Ex-ante Evaluation

1. Name of the Project

Country: India
Project Title: Chennai Metro Project
Loan Agreement: November 21, 2008
Loan Amount: 21,751million Yen
Borrower: The President of India

2. Background and Necessity of the Project

In Delhi, Chennai and other major cities in India, increased traffic congestion resulting from an increase in road traffic demand has become a serious problem leading to worsening economic losses and health problems arising from vehicle pollution such as air pollution and noise pollution. Accordingly a public transport system is necessary to alleviate traffic congestion and improve the urban environment.

In its Eleventh Five Year Plan (April 2007 – March 2012) the Government of India has outlined goals of meeting increased transport demand from recent economic growth as well as the development of public transport systems, based on perspectives of safety, energy efficiency and environmental conservation. In the National Urban Traffic Policy currently under preparation, measure have been included to foster use of public transport and promote investment, strengthen traffic regulation and introduce cutting-edge technologies in order to meet the transport needs of the rapidly increasing urban population. In particular, construction of mass transit systems is being recommended for cities with a population over 4 million.

In the “Japan’s Country Assistance Program for India” prepared by the Government of Japan, “promotion of economic growth” has been set down as a priority area. Accordingly, JICA has set down (1) support of sustainable growth through development of economic infrastructure, (2) support for economic growth increasing employment (3) support for poverty reduction and (4) support for environment / climate change measures as major aid areas. This project complies with these goals.

The Chennai metropolitan area in the State of Tamil Nadu has the 4th largest population in India, and is the largest metropolitan area in southern India. Its population has increased rapidly from 4.5 million in 1981 to 7.06 million in 2001,

and has now reached 7.6 million, and Chennai city has a population density of 24,000 people/km2 (Population density of Tokyo's 23 wards was 13,000 people/km2 in 2001), and it is one of the most overpopulated cities in the world. In line with the population increase, the number of registered vehicles has also increased dramatically, more than doubling from 1991 to 2001. As a result the current average speed on major city roads is roughly 15km/h, and traffic congestion is severe. On the other hand, expanding the capacity of existing public transport (bus, trains) and improving the road network is not easy. Accordingly, to relieve traffic congestion and reduce vehicle pollution, construction of a mass rapid transport system has been positioned as a central pillar of the Tamil Nadu State Government's urban transport policy / urban environment measures. Therefore, JICA's support for this project is highly necessary and relevant.

3. Project Description

(1) Project Objectives

This project aims to cope with the surge of transport demand in the Chennai metropolitan area in the Tamil Nadu State, southern India, by establishing a mass rapid transport system, and thereby contribute to development of the regional economy and improvement in the urban environment by relieving traffic congestion and reducing traffic pollution.

(2) Project Site / Target Area

State of Tamil Nadu, Chennai metropolitan area

(3) Project Outline

Construction of a mass rapid transport system (approx. 43km) in the Chennai metropolitan area.

1) Construction of elevated railway (20.02km), underground railway (23.39km), 16 elevated stations, 20 underground stations
2) Construction of electrical, telecommunication and signaling systems
3) Rolling stock procurement
4) Construction of maintenance depots
5) Consulting services (tender assistance, detailed design, execution planning/supervision, etc.)

The Japanese ODA loan portion applies to civil work (underground portion including underground stations, track portion for entire length), construction of electrical, telecommunication and signaling systems for underground portion,

rolling stock procurement and consulting services.

(4) Total Project Costs/Loan Amount

392,087 million Yen (21,751 million Japanese ODA loan this tranche)

(5) Project Implementation Schedule

Planned for October 2008 ~ September 2014 (Total 72 months). Project will be considered complete when consulting service has finished.

