Ex-Ante Evaluation

South Asia Division 1, South Asia Department

Japan International Cooperation Agency

1. Name of the Project

（１） Country: Republic of India (India)

（２） Project Title: The Project for the Construction of Chennai Peripheral Ring Road (Phase 2))

（３） Project Site/ Target Area: Chennai metropolitan area, State of Tamil Nadu (Total population approx. 8.9 million (2011))

Loan Agreement: February 20, 2024

2. Background and Necessity of the Project

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

Along with railways, roads are a major mode of transportation in India, carrying 85.2% of passenger traffic and 62.9% of freight traffic. In recent years, the number of registered vehicles in India has increased 2.5 times in the last decade, from about 90 million in 2006 to 230 million in 2016, due to population growth, economic growth, and other factors (India Statistical Yearbook (2018)). As passenger and freight traffic continues to increase and traffic congestion, which is becoming increasingly severe in metropolitan areas, hinders economic development, there is a significant need for road infrastructure development to support the rapidly growing traffic and transportation demand.

Similarly, in the Chennai metropolitan area, as the population grew from approximately 6.56 million in 2001 to 8.9 million in 2011 (Census 2011), the volume of passengers and traffic continued to increase along with economic growth, further exacerbating chronic traffic congestion. The state government has set a goal of high economic growth in its “Vision Tamil Nadu 2023” (enacted in 2012) and is emphasizing the promotion of logistics through the development of road infrastructure to achieve this goal and plans to construct a peripheral ring road to meet further increases in traffic demand in the future.

The Chennai metropolitan area facing the Bay of Bengal, is the gateway to Southeast Asia and serves as one of the key transportation and logistics hubs in India and other countries. In addition, the Chennai metropolitan area is known as Industrial hub as well and there are approximately 600 Japanese companies in Industrial sector such as automobile industry in the area. In recent years, however, the Chennai Port in the center of the city has experienced a shortage of handling

capacity and improving access to the Ennore Port in the northern part of the city, which is being developed and utilized, has become an urgent issue. With this background, the Government of Tamil Nadu requested the ODA loans project “The Project for the Construction of Chennai Peripheral Ring Road (Phase 1)” (hereinafter referred to as “Phase 1”) (Loan Agreement signed in March 2019) to build a Section 1 of the Peripheral Ring Road (see attached for the section), which is located in the northern part of Chennai metropolitan area and provides an access road to the Ennore Port, and introduce an Intelligent Transportation System (hereinafter referred to as "ITS") to this section.

In the southern part of the Chennai metropolitan area, there are industrial parks where many manufacturing companies are concentrated, such as “One Hub Chennai,” an industrial park exclusively for Japanese companies, and access to the northern port of Ennore and to meet transportation needs is an issue. Currently, access from the southern part of the metropolitan area to the northern port of Ennore must be via the city center, which causes traffic congestion, especially for large cargo trucks and other vehicles passing through the center of the city. The ODA loans “Project for Installation of Chennai Metropolitan Area Intelligent Transport Systems” (Loan Agreement signed in March 2018) is expected to reduce the total travel time in the most congested section of the city center (65 km in total for 5 lines) during peak hours to some extent, by about 10% (from 152 minutes to 137 minutes). However, further road capacity expansion is needed to meet the growing transport demand in the Chennai metropolitan area, which is expected to grow 3.7 times by 2036 compared to 2017.

The Project for the Construction of Chennai Peripheral Ring Road (Phase 2) (hereinafter referred to as “the Project”) will construct a new road in Section 5 and introduce ITS in Section 2 to 4, which are under construction or have already been constructed by India. Section 5 is the last remaining section to complete the Peripheral Ring Road, which is expected to ease traffic congestion in the Chennai metropolitan area and improve connectivity to the southern region. In addition to being an important Project in line with the above-mentioned “Vision Tamil Nadu 2023” policy of the Government of Tamil Nadu, it is also an important part of the Chennai-Bengaluru Industrial Corridor (CBIC) concept, which is a high priority for the Government of India. The Project is also strongly requested by Japanese companies participating in Japanese industrial parks and is an important project from the perspective that it may lead to the future development of Japanese industrial parks and the possibility of Japanese companies moving into these

areas.

