

Ex-Ante Evaluation (for Japanese ODA Loan)

**Southeast Asia Division 5, Southeast Asia and Pacific Department
Japan International Cooperation Agency**

1. Name of the Project

- (1) Country: The Republic of the Philippines (the Philippines)
- (2) Project: North-South Commuter Railway Project (Malolos-Tutuban) (II)
- (3) Project Site/Target Area: Metro Manila and Bulacan Province (population: approx. 17.19 million)

Loan Agreement: February 9, 2023

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 a relatively small urban area of 620 km², however, its population is growing at a rate of 1.6% per year, from approx. 9.93 million in 2000 to 13.48 million, representing a 1.4-fold increase in 2020. In the region including the provinces of Bulacan, Rizal, Cavite, and Laguna, which are close to Metro Manila (hereinafter referred to as the "Mega Manila Region"), the population has increased rapidly from approx. 17.9 million to 28.25 million in the 20 years since 2000, and the amount of traffic entering Metro Manila has also increased. Despite the overcrowded population, the development of rail-based public transportation as a means of mass transportation is lagging behind, which is represented by the situation that the three main urban railroads (two of which are for Light Rail Transit (LRT)) in the metropolitan area are only 50 km in total length, so Metro Manila and its suburbs have serious traffic congestion. The economic loss due to traffic congestion is estimated at 2.5 billion pesos (approximately 5.7 billion yen) per day ("Follow-up Survey on Roadmap for Transport Infrastructure Development for Greater Capital Region (GCR)" (2019)), which means that traffic congestion is one of the bottlenecks for smooth logistics and mobility, thus reducing the country's international competitiveness.

Solving traffic congestion and promoting sustainable suburban development in Metro Manila is an urgent issue for the quality growth of the metropolitan area and its suburbs. However, in the southern part of the metropolitan area, there are only a few commuter lines operated as non-electrified lines with a small number of services on the section between Tutuban, Manila and Mamatid, Cabuyao. In the northern part of the metropolitan area, there is no rail-based public transportation. Therefore, residents in the area are forced to commute by bus or car in congested traffic where automobile traffic speeds are limited to less than 20 km/hour throughout the day. In addition, a new terminal at the Clark International Airport opened in July 2021 to mitigate congestion at the Manila International Airport. Furthermore, a redevelopment project of New Clark City (hereinafter referred to as "NCC") is underway using a former US

military site. These plans are expected to further increase the demand for commuting and rapid travel between Metro Manila and NCC in the future.

In the "Roadmap for Transport Infrastructure Development for Metro Manila and its Surrounding Areas (Region III & Region IV-A)" (2014), which was created with the support of JICA and approved by the government of the Republic of the Philippines in response to this situation, a proposal was made to strengthen the public transportation network connecting the center of the metropolitan area with the suburbs through the development of a large-scale public transportation system that would serve as a north-south axis for Metro Manila, and to encourage planned urban expansion along this north-south axis and a shift to public transportation in order to eliminate overcrowding and traffic congestion in the center of Metro Manila. The Philippine government is proceeding with public transportation development based on this roadmap. This is expected to increase investment, accelerate economic growth through industrial expansion, mitigate health problems caused by air pollution, noise, etc., and improve people's quality of life by reducing commuting time. The "North-South Commuter Railway Project (Malolos-Tutuban)" (hereinafter referred to as "the Project") is positioned as one of these initiatives. The current Philippine administration, which took office on June 30, 2022, inherited the previous administration's infrastructure development policy "Build, Build, Build" and announced that it would promote "Build, Better, More" to further promote infrastructure investment. The strengthening of the rail network in Metro Manila, including this Project, is ranked as one of the top priorities of the current administration, following up on the previous administration and is consistent with the policies of the Philippine government.

(2) Japan's and JICA's Cooperation Policy and Operations in the Railway Sector in Metro Manila and its suburbs (especially in relation to major foreign policies such as the Free and Open Indo-Pacific (FOIP))

Japan's Country Development Cooperation Policy for the Republic of the Philippines (April 2018) sets "Strengthening a Foundation for Sustainable Economic Growth" as a priority area and states that Japan will provide support for high quality infrastructure development including transportation networks mainly in the major metropolitan areas and regional cities. "Republic of the Philippines JICA Country Analysis Paper" (July 2020) states that Japan will develop the necessary socioeconomic infrastructure in the urban areas of the Philippines as a direction of future support so that, in the Philippines that shares basic values such as democracy, the rule of law, and a market economy, the middle class that benefits from these values will improve in both quality and quantity. It also states that given the fact that the Philippine government has placed "Build, Build, Build" and "Build, Better, More" policy as a catalyst for economic recovery from the economic downturn caused by the spread of the new coronavirus infection (hereinafter called as "COVID-19"), Japan will continue to cooperate with efforts related to high-quality infrastructure investment in response to the above. The Project is consistent with these policies. In addition, it is considered that the Project will contribute to SDGs Goal 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), 11 (Make cities and human settlements inclusive, safe, resilient, and sustainable), and 13 (Take urgent action to combat climate change and its impacts).

Japan has been supporting the development of a track-based transportation network in Metro Manila through development of masterplans, ODA yen loans, and technical cooperation. With regards to the masterplans, Japan has been supporting the actual transportation survey and urban transportation planning through the "Roadmap for Transport Infrastructure Development for Metro Manila and its Surrounding Areas (Region III & Region IV-A) in the Republic of the Philippines" (2014) and the "Follow-up Survey on Roadmap for Transport Infrastructure Development for Greater Capital Region (GCR)" (2019), which revised the infrastructure roadmap of 2014. As ODA loan projects, Japan has implemented the "Capacity Enhancement of Mass Transit Systems in Metro Manila" (2013), the "Metro Rail Transit Line 3 Rehabilitation Project" (2018), the "North-South Commuter Railway Extension Project (I)" (2019), and the "Metro Manila Subway Project (Phase 1) (I) (II)" (2018 and 2021), in addition to past projects aimed at easing traffic congestion in Metro Manila. As for technical cooperation, Japan has been dispatching experts to the Department of Transportation (hereinafter referred to as "DOTr") of the Philippines for many years, and has also been supporting the Philippines in developing human resources in the railway field by way of the "Technical Assistance Project to Establish of the Philippine Railway Institute (hereinafter referred to as "PRI") "

(3) Other Donors' Activities

The Asian Development Bank (hereinafter referred to as ADB), in its Country Operations Business Plan (2021-2023), focusing on accelerating infrastructure projects that bring economic synergies and long-term growth, has been co-financing with JICA in the North-South Commuter Railway Extension Project (hereinafter referred to as "Extension Project"). The ADB has also been providing procurement assistance to private operators for the operation and maintenance of the Metro Manila Subway Project and the North-South Commuter Railway Project through the Transaction Advisory Service for the Public Sector of the ADB's Office of Public-Private Partnership. It has also granted a technical assistance loan "Infrastructure Preparation and Innovation Facility" (L/A signed in November 2017), for the purpose of bidding assistance in the civil works package for the Extension Project it is financing.

3. Project Description

(1) Project Description

① Project Objective

The objective of the Project is to strengthen the transportation network and decongest Metro Manila through developing a new railway from Malolos, Bulacan to Tutuban, Manila and thereby contributing to expansion of Metro Manila's economic sphere and alleviation of air pollution.

② Project Components

- (a) Civil engineering and construction work (main line (approx. 37.7 km) and depot)
- (b) Railway system improvement (electricity, machines, signal, and communication)
- (c) Rolling stocks procurement (104 cars)
- (d) Consulting services (review of detailed design, bidding assistance, construction supervision, response to warranty period, support for coordination with relevant

projects)

(2) Estimated Project Cost

418,256 million Yen (of which the present loan amount is 107,017 million Yen)

(3) Schedule

November 2015 - November 2027 (145 months in total). The commencement of the facility operation is considered as the completion of the Project (November 2025).

(4) Project Implementation Structure

- ① Borrower: Government of the Republic of the Philippines
- ② Guarantor: None
- ③ Executing Agency: Department of Transportation (DOTr)
- ④ Operation and Maintenance System: The DOTr envisions outsourcing the operation and maintenance to the private sector. The operation and maintenance entity will be determined through a bidding process.

