

## Ex-ante Evaluation Paper (for Japanese ODA Loan)

### South Asia Division 1, South Asia Department, JICA

#### 1. Basic Information

Country: India

Project: Project for the Construction of Chennai Peripheral Ring Road (Phase 1)

Loan Agreement: January 18, 2019

#### 2. Background and Necessity of the Project

##### (1) Current State and Issues of the Road Sector and the Development of the North East State Region in India and the Positioning of this Project

As rapid urbanization has progressed in India in recent years, traffic congestion due to the lack of an adequate transportation infrastructure has become a severe issue in urban areas, obstructing economic development. As roads carry 85.2% of all passenger transport and 62.9% of all freight transport in India, a Three-Year Action Agenda (Apr. 2017 to Mar. 2020) set by NITI Aayog (National Institution for Transforming India Aayog) cited transportation as a top requirement for the country to realize economic growth, and expressed intentions to develop transportation infrastructure including roads.

The population of the Chennai metropolitan area, the target area of the Project for the Construction of Chennai Peripheral Ring Road (Phase 1) (hereinafter the “Project”) increased from around 6.56 million in 2001 to 8.9 million in 2011 (Source: 2011 India census), causing traffic volumes in the city to increase and worsening the already chronic traffic congestion. The state government, while aiming for high economic growth under Vision Tamil Nadu 2023 (2012), prioritized road infrastructure development in an effort to stimulate logistics, and planned to construct the Peripheral Ring Road in order to address the rising transportation demand.

The Chennai metropolitan area, which faces the Bay of Bengal, functions as a key location for transportation and logistics in and outside India while serving as a gateway to South East Asia. As manufacturing is brisk in the area, there are many industrial parks mainly in the southwest district of the city, where numerous Japanese-owned companies, such as automobile manufacturers, have expanded. Given that in recent years, an issue has been raised about the shortage in handling capacity of the Port of

Chennai, situated in central part of the city, it is urgently required to improve access to Ennore Port, a port seeing increased development and usage lying to the north of the city. The master plan formulation survey (2015) for the Chennai Bengaluru Industrial Corridor (hereinafter "CBIC") vision, pursued by Japan and India, said the slow development of the access road to this port impeded the business activities of the entire CBIC area. In 2016, the Japanese Chamber of Commerce & Industry, Chennai submitted to the Government of Tamil Nadu a proposal outlining the need for early development of the road given its high priority. Aware of its importance, the government plans to develop, on a priority basis, section 1 of the Peripheral Ring Road, which will serve as the access road to Ennore Port. The Project is expected to contribute to the economic development of the Chennai metropolitan area through installation of section 1, and is positioned as a priority project under the CBIC Project.

(2) Japan's and JICA's Road Sector and North East State Region Cooperation Policy and the Positioning of this Project

Japan's Country Assistance Policy for India (March 2016) specifies "strengthening connectivity" as a priority area and states that Japan will support the development of a transportation hub and network infrastructure to strengthen regional connectivity as well as connectivity in major industrial cities and economic zones. The policy also says Japan will give specific form to wide-area economic development programs such as the CBIC vision.

The JICA Country Analysis Paper for India (March 2018) specifies strengthening of India's industrial competitiveness as a priority area in order to give increased stability to the nation's economic growth. Japan will assist in developing significant infrastructure, such as high-standard roads that will contribute to the competitiveness of industries such as manufacturing, and provide assistance conducive to promoting direct overseas investment. In this respect, the Project is consistent with the policy and analysis discussed above.

JICA has approved 59 ODA loans totaling 2,124.3 billion yen to India for its transportation sector (as of August 31, 2018).

(3) Other Donors' Activity

In the road sector, the World Bank has provided support for a state road development project in Tamil Nadu (approved in 2003; US \$348 million) as well as Phase 2 of the same project (approved in 2015; US \$300 million). Meanwhile, the Asian Development Bank has provided support for the construction of state roads in other states including the Karnataka State

Highways Improvement Project (approved in 2010; US \$305 million) and, Rajasthan State Highway Investment Program (approved in 2017; US \$500 million).

