

**Ex-Ante Evaluation (for Japanese ODA Loan)**  
**Southeast Asia Division 4, Southeast Asia and Pacific Department,**  
**Japan International Cooperation Agency (JICA)**

<b>1. Basic Information</b>
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Country: The Republic of the Union of Myanmar

Project: Yangon-Mandalay Railway Improvement Project Phase I (III)

Loan Agreement: March 31, 2020

<b>2. Background and Necessity of the Project</b>
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( 1 ) Current State and Issues of the Development of the Railway Sector in Myanmar and the Positioning of the Project

The total length of the railway network in the Republic of the Union of Myanmar (“Myanmar”) is 6,112 km as of 2018, and all railway lines are managed and operated by Myanmar Railways (“MR”). Most of the lines were constructed during the British colonial era, and insufficient maintenance by MR has resulted in the deterioration of railway facilities and equipment, lowering traveling speeds and causing delays, derailments, and other problems. This makes safe, consistent railway operation difficult to achieve.

The Yangon-Mandalay Railway is an important railway line that connects Yangon, the country’s largest commercial city, to the capital of Naypyitaw and Mandalay, the country’s second-largest commercial city. The line is double-tracked along a roughly 620-km section, and roughly 40% of the country’s population lives along the line. Demand for the transport of people and goods is rising as the country’s economy develops, and modernizing transport facilities and equipment to improve on obsolescence is an urgent issue for improving response and services to meet further increases in demand.

Under these circumstances, the Yangon-Mandalay Railway Improvement Project Phase I (“the Project”) is positioned as a high-priority project for swift implementation as part of the National Transport Master Plan formulated with assistance from JICA and approved by the Cabinet of Myanmar in December 2015. Japan agreed to provide ODA loans worth 20 billion yen for the first tranche in September 2014, and 25 billion yen for the second tranche in March 2017. Additionally, the Myanmar government indicated the expansion, modernization, and sustainability of domestic railway lines as one of the strategies in its Myanmar Sustainable Development Plan (MSDP) (2018-2030) published in August 2018.

( 2 ) Japan and JICA’s Cooperation Policy, etc. in the Railway Sector and the Positioning of the Project

In the Japanese government’s policy for economic cooperation to Myanmar established in

April 2012, “Assistance for development of infrastructure and related systems necessary for sustainable economic growth” is positioned as a priority field, which includes “improvement and modernization of railway operations” as one of the specific measures. Also, the Project is consistent with “Strengthening of transportation infrastructure to connect urban and rural areas,” one of the cooperation pillars of the “Japan-Myanmar Cooperation Program” agreed upon between the Japanese and Myanmar governments in November 2016. The Project is also consistent with cooperation policies discussed at the meeting between Myanmar State Counsellor Aung San Suu Kyi and Japanese Prime Minister Shinzo Abe in November 2017, specifically because it contributes to infrastructure development in the transportation sector intended to accelerate concrete cooperation. Furthermore, in terms of “Improving physical connectivity including quality infrastructure development such as ports, railways and roads” the Project should contribute to “the pursuit of economic prosperity,” the second goal of the Free and Open Indo-Pacific Strategy, as well as Sustainable Development Goal (SDG) 9 (“Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation”).

### (3) Other Donors’ Activities

China has constructed factories for rolling stock (locomotives and passenger cars), and is conducting a study on the establishment of a new railway between Mandalay and Muse. India is providing loan assistance for the procurement of rolling stock, switches, and so on. South Korea entered an agreement regarding assistance with procuring new passenger cars through an Economic Cooperation Development Fund loan in 2015, and is conducting a preparatory study for cooperation on improving the railway between Mandalay and Myitkyina. Germany provided assistance with the establishment of a railway technology training center in 1981. The ADB is conducting a study on the establishment of a new railway between Yangon and Pyay. Note that these activities do not overlap with the Project.

## **3. Project Description**

### ( 1 ) Project Objective

The objective of the project is to improve the capacity of railway transportation by rehabilitating and modernizing the existing railway and related facilities from Yangon to Toungoo in part of Yangon-Mandalay Railway thereby contributing to economic development of Myanmar.

### (2) Project Site/Target Area

Yangon Region and Bago Region

### (3) Project Components

Existing railway line and related facilities, machinery, etc. between Yangon and Taungoo

(roughly 260 km) which is the part of Yangon-Mandalay Railway (roughly 620 km).

- (i) Civil engineering work (Rehabilitation and new construction of civil engineering structures including tracks, bridges, and a depot)
- (ii) Railway systems (Improvement of signal and telecommunication system)
- (iii) Rolling stock (including procurement of 24 new rolling stocks)
- (iv) Electric power facilities (including a 66 kV/6.6 kV substation)
- (v) Consulting services (tender assistance, construction supervision, etc.)

(4) Estimated Project Cost

124,663 million yen (including ODA loan of 40,604 million yen)

(5) Project Implementation Schedule

The Project is scheduled to be implemented from September 2014 to December 2025 (136 months in total). Project completion is defined as completion of civil works in December 2023.

(6) Project Implementation Structure

- 1 ) Borrower: The Government of the Republic of the Union of Myanmar
- 2 ) Guarantor: None
- 3 ) Executing Agency: Myanma Railways (MR)
- 4 ) Operation/Maintenance and Management Agency: Myanma Railways (MR)

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

1) Japan's Assistance Activities

The Project for Installation of Operation Control Center System and Safety Equipment (a grant aid project signed in March 2014) introduced signals, telecommunications equipment, and safety equipment, which were quite urgently needed, to the target area of the Project in advance of the Project. Also, maintenance capacity enhancement is being implemented through the Project on Improvement of Railway Service and Rolling Stock Maintenance (technical cooperation with R/D concluded in November 2016).

