

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country : The Kingdom of Thailand

Project : Mass Transit System Project in Bangkok (Purple Line) (II)

Loan Agreement : September 28, 2010

Loan Amount : 16,639 million Yen

Borrower : Mass Rapid Transit Authority of Thailand (MRTA)

2. Background and Necessity of the Project

(1) Present situation and issues concerning the urban transportation sector in Thailand

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, leading to an increase in the number of automobiles and other vehicles. As a result, there has been a serious rise in traffic congestion in the transportation system, which depends heavily on the automobile. Moreover, air pollution caused by automobiles is recognized as a problem, and measures to ease the load on the environment are required.

(2) Development policies for the urban transportation sector in Thailand and the Priority of the Project

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 financed by Japanese ODA loans, began operation. In addition, Airport Rail Link connecting the new Bangkok International Airport and the city center was opened in August 2010 and is currently in operation. Meanwhile, the Skytrain and subway operate only within the central district of Bangkok, and their operating distances is limited. As connections with other modes of transportation are inconvenient, its ability to meet transportation demands is limited.

In order to alleviate 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 Mass Transit Investment Plan (2005-2012) which aims for investment in the development of seven lines in the Bangkok Metropolitan Area between 2005 and 2012. In the cabinet meeting on August 1, 2006, the construction of three lines was approved including the Purple Line between Bang Sue and Bang Yai to be built by MRTA, the extension of the Blue Line from Bang Sue to Tha Phra and from Hua Lamphong to Bang Kae, also to be built by MRTA, and the Red Line of the State Railway of Thailand linking Phaya Thai, Bang Sue and Rangsit.

The present administration, established in January 2009, also places high priority on urban railway development in the Bangkok Metropolitan Area.

Furthermore, the National Economic and Social Development Plan, which is enacted every five years by Thailand's National Economic and Social Development Board (NESDB), has, from the 7th Plan (1992-1996) to the 10th Plan (2007-2011), consistently stressed the importance of developing

an urban transportation network in the Bangkok Metropolitan Area, indicating that this Project has high priority as a policy objective.

(3) Japan and JICA's Policy and Operations in the urban transportation sector

In Japan's economic cooperation plan for Thailand, the "Enhancement of Competitiveness for Sustainable Growth" has been placed in a priority area. JICA declares its policy as the advancement of smooth distribution to promote dynamic economic activity within the "Program for Facilitation of Commerce Activity," and this Project follows said policy. In addition, this Project is consistent with the "Program for Improvement of Urban Environment" of the "Development Issues in Maturing Society", which is placed in high priority area in the cooperation plan. The major assistance Projects targeting mass transit systems are as follows.

- ODA loans:

- Bangkok Subway Construction Project – (Phase I: FY 1996 agreement) ~ (Phase V: FY 2000 agreement), total loan amount: 222,426 million yen

- Mass Transit System Project in Bangkok (Purple Line) – (Phase I: FY 2007 agreement), total loan amount: 62,442 million yen

- Mass Transit System Project in Bangkok (Red Line) – (Phase I: FY 2008 agreement), total loan amount: 63,018 million yen

- Individual expert:

- 1 person dispatched to the Office of Transport and Traffic Policy and Planning (April 2005-March 2008)

(4) Other donors' activity

The Asian Development Bank (ADB) has provided technical assistance regarding the use of PPP for mass transit system development (2007), a comprehensive plan for public transit (2007), and the introduction of a common ticketing system (2009).

(5) Necessity of the project

By developing an efficient mass transit system in Bangkok Metropolitan Area, this Project will contribute to the mitigation of air pollution and alleviation of traffic congestion in Bangkok. This Project is consistent with JICA's priority assistance area. Therefore, the project is highly necessary to provide assistance.

<h3>3. Project Description</h3>
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(1) Project objective

The aim of this project is to meet the increasing traffic demand and to mitigate traffic congestion in Bangkok Metropolitan Area by constructing new mass transit railway line (Purple Line:Bang Sue-Bang Yai), thereby contributing to urban economic development and environmental improvement.

