

## Ex-Ante Evaluation

Southeast Asia 5 Division  
Southeast Asia and Pacific Department, JICA

### 1. Name of the Project

Country: The Republic of the Philippines  
Project: North-South Commuter Railway Extension Project (I)  
Loan Agreement: January 21, 2019

### 2. Background and Necessity of the Project

#### (1) Current State and Issues of the Railway Sector in Metro Manila and its suburbs

Metro Manila is the largest hub of economic activity in the country with a concentration of 13% of the country's total population and 36% of the GDP. The population is rapidly increasing from 7.92 million people in 1990 to 12.87 million people in 2015, which represents about a 1.6 times increase over that period. In the areas including Laguna Province, Bulacan Province and Pampanga Province near Metro Manila, the population has rapidly increased from 12.35 million to 21.81 million in the 20 years since 1990, and the volume of inflow traffic to Metro Manila is increasing. However, in these areas, the development of a rail-based public transportation system as a means of mass transport has been delayed, and the total length of the three elevated railway lines in Metro Manila (including two light rails) is a mere 50 km. Consequently, traffic congestion in Metro Manila and its suburbs is getting worse day by day, making it a bottleneck for smooth logistics and the movement of people.

Eliminating congestion in the Metro Manila area and promoting sustainable suburban development has become an urgent issue for high quality growth in the metropolitan area and in the suburbs. However, in the southern part of the Metro Manila, only a non-electrified commuter line with a low service frequency is running from Tutuban in the City of Manila to Mamatid in the City of Cabuyao. In the northern part of Metro Manila, there is no rail-based public transportation system. Residents in the area have therefore no means except commuting by bus, car etc. in traffic congestion at vehicle speeds of less than 20 km/h all day. Also, at present, the expansion of Clark International Airport located about 50 km north of Malolos City (the northern end point of North-South Commuter Railway currently under construction) is ongoing to alleviate congestion at Manila International Airport. Furthermore, approximately 30 km north of Clark International Airport, the project to redevelop New Clark City (hereinafter referred to as "NCC") using the site of the former U.S. military base is underway. These plans are expected to further increase commuting and high-speed travel demand from Malolos City to NCC in the future.

In response to this situation, the Government of the Republic of the Philippines (hereinafter referred to as "the Philippines") has given top priority to the development of a large-scale public transportation network which will function as the north-south axis of the Metro Manila area in "the Roadmap for Transport Infrastructure Development for Metro Manila and Its Surrounding Areas" (2014) which JICA supported during its formulation. The current Duterte Administration announced the "Build Build Build" Program after its inauguration, which planned to increase infrastructure investment to 5.4% of GDP by 2017 which has been 2.4% on average for the past 50 years, and to raise it to 7.3% by 2022. "North-South Commuter Railway Extension Project" (hereinafter referred to as "the Project") is positioned as a flagship project of the program.

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

"Strengthening of Foundations for Sustainable Economic Growth" has been set as a priority area in Japan's Country Assistance Policy for the Republic of the Philippines (April 2018). More specifically, support will be provided for the development of transportation/traffic networks centering on Metro Manila. Meanwhile, the JICA Country Analysis Paper for the Republic of the Philippines (November 2014) analyzed that "Infrastructure Development in Greater Capital Region" is a priority area, and it is necessary to alleviate traffic congestion and improve logistics centering on the metropolitan region through infrastructure development including expansion of the public transportation system. The Project is consistent with these policies and analyses. In the meantime, Japan has implemented the following ODA Loan projects in the Philippines for passenger transportation and system improvement: "LRT Line 1 Capacity Expansion Project (I) and (II)" (Loan Agreement (L/A) signed in 1994 and 2000), "Metro Manila Strategic Mass Rail Transit Development Project (I), (II) and (III) (L/A signed in 1997, 1998 and 1999), "Capacity Enhancement of Mass Transit Systems in Metro Manila"(L/A signed in 2013), "North-South Commuter Railway Project (Malolos-Tutuban) " (L/A signed in 2015), "Metro Manila Subway Project (Phase 1) (I )" (L/A signed in March 2018) and "Metro Rail Transit Line 3 Rehabilitation Project" (L/A signed in November 2018), etc.

## (3) Other Donors' Activities

The Asian Development Bank (hereinafter referred to as "ADB") defines improvement in the availability and sustainability of transportation and traffic infrastructure as one of its major programs in the Country Operations Business Plan (2018-2020), and provides advisory support for promoting investment in transportation and traffic infrastructure. The World Bank defines assistance to improve urban traffic in Metro Manila and Cebu City, in order to achieve "rapid, inclusive and sustainable economic growth," which is one of its priority areas in the Country Partnership Strategy (2015-2018). It provides support for introducing a BRT (bus rapid transit) system in Metro Manila. In addition, the People's Republic of China has expressed support for railway construction in Luzon and Mindanao Islands as infrastructure development support.

