

## Ex-Ante Evaluation (for Japanese ODA Loan)

Southeast Asia Division 1,  
Southeast Asia and Pacific Department, JICA

### 1. Basic Information

Country: The Republic of Indonesia

Project: Construction of Jakarta Mass Rapid Transit Project (Phase 2) (I)

Loan Agreement : October 24, 2018

### 2. Background and Necessity of the Project

#### (1) Current State and Issues of the Urban Transportation Sector in Indonesia

The Jakarta Metropolitan Area has a population of about 30 million people (in 2015), which continuing to increase by approximately 2.7 percent every year. The increase in population is remarkable especially that of the provinces' adjacent to the Special Capital Region of Jakarta.

The number of commuters who move from the provinces to Jakarta, the center of economic and industrial activities, increased from 1,105,000 people/day in 2010 to 1,382,000 people/day in 2014, and the number is increasing year by year. At the same time, 91 percent of passengers and freights in the Metropolitan Area are depending on road transportation. Meanwhile, as the consequence of Indonesia's economic growth, there is a sharp rise in the number of vehicles, such as cars and trucks. The number of registered vehicles in the Special Capital Region of Jakarta increased around 50 percent from 11,990,000 in 2010 to 17,860,000 in 2016. Such increase causes severe traffic congestions that leads to worsening the investment environment as well as air pollution caused by exhaust fumes. Therefore, both enhancement of capacity of passenger transport and mitigation of the traffic congestion are the urgent issues for both the Government of the Republic of Indonesia and the DKI Jakarta Provincial Government. To resolve these urgent issues, the DKI Jakarta Provincial Government has been taken measures, such as limiting the volume of passenger cars coming into the center of Jakarta, and introducing bus lanes. However, the issue is yet to be solved.

As the transport demand is expected to rise, the Government of the Republic of Indonesia and DKI Jakarta Provincial Government decided to construct the Mass Rapid Transit (hereinafter referred to as "MRT") system by implementing "Construction of Jakarta Mass Rapid Transit Project" (hereinafter referred to as "this Project") to accelerate modal shift from automobile traffic to public transportation. Under the Phase 1 section of this Project, they have utilized Japanese ODA loans to construct 15.7 km of MRT system between Lebak Bulus located in south of Jakarta City and Bundaran HI (Hotel Indonesia) in the City center. The loans already provided consist of Engineering Service (E/S) loan of 1.87 billion yen, the first batch loan of 48.15 billion yen, and the second batch loan of 75.218 billion yen.

National Mid-term Development Plan (2015-2019) of Indonesia (January 2015) has set the construction of a public mass transport system in the urban area as a key goal. In this Plan, the specific targets are set relating to promotion of a modal shift to public transportation and implementation of project for constructing public mass transport. The Ministry of Transportation's five-year strategic plan, the Strategic Plan (2015-2019) (December 2015), also sets the construction of public mass transport in the Jakarta Metropolitan Area as the key goal. In this Strategic Plan, the development plan for mass rapid transit (MRT) is placed under the major goal to develop modern and advanced mass transport systems in the urban area.

#### (2) Japan and JICA's Policy and Operations in the Urban Transport Sector

Japan's Country Assistance Policy for the Republic of Indonesia (September 2017) identifies "assistance for further economic growth" as a priority area, including improving the business and investment environment by providing assistance for infrastructure development in the Jakarta Metropolitan Area. The program that supports improvement of transport environments in the Jakarta Metropolitan Area is positioned as one of the prioritized Japan's assistance program. This Project has status as the project that contributes to meet the

objective of the program as well as the priority area mentioned above. Simultaneously, JICA Country Analysis Paper for the Republic of Indonesia (June 2018) analyzes that priority should be given to the infrastructures development including urban transport in the Jakarta Metropolitan Area. Therefore, this Project is consistent with these policies and the analysis.

The Jakarta Metropolitan Area has been suffering from heavy economic losses caused by traffic congestion. The construction of MRT system in the area is expected to contribute to mitigating traffic congestion, thus lead to the investment environment of the Country. It is also expected to contribute to achieving Goal 9 of the SDGs (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation). Therefore, it is highly necessary for JICA to provide support for the implementation of this Project.

### (3) Other Donors' Activity

There are no other donors that support the construction of MRT system in Jakarta Metropolitan Area. KfW (Kreditanstalt für Wiederaufbau) supported the procurement of rolling stock for KRL Jabodetabek in 2005. The World Bank Group assisted the "Indonesian Railway Efficiency Project", which included the improvement of the Bandung line, from 1996 to 2009. Because both donors' support were for the existing railways, they do not overlap with this Project or the construction of the new urban MRT system.

## **3. Project Description**

### (1) Project Objective

The objective of the Project is to enhance the transportation capacity of Jakarta metropolitan area through construction of mass rapid transit system, thereby respond to the increasing transport demand, and to promote the modal shift from automobile traffic to public transportation to mitigate the escalating traffic congestion. It will ultimately contribute to the improvement of the investment environment and mitigation of the climate change in Jakarta Metropolitan Area.

### (2) Project Site/Target Area: Special Capital Region of Jakarta

### (3) Project Components

This Project will construct MRT system (23.5 km in total length) between Lebak Bulus and Kampung Bandan in two phases: the Phase 1 section is 15.7 km long between Lebak Bulus and Bundaran HI, and the Phase 2 section is 7.8 km long between Bundaran HI and Kampung Bandan.

#### 1) Civil Work and construction of railway structures (23.5 km in total length and 21 stations)

Phase 1 section (15.7 km): Underground part (5.9 km and 6 stations) and elevated part (9.8 km and 7 stations)

Phase 2 section (7.8 km): Underground part (7.5 km and 7 stations) and overground part (0.3 km and 1 station)

#### 2) Construction of depots (Lebak Bulus and Kampung Bandan)

#### 3) Procurement of rolling stocks: 180 cars (30 trains, each consisting of 6 cars)

#### 4) Electric and mechanical systems

#### 5) Development of Dukuh Atas Station Area

#### 6) Consulting services (basic design, detailed design (LCB (local competitive bidding) package only), tender assistance, construction supervision, support for operation and maintenance etc.)

### (4) Estimated Project Cost

407,931 million yen (of which, eligible for Japanese ODA Loan is 333,369 million yen including 70,021 million yen on this occasion)

### (5) Schedule

From March 2009 to June 2026 (208 months in total). The Project will be deemed as completed on the date on which the all facilities begin to be made available (June 2025).

### (6) Project Implementation Structure

#### 1) Borrower: The Government of the Republic of Indonesia

#### 2) Guarantor: None

- 3) Executing Agency: Directorate General of Railways (DGR), Ministry of Transportation /DKI Jakarta Provincial Government (DKI)
- 4) Operation and Maintenance Agency: PT Mass Rapid Transit Jakarta (MRTJ)
- (7) Collaboration and Division of Roles with Other Projects and Donors:
  - 1) Japan's assistance activities
 

Since 2008, Japan has dispatched Jakarta MRT project adviser to DKI, supervising MRTJ, to support planning and implementation of this Project.
  - 2) Other development partners' assistance activities: None
- (8) Environmental and Social Consideration/Poverty Reduction/Social Development
  - 1) Environmental and Social Consideration
    - i) Category: A
    - ii) Reason for Categorization
 

It is because this Project falls under the railway sector under the Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations, established in April 2002 (hereinafter referred to as "JBIC Guidelines"), and is likely to have significant adverse impact due to its characteristic.
    - iii) Environmental Permit
 

Local Environmental Monitoring Agency of DKI already approved the revised Environmental Impact Assessment (EIA) Report for Phase 1 of this Project in November 2010. The Agency also approved the EIA Report for Phase 2 in January 2011.
    - iv) Anti-Pollution Measures
 

The construction contractor takes measures against degradation of air quality and noise during the construction, which include but are not limited to regular maintenance of construction vehicles and equipment, covering over construction materials during delivery, and installation of temporary noise fences around construction sites. The construction contractor disposes of waste produced during the construction in accordance with the national waste management laws and regulations, and MRTJ and the construction contractor take measures necessary to reuse and/or dispose of surplus soil, followed by consultations with DKI. As measures against noise and vibration during operation, MRTJ will install noise barriers, and adopt long rails and vibration isolation mats to meet Indonesian environmental standards for noise.
    - v) Natural Environment
 

The Project site is not located in or around any sensitive areas such as national parks, and it is likely to have a minimal adverse impact on the natural environment.
    - vi) Social Environment
 

Phase 1 of this Project required the acquisition of about 13.3 ha of land and the involuntary resettlement of 454 displaced persons. Land acquisition and involuntary resettlement have been implemented in accordance with the domestic laws and regulations of Indonesia, and the Land Acquisition and Resettlement Action Plan (LARAP) developed as per the JBIC Guidelines. No particular objection for implementation of Phase 1 of this Project was confirmed through consultations with project affected persons. It was confirmed that public consultations and grievance redress mechanism have been implemented and available to any complaints during the project implementation. Lawsuit cases over title owner of land acquired for the Project on several parcels of the land were raised against the land ownership, but they were settled by the end of 2017 in accordance with LARAP as well as the Indonesian legal system.

In Phase 2 of this Project for the extension of the north-south line, it is expected that approximately 3.8 ha of lands are to be acquired 590 persons are to be resettled involuntarily. In addition, the construction of a rolling stock depot in Kampung Bandan is expected to require involuntary resettlement of 1,614 informal settlers who occupy approximately 5.5 ha of the land which is owned by the Indonesian Railway Company (PT Kereta Api Indonesia). Land acquisition, and displacement and relocation of business and informal settlers, etc. are to be implemented in accordance with the

domestic laws and regulations of Indonesia, and LARAP which have been developed in accordance with the JBIC Guidelines. No particular objection for implementation of extension of the north-south line under this Project was confirmed through consultations with project affected persons.

vii) Other/Monitoring

In Phases 1 and 2 of this Project, MRTJ monitors environmental impacts on such items as noise and vibrations, air quality, waste management, and groundwater quality during the construction and operation phases. DKI monitors the progress of land acquisition and involuntary resettlement caused by this Project.

