

**Ex-Ante Evaluation (for Japanese ODA Loan)****1. Name of the Project**

Country:	Federative Republic of Brazil
Project:	Belem Metropolitan Trunk Bus System Project
Loan Agreement:	September 4, 2012
Loan Amount:	16,411 million yen
Borrower:	Estado do Pará

**2. Background and Necessity of the Project****(1) Current State and Issues of the Transportation (Urban Traffic) Sector in Brazil**

Although the paved road ratio is only 12.9% in Brazil, recent urbanization and improvement in people's incomes have led to an increase in the proportion of households that own cars and road congestion has become a serious social problem in large cities. The population of the Belem metropolitan area in Estado do Pará, which is located in the northern part of Brazil, is about two million. Its urban district has expanded from Belem City, the commercial center of the area, to Ananindeua City. In the urban district, traffic congestion has worsened due to an increase in the traffic volume of buses and passenger cars on the highways between both cities. As the only means of public transportation, buses account for about 75% of passenger traffic during peak hours, indicating that they are an important means of transport for local population. Although 29 private companies operate buses on the same highways that run towards the main town, a smooth system of bus transport operation has not been established and an excessive number of buses occupy the highways, becoming a cause of traffic congestion. In addition, because air pollution due to NO<sub>x</sub> and CO<sub>2</sub> is high on the highly-traveled arterial highways, measures are necessary to reduce the environmental load.

**(2) Development Policies for the Transportation (Urban Traffic) Sector in Brazil and the Priority of the Project**

In its multi-year investment plan (2012-15) (Plano Plurianual, PPA), the Brazilian Government places importance on measures for the urban transport sector, such as railway projects and the BRT project for establishing efficient networks of existing roads. In addition, the Government announced an infrastructure investment plan for sustainable economic growth called the "Second Growth Acceleration Plan (2011-14) (PAC2)," in which urban improvement is regarded as one of the priority measures and the urban traffic sector is regarded as one of the priority projects in which major investments should be made. In 2008, Estado do Pará established the "Ação Metr pole (urban action plan)" to ease traffic congestion in the Belem metropolitan area. Under the action plan, roads will be constructed for 21 routes, and an urban traffic system will be established through the introduction of a trunk bus system for 18 routes. The purpose of this project is to establish the three routes to which the highest priority is given among the 18 routes planned for the trunk bus system.

**(3) Japan and JICA's Policy and Operations in the Transportation (Urban Traffic) Sector**

In the Cool Earth Promotion Program in January 2008 and the "Hatoyama Initiative" in September 2009, Japan has declared that it will actively cooperate in climate change measures in developing countries. Based on the PPA and the results of policy consultations with the Brazilian Government in July 2007, Japan designated five sectors – "environment," "industry," "agriculture," "health" and "social development" – as priority sectors for aid through the Country Assistance Program for Brazil. Among the five sectors, the greatest importance is placed on aid for environmental conservation. As a concrete cooperation policy, JICA stated in its "Urban Environmental

Improvement Program” that it will support measures for establishing urban traffic networks – especially with regard to measures for easing air pollution and traffic congestion through conversion into highly efficient means of transportation with a low environmental impact. This project is therefore consistent with this policy. Although Japan has so far granted 19 ODA loans to Brazil, totaling about 314.9 billion yen, this is the first ODA loan for the transportation (urban traffic) sector and climate change measures. Many surveys have been carried out concerning technical assistance to the transportation (urban traffic) sector. Of these, a master plan survey and an F/S survey were carried out as assistance related to this project.

#### **(4) Other Donors’ Activity**

The World Bank has placed priority on the promotion of public-private investment in poverty-stricken areas, the strengthening of economic development and competitiveness through strategic infrastructure improvements in suburban cities and environmental conservation. As a part of strategic infrastructure improvements in suburban cities, the World Bank is providing assistance for the improvement of urban traffic systems, including subways and railways, mainly in Sao Paulo and other major cities. In its policy for providing assistance to Brazil, the Inter-American Development Bank has placed the priority on social development, infrastructure improvements, the sustainable growth of cities, the sustainable development of natural resources and climate change measures. It has granted loans to Curitiba City, Estado do Paraná for the establishment of a bus transportation system and has cooperated with the World Bank to provide loans to Sao Paulo and Rio de Janeiro for the establishment of urban transportation systems.

#### **(5) Necessity of the Project**

Since this project aims to alleviate traffic congestion in major cities by establishing transportation networks, on which the Brazilian Government and the Government of Estado do Pará have focused, this project is consistent with Brazil’s development policy. In addition, since this project supports Brazil’s climate change measures, it is consistent with Japan and JICA’s support policy. Therefore, it is highly necessary and appropriate for JICA to support the implementation of this project.

### **3. Project Description**

#### **(1) Project Objective**

By establishing a trunk bus transportation system in the Belem metropolitan area, Estado do Pará, this project aims to alleviate traffic congestion and air pollution in the area and thereby contribute to the improvement of the living environment of the local population and to mitigate climate change.

#### **(2) Project Site/Target Area**

Belem metropolitan area, Estado do Pará

#### **(3) Project Components**

- 1) Improvement of trunk bus roads (exclusive roads and lanes and priority lanes) totaling 27.1 km
- 2) Construction of a bus terminal, a bus station and 28 bus stops
- 3) Consulting services (detailed design, bidding assistance, construction supervision, assistance in concretization of the clean development mechanism (CDM), etc.)
  - \* Private bus companies are responsible for the construction of bus monitoring facilities and the purchase of buses.

