing HIV/AIDS prevention activities by its own funds. At the same time, as a working environment policy, HIV/AIDS prevention clauses have been inserted in tender documents, and each contractor is expected to cooperate with efforts to prevent HIV/AIDS infection.

(8) Collaboration with Other Donors

None in particular

(9) Other Important Issues

None in particular

4. Targeted Outcomes

(1) Quantitative Effects

1) Operation and effect indicators ¹

Indicators	Baseline (2007) ²	Target (2026) [two years after completion]
Operation rate (%)	—	93
Running distance (1,000 trains-1,000 km/day)	37.9	250.8
Number of running trains (both directions)	33	222
Volume of transportation (millions of tons/km) per day ³	55.6	336.9
Maximum speed (km/hour)	75	100
Reduction in transportation time (hours) ⁴	—	18.25

¹ Values only for the target section of the Project (between Rewari and Vadodara).

² Current values of Indian Railways' conventional lines were set as the baseline of each indicator.

³ Volume of transportation does not include road transportation, etc.

⁴ Transportation time in the target section shows the gap of time required with the current average speed and the average speed in the target years.

2) Internal Rate of Return

Based on the conditions indicated below, the economic internal rate of return (EIRR) of the Project will be 17.0% and the financial internal rate of return (FIRR) will be 6.4%.

【EIRR】

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

Benefit: Reduction in freight transportation costs, reduction in transportation time, and reduction in road maintenance cost.

Project Life: 30 years

【FIRR】

Cost: Project cost, operation and maintenance cost

Benefit: Revenue from freight charges

Project Life: 30 years

(2) Qualitative Effects

The qualitative effects of the Project include response to freight transit needs, efficient logistics network, and promotion of economic development in broad areas.

5. External Factors and Risk Control

(1) Precondition: none in particular

(2) External Factors: none in particular

6. Evaluation Results and Lessons Learned from Past Projects

(1) Results of Evaluation of Similar Past Projects

The results of ex-post evaluation of the Metro Manila Strategic Mass Rail Transit Development (I), (II), (III) in the Republic of the Philippines, etc. indicate that in a case where a public enterprise implements an ODA Loans project and its operation and maintenance works, a comprehensive support including financial improvement of executing agency and efficient management is needed with a particular attention made to financial sustainability of such an enterprise.

(2) Lessons for the Project

Based on the lessons as above, the Project is following the enhancement of operation and management structure including formulation of financial strategy implemented by consultants hired by the DFCCIL. Besides, the Technical Assistance Project on Freight Transportation of Dedicated Freight Corridor will be implemented to propose the improvement of organizational structure.

7. Plan for Future Evaluation

(1) Indicators for Future Evaluation

- 1) Operation rate (%)
- 2) Running distance (1,000 trains-1,000 km/day)
- 3) Number of running trains (both directions)
- 4) Volume of transportation (millions of tons/km) per day
- 5) Maximum speed (km/hour)
- 6) Reduction in transportation time (hours)

(2) Timing

Two years after project completion