## **3. Project Description**

### (1) Project Objectives

The objectives of the Project are to enhance the connectivity of the urban transportation network, and to expand the transport capacity in Metro Manila and its suburbs by extending the North-South Commuter Railway (Malolos-Tutuban) in the Metro Manila area to Calamba in Laguna Province in the south and Clark International Airport in Pampanga Province in the north, thereby contributing to expansion of the economic zone of Metro Manila, alleviation of traffic congestion, improvement of the investment environment, and alleviation of air pollution and climate change.

### (2) Project Site/Target Area

Metro Manila, Provinces of Laguna, Bulacan and Pampanga

### (3) Project Components

Of the following, JICA plans to provide loans to ii), iii) and iv), while ADB to i).

- i) Civil works (main line and depot)
- ii) Railway system/tracks construction
- iii) Rolling stock
- iv) Consulting services (construction supervision, capacity development for supervising

railway operations and maintenance) (short list selection)

- (4) Estimated Project Cost  
1,375,074 million yen (of which, the ODA Loan amount of Project (I) is 167,199 million yen)
- (5) Project Schedule  
January 2019 – September 2027 (106 months in total). The commencement date of service (September 2025) shall be the time of the Project's completion.
- (6) Project Implementation Structure
  - 1) Borrower: Government of the Republic of the Philippines
  - 2) Guarantor: None
  - 3) Executing Agency: Department of Transportation
  - 4) Operation and Maintenance Agency:  
A private operation and maintenance body of the "North-South Commuter Railway Project (Malolos - Tutuban)" will take charge of operation and maintenance for the Project.
- (7) Collaboration and Division of Work with Other Projects and Donors  
Co-financing with ADB is planned for the Project. ADB will finance the package for civil works (main line and depot).
- (8) Environmental and Social Consideration/ Poverty Reduction/ Social Development
  - 1) Environmental and Social Consideration
    - i) Category: A
    - ii) Reason for categorization: The Project is classified as Category A because it falls into the rail sector and is likely to have significant adverse impact due to its characteristics under the JICA Guidelines for Environmental and Social Considerations (April 2010, "JICA Guidelines").
    - iii) Environmental Permit: An Environmental Compliance Certificate (ECC) was issued by the Department of the Environment and Natural Resources (DENR) in August 2018 for the Environmental Impact Statement (EIS) Report for the Project.
    - iv) Anti-Pollution Measures: Adverse impacts such as air pollution, noise, vibration etc. are anticipated during construction. However, the impacts will be minimized by taking mitigation measures such as sprinkling water regularly, limiting speed of vehicles carrying construction waste soil, equipping construction machines with mufflers and silencers, installing noise barriers, and adopting low-vibration-type construction machines. Although noise, vibration and impacts on water quality etc. are anticipated after the commencement of services, it is expected that these impacts will be minimized by taking mitigation measures such as installing noise barriers, laying long rails, installing wastewater treatment equipment in the depots and hygiene equipment in the station buildings. In addition, Traffic Management Plan will be prepared during and after construction to alleviate traffic congestion and prevent accidents.
    - v) Natural Environment: This Project is not located in or near any sensitive areas such as national parks, and is expected to have minimal adverse impact on the natural environment. Although some sections of the north extension pass along parts of Manila Bay designated as Important Bird Areas and Key Biodiversity Areas, the existing route of the Philippine National Railway is used for the planned site of the

Project, and endangered species etc. have not been observed in the baseline survey around the route. Therefore, the Project site is not located in an important natural habitat.

- vi) **Social Environment:** The Project involves the land acquisition of about 131.92 ha, resettlement of 13,626 households (51,188 residents), and will have an effect on 1,891 business owners. The resettlement and land acquisition process will be implemented in accordance with the Philippine laws and regulations and the Resettlement Action Plan which is prepared based on the JICA Guidelines. The majority of the residents targeted for relocation are informal settlers. They are offered an opportunity to purchase a home in addition to the opportunity to select a relocation site through the relevant organizations (National Housing Authority and Social Housing Finance Corporation). In the Stakeholder Consultation Meetings, explanations were provided including an overview of the Project, the compensation and overview of the support available. There is no opposition to the project implementation through these meetings.
- vii) **Other/Monitoring:** Under the responsibility of the executing agency (DOTr), the contractor will monitor air quality, noise/vibration etc. during the construction. After operation starts, the operation and maintenance body will monitor noise/vibration, water quality etc. under the responsibility of DOTr. DOTr will monitor the implementation status of land acquisition and resident resettlement, and the state of the affected residents' livelihood recovery.

