Japanese ODA Loan

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Republic of the Union of Myanmar
Project: Bago River Bridge Construction Project
Loan Agreement: March 1, 2017
Loan Amount: 31,051 million yen
Borrower: The Government of the Republic of the Union of Myanmar

2. Background and Necessity of the Project

(1) Current State and Issues of the Development of the Urban Transportation Sector and the Yangon Region in Myanmar

The Greater Yangon, including Myanmar's former capital Yangon City, is the center of the country's economic activities with a population of about 7.36 million (as of 2015). The recent rapid democratization has invigorated overseas investment and private investment in the area. In the meantime, a population increase driven by economic growth has accelerated urbanization even further.

In Myanmar, restrictions on automobile imports effective until September 2011 had limited the number of automobiles owned across the nation. The recent economic development and eased restrictions on automobile import ,however, rapidly increased the number of automobiles owned in the Yangon region from 350,000 in 2012 to 770,000 in 2016. This rapid increase is causing frequent traffic jams which point to a lack of road infrastructures in Yangon City.

The Bago River connecting Yangon City and Thanlyin Township, including the Thilawa Special Economic Zone ("SEZ") (this is an ongoing project under a public-private partnership framework between Japan and Myanