

## Ex-ante Evaluation

### 1. Name of the Project

Country: The Kingdom of Thailand

Project title: Mass Transit System Project in Bangkok (Red Line) (I)

Loan Agreement: March 30, 2009

Loan Amount Approved: 63,018 million yen

Borrower: The Government of Kingdom of Thailand

### 2. Background and Necessity of Project

The Bangkok Metropolitan area has a population of approximately 10.07 million people as of 2008 and is the political and economic center of Thailand. With Thailand's economic recovery following the Asian currency crisis, urban industrial activity has surged and there has been a serious rise in traffic congestion in the transportation system, which depends heavily on the automobile. While traffic congestion is a bottleneck in the flow of people and products, air pollution caused by automobiles is recognized as a problem, and measures to ease the load on the environment are required.

As measures against such urban problems, since 1970s, the development of mass transit system for the Bangkok Metropolitan Area has been planned, and in December 1999, the Skytrain began operation. In July 2004, the Blue Line subway, the construction of which was assigned by Japanese ODA loans, began operation. On the other hand, both the Skytrain and subway operate only in the central district of Bangkok and their operating distance is limited. Therefore, approximately 75% of public transportation users still depend on bus transportation. The ability to meet transportation demand is limited and thus it remains necessary to promote modal shift by improving convenience of the urban train networks.

In order to relieve traffic congestion and environmental problems in the Bangkok Metropolitan Area, the Government of Thailand adopted a 5-Year Development Plan (2005-2009) ("Mega Project") and has been implementing the mass transit investment plan. "Mass Transit Investment Plan (2005-2012)" declares its investment plan in the development of seven lines in the Bangkok Metropolitan Area between 2005 and 2012 and three lines thereof including this project were approved in the cabinet meeting on August 2006. The new government under Prime Minister Abhisit established in December 2008 also places high priority on this project and aims for early commencement of bidding.

Japan's economic cooperation plan for Thailand positions "Enhancement of

Competitiveness for Sustainable Growth” and “Development Issues in Maturing Society” as priority areas and declares “Development of Bases for Industrial Promotion” and “Strengthening of Environmental Management System” as development agenda. Following such policy, JICA declares its policy such as infrastructure development for the purpose of improvement of urban functions for industrial promotion and enhancement of competitiveness, as well as antipollution measures and well-planned urban development for the purpose of improvement of life and environment of the urban area to improve the urban problems. Support to this project is consistent with the policies in the aforementioned priority areas.

The projected daily ridership for this project is 160 thousand in 2014 at the time of its opening, and it is forecasted to increase to 310 thousand in ten years thereafter (2024) and to 430 thousand in twenty years thereafter (2034). MRT Red Line is expected to greatly relieve the traffic congestion of metropolitan Bangkok area. In addition, since Bang Sue, the starting station of this project, is adjacent to an inter-city bus terminal and is connected to the Skytrain (serving since 1999) and MRT Blue Line (serving since 2004) as well as MRT Purple Line (received Japanese ODA loan in March 2008 and scheduled to open in 2013), Bang Sue is expected to function as the connecting terminal station for Bangkok’s traffic system. This project intends to improve mass transit network spreading from the central district of Bangkok and promotes smooth trade activities by implementing networking of the existing subway and urban railway and will further contribute to relieving traffic congestion and reducing air pollution in the Bangkok Metropolitan Area. Thus, necessity and relevance of JICA’s assistance is high.

### **3. Project Description**

#### (1) Project objectives

The purpose of this project is to cope with increase in traffic demand, mitigate traffic congestion in Bangkok Metropolitan Area by constructing new mass transit railway line, thereby contributing to urban economic development and environmental improvement.

#### (2) Project site/target area

Bangkok Metropolitan Area

#### (3) Project outline

Construction of the urban railway Red Line (total length is 26.4 kilometers including 22.5 kilometers between Bang Sue and Rangsit).

1) Civil works: elevated structures (19.4 kilometers), ground-based structures (7.0

kilometers) and stations (seven elevated stations excluding the Bang Sue station)

2) Development of the Bang Sue station and surroundings

3) Electrification and mechanical systems

4) Procurement of rolling stock

5) Consulting service (bidding assistance, project management support, construction supervision, staff training, implementation of a plan for resettlement of residents and support for environmental and social considerations such as environmental management and monitoring, etc.)

(4) Total project cost

347,383 million yen (Japanese ODA Loan amount of this tranche: 63,018 million yen)

(5) Project implementation schedule

Planned for April 2009 - July 2014 (64 months). Project completion is defined as the start of commercial operation. With regard to the consulting service, environmental and social consideration services are scheduled to be continuously provided by July 2016.