## 2) Cross-cutting Issues

- i) **Climate change countermeasures:** The Project will contribute to reducing greenhouse gas (GHG) emissions as a climate change mitigation measure. The expected amount of climate change (GHG emissions) mitigation through the Project is approximately 539,135 tons of CO<sub>2</sub> per year.
- ii) **Measures against infectious diseases including HIV/AIDS:** To mitigate the infectious risk including HIV/AIDS during the construction period, the Project will include preventive measures in the bidding documents to urge contractors to provide HIV/AIDS prevention programs for their construction workers.
- iii) **Consideration for persons with disabilities:** Universal design (barrier-free design) will be introduced, including the installation of elevators, accessible toilets and studded paving blocks in station buildings, and the elimination of differences in level between platforms and train cars.

## 3) Gender Category: Gender Informed (Significant)

<Activity Content and Reason for Classification> To ensure that women are able to use the railway system safely and comfortably, the Project will install security cameras and emergency alarms in each train car, while also introducing women-only cars.

## (9) Other Important Issues

Advanced Japanese technologies are expected to be introduced in the railway system and vehicles (highly safe and punctual traffic signal systems, and lightweight, energy-efficient train vehicles, etc.).

## 4. Targeted Outcomes

### (1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual Value in 2017)	Target (2027) [2 years after project completion]
Number of train services (No. of trains/day)	-	305
Running distance (km/day)	-	37,292
Operation rate (%)	-	87
Volume of transportation (1,000 persons x km)	-	29,450
Time required (minutes)	240(*)	111.75

Target section: Calamba - Clark International Airport for all of the above indicators.

\* The travel time between Calamba and Tutuban is 120 minutes using the existing commuter line or by car, and that between Tutuban and Clark International Airport is 120 minutes by car. The travel time by car is the daily average on the shortest route.

(2) Qualitative Effects

Enhancing the connectivity of the urban transportation network in Metro Manila and its suburbs, alleviating traffic congestion, improving air pollution, mitigating climate change, expanding the economic sphere of Metro Manila, and improving the investment environment as a result.

(3) Internal Rate of Return (IRR)

Based on the conditions indicated below, the economic internal rate of return (EIRR) of the Project (between Calamba and Clark International Airport) is 10.4% and the financial internal rate of return (FIRR) is 0.5%.

[EIRR]

Cost: Project cost, operation and maintenance expenses (taxes excluded for both)

Benefits: Vehicle running cost saving, travel time and cost saving, and reduction of carbon dioxide emissions

Project Life: 40 years

[FIRR]

Cost: Project cost, operation and maintenance expenses

Benefits: Revenues from fares, etc.

Project Life: 40 years

**5. Preconditions/ External Factors**

(1) Preconditions: Land acquisition/resident resettlement, relocation of obstructive structures etc., and confirmation of construction yards as scheduled by the Philippine government execution. Loan as planned by ADB.

(2) External Factors: None in particular

**6. Lessons Learned from Past Projects and Application to the Project**

The ex-post evaluation of India's "Delhi Mass Rapid Transport System Project" etc. identifies the need for measures to establish systematic and efficient urban transportation together with other

transportation systems, in order to improve the utilization ratio, thereby increasing profitability and ensuring project continuity. Therefore, the Project will ensure more use of the railways and secure passenger convenience through developing transport hub facilities which involve feeder transport links around the stations, while considering convenient transfer and connections with other lines and with other modes of transportation.

Furthermore, some other projects in the transportation sector in the Philippines have also proposed rapid construction method etc. to alleviate traffic congestion. However, these projects have been faced with the problem that the technics and capacities required to apply these technologies during the construction stage have not been secured. Based on this background, the Project will ensure: a) thorough liaison and confirmation with ADB which is financing the civil works concerning the contents of the bidding documents and other related documents prepared during the detailed design study, and b) the early establishment of a system for JICA and ADB to receive reports and communication from consultants during the construction supervision stage to enable immediate responses when problems arise.

## **7. Evaluation Results**

The Project aims to strengthen the connectivity of urban traffic, and expand the transport capacity in Metro Manila and its suburbs by expanding the railway connecting the suburbs of the north-south axis in the Metro Manila area, thereby contributing to the expansion of the economic zone and the alleviation of traffic congestion in Metro Manila. Therefore, the Project is aligned with the Philippines' development policy, and both Japan's and JICA's assistance policies and analysis. Furthermore, the Project is expected to contribute to Sustainable Development Goals (SDGs) Goal 9 (Build resilient infrastructure), making JICA's support of the Project both necessary and relevant.

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

- (1) Indicators to be Used  
Same as 4. (1) - (3)
- (2) Timing  
Ex-post evaluation : Two years after the project completion

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