（２）Japan's and JICA's Policy Cooperation and Operations in the Road Sector. (especially in relation to key foreign policies such as the Free and Open Indo-Pacific Partnership

Country Assistance Policy for India (March 2016) formulated by the Government of Japan stipulates “enhancement of connectivity” as a priority area, and states that Japan will support the development of transport infrastructure to strengthen connectivity within the country's major industrial cities and economic zones, and between regions, with a view to removing infrastructure bottlenecks related to investment and economic growth. Another priority area is “strengthening industrial competitiveness,” and Japan will support the development of transportation networks in metropolitan areas through the construction of metro lines, outer ring roads, etc., in order to reduce traffic congestion, improve the efficiency of passenger and freight transportation, and improve the urban environment. The JICA Country Analysis Paper for India (March 2018) identifies strengthening industrial competitiveness as a priority area, and states that in order to make economic growth more stable, the development of high-standard roads and other critical infrastructure that contribute to the competitiveness of manufacturing and other industries should be undertaken.

The JICA’ Global Agenda (JICA’s Strategies for Global Development) for Transportation also emphasizes the importance of removing bottlenecks in urban areas, developing traffic control systems that contribute to congestion management and traffic safety, and developing roads to international ports that will serve as logistics hubs for “building a global network, thus the Project is consistent with these policies and analyses.

（３）Other Donor’s Activities

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 Description

① Project Objective

The objective of the Project is to meet the rapidly increasing road traffic demand in Chennai metropolitan area, alleviate traffic congestion and strengthen connections to the southern part of the state by constructing Section 5 of Peripheral Ring Road and introducing ITS in Section 2 to 5, thereby promoting regional economic development.

② Project Components

1） Road construction (26.3 km of Peripheral Ring Road (Section 5): 25.5 km of new section, 0.8 km of existing road improvement, 6 two-way main roads, 4 two-way service roads, bridges and underpasses, etc.)

2） ITS facility construction and maintenance (Toll collection system (5 locations) and traffic control system in sections 2 to 5, including contractor procurement for ITS operation (Note))

3） Consulting services (detailed design review (road construction), basic design review (ITS), bidding assistance, construction supervision, technology transfer for ITS operation and maintenance, implementation of environmental and social considerations, etc.)

③ Project Beneficiaries (Target Groups)

Direct beneficiaries (users of the improved roads: approx. 87 million people per year)

Ultimate beneficiaries (population of the Chennai metropolitan area that will benefit from economic development around the improved road: approximately 8.9 million people)

（2） Estimated Project Cost:

91,832 million yen (Japanese ODA loan: 49,847 million yen)

（3） Schedule (Cooperation Period):

September/2023-June/2033 (118 months) Completion of all facilities (June 2030) is considered completion of the Project

（4） Project Implementation Structure

1）Borrower: President of India

2）Guarantor: N/A

3） Executing Agency: Highways and Minor Ports Department (HMPD), Government of Tamil Nadu

4）Operation and maintenance system:

After completion of the Project, the procurement, installation, and maintenance of the ITS (toll collection system and traffic control system)

equipment and materials will be carried out by the contractor to be procured under the Project. The road maintenance and operation of the ITS will be carried out by a separate contractor to be hired with HMPD's own funds under the responsibility of HMPD. There are several companies in India that have experience in the maintenance and management of materials and equipment for toll collection systems, and HMPD has sufficient supervisory experience. On the other hand, since the traffic control system requires advanced technology for the maintenance and operation of the facilities, the TOR for consulting services will include technology transfer to HMPD for the maintenance and operation of the traffic control system in order to establish an appropriate operation and maintenance management system. It has been confirmed that the operation and maintenance costs will be borne by toll fee and budget allocation from the state government.

（５） Collaboration and Sharing of Roles with Other Donors:

１） Japan's Activities: None

２） Other Donor’s Activities: None

（６） Environmental and Social Consideration

① Category: A

② Reason for Categorization

The project falls into the Road sector and is likely to have significant adverse impact due to its characteristic under the JICA Guidelines for Environmental and Social Considerations (January, 2022)

③ Environmental Permit:

The Environmental Impact Assessment (EIA) for all sections of the Project for the Construction of Chennai Peripheral Ring Road, including the Project, was created by HMPD and approved by the Tamil Nadu State Environmental Impact Assessment Authority (TNSEIAA) in August 2018. The EIA and Social Impact Assessment (SIA) for Section 5, which is the subject of the Project, were approved by HMPD in March 2023.

④ Anti-pollution measures:

During construction, air pollution, water pollution, waste, noise/vibration, and soil contamination are expected to occur. Necessary measures will be taken to minimize these effects by installing anti-pollution membranes at construction sites near water spraying and water areas, installing waste disposal facilities at worker accommodation facilities, installing sound barriers, and installing oil separators. In addition, necessary measures will

be taken to minimize noise and vibration during the operation phase, including the installation of sound insulation walls.