### **3. Project Description**

#### (1) Project Objective

To construct section 1 of the Peripheral Ring Road in the Chennai metropolitan area, thereby addressing fast-growing road transportation demand and contributing to economic growth in the area.

#### (2) Project Site/Target Area: Chennai Metropolitan Region (Tamil Nadu State)

#### (3) Project Components

- 1) Road construction work (25.1 km [21.5 km of the east-west main line and 3.6 km of the north-south branch line]): Two lanes on each side of the main line road, two lanes on each side of the service road (frontage road), coupled with interchanges and flyovers (bridges)
- 2) Introduction of ITS equipment (toll collection system [ETC] and traffic control system)
- 3) Consulting services (detailed design review [road construction], basic design [ITS], tender assistance, construction supervision and technical transfer for the operation, maintenance and control of ITS, etc.)

#### (4) Estimated Project Cost

74,497 million yen (of which, the ODA Loan amount is 40,074 million yen)

#### (5) Schedule

January 2019 to August 2026 (92 months in total). Project completion is defined as the date on which the installed facilities are put into operation (August 2023).

#### (6) Project Implementation Structure

- 1) Borrower: President of India
- 2) Guarantor: None
- 3) Executing Agency: Highways and Minor Ports Department (hereinafter "HMPD")
- 4) Operation and Maintenance agency:  
O&M will be outsourced to private companies under the supervision and responsibility of HMPD, which has experience of outsourcing before as the controller of state roads and certain national roads in Tamil Nadu.

While O&M expenses will be paid for with toll income, budget will be appropriated by the state government, as required.

(7) Collaboration with Other Schemes and Donors

1) Related aid activities by Japan:

The introduction of ITS equipment (Traffic Information System [TIS], Traffic Management System [TMS] and Bus System [BS]) in Chennai, although having been initially included in the Project, was separated as the Project for Installation of Chennai Metropolitan Area Intelligent Transport Systems, an ODA program, and the L/A was entered into in March 2018.

2) Aid activities of other aid organizations: None in particular.

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

1) Environmental and Social Considerations

(i) Category: A

(ii) Categorization Rationale:

This Project falls under the road sector and a characteristic prone to have effects (large-scale non-voluntary resident transfer) that are listed in the 'JICA Guidelines for Environmental and Social Considerations' (promulgated in April 2010).

(iii) Environmental approval: HMPD conducted an environmental impact assessment (EIA) for potential environmental impact from the Project. In August 2018, the assessment was approved by the State Environment Impact Assessment Authority Tamil Nadu (TNSEIAA).

(iv) Pollution control measures: During the construction work period, the Project will probably create effects such as air pollution, water quality erosion, waste, noise and vibration and soil pollution. The personnel will work to minimize these potential effects by taking control measures in the form of water sprinkling systems, septic tanks and waste treatment facilities at worker accommodations, low pollution equipment and sound insulation walls and oil separation machines. To address noise and vibrations after the start of operation, personnel will take control measures such as the installation of sound insulation walls.

(v) Natural environment aspect: Given that the area targeted by the Project does not fall under a location or is nearby a place that is susceptible to effects, such as a national park, any undesirable effect

on the natural environment will likely be minimal. Although 120 trees will be felled and 217 trees transplanted, 1,200 trees (10 times the number) will be planted as substitutes for the trees to be felled and, for the trees to be transplanted, they will be planted in an identical number in the vicinity of the original habitat of them, according to the plan.

(vi) Social environment aspect: The Project will involve an acquisition of land 250.8 ha in size and a relocation of residents of 60 households, the land acquisition and resident relocation programs will be carried out according to a resident relocation plan to be devised in conformity to the laws of India as well as JICA guidelines. Consultations with local residents found they wished to see the shape of the branch line (a total of 4.35 km) revised. Hence, pondering an alternative line shape, the executing agency chose a shape designed to minimize social effects before consulting with the residents again. The post-shape change consultations found no opposition to the project implementation.