(5) Collaboration and Sharing of Roles with Other Donors

① Japan's Activities

In the Extension Project, the section to Calamba, Laguna Province in the south and the section to the Clark International Airport, Pampanga Provision in the north (about 113 km in total) are under construction. In addition, the " Technical Assistance Project to Establish of the PRI " is currently underway as an ancillary project to the Project with ODA loan. The PRI, which has been providing assistance for the Project, is planning to improve the skills of the railroad employees involved in the Project.

② Other Donors' Activities

The Extension Project will be co-financed with the ADB. The ADB will finance the package for civil works (main line and Depot).

(6) Environmental and Social Consideration

① Environmental and Social Consideration

(a) Category: A

(b) Reason for Categorization: The Project falls under the Railway Sector and influential characteristics (large-scale involuntary resettlement) listed in the "JICA Guidelines for Environmental and Social Considerations" (promulgated in April 2010 (hereinafter referred to as "JICA Guidelines")).

(c) Environmental Permit: The Environmental Performance Report and Management Plan (EPRMP) for the Project was prepared by the DOTr and approved by the Department of Environment and Natural Resources (DENR) on April 28, 2015. An Environment Clearance Certificate (ECC) was also issued by the DENR on the same day. The revised ECC had already been obtained in July 2020 when the method for connecting Solis, Blumentritt and Tutuban was changed. The revised ECC had already been obtained in August 2021 when the substation location was changed.

(d) Anti-Pollution Measures: Air pollution during construction will be mitigated through periodic water sprinkling and temporary fencing, etc. Noise will be mitigated by installing mufflers or sound deadening devices on construction machines and

installing noise-insulating walls, etc. Vibration will be mitigated by adopting low-vibration construction machines and using low-vibration construction methods and so on. Noise during operation will be mitigated by installing noise-insulating walls and vibration will be mitigated by laying long rails, installing rail dampers and so on. Wastewater treatment facilities will be installed at depot and sanitation facilities will be installed at the station building to mitigate water pollution in the surrounding environment.

- (e) Natural Environment: The project area does not fall in or near sensitive areas such as national parks and will have minimum undesirable effects on the natural environment.
- (f) Social Environment: The Project is expected to acquire approximately 33,030.2 m² of land and affect 1,005 households (4,119 persons) that will need to be resettled. The resettlement and land acquisition will be implemented in accordance with the national procedures of the Philippines and the Resettlement Action Plan that meets the JICA Guidelines.
- (g) Others and Monitoring: Based on the Environmental Management Plan and Environmental Monitoring Plan, the contractor will monitor the project site for air quality, noise, vibration, etc. during construction under the responsibility of the DOTr. An operation and maintenance entity will be determined prior to the start of service. Once the operation starts, the operation and maintenance entity will monitor noise and vibration from the railway, drainage from the rail yard and station buildings, etc. under the responsibility of the DOTr. The implementation status of land acquisition and resettlement, as well as the restoration of livelihoods of affected people, will be monitored by the Internal Monitoring Agent, an internal monitoring team within the PMO to be established under the DOTr.

(7) Cross-Sectoral Issues

- ① Climate Change Countermeasures: The Project will contribute to the reduction of greenhouse gas (GHG) emissions as a climate change mitigation measure. The climate change mitigation effects (estimated GHG emission reductions) from the Project and the Extension Project are approximately 685,477 tons/year in CO₂ equivalent (in 2035).
- ② Measures against AIDS/HIV and Other Infectious Diseases: As a measure against AIDS and other infectious diseases during the construction period, the construction contractor is planning to include an AIDS clause in the bidding documents to take measures against AIDS and other infectious diseases for construction workers. In response to the spread of COVID-19, the DOTr has established measures such as temperature checks for workers and thorough hand washing and gargling at construction sites, operation of offices avoiding “3 C's” (closed spaces, crowded places, and close-contact settings), restrictions on sharing of property, disinfection of work areas, and self-isolation in the event of potentially infectious symptoms, as guidelines for quarantine measures and has been ensuring that these measures are thoroughly enforced. Furthermore, in the detailed design, JICA is also proposing (1) installation of the number of toilets based on use at Japanese railroad lines and (2) introduction of

train cars with ventilation capacity equivalent to those of Japanese railroad lines, which is a design that would lead to measures against infectious diseases such as COVID-19. In the aforementioned technical assistance project for the PRI, JICA is now additionally holding counter-infectious disease training courses online as part of its safety measures for employees and passengers. In response to the concerns of the contractors and consultants, the DOTr is also preparing guidelines for extension of the construction period and additional costs due to the impact of this infectious disease on the projects implemented by the DOTr.