2) Other Donors' Assistance Activities

None in particular.

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

1) Environmental and Social Considerations

- ① Category: B
- ② Reason for Categorization: The project is not considered to be a large-scale railways project, is not located in a sensitive area, and has none of the sensitive characteristics under the JICA guidelines for environmental and social considerations (April 2010), it is not likely to have a significant adverse impact on the environment.
- ③ Environmental Permit: The Environmental Impact Assessment (EIA) Report for

the Project was approved by the Environmental Conservation Department (ECD) of the Myanmar Ministry of Environmental Conservation and Forestry (MOECF) in October 2014. As for the embankment work for depot and other work added to the scope of the Project, Myanmar's environmental laws and regulations require no additional environmental procedures.

④ Anti-Pollution Measures: The adverse impacts of the work are expected to be minimal due to measures to mitigate the air pollution, water contamination, and noise the work is expected to cause. To mitigate air pollution and water contamination, water will be sprinkled to reduce dust, drainage channels will be installed, and settling basins will be installed as necessary. To mitigate noise, work schedules will be adjusted, and construction equipment will be maintained to minimize noise. Noise from train operation and other noises are expected to occur after the infrastructure is put into service, but the adverse impacts are expected to be immaterial due to the distance of the infrastructure from residential areas.

⑤ Natural Environments: Since the project site is not in or near sensitive areas such as national parks, the Project is expected to have minimal adverse impacts to the natural environment.

⑥ Social Environment: The Project will impact 28 people from five households, and requires the acquisition of 80 acres of land. However, the resettlement and land acquisition has already been implemented according to an Abbreviated Resettlement Action Plan (ARAP) created based on JICA Guidelines for Environmental and Social Considerations and the laws and regulations of Myanmar.

⑦ Other/Monitoring: During the work, MR will monitor air quality, water quality, noise levels, and more. Also, MR will continue to monitor noise levels and so on after the project output is put into service.

2) Cross-Cutting Issues: The Contractor will implement an HIV prevention program for the employees to prevent them from contracting HIV during the work period.

### 3) Gender Classification:

[Gender equality project] ■GI(S) (Gender Integrated Project)

Reason for Activity Details/Classification: In order to reflect the views of women in railway operation, an agreement was made to assign female employees to project management units. The leader of the department responsible for finances is a woman, and several female employees from that department are assigned to project management units. Therefore, the project is classified as Gender Integrated Project.

### (9) Other Important Issues

None in particular.

#### 4. Targeted Outcomes

##### (1) Quantitative Effects

##### 1) Outcomes (Operation and Effect Indicators)

Indicator	Baseline (actual value in 2013)	Target (2027: 4 years after project completion)**
Passenger transport volume (passenger-km/day)*	3,317,908	27,524,873
Freight transport volume (ton-km/day)*	2,789,477	15,815,649
Number of trains (trains/day)	27.5	164
Vehicle travel distance (km/day)	11,112	52,119
Travel time from Yangon to Taungoo (hr:min)	6:54	3:20

\*Effects measured in the entire section between Yangon and Mandalay

\*\*Phase I (Yangon-Taungoo) work is scheduled for completion in 2023. However, the target values are set to two years after the scheduled completion of the improvement and modernization of the entire section between Yangon and Mandalay (2025).

(2) Qualitative Effects: Safer train operation, Revitalization of the regional economy, and Invigoration of logistics

##### (3) Internal Rate of Return

Based on the following assumptions, the economic internal rate of return (EIRR) of the Project is 19.2%, and the financial internal rate of return (FIRR) is 8.6%.

##### EIRR

Costs: Project cost, maintenance cost (both excluding taxes)

Benefits: Reduced travel time for railway users, reduced automobile travel expenses, reduced automobile travel time, increased income from fares

Project life: 30 years

##### FIRR

Costs: Project cost (including taxes), maintenance cost

Benefits: Income from fares

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 and Application of Lessons Learned to the Project**

The ex-post evaluation results of the ODA loan project “Depok Depot Construction Project” highlight the need to introduce suitable technology when designing facilities that automate work processes in pursuit of streamlining work; without the technology, it is impossible to fully use whatever equipment is introduced. Therefore, it is important to fully understand the executing agency’s technical capacities before implementing the design so that the designed facilities can be properly operated and managed. It is also important to consider comprehensive technical assistance that includes facility operation and management.

This Project also involves the introduction of relatively high-performance machinery and facilities for railyards, rolling stock, signal systems, and so on. Therefore, technology will be transferred as part of consulting services under the Project, and technical assistance for rolling stock maintenance will be provided as part of the ongoing Project on Improvement of Railway Service and Rolling Stock.

## **7. Evaluation Results**

The Project conforms to the development issues and policies of Myanmar and the assistance policies and analysis of Japan and JICA, and contributes to improved safety and higher speeds of train operation and the strengthening of the capacity to transport goods and people through the improvement and modernization of obsolete facilities and equipment and the procurement of rolling stock. Also, as the Project is deemed to contribute to the achievement of SDG 9 (“Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation”), it is highly necessary for JICA to provide support for the implementation of the Project.

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

### **(1) Indicators to be Used**

As provided in 4. (1) to (3).

### **(2) Next Evaluation Schedule**

Ex-post evaluation: Four years after the project completion