

Ex-Ante Evaluation

Southeast Asia Division 5 Southeast Asia and Pacific Department, JICA

1. Name of the Project

Country: The Republic of the Philippines (Philippines)

Project: Metro Manila Subway Project (Phase 1) (II)

Loan Agreement: February 10, 2022

2. Background and Necessity of the Project

(1) Current State and Issues of the Railway Sector in Metro Manila in the Philippines

Despite its relatively small size (620 square kilometers), the population of Metro Manila surges by 1.8% every year. It has rapidly increased from 7.92 million people in 1990 to 12.87 million in 2015, an increase of around 60%. Irrespective of this overpopulation, the total length of the three elevated urban railway lines servicing Metro Manila (including two light rails) is merely 50 kilometers, and the construction of a railway system is lagging behind the need, resulting in further traffic congestion. The economic loss caused by the traffic congestion is estimated to be approximately 3.5 billion pesos (about 7 billion yen) per day, an indication of how the severity of the situation is harming the international competitiveness of the Republic of the Philippines (Philippines) by presenting a bottleneck to the smooth mobility of goods and people.

In response to these circumstances, JICA supported the formulation of "the Roadmap for Transport Infrastructure Development for Metro Manila and Its Surrounding Areas (Region III & Region IV-A)" (referred to as "Infrastructure Roadmap") in 2014, which was approved by the government of the Philippines. The Infrastructure Roadmap proposes the building of large-scale public transportation to improve north-south connectivity in Metro Manila to strengthen public transportation networks connecting the metropolitan city center and the suburbs to alleviate overpopulation and traffic congestion in the city center. The aim is to promote systematic expansion of the urban area in the north-south direction and a shift towards public transportation. This is expected to result in increased investment, industrial expansion and consequent acceleration in economic growth, reduced health hazards, such as air and noise pollution, and shorter commuting times and other factors contributing to better quality of life. Furthermore, the Metro Manila Subway Project (Phase 1) ("the Project") is given high priority as one of the flagship projects in the "Build, Build, Build" (BBB) program, promoted by the current regime to improve infrastructure.

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

Under the Country Development Cooperation Policy for the Philippines (April 2018), "Strengthening a Foundation for Sustainable Economic Growth" is defined as one of the priority areas. It mentions that Japan will cooperate in developing quality infrastructure, including the development of transportation networks in the Greater National Capital Region and provincial cities and develop other quality infrastructure. The JICA Country Analysis Paper for the Philippines (July 2020), which outlines the direction of cooperation with the country, states that JICA will help build necessary socio-economic infrastructure in urban areas as part of its efforts to increase both the quality and quantity of the middle class in the Philippines who can benefit from fundamental values such as democracy, the rule of law, and market economy which the Philippines and Japan share in common. As the government of the Philippines recognizes the BBB program as a trigger for recovering from the economic downturn associated with the spread of COVID-19, the paper also states that Japan will continue to cooperate with efforts related to quality infrastructure investment. In this way, the Project is in line with these policies. Furthermore, the Project is expected to contribute to Sustainable Development Goals (SDGs) Goal 9 (Build resilient infrastructure), Goal 11 (Make cities and human settlements inclusive, safe, resilient and sustainable) and Goal 13 (Take urgent action to combat climate change and its impacts).

Japanese ODA Loans have supported the country's projects in the railway sector. Examples include: the LRT Line 1 Capacity Expansion Project (I) (II) (Loan agreement signed in 1994 and 2000); the Metro Manila Strategic Mass Rail Transit Development (Line 2) (I) (II) (III) (Loan agreement signed in 1997, 1998, and 1999); the Capacity Enhancement of Mass Transit Systems in Metro Manila (Loan agreement signed in 2013); the North-South Commuter Railway Project (Malolos—Tutuban) (Loan agreement signed in 2015); the Metro Rail Transit Line 3 Rehabilitation Project (Loan agreement signed in 2018); and the North-South Commuter Railway Extension Project (Loan agreement signed in 2019).