(6) Implementation structure

1) Borrower: The Government of Kingdom of Thailand

2) Executing agency: SRT: State Railway of Thailand

3) Operation, maintenance, and management system: expected to be performed by an SRT's operating subsidiary to be established hereafter.

(7) Environmental and social considerations / reduction of poverty / social development

1) Environmental and social considerations

(a) Category: A

(b) Reason for categorization: This project falls under category A because it concerns the railway sector and has characteristics that could have significant impact as given in Japan Bank for International cooperation Guidelines for Confirmation of Environmental and Social Considerations (established in April 2002).

(c) Environmental permit: The Environmental Impact Assessment (EIA) report on this project was approved by the National Environment Board (NEB) in June 18, 2008 and is opened to the public on the SRT website and in the Office of Natural Resource and Environmental Policy and Planning, and the Ministry of Transport.

(d) Anti-pollution measures: Air pollution, noise and vibration after the start of the

project generally satisfy Thailand's standards. Further, the simulation of vibration expected to arise during its operation did not show possible serious impact due to vibration of this project. It has been confirmed that, in the event that any monitoring results around stations exceed the standards, measures to diffuse accumulated contaminant (installation of a ventilation system), etc., will be taken.

(e) Natural environment: The area to be targeted by this project is an area surrounding the city and do not include areas easily affected such as national parks and their surrounding areas and it is expected that undesirable impacts on the natural environment will be minimal.

(f) Social environment: As this project will be implemented in the premises of SRT, there would be no need for acquisition of sites. However, it is necessary to remove 1,236 illegal buildings in the premises of SRT. Procedures for such removal are moving forward in line with the local legal system and SRT's basic plan for resettlement of residents and residents to be affected will be compensated in money. It has been confirmed that SRT had held discussion about resettlement and there are no particular objections against resettlement policy from residents to be affected.

(g) Other and monitoring: SRT, an executing agency, will monitor resettlement and support of residents, noise and vibration, air quality, etc., throughout construction and operation.

2) Promotion of poverty reduction: None

3) Promotion of social development (gender perspective, prevention of infections diseases including AIDS, participatory development, consideration for disabled and others)

(a) Measures against HIV/AIDS

SRT and JICA have confirmed importance of addressing measures against AIDS of workers to be employed for this project and it is expected that SRT will specify necessity of consideration in bidding documents and contractually obligate a contractor to carry out measures against AIDS for workers.

(b) Consideration for disabled persons, the elderly and others

This project plans design taking into account utilization by the elderly, disabled persons and others (elevators, ramps, lavatories for disabled persons, etc.).

(8) Collaboration with other donors

As some of the technical assistance which ADB is currently providing relates to operation, maintenance and control system of urban traffic, further cooperation and

coordination are expected.

(9) Other important issues: None

#### **4. Output Targets**

(1) Operational and effect indicators

(a) Water supply

Indicator Name	Target (2016) [2 years after project completion]
Operating rate (%)	85.4
Running distance (1,000km/day)	43.9
Number of running train (runs/day)	432
Volume of passengers (passenger km/day)	1,755

(2) Internal rate of return

Based on the following assumptions, the Economic Internal Rate of Return (EIRR) will be 15.8%.

Cost: Project cost (excluding tax), operation and management costs

Benefits: Reduction in operating costs, saving of operating time, reduction in air pollution, etc.

Project life: 30 years after project completion

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

Stagnation/deterioration of the economy of Thailand and areas affected by this project and natural disasters

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

In the case of cities where roads are extremely congested and where there is high potential demand for elevated railways that are punctual and effective in reducing travel time, past ex-post evaluations of similar projects in the transportation sector recommended that studies for increasing the effectiveness of projects by stimulating potential demand should be conducted. This project will consider approaching the Government of Thailand based on discussions with SRT, including implementation of Japanese ODA loans, program for technical support, etc., if necessary, to urge (1) development of the area surrounding new

stations; (2) development of the area of services; (3) coordination with bus services, which will compete with railways (including a review of operating routes and fares); (4) new bus services to and from new stations; (5) introduction of common ticketing to encourage transfer between different modes of transportation such as subways, elevated railways, and buses.

## **7. Plans for Future Evaluation**

(1) Indications for future evaluation

Operating rate (%)

Running distance (1,000km/day)

Number of running train (runs/day)

Volume of passengers (passenger km/day)

Economic internal rate of return (EIRR)

(2) Timing of next evaluation

Two years after completion of this project