#### **(4) Estimated Project Cost (Loan Amount)**

24,960 million yen (loan amount: 16,411 million yen)

#### **(5) Schedule (period of cooperation)**

Planned for September 2012 to September 2016 (49 months in total). The project will be completed when the facilities start operation.

#### **(6) Project Implementation Structure**

- 1) Borrower: Estado do Pará
- 2) Executing Agency: Estado do Pará  
The executing unit is Núcleo de Gerenciamento de Transporte Metropolitano (NGTM) of Estado do Pará.
- 3) Operation and Maintenance System: By a Public Consortium consisting of Estado do Pará and six neighboring cities

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

- 1) Environmental and Social Considerations

(1) Category: B

(2) Reason for Categorization

This project is not likely to have significant adverse impact on the environment due to the fact that the project sector and project characteristics are not likely to exert impact and the project is not located in a sensitive area under the “Japan Bank for International Cooperation Guidelines for the Confirmation of Environmental and Social Considerations” (established in April 2002).

(3) Environmental Permit

According to the regulations of the Environmental Bureau of Estado do Pará, it is unnecessary to prepare an environmental impact assessment (EIA) report for this project and only a Plano de Control Ambiental (hereinafter referred to as a “PCA”) needs to be prepared. A PCA was prepared in December 2009. With regard to other environmental permits, it is necessary to obtain permits for the commencement of the work and its operation. Permit for the commencement of the work (Installation License, “L/I”) is scheduled to be obtained within two months of the completion of the detailed design.

(4) Anti-Pollution Measures

Although the production of asphalt waste is predicted, this is planned to be disposed of at disposal sites for which environmental permission has been obtained according to the law and no impact from the waste is foreseen. In addition, because basic sewage treatment is planned at bus terminal facilities and management facilities, no impact from water discharges is foreseen.

(5) Natural Environment

The target area is not located in or around any sensitive areas, such as national parks, and so any adverse impact on the natural environment is assumed to be little.

(6) Social Environment

The acquisition of sites amounting to 7 ha in total is necessary for the construction of the bus management facilities, bus terminals and bus stations and is to be proceeded according to domestic procedures in Brazil. No relocation of residents is required.

(7) Other/Monitoring

In this project, it is planned that the air and water quality will be monitored by NGTM during the construction and by a public consortium during its use.

2) Promotion of Poverty Reduction

None in particular

3) Promotion of Social Development (gender prospective, measures for infectious diseases including HIV/AIDS, participatory development, consideration for persons with disabilities, etc.)

Design that also takes into account access for the disabled (universal design) is planned to be introduced for the bus facilities under this project.

**(8) Collaboration with Other Donors**

None in particular

**(9) Other Important Issues**

None in particular

**4. Targeted Outcomes**

**(1) Quantitative Effects**

1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual value in 2010)	Target (2018) [2 years after project completion]
Volume of transportation (thousand person-km/day)	N.A.	2,598
Number of running bus (buses/per day)	N.A.	582
Time required for a specific section (between Marituba and Sao Bras in the section covered by the ODA loan) (peak time between 7 to 8 a.m.) (in minutes)	58	35

2) Internal Rates of Return

Based on the conditions indicated below, the economic internal rate of return (EIRR) of this project is 17.2% and the financial internal rate of return (FIRR) is 4.6%.

**EIRR**

Cost: Project cost (excluding taxes), operating and maintenance costs

Benefits: Reduction in expenses for operating automobiles, travel time and expenses

Project life: 25 years

#### FIRR

Cost: Project cost (excluding taxes), operating and maintenance costs

Benefits: Revenues from fares and advertisements

Project life: 25 years

### **(2) Reduction in GHG Emissions**

In this project, the introduction of CDM is under consideration. If this project is carried out, the amount of reduction in GHG emissions is estimated to be about 500,000 tons (in terms of CO<sub>2</sub>) if the credit period is 10 years.

### **(3) Qualitative Effects**

Improvement in the living environment for local residents due to alleviation of traffic congestion and reduction of air pollution

## **5. External Factors and Risk Control**

Any deterioration in the political or economic situation and any natural disaster in Brazil or in the vicinity of the target area

## **6. Results of Evaluations and Lessons Learned from Past Projects**

### **(1) Results of Evaluations of Similar Past Projects**

According to ex-post evaluations of the Project for Construction of Coastal Roads on the East Coast of Sumatra in Indonesia, it has been learned that, monitoring of the land acquisition states, including the partner government's and the executing agency's securing of the budget, during the appraisal and implementation stage of the project, is important for those projects in which the acquisition of sites is expected.

### **(2) Lessons for the Project**

Based on the above lesson, it is planned to receive regular progress reports from the executing agency and will be monitored carefully so that land acquisition is completed by the time of commencement of works.

## **7. Plan for Future Evaluation**

### **(1) Indicators to Be Used**

- 1) Transportation volume (Unit: Thousand person-km/day)
- 2) Number of bus running (bus/per day)
- 3) Time required to travel a specific section (between Marituba and Sao Bras in the section covered by the ODA loan) (peak time between 7 to 8 a.m.) (in minutes)
- 4) EIRR (%)

### **(2) Timing**

Two years after project completion.