

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: Republic of India

Project: Mumbai Trans-Harbour Link Project (I)

Loan Agreement: March 31, 2017

Loan Amount: 144,795 million yen

Borrower: Mumbai Metropolitan Region Development Authority

2. Background and Necessity of the Project

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

In India, which has not adequately developed its public transport infrastructure despite the recent rapid urbanization, road traffic congestion has become a serious problem in major urban centers of the country, and economic losses associated with this pose a huge obstacle to furthering economic development. As the road sector accounts for about 57% of the transport activities of the country, India regards the comprehensive development of roads and other infrastructure as a vital element for continuing its economic growth and places great emphasis on development work in this sector.

The Mumbai metropolitan region is one of the largest metropolitan areas in India, the population of which reached 18.41 million people in 2011, and the city of Mumbai, the center of the region, is one of the world's most densely populated cities (with a population density of 20,694 people/km²). As a result of the rapid urbanization, the number of registered automobiles in the city has risen dramatically in recent years, from 107 million in 2002 to 203 million in 2012 (source: Road Transport Year Book 2011-2012, issued by the Ministry of Road Transport and Highways of India). Taking this situation into account in Mumbai and the fact that the city is located on the edge of the peninsula and thus does not have much land remaining for development, the Government of Maharashtra decided to promote economic growth in a wider area for the Mumbai metropolitan region by attracting industries to Navi Mumbai, which is situated on the shore opposite to Mumbai, as well as implementing various development work there, such as the development of a special economic zone, expansion of the Jawaharlal Nehru Port (406 million TEU capacity, 2010-2011), a port with one of the largest amounts of cargo handled in India, and the development of a new airport. Nevertheless, there are only two routes connecting Navi Mumbai to Mumbai, a road and a railway route running around the gulf. In fact, this lack of sufficient connectivity between the two areas poses another challenge and it is anticipated that traffic congestion will become even more serious in the future.

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

In response to the challenges faced by the transport sector, the Indian Government

has indicated in the National Highway Development Plan (hereinafter referred to as “NHDP”) the necessity of facilitating the development of National Highways while striking a good balance with the development of state and other highways and local main roads. The Indian Government also advises that a program similar to the NHDP should also be established for State Highways and recommends that each state government develop their own core network of State Highways. In addition, the Comprehensive Transport Study for the Mumbai Metropolitan Region was established in 2008 to summarize necessary transport measures in the region. This plan envisions regional transport as a seamless and integrated system, promotes expansion of the railway network inside and around the Mumbai metropolitan region, and proposes expansion of the road network. In the plan, the Mumbai Trans-Harbour Link Project (hereinafter referred to as “the Project”), which connects the Mumbai city center with Navi Mumbai via a road on the sea, is referred to as a project that needs to be implemented as soon as possible to resolve the above challenge and is regarded as an essential project for further economic growth in the Mumbai metropolitan region. Furthermore, the Project is also expected to contribute to better access to Pune, a city in the same state that is situated to the northeast of the Mumbai metropolitan region.

(3) Japan and JICA’s Assistance Policies and Operations in the Road Sector

Japan’s Country Assistance Policy for India, established by the Japanese Government in March 2016, states that it is necessary to “develop important infrastructure required to ensure continued investments and a high economic growth rate while India needs to achieve comprehensive and stable high economic growth.” In addition, the policy sets “enhancement of regional connectivity” as one of its priority areas and states that with a view to removing the bottlenecks in the infrastructure constraining investment and growth, it is necessary to support the development of transport infrastructure that will act as transport hubs and networks, to strengthen connectivity among major industrial cities and economic zones, as well as regional connectivity, in the country. It also says that Japan-India cooperation towards greater connectivity between regions in the northeastern part of India and other parts of the country, which has been confirmed between the leaders of the two countries, should be promoted. Furthermore, JICA’s Country Analysis Paper for India (March 2012) also regards the development of industrial and urban infrastructure as one of its priority areas and indicates the necessity of providing assistance for the development and improvement of infrastructure contributing to the acceleration of regional economic development and streamlining of logistics, including roads, to resolve bottlenecks in economic growth. The Project is consistent with these policies and analysis paper. As of February 2017, JICA received authorization to provide ODA loans to India in the amount of 175.8 billion yen for 10 projects in the road/bridge sector (which accounts for 14% of the transportation sector in India). Also, in the area of Technical Cooperation, JICA has implemented the Institutional Development Project on the

Supervision for Highway and Expressway Operation, Management and Maintenance to help develop management and maintenance manuals and prepare technical specifications.