(3) Other Donor's Activities

The Asian Development Bank (ADB) defines improvement in the accessibility, sustainability, etc. of transportation and traffic infrastructure as a key program under its Country Operations Business Plan (2018–2020). ADB also co-finances the North-South Commuter Railway Extension Project with JICA, while at the same time providing support to find private-sector operators for management and maintenance work in railway-related projects, including the Project, through the Transaction Advisory Service, which is an advisory service for the public sector provided by ADB's Office of Public-Private Partnership.

3. Project Components

(1) Project Objective

The objective of the Project is to accommodate increasing transportation demand by constructing a subway line in Metro Manila, thereby contributing to the alleviation of serious traffic congestion as well as to the mitigation of air pollution and climate change.

(2) Project Site/Target Area: Metro Manila (with a population of 12.87 million people and an area of approximately 620 square kilometers)

(3) Project Overview

1) Civil works (27-km main line and railyard including a training center)

2) Railway system (electricity/machines/signals/communications)

3) Procurement of 240 train cars

4) Consulting services (e.g., bidding assistance, supervision of construction, capacity building of the executing agency, and support for implementing Transit Oriented Development (TOD))

(4) Estimated Project Cost: 1,078.120 billion yen (Loan Amount: 804.460 billion yen)

(5) Project Schedule

March 2018 to November 2029 (141 months in total). Project completion is defined as the commencement of the service of the facilities (scheduled in November 2027).

(6) Project Implementation Structure

1) Borrower: Government of the Republic of the Philippines

2) Executing Agency: Department of Transportation (DOTr)

3) Operation and Maintenance Agency: The operation and maintenance will be outsourced to the private sector and will be selected through a tender process before the commencement of the service. From the perspective of ensuring appropriate operation and maintenance quality, JICA provides information concerning all aspects of the Project (such as civil engineering, facility and equipment plans) and advice on passenger demand predictions and other matters to DOTr through the consulting services of the Project, in order to ensure the selection of an operation and maintenance body that has no technical or financial problems. The operation and maintenance expenses are planned to be covered by fare revenue and finance from the general budget of the government.

Furthermore, the government of the Philippines has established the Philippine Railway Institute (PRI) to develop personnel specializing in railway operation, and Japan has been providing support through ODA Loans, Grant Aid (by the Ministry of Ministry of Foreign Affairs of Japan), etc. The operation and maintenance body of the Project is also expected to receive basic training at the PRI.

(7) Collaboration and Division of Work with Other Projects and Donors

The Project provides Technical Assistance Related to ODA Loan to assist the development of detailed design and tender documents (drafts), as well as to implement the Technical Assistance Project to Establish of the Philippine Railway Institute.

(8) Environmental and Social Considerations/Cross-Cutting Issues/Gender Categorization

1) Environmental and Social Considerations

- i. Category: A
- ii. Reason for Categorization: The Project targets the road sector and areas vulnerable to the features and impacts defined in the JICA Guidelines for Environmental and Social Considerations (Promulgated in April 2010, "JICA Guidelines") (large-scale involuntary resettlement).
- iii. Environmental Permit: The Project obtained an Environmental Compliance Certificate (ECC) in October 2017. In addition, the Project's Environmental Impact Statement (EIS) was updated in association with scope changes, and a revised ECC was obtained in December 2019.
- iv. Anti-Pollution Measures: While the construction may affect the air and water quality and cause waste, soil pollution, noise and vibration, mitigation measures will be in place, such as watering, setting up silt screens, drainage paths and septic tanks, regularly measuring the concentration of heavy metals and recycling them, appropriately storing fuels and oils and adopting a shield tunneling method. After the commencement of service, the impact of surface vibrations will be governed by the nighttime regulation standards stipulated by the Tokyo Metropolitan Government.
- v. Natural Environment: The project site is not located in or around sensitive areas such as national parks, and adverse impact on the natural environment is predicted to be minimal.