⑤ Natural environment:

The Project area is not located in or near a sensitive area such as a national park, etc., and is expected to have minimal undesirable effects on the natural environment. Although approximately 3,400 trees are expected to be affected, transplanting and replacement planting for logging are planned.

⑥ Social environment:

The Project involves the land acquisition of 167 ha (120 ha of private land and 47 ha of public land) and resettlement of 75 households. The land acquisition and resettlement will be carried out in accordance with the Resettlement Action Plan created in accordance with domestic laws and JICA guidelines.

⑦ Other/Monitoring:

During construction, the contractor will monitor air quality, water quality, waste, noise/vibration, soil, etc., under the supervision of HMPD. When in service, under the supervision of HMPD, a monitoring accreditation organization, etc. employed by HMPD will monitor noise, vibration, ecology, etc. Land acquisition and involuntary resettlement will be monitored by HMPD.

（７） Cross-Sectoral Issues:

Measures against infectious disease control: To prevent the risk of HIV infection during construction, which is expected to involve a large number of workers, the Project will require contractors to implement HIV/AIDS measures for workers through an awareness campaign by NGOs and the inclusion of an HIV/AIDS prevention clause in the bidding documents.

（８） Gender Category: ■GI（S）Gender Informed (Significant)

< Details of Activities/ Reason for Categorization> The Project will include gender-sensitive facilities such as gender-segregated toilets and street lighting to create a more comfortable working environment for women on construction sites, establish gender ratios for construction workers and office staff, and provide training for female workers. In addition, a Gender Action Plan has already been agreed upon to guide these efforts. For these reasons, the Project is classified as a “gender activity integration project”.

（９） Other Important Issues: None

4. Targeted Outcomes

（１） Quantitative Effects

１）Outcomes (Operation and Effect Indicators)

Indicator	Baseline (Actual value in 2022)	Target (2031) (Note1)
Annual average traffic volume(PCU/day)(Note 2)	0	52,894
Annual average traffic volume (number of vehicles/day) (Note 2)	0	45,241
Number of passengers (thousand/year) (Note 3)	0	87,003
Cargo volume (thousand tons/year) (Note 3)	0	18,405
Time required (minutes) (Note 4)	57	43

(Note 1) Two years after the year the road is put into service.

(Note 2) The measurement points were taken between National Highway 32 and Major District Road (MDR) 581 in Section 5.

(Note 3) Calculated on an annual basis based on the most recent daily passenger and cargo volume.

(Note 4) 35.3 km from Singaperumalkoil to Perumaleri across Section 5.

（２） Qualitative Effects:

Promote economic development in the Chennai metropolitan area, including the area surrounding the new road, and reduce traffic accidents by easing congestion.

（３）Internal Rates of Return

Based on the following assumptions, the economic internal rate of return (EIRR) for the Project is 19.08%. The financial internal rate of return (FIRR) is negative due to the low level of tolls. Toll rates are determined by state governments in accordance with the standards set by the central government of India, and revisions are periodically reviewed based on socioeconomic conditions and other factors.

【EIRR】

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

Benefit: Reduction in vehicle running costs and travel time costs

Project Life: 25 years

【FIRR】

Cost: Project cost, operation and maintenance cost, land acquisition cost

Benefit: Toll income

Project Life: 25 years

5. External Factors and Risk Control

（１）Preconditions: None

（２）External factors: None

6. Lessons Learned from Past Projects

As a lesson learned from the ex-post evaluation of the “Saigon East-West Highway Construction Project (evaluation year: 2016) ,” an ODA loan to Vietnam among others, it is important to follow up the progress carefully with regular consultations with relevant organizations involved in land acquisition and resettlement, and to facilitate the Project to a certain extent so that the overall project schedule is not affected.

In the Project, a dedicated team for land acquisition and resettlement will be established within the executing agency to facilitate appropriate and timely compensation and support based on the land acquisition and resettlement plan. The team also plans to set up regular consultation meetings with relevant organizations involved in land acquisition and resettlement to communicate closely with them and carefully follow up on progress to ensure that the overall Project schedule is not affected.

7. Evaluation Results

The Project will contribute to the development of the local economy in the Chennai metropolitan area, where many Japanese companies have already established business operations. The improvement of connectivity in this metropolitan area is expected to indirectly benefit Japanese companies that have their bases in the area. In addition to meeting India's development agenda and

policies, as well as the cooperation policy and analysis of Japan and JICA, the Project is expected to contribute to SDGs Goal 3 (Ensure healthy lives and promote well-being for all (halve the number of deaths and injuries from road traffic accidents)), SDG Goal 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all), and Goal 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation). and rewarding work for all) and Goal 9 (build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation). For these reasons, there is a strong need to support the implementation of the Project.