(2) Project site/ Target area

Bangkok Metropolitan Area

(3) Project outline

- 1) Civil works (elevated structures (23 km), stations (16), depot, tracks)

- 2) Procurement of mechanical and electrical facilities (signaling and communication systems/

electrification systems, operation control center, ticket gates)

3) Procurement of rolling stock

4) Consulting services (construction supervision, environmental management planning, etc.)

Project operations will be contracted to the private sector under the supervision of the executing agency of the Project.

(4) Total project cost (Loan Amount)

214,240 million Yen (Loan Amount at this phase : 16,639 million Yen)

(5) Schedule

Planned for March 2008 - April 2016 (98 months in total). Project completion is defined as the start of commercial operation (August 2014).

(6) Implementation structure

1) Borrower : Mass Rapid Transit Authority of Thailand (MRTA)

2) Guarantor : The Government of Kingdom of Thailand

3) Executing agency : Same as 1)

4) Operation and maintenance system

M&E systems, rolling stock procurement, and operations/maintenance will be performed by a private sector company.

(7) Environmental and social consideration/ Poverty reduction/ Social development

1) Environmental and social considerations

① Category: A

② 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).

③ Environmental permit

The Environmental Impact Assessment (EIA) was approved by the National Environment Board (NEB) in January 2002 for the section between Bang Sue and Phra Nan Klao Bridge and in February 2007 for the section between Phra Nan Klao Bridge and Bang Yai.

④ Anti-pollution measures

By taking such measures as installation of noise-blocking walls and ventilation system in order to prevent air pollution, noise and other environmental impacts after the start of the Project, it is expected that the Project will satisfy Thailand's domestic environmental standards.

⑤ Natural environment

The areas to be targeted by this Project 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.

⑥ Social environment

Concerning the resettlement of 481 residential households and the acquisition of sites of

approximately 40ha, this Project is moving forward with acquisition procedures through MRTA in line with site acquisition laws and other laws.

⑦ Other / Monitoring

MRTA will monitor such impacts as noise, vibrations, and water and air quality, etc., for this Project.

2) Promotion of poverty reduction

None in particular

3) Promotion of social development (e.g. gender perspective, measure for infectious diseases including HIV/AIDS, participatory development, consideration for persons with disabilities etc.)

① The measures against HIV/AIDS for construction workers will be taken in the contract of civil works.

② This Project plans design taking into account utilization by the elderly, disabled persons and others as a part of the civil works contract.

(8) Coordination with other donors

The ADB continues cooperating in the area of Thailand's mass transit system, therefore, information will be shared appropriately.

(9) Other important issues

None in particular

4. Targeted Outcomes

(1) Performance indicators (Operation and Effect Indicator)

Indicator	Target (2016) [2 years after project completion]
Operating rate (%/year)	92
Running distance (1,000km/day)	31.7
Number of running train (runs/day)	246
Volume of passengers (passenger km/day)	1,816,546
Income from passengers (million baht/day)	6.49
Maximum speed (km/hour)	80

(2) Internal rate of return

Based on the assumptions indicated below, the Economic Internal Rate of Return (EIRR) will be 12.7%.

**【EIRR】**

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

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

Project Life : 30 years

## 5. External Factors and Risk Control

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

## 6. Lessons Learned from Past Projects

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 MRTA, including implementation of technical assistance related to Japanese ODA loans and technical cooperation projects, 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) Indicators to be used

- 1) Operating rate (%/year)
- 2) Running distance (1,000km/day)
- 3) Number of running train (runs/day)
- 4) Volume of passengers (passenger km/day)
- 5) Income from passengers (million baht/day)
- 6) Maximum speed (km/hour)
- 7) Economic internal rate of return (EIRR) (%)

### (2) Timing of next evaluation

Two years after completion of this Project