- vi. **Social Environment:** The total number of people involuntarily resettled in association with the Project is planned to be 2,124 people. Although the scope changes made at this time (a linear change and an extension of NAIA Terminal 3) will involve the acquisition of an additional 11.5-hectare site, this will not entail any involuntary resettlement. Land acquisition and resettlement will begin in accordance with the country's laws and regulations and a Resettlement Action Plan (RAP) that satisfies JICA guidelines.
- vii. **Other/Monitoring:** During the construction period, the contractor will monitor water and air quality, noise, vibration, waste and the like on the project site under the supervision of the executing agency (DOTr), based on the Environment Management Plan and Environment Monitoring Plan. After the commencement of service, the operation and maintenance body will monitor noise, vibration, etc., under the responsibility of the DOTr. The DOTr will monitor land acquisition, resettlement, and the success of income restoration efforts.

2) Cross-Cutting Issues

- i. **Climate Change Measures:** The Project helps reduce GHG emissions as an alleviating measure for climate change. The expected amount of climate change (GHG emissions) mitigation through the Project is 303,453 tons of CO₂ per year (2045).
- ii. **Measures to Prevent Infectious Diseases Including HIV/AIDS:** To mitigate the risk of infection of HIV/AIDS during construction, the Project will include preventative measures in the bidding documents to urge contractors to provide preventative programs to their labor force. At the same time, DOTr has established and ensures thorough observation of a set of measures as CDC guidelines to prevent the spread of COVID-19, such as checking temperatures of workers and making sure that they practice hand-washing and gargling at construction sites, avoid the Three C's (closed spaces with poor ventilation, crowded places with many people nearby and close-contact settings such as close-range conversations) in offices, restricting sharing of things, sterilizing workplaces and requiring those with infectious symptoms to isolate themselves. Besides the above, JICA has also established CDC measures against COVID-19 and other infectious diseases in its detailed design (paid technical accounting support) including the following: i) increasing toilet units to avoid the Three C's (the same measure adopted in Japanese railways) and ii) introducing train cars with a ventilation capacity as high as those adopted in Japanese railways. Furthermore, JICA has also been

providing online training programs on infectious disease control in the above technical assistance project for PRI as part of its efforts to assure safety for employees and passengers. In response to concerns between contractors and consultants, DOTr has also been developing guidelines about how to deal with extensions of construction period and additional expenses caused by COVID-19 in projects implemented by the Department.

- iii. Consideration for People with Disabilities: For universal design reasons, installation of elevators, accessible toilets and studded paving blocks (to aid the blind) in station buildings, introduction of accessible train cars, and elimination of differences in level between platforms and train cars are planned.

3) Gender Categorization: Gender Informed (Significant)

<Activity Content and Reason for Classification> The Project takes measures to encourage women to use the subway system and make sure that they are able to use it safely, such as introducing women-only cars and installing security cameras, single-gender toilets, etc. In addition, the RAP plans to offer preferential payment conditions, medical assistance and other benefits to households headed by females and provide other support to benefit women and the vulnerable. An agreement has also been reached with the executing agency to implement awareness building activities to prevent sexual harassment on the subway system.

(9) Other Important Issues

- i. Advanced Japanese technologies are introduced such as underground tunnel excavation, construction in narrow spaces, safe and highly reliable time signal systems, and light-weight/energy-efficient train cars, and the Special Terms for Economic Partnership (STEP) is adopted.
- ii. The governments of Japan and the Philippines have agreed on a policy to objectively confirm the appropriateness of the project cost, which has increased from what had been estimated in Phase 1 (I), and a third-party check (proof engineering) has been implemented on the engineering and construction package for the section that remains uncontracted. Consequently, it has been concluded that the work volumes, construction plans and makeshift plans in the detailed design are all rational and the quantity survey also lives up to reasonable standards.
- iii. The cost-cutting measures that have been adopted in the Project so far include halting express services, decreasing the number of tunnel boring machines, reducing the height of station ceilings and simplifying the interior.