8. Plan for Future Evaluation

（１） Indicators to be Uses.

As indicated in Section 4.

（２） Future Evaluation Schedule

Ex-post evaluation: 2 years after project completion

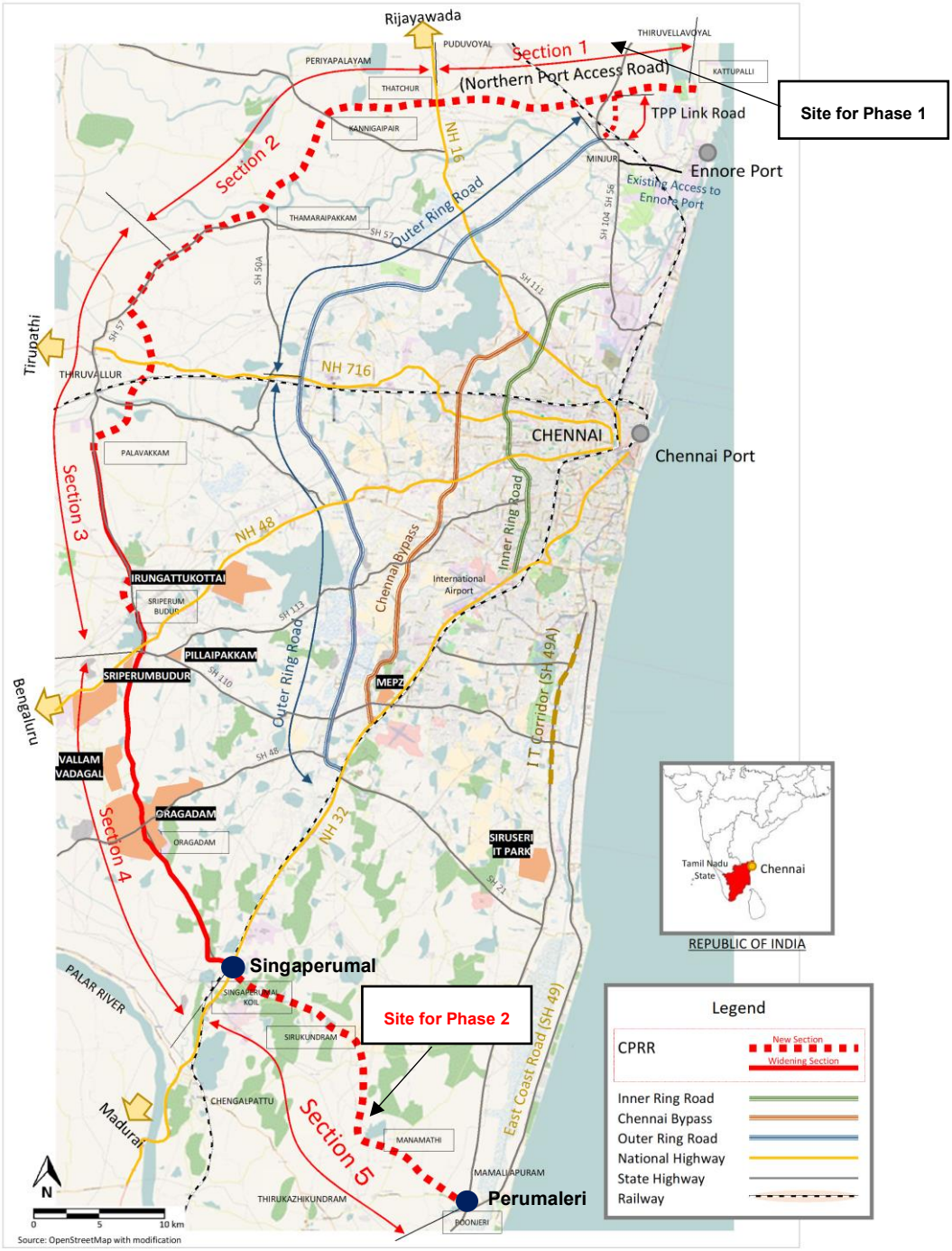
END

Appendix:

Map of the Project for the Construction of Chennai Peripheral Ring Road (Phase 2)

Appendix

Map: The Project for the Construction of Chennai Peripheral Ring Road (Phase 2)



Source: Created by JICA