(6) Project Implementation Structure

1) Borrower: The President of India

2) Executing Agency: Chennai Metro Rail Limited

3) Operation / management: As per 2)

(7) Environmental/social awareness / poverty reduction / social development

1) Environmental/social awareness

a) Category: A

b) Reasons for categorization: This project falls into a railroad sector project which is likely to have significant adverse impact on the environment under the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established in April 2002). Thus this project is classified as Category A.

c) Environmental Permit: The Environment Impact Assessment (EIA) report for this project has been prepared in May 2008, though it is not required for the project in the country’s legal system.

d) Anti-Pollution Measures: With regard to noise and vibration pollution, noise reduction measures including soundproof walls and sound/vibration insulating pads are scheduled to be adopted. Further, by using the shield tunneling method, ground loosening and water inflow can be prevented, and it is expected that there will be no major impacts on ground subsidence.

e) Natural Environment: The project’s site is located in an urban area, and the planned route generally runs along existing roads, and so adverse impact on the natural environment is assumed to be minimal.

f) Social Environment: This project requires 8.01ha of land, and 213 households (of which 187 are squatters) and 417 shops are expected to be relocated. The executing agency has already held discussions with targeted for land acquisition and relocation, and the procedures will be implemented in accordance with compensation schemes and resettlement action plan prepared by the executing agency and the Land

Acquisition Act.

g) Other/Monitoring: As a part of this project, monitoring will be performed on: noise/vibration pollution, air quality, water quality, soil contamination, land acquisition and resident relocation, etc.

2) Promotion of Poverty Reduction: None

3) Promotion of Social Development (Gender, AIDS and other infectious disease measures, participative development, disability awareness, etc.): Many of the migrant workers on this project are expected to be single workers living alone at high risk of HIV/AIDS infection. The executing agency in cooperation with the Tamil Nadu State AIDS Control Society will implement an HIV/AIDS prevention program. HIV/AIDS prevention clauses will be inserted into the tender documents, and the contractor will also be expected to cooperate with efforts to prevent HIV/AIDS infection in workers. Further, in line with Indian laws and regulations, stations and coaches that are elderly- and disabled-friendly (elevators, escalators, station announcements, Braille blocks, wheelchair spaces, etc.) are planned.

(8) Cooperation with Other Donors.

None

(9) Other Important Issues

None

4. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Target (2016) [2 years after completion]
Operation rate (% / year)	92
Running distance (1000km / day)	70.90
Number of running trains (per day each direction)	409
Volume of transportation (million people–kilometers / day)	6.2
Passenger traffic receipts (million Rupees / day)	11.6

(2) Internal Rate of Return

Based on the following assumptions, the Economic Internal Rate of Return

for this project is 10.95% and the Financial Internal Rate of Return (FIRR) is 2.32%.

[EIRR]

Cost: Project costs (excluding tax), operation / maintenance costs

Benefit: Benefits of cost savings on existing public transport and roads, benefits of travel time saved by users of this route and other transport methods, benefit of operating cost savings to transport systems such as buses from a reduction in road traffic congestion, benefits of a reduction of accidents and pollution relief.

Project life: 30 years

[FIRR]

Cost： Project costs, operation / maintenance costs

Benefit：Fare income, advertising income, real-estate development income

Project life: 30 years

5. External Factors / Risk Control

Changes in transport demand.

6. Lessons Learned from Findings of Similar Projects Undertaken in the Past

Based on ex-post evaluations of past railroad / subway projects, the lesson learned is that, creating a financially independent project implementation structure is important from the perspective of ensuring appropriate operation and management. In order to ensure a strong financial base for this project, the number of passengers must meet targets, and to ensure this the Chennai transport authority is expected to adjust bus routes so they do not compete with the metro and instead perform a feeder role. Also, to further improve the financial base of this project, the executing agency will implement advertising, real-estate development and other related projects.

7. Future Evaluation Plan

(1) Indices to be Used in Future Evaluations

1) Operation rate (rolling stock in use / rolling stock procured) (% / year)

2) Running distance (1000km / day)

3) Number of running trains (per day each direction)

4) Volume of transportation (million people–kilometers / day)

5) Passenger traffic receipts (million Rupees / day)

6) FIRR (%), EIRR(%)

(2) Timing of Future Evaluations

2 years after project completion

End