2) Cross-cutting Issues:

i) Measures against Climate Change: This Project aims to suppress air pollution and to mitigate climate change through the promotion of public transport, resulting in a contribution to reducing greenhouse gas emissions.

ii) Consideration for the people with disabilities: Stations with a barrier-free design in consideration of those with disabilities and the elderly are under construction in Phase 1, which will also apply to Phase 2.

3) Gender Category: GI(S) (Gender Integrated Project)

< Activities / Classification Rationale >

In this Project, facilities and equipment will be constructed convenient for both genders. For instance, nursery room is planned to be installed in each station for female passengers. Moreover, MRTJ holds gender policies in its internal regulations to provide both genders an equal chance to obtain jobs, higher positions, and rewards etc..

(9) Other Important Issues

The Special Terms for Economic Partnership (STEP) will apply to the Japanese ODA Loans for this Project, which represents that Japanese technologies will be utilized in various scenes, such as tunneling work based on the shield method, rolling stock manufacturing based on STRASYA, and the automatic fare collection system which uses IC cards.

**4. Targeted Outcomes**

(1) Quantitative Effects

1) Outcomes (Operation and Effect Indicators) (Whole Section)

Indicator	Baseline (Actual value in 2018) (Note 1)	Target (2027) [2 years after project completion]
Volume of passengers (person per km per day)	N.A.	2,723,748
Number of running trains (trains per day)	N.A.	236
Running distance (km per day)	N.A.	32,180
Operating rate (%)	N.A.	81.5

Note 1: N.A. stands that no actual value is available because the MRT system is not yet in service.

Note 2: DKI will review the ratio of railways to other modes of transport every year starting from Phase 1 section's commencement of operation up to the ex-post evaluation of this project which to be conducted after Phase 2 section's completion.

2) Impacts

i) DKI will measure the status of greenhouse gas (CO<sub>2</sub>) emission reduction along the MRT in 2030 in accordance with DKI Jakarta Governor Regulation.

ii) The one-way travel time will be shorten within this Project's section.

(2) Qualitative Effects

Creation of employment opportunities; improvement in both living and investment environment in the Jakarta Metropolitan Areas by alleviation of traffic conditions and punctual movement; economic development of the Metropolitan Areas; and reduction of air pollution

and greenhouse gas emission to mitigate climate change by promoting public transportation etc.

### (3) Internal Rate of Return

Based on the following assumptions, the Project's economic internal rate of return (EIRR) is 10.10% and its financial internal rate of return (FIRR) is 5.79%.

[EIRR] Cost: Project costs, operation and maintenance costs (excluding tax)

Benefits: Reduction of travel time, travel costs, construction costs for alternative transportation (bus way), and greenhouse gas (CO<sub>2</sub>) emissions.

Project Life: 30 years

[FIRR] Cost: Project costs, operation and maintenance costs, and equipment renewal expenses.

Benefits: Fare and non-fare revenues (including advertisement revenue)

Project Life: 30 years

## **5. Prerequisites and External Factors**

(1) Prerequisites: None in particular

(2) External Factors: None in particular

## **6. Lessons Learned from Past Projects**

The following lessons were learned from ex-post evaluation of the Metro Manila Strategic Mass Rail Transit Development Project in the Republic of the Philippines (evaluated in FY2008). Firstly, urban mass transit system generally requires a huge initial capital investment, which makes it difficult to run the project from fare revenue alone, and it is inevitable to obtain capital investments and subsidies from the government. Secondly, to secure the financial soundness of the project's executing agency, and it is necessary to prepare a detailed financial plan and an action plan for the government assistance at the initial stage.

Because this Project also requires a huge initial capital investment, securing the financial soundness of MRTJ is necessary. DKI plans to provide subsidies to MRTJ until MRTJ's financial situation stables. In addition, to support MRTJ to prepare its financial plan, DKI will decide appropriate level of fare by also taking account of estimation to be provided by MRTJ, at the same time, consultant hired under Japanese ODA Loan will assist MRTJ to plan to increase non-fare revenue deriving from non-railway business, such as development of stations and surrounding areas.

## **7. Evaluation Results**

This Project conforms to the development issues and policies of the Republic of Indonesia as well as the assistance policy of Japan and JICA's analysis documents. The construction of MRT system will contribute to mitigating traffic congestions in the Jakarta Metropolitan Area. Moreover, this project is to contribute to the achievement of Goal 9 of the SDGs (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation). Therefore, it is highly necessary for JICA to provide support for the implementation of this Project.

## **8. Plan for Future Evaluation**

(1) Indicators to Be Used

As indicated in Section 4. (1) - (3)

(2) Timing

Ex-post evaluation: 2 years after project completion

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