

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: India

Project: Project for the Construction of Training Institute for Mumbai-Ahmedabad High Speed Rail

Loan Agreement: September 15, 2017

Loan Amount: 10,453 million yen

Borrower: The President of India

2. Background and Necessity of the Project

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

The population of India has been growing rapidly. It jumped from 844 million in 1991 to 1,002.9 million in 2001 and further to 1,210 million in 2011 and will continue to grow, according to the 2011 Census of India. Such a population growth and the recent rapid economic growth of more than seven percent per annum have been sending domestic passenger and freight traffic soaring. The passenger traffic rose about 70 percent from 2000 to 2016, while the freight traffic surged some 130 percent during the same period, according to the Ministry of Railways' Indian Railways Year Book 2015-2016. The current track capacity is only about 50 percent of the passenger and freight traffic demand projected for 2032 on national average. Frequent delays in the train service also constitute a major bottleneck for the smooth movement of people.

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

As it stands, private cars and buses account for some 85 percent of the traffic between Mumbai--the capital of Maharashtra State and the second largest city in India--and Ahmedabad--which has recently been growing as a commercial and industrial city in Gujarat State. These two states are experiencing economic growth at a faster rate than the national economy, and their economies will continue to grow for more than three decades, according to the Planning Commission of the Government of India. In India, higher income households are more likely to resort to airplanes or other means of transportation that allow them to travel longer distances in a shorter amount of time. Expectations are high for high-speed rail with mass transit and high-frequency transit capacities to play an important role in meeting that demand. Under these circumstances, a demand forecasting study that has been conducted for the Mumbai-Ahmedabad High Speed Railway Project ("High Speed Railway Project") in connection with the Joint Feasibility Study for Mumbai-Ahmedabad High Speed Railway Corridor (ODA loan account technical assistance) estimates that the passenger traffic demand will increase fivefold by 2053 from the 2023 level, when the railway is scheduled to be put into service.

In December 2009, the Ministry of Railways (MoR) of India announced the Indian Railways Vision 2020, which called for, among other things, constructing high-speed rail for priority lines, including the Mumbai-Ahmedabad section, as well as modernizing the existing lines and boosting their transport capacity. In a joint Japan-India statement in December 2015, the two governments agreed that the Mumbai-Ahmedabad section will be developed with the use of Japanese high speed rail technologies and experience and that, in this regard, detailed consultations will be held so that financial and technical assistance will be provided by Japan. As this will be the first high-speed railway in India, they also

confirmed the need to build a training institute designed to develop human resources for operation and maintenance services before this section is put into service. (Although the construction of other priority lines has not been confirmed yet, other donors have conducted pre-F/S and F/S on some of these planned lines.)

The High Speed Rail Project makes for efficient passenger transport by boosting passenger transport capacity through the construction of the line, the installment of a fully-automated signal and communication system, and the introduction of high-speed cars. Since it will be India's first high-speed line, there is an urgent need to develop human resources for the operation and maintenance of the facilities in parallel with their construction, Though there are training institutes under the purview of the MoR, they are incapable of teaching both physical and non-physical aspects of technologies for running trains at the operational speed of more than 300 km/h. Such technologies need to be taught otherwise. The Project for the Construction of Training Institute for Mumbai-Ahmedabad High Speed Rail ("Project") is designed to construct a facility for training personnel who can engage in the High Speed Rail Project. As noted earlier, it is one of the essential projects for the operation of the High Speed Rail Project, which is defined as a priority undertaking in the Indian Railways Vision 2020 among other national policies.

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

Japan's Country Assistance Policy for India (March 2016) identifies enhancing connectivity as one of the priority areas of assistance. It states to the effect that, with a view to de-bottlenecking the infrastructure constraints to investment and growth, Japan will support the development of a transportation hub and network infrastructure as well as electricity and other infrastructure to strengthen connectivity among major industrial cities and economic zones, and also among regions in the country. JICA Country Analysis Paper for India (March 2012) states that, in order to eliminate economic bottlenecks, assistance is necessary to support the development of trunk railways (which may include high-speed rail and freight transport), urban rail, roads, ports, and other infrastructure that will contribute to promoting regional economic development, streamlining logistics, and increasing investment by foreign capital, chiefly in areas where JICA's assistance will likely have a greater impact: special economic zones, economic corridors, and other industrial clusters located in India's six major metropolitan areas and along the Delhi-Mumbai Industrial Corridor (DMIC). The Project is consistent with the policy and analysis above. It is worth adding that, by July 2017, Japan made a total of 53 ODA loan commitments in the transport sector in India, totaling 1,850.2 billion yen. These include five commitments, totaling 334.3 billion yen, for the Dedicated Freight Corridor Project (Phases 1 and 2), which constitutes a core element of DMIC. The plan and design of the training institute to be developed under the Project, as well as its human resource development plan, was formulated under the Joint Feasibility Study for Mumbai-Ahmedabad High Speed Railway Corridor (ODA loan account technical assistance).

(4) Other Donors' Activity

The World Bank has supported the Mumbai Urban Transport Project (the development of roads and suburban railways) 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. For urban railways, the ADB extended 250 million

dollars in aid to Bangalore Metro in March 2012 and 176 million dollars in aid to Jaipur Metro in May 2014.

(5) Necessity of the Project

The Project, which is designed to construct a training institute for developing human resources for the operation and maintenance services for the High Speed Rail Project, is consistent with the development issues and policies of India, as well as Japan's and JICA's assistance policy and analysis. It is also expected to contribute to attaining Goal 9 of the SDGs. Therefore, JICA's support for the implementation of the Project is much needed.