- ③ Disability Consideration: As for the universal design, it is planned to install barrier-free equipment such as elevators, restrooms for the physically challenged, braille blocks, barrier-free train cars, and no steps between platforms and train cars.

(8) Gender Category

[Gender cases] GI (S) Gender Informed (Significant)

<Details of Activities/Reason for Categorization>

This activity stems from the fact that the Project plans to promote the use and safety of women by providing security cameras, gender-friendly restrooms, nursing rooms, and counseling services for women, as well as enforce measures that take into account the benefits to women and vulnerable groups by providing preferential payment terms and medical assistance to female-headed households and so on in the Resettlement Action Plan.

(9) Other Important Issues

The Project applies STEP conditions using Japanese technologies related to railroad systems including operation management systems with high safety and stability, and train cars with high energy-saving effects.

4. Targeted Outcomes

(1) Quantitative Effects

1) Outcomes (Operation and Effect Indicators)

Indicator	Baseline (Actual value in 2017)	Target (2030) [2 years after the Project completion] (*2)
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 (between Calamba and Clark International Airport) (minutes)	240 (*1)	111.75 (*3)

*1 Existing commuter rail line between Calamba and Manila, bus transfer between Manila and Clark International Airport.

*2 The starting point shall be the completion of the Extension Project, which is an

integrated project with this Project.

*3 When a rapid train is used.

(2) Qualitative Effects: Enhancing the connectivity of the urban transportation network in Metro Manila and its suburbs, 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

Based on the assumptions listed below, the economic internal rate of return (EIRR) for the Project is 12.20%, and the financial internal rate of return (FIRR) is 0/85%.

[EIRR]

Costs: Project costs, operation, and maintenance costs (excluding taxes)

Benefits: Reduction of train car traveling expenses, shortening of travel time, and reduction of greenhouse gas emissions, etc.

Project Life: 40 years

[FIRR]

Costs: Project costs, operation, and maintenance costs

Benefit: Freight income

Project Life: 40 years

At the time of the initial loan review, calculations were made only for the Malolos-Tutuban section, but since then, the Project and the Extension Project have come to be regarded as an integrated project in the Philippines. Therefore, it is now difficult to recalculate these costs only for the Project. The internal rate of return for the Project only shall be calculated and compared based on actual results at the time of ex-post evaluation.

5. External Factors and Risk Control

(1) Preconditions: Site acquisition and excavation relocation on schedule.

(2) External Factors: Opening of connecting lines on schedule. Convergence of COVID-19 infection.

6. Lessons Learned from Past Projects

The ex-post evaluation of the " Delhi Mass Rapid Transport System Project" in India pointed out that it is necessary to take measures to establish a systematic and efficient urban transportation system in combination with other transportation systems to improve utilization rates and thereby increase revenues and ensure business viability. Therefore, in this Project, it is planned to promote rail use and ensure user convenience by developing transportation facilities with feeder traffic in the vicinity of the station as well as considering appropriate transfers and connections to other lines.

7. Evaluation Results

The Project aims to strengthen the transportation network and decongest Metro Manila and thereby contributing to expansion of Metro Manila's economic sphere and alleviation of air

pollution. Therefore, the Project is aligned with the development policies of the Philippines and both Japan's and JICA's cooperation policies and analysis. In addition, since it is considered that the Project will contribute to SDGs Goal 9 (Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation), 11 (Make cities and human settlements inclusive, safe, resilient, and sustainable), and 13 (Take urgent action to combat climate change and its impacts), there is a strong need to support the implementation of the project.

8. Plan for Future Evaluation

(1) Indicators to be Used

As indicated in Sections 4.

(2) Future Evaluation Schedule

Ex-post evaluation: 2 years after the project completion

End

Attachment: Map of the North-South Commuter Railway Project (Malolos-Tutuban) (II)

Map of the North-South Commuter Railway Project (Malolos-Tutuban) (II)

Railway Alignment Map

Alignment Map

November 15, 2021