(vii) Others and Monitoring: During the construction work period of the Project, the contractor will monitor air quality, water quality, waste, noise and vibrations and soil under the supervision of HMPD. After the start of operations, a monitoring approval agency hired by HMPD will monitor noise and vibrations as well as the eco-system. Land acquisition and non-voluntary resident relocation will be monitored by HMPD.

2) Cross-cutting Items: Control measures for infectious disease such as AIDS and HIV

As many workers will likely be required for the Project, it will probably involve a high risk of HIV infection. In this respect, to avoid the risk of HIV infection during the construction work period, JICA will ask the contractor for cooperation on HIV/AIDS control measures for workers in the form of HIV/AIDS prevention clauses in tender documents.

3) Gender Category: GI (S) Gender Integrated Project

<Activities/Classification Rationale> Through a cooperation preparation survey, we had consultations with stakeholders while taking gender balance into account, such as taking care to allow women to attend the consultations, among other steps. Moreover, we plan to develop a female worker-friendly work environment at work sites of the Project. Based on the above, this Project is classified as a "gender integrated

project."

(9) Other Important Issues: None in particular

#### 4. Targeted Outcomes

##### (1) Quantitative Effects

##### 1) Outcomes (Operation and Effect Indicators)

Indicator	Baseline (Actual value in 2018)	Target (2025) [2 Years after Completion]
Annual average traffic volume (PCU/day) (Note 1)	0	42,106
Annual average traffic volume (unit count/day) (Note 1)	0	15,744
Passenger count (passenger/year) (Note 2)	0	13,464,666
Freight volume (tons/year) (Note 2)	0	56,452,264
Time required (minutes) (Note 3)	49.7	21.7
Time required (minutes) (Note 4)	36.4	22.0

(Note 1) The measurement spot will be on section 1 and lie east of an intersection with a branch line.

(Note 2) Annualized based on the latest passenger count and freight volume per day

(Note 3) From Thatchur (an intersection between National Road 5 and section 1) to the Ennore Port (31.4 km)

(Note 4) From Red Hills (an intersection between the Peripheral Ring Road and National Road 5) to the Ennore Port (23.7 km)

##### (2) Qualitative Effects

The qualitative effects of the Project include the promotion of regional economic development in the Chennai Metropolitan Region as well as improved travel comfort in the target section.

##### (3) Internal Rate of Return

Based on the following assumptions, the Economic Internal Rate of Return (EIRR) of this Project is 15.6%. The Financial Internal Rate of Return (FIRR) is -6.1% (this is negative due to the significant initial investment cost [mainly land acquisition cost]).

[EIRR]

Cost: Cost of project, O&M and land acquisition (excluding tax)

Benefits: Reduction of vehicle operation cost, reduction of travel time cost

Project life: 25 years

[FIRR]

Cost: Cost of project, O&M and land acquisition

Benefits: Toll income

Project life: 25 years

## **5. Prerequisites / External Factors**

- (1) Preconditions: None in particular
- (2) External Factors: None in particular

## **6. Lessons Learned from Past Projects**

Based on the ex-post evaluation results of the Calcutta Transport Infrastructure Development Project, an ODA loan program for India, it was pointed out that actively incorporating the opinions of residents and relevant entities in the planning and execution stages would lead to smoother acquisitions of land, given that land acquisition and facility relocation would take much time and create potential delays. For the Project, land acquisition officers will be assigned at the executing agency in order to provide the appropriate compensation according to the Resettlement Action Plan. The personnel will perform the land acquisition and resident relocation processes smoothly in response to the matter pointed out, and the executing agency will follow up on the process.

## **7. Evaluation Results**

This Project will contribute to alleviating traffic congestion and promoting regional economic development in the Chennai metropolitan region, where many Japanese companies have expanded. This is consistent with the Government of India's policies on development and solving issues, as well as Japan's and JICA's policy on assistance. Moreover, given that the Project is deemed to contribute to Goal 9 of the Sustainable Development Goals, namely, "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation," the need for JICA to support the implementation of this Project is high.

## **8. Plan for Future Evaluation**

(1) Indicators to be Used

As indicated in sections 4. (1) to (3)

(2) Timing of the Next Evaluation

Ex-post evaluation: 2 years after the project completion

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