(4) Other Donors' Activities

The World Bank has been implementing the Mumbai Urban Transport Project (developing state highways and a suburban rail system for the city of Mumbai). The Asian Development Bank has also been working on a state highway improvement project in the states of Maharashtra and Gujarat.

(5) Necessity of the Project

The Project is designed to contribute to regional economic growth in the Mumbai metropolitan region, where many Japanese companies are in operation. Furthermore, improved connectivity between Mumbai and Navi Mumbai is expected to not only benefit Japanese companies that have their bases in Navi Mumbai, but also have indirect positive effects on Japanese companies operating in and around the city of Pune, as well as Japanese companies planning to join the industrial complex for Japanese companies that is planned to be built in the city of Pune. The Project is consistent not only with the development themes and policies of the Indian Government, but also with the assistance policies of Japan and JICA. Therefore, it is highly necessary and appropriate for JICA to provide assistance in implementing the Project.

3. Project Description

(1) Project Objective

The objective of the Project is to increase connectivity between Mumbai and its surrounding areas, particularly Navi Mumbai, which is undergoing large-scale urban development, by constructing an ocean road connecting the Mumbai city center to Navi Mumbai in the eastern suburbs of Mumbai across the Gulf of Mumbai, thereby contributing to further economic growth in the Mumbai metropolitan region.

(2) Project Site/Target Area

Mumbai Metropolitan Region, State of Maharashtra

(3) Project Components

- 1) Road on the sea: three lanes on each side, superstructure work (including a 4-km extension of the bridge consisting of a PC girder bridge and steel composite deck slab bridge), substructure and foundation work (pile bent and cast-in-place), approach roads, connectors to the major highways, related facilities (toll gates, management facilities, etc.), road safety facilities and intelligent transport systems (ITSs), such as an electronic toll collection system (ETC) and control center
- 2) Consulting services: outline design, bidding assistance, and supervision for construction work

(4) Project Cost

326,531 million yen (Loan Amount: 276,333 million yen)

(5) Schedule

June 2016 – June 2023 (85 months in total). Project completion is defined as the commencement of service (June 2021).

(6) Project Implementation Structure

1) Borrower: Mumbai Metropolitan Region Development Authority (MMRDA)

2) Guarantor: President of India

3) Executing Agency: MMRDA

4) Operation and Maintenance System: Once the Project is completed, operations and maintenance work are to be outsourced to private-sector companies under the supervision and responsibility of the MMRDA. It is planned that the MMRDA will pay a fixed amount of money to the private-sector companies to cover the cost of operations and maintenance work.

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

1) Environmental and Social Considerations

① Category: A

② Reason for Categorization: The Project is classified as Category A because it has the potential to exert significant negative impact by being classified into the road/bridge sector under the Japan International Cooperation Agency Guidelines for Consideration of Environmental and Social Considerations (published in April 2010).

③ Environmental Permit: Preparation of an Environmental Impact Assessment (EIA) report for the Project is not required under Indian law. However, an EIA report was created and approved in November 2015 by the MMRDA. A Coastal Regulation Zone (CRZ) clearance was also granted by the Ministry of Environment & Forests in January 2016.

④ Anti-pollution Measures: Mitigation measures against air pollution, noise, vibration, etc. that may be caused during the construction work will be taken by the contractors, such as water sprinkling and use of low-noise construction machinery. After the commencement of the service, it is planned that measures will be taken in cooperation with the environmental authorities of the state of Maharashtra to minimize air pollutants, noise and vibration to meet the environmental standards set by India, for example by controlling use of land along the route and installing noise reduction walls.

⑤ Natural Environment: Although the project site partially passes through a tidal flat designated by BirdLife International as an Important Bird Area (Mahul-Sewri Creek), the Project is unlikely to cause any significant negative impact on the habitats of flamingoes or other birds. Given that a bird-friendly bridge design is adopted and mitigation measures, such as installation of noise

reduction walls, are planned to be taken, it is believed that no significant negative influence will be caused on the natural environment.