4. Targeted Outcomes

(1) Quantitative Effects

Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (2017 actual)	Target (2029) [Two years after project completion]
Volume of Transportation (Person x km/Day)	-	4,679,071
Number of Running Trains (Number of running train return trips/Day)	-	128
Operation Rate (%)	-	86
Running Distance (km/Day)	-	45,612
Running Hours between East Valenzuela Station and NAIA Terminal 3 Station	(Note) (Road transportation)	39 minutes 20 seconds

(Note): As of November 2020, Metro Manila is under General Community Quarantine (GCQ), which imposes travel restrictions in response to the spread of COVID-19, resulting in a marked reduction in the use of road transportation. This is the reason that values need to be measured later, after life returns to normal. For reference, the time required to travel the section between Quirino Highway Station and FTI Station (approximately 22.5 km) by road transportation was 100 minutes as of September 2019, before the spread of COVID-19.

(2) Qualitative Effects

Transit Oriented Development (TOD) along the subway, mitigation of severe traffic congestion in Metro Manila, and alleviation of air pollution and climate change.

(3) Internal Rate of Return (IRR)

Based on the conditions indicated below, the Economic Internal Rate of Return (EIRR) of the Project is calculated as 10.7%, while the Financial Internal Rate of Return (FIRR) is -1.5%. The operation and maintenance services are planned to be outsourced to the private sector in the Project. The project cost and operation and maintenance expenses of the Project are planned to be covered by fare revenue, while depending on the general finances of the government to make up for shortfalls.

[EIRR]

Costs: Project cost, and operation and maintenance expenses
(excluding tax)

Benefits: Reducing vehicle running costs, travel time costs, greenhouse gas emissions, etc.

Project Life: 45 years

[FIRR]

Costs: Project cost, and operation and maintenance expenses

Benefits: Revenues from fares, advertisement, and income other than railway business

Project Life: 45 years

5. Pre-conditions and Important Assumptions

None in particular

6. Lessons Learned from Past Projects

Past ex-post evaluations of Japanese ODA Loan projects to the Philippines (e.g., Improvement and Modernization of Commuter Line South Project) indicate the necessity of thorough investigation on the feasibility of possible measures taken by the executing agency and the determination of role-sharing among institutions implementing resettlement, and preparation of the implementation plan with sufficient time to complete the resettlement. This is because reports indicate that projects involving the resettlement of squatters are highly likely to require a long time to complete. According to the ex-post evaluation of the Batangas Port Development Project, another Japanese ODA Loan to the Philippines, it is essential to consult with local communities by involving not only representatives, but also residents from all walks of life and ensure early identification of people to be resettled to prevent the number of target households from increasing later. In addition, according to the ex-post evaluation of Delhi Mass Rapid Transport System Project, Japanese ODA Loan to India, special measures need to be taken to establish a systematic and effective urban transportation system including other means of transportation, in order to ensure profitability and feasibility through encouraging increased use of the transport system.

Since the Project involves the resettlement of 2,124 people in and around the railyard, dialogues will be had with a wide range of residents and the people to be resettled will be finalized at an early point in time based on the Resettlement Action Plan (RAP) prepared by the DOTr. To ensure smooth implementation, the parties involved (such as the National Housing Authority (NHA) and Local Government Units (LGUs)) should engage in sufficient collaboration as well. In addition, high-level meetings between the two governments and regular reports to and consultations with the Secretary of Transportation of the Philippines will be implemented to promote steady progress in the land acquisition and resettlement

of residents. The Project will ensure increased use of the subway and convenience of users through integrated development of railway stations and the surrounding areas together with the development of transport hub facilities involving feeder transportation at stations, while considering convenient transit and connection with other lines.

7. Evaluation Results

The Project aims to take measures for the increasing demand for transportation by developing a subway in Metro Manila and contributes to the mitigation of severe traffic congestion in the metropolitan area, as well as to the alleviation of air pollution and climate change. Therefore, the Project is aligned with the Philippines' development policy and Japan's and JICA's country assistance policies. Furthermore, the Project is expected to contribute to Sustainable Development Goals (SDGs) Goal 9 (Build resilient infrastructure), Goal 11 (Make cities and human settlements inclusive, safe, resilient and sustainable) and Goal 13 (Take urgent action to combat climate change and its impacts), making JICA's support of the Project necessary and relevant.

8. Plan for Future Evaluation

(1) Indicators for Future Evaluation

Per 4. (1) to (3).

(2) Timing of Next Evaluation

Two years after project completion

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