3. Project Description

(1) Project Objective

The objective of the Project is to enhance the structure for training personnel responsible for the operation and maintenance services for the High Speed Rail Project by constructing a training institute in the city of Vadodara in Gujarat State, thereby contributing to smooth operation and maintenance services for the High Speed Rail Project as well as to safe and comfortable transit services.

(2) Project Site/Target Area

Vadodara, Gujarat State

(3) Project Components

- 1) A training line with slab track (international competitive bidding (tied))
- 2) A training building, a building for meals and other services, training equipment, and training facilities (excluding the training line with slab track (international competitive bidding (tied)))
- 3) An accommodation building (local competitive bidding)
- 4) Consulting services (construction supervision; technology transfer, etc., for developing the management capacity of the executing agency) direct contract)

(4) Estimated Project Cost (Loan Amount)

12,514 million yen (loan amount: 10,453 million yen)

(5) Schedule

September 2017 - September 2020 (37 months in total). The Project is considered completed when the facilities are put into service (scheduled for September 2020).

(6) Project Implementation Structure

- 1) Borrower: The President of India
- 2) Guarantor: none
- 3) Executing Agency: National High Speed Rail Corporation Limited (NHSRCL)
- 4) Operation and Maintenance System: NHSRCL will operate and maintain the completed institute and provide training there. Before and sometime after the high speed rail is put into operation, Japan will provide multiple long-term experts as necessary. The idea is to complement any training activities that may be inadequate due to insufficient working experience on the part of NHSRCL in this field, including the lack of competent instructors for more

effective training. The central government has allocated a sufficient budget to the MoR, the supervising body and the largest investor of NHRCL, for the Project. This budget will also cover the operation, maintenance, and training costs as these activities are essential for the safe and timely implementation of the High Speed Rail Project--a national development project--leaving no significant financial concerns.

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

1) Environmental and Social Consideration

(i) Category: C

(ii) Reason for Categorization

The Project is deemed to have the minimum adverse impact on the environment as defined by the JICA Guidelines for Environmental and Social Considerations, promulgated on April 1, 2010.

2) Promotion of Poverty Reduction

None in particular

3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for the Person with Disability, etc.)

As many of the workers who will engage in the Project will likely live alone during the construction work, a high risk of HIV/AIDS infection will be likely. For this reason, a plan for HIV prevention activities will be put in place. The contractors will be obliged to take measures in line with such a plan.

(8) Collaboration with Other Donors

None in particular

(9) Other Important Issues

Tied procurement is part of the terms and conditions of the Project. The two governments have agreed that the Project will be implemented by taking advantage of Japan's technology and experience.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

A) Outcomes

Indicator	Baseline (Actual value in 2017)	Target (2023) [Expected value when the high speed rail is put into service*]
1. Cumulative total of training participants		
Station operation and management	—	390
Train operation (driver)	—	100
Train operation (conductor)	—	168
Stock maintenance	—	93
Stock manufacturing	—	290
Civil engineering and track maintenance	—	257
Overhead contact lines	—	165
Signal and communication system	—	165
System maintenance	—	10
2. Usage of training equipment and accommodation building (annual average) (%)	—	90

B) Impact

Indicator	Baseline (Actual value in 2017)	Target (2023) [Expected value when the high speed rail is put into service*]
Percentage of training participants who come to provide services related to the High Speed Rail Project (providers/participants/year)	—	100

* The target is set for the time when the high speed rail is put into service, scheduled for 2023, because this is when the effects of the Project will manifest themselves in the performance of the training of necessary operation and maintenance personnel.

2) Internal Rate of Return

The internal rate of return is not calculated because the training itself will generate no return and because the benefit of the training is difficult to quantify.

(2) Qualitative Effects

Raised awareness of the employees engaged in the high-speed rail between Mumbai and Ahmedabad about the safety and accuracy of the services.

5. External Factors and Risk Control

- The plan to hire new and additional employees is developed in accordance with the mid- to long-term business forecasts of NHSRCL.

6. Lessons Learned from Past Projects

The ex-post and other evaluations of the Mulawarman University (UNMUL) Development Project and the project entitled “Development of Faculty of Medicine and Health Sciences of Syarif Hidayatullah State Islamic University,” both of which were conducted in Indonesia, indicate that the advanced equipment procured in these projects remains underused, meaning that experience and skills have not been accumulated, resulting in technical insufficiency.

The Project also plans to procure advanced equipment such as driving simulators, in addition to the construction of the institute, including the training building. While accurately assessing the actual and potential usage of such equipment, the Project will support the development of the plan to hire NHSRCL employees who will serve as instructors as well as training plans. It will also provide capacity building training for such employees. In these processes, the Project will build on two projects that were launched earlier as ODA loan account technical assistance: the Assistance for Formulation of Technical Regulations regarding the High Speed Railway Project, and the Detailed Design Study on the High Speed Railway Construction Project in India.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Cumulative total of actual training participants (station operation and management)
- 2) Cumulative total of actual training participants (train operation (driver))
- 3) Cumulative total of actual training participants (train operation (conductor))
- 4) Cumulative total of actual training participants (stock maintenance)
- 5) Cumulative total of actual training participants (stock manufacturing)
- 6) Cumulative total of actual training participants (civil engineering and track maintenance)
- 7) Cumulative total of actual training participants (overhead contact lines)
- 8) Cumulative total of actual training participants (signal and communication system)
- 9) Cumulative total of actual training participants (system maintenance)
- 10) Usage of training equipment and accommodation building (annual average based on monthly usage) (%)
- 11) Percentage of training participants who come to provide services related to the High Speed Rail Project (providers/participants/year)

(2) Timing

2023 (when the high speed rail is put into service)

(The target is set for the time when the high speed rail is put into service, scheduled for 2023, because this is when the effects of the Project will manifest themselves in the performance of the training of necessary operation and maintenance personnel.)