⑥ Social Environment: The Project involves resettlement of 1,272 residents in 282 households. The resettlement will be implemented in accordance with a resident relocation plan that is created and approved by the executing agency in compliance with Indian law and the resident resettlement policy of the state of Maharashtra and meets the JICA guidelines. The Project also involves land acquisition of 96 ha, of which 69 ha will be transferred from City and Industrial Development Corporation of Maharashtra Limited (CIDCO) to the MMRDA and the remaining 27 ha is now in the process of acquisition by CIDCO. Land owners are to receive compensation equivalent to the reacquisition prices after their consent. The MMRDA provided residents with detailed information about their places of resettlement after receiving opinions from them about the places, e.g., location and distance, at a resident consultation meeting, and obtained their basic consent. No particular objections to the Project have been raised among them. Furthermore, as the Project may affect the livelihood of some of the fishermen working around the Gulf of Mumbai, the MMRDA has established a compensation policy and explained it to local fishery workers. There has been no significant resistance among them either.

⑦ Other/Monitoring: Anti-pollution measures (air quality, noise, vibration, etc.) are to be monitored by the contractor of each kind of construction work during construction and by the MMRDA after the commencement of the service. Furthermore, the MMRDA will also monitor the resettlement of residents, as well as flamingoes and other birds.

2) Poverty Reduction: N/A

3) Social Development: As the Project involves a large number of workers, the HIV transmission risk is considered to be rather high¹. As such, it is planned that the instructions to bidders will contain a provision on HIV/AIDS prevention requiring contractors to cooperate in its preventive measures against HIV/AIDS as part of the Project's efforts to minimize HIV infection risks during construction work.

(8) Collaboration with Other Donors: N/A

(9) Other Important Issues: N/A

¹ According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), India was ranked third in the world after South Africa and Nigeria in the number of HIV infected people, with 2.1 million infected people (estimated number) as of 2012. (Source: Global Report; UNAIDS report on the global AIDS epidemic 2013)

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (recorded in 2015)	Target (2023) [2 years after project completion]
Annual average traffic volume (PCU/day)	-	42,650
Time required (min/vehicle) (peak times) Sewri – Chirle (General road route via Vashi Bridge)	61	16

(2) Qualitative Effects

The qualitative effects of the Project include mitigated road traffic congestion in the Mumbai metropolitan region and increased convenience resulting from more punctual journeys inside the region.

(3) Internal Rate of Return

Based on the conditions indicated below, the economic internal rate of return (EIRR) of the Project will be 13.7% and the financial internal rate of return (FIRR) will be 0.7%.

【EIRR】

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

Benefit: Saving of vehicle operating cost and travelling time

Project Life: 32 years

【FIRR】

Cost: Project cost, and operation and maintenance cost

Benefit: Toll revenue

Project Life: 32 years

5. External Factors and Risk Control

- The political and economic conditions in India, particularly in and around the target area, will not worsen. No large-scale natural disasters will hit the country/area.
- The policy of the Indian Government and the organization and operations of the executing agency will not be changed.
- There will not be any drastic change in the use of land or facilities in the target area.

6. Lessons Learned from Past Projects

(1) Results of Evaluation of Similar Past Projects

The lesson that when implementing a project, the major objective of which is to develop infrastructure from a comprehensive perspective, it is important to fully analyze and examine how other road/transport networks have been developed and are being planned and reflect the results in the preparatory work for the project was learned from the ex-post evaluation of the “Second Mekong International Bridge Construction Project” in the Kingdom of Thailand and Lao People's Democratic Republic.

(2) Lessons for the Project

In accordance with the above lesson, JICA will conduct comprehensive research on road plans and all other development plans that could be related to the Project at the implementation stage and make proposals for the construction of a wide-area transport network across the target area in order to maximize the development effects of the Project.

7. Plans for Future Evaluation

(1) Indicators to be used

- 1) Annual average traffic volume (PCU/day)
- 2) Time required (min/vehicle)
- 3) Economic internal rate of return (EIRR) (%)
- 4) Financial internal rate of return (FIRR) (%)

(2) Timing of the next evaluation

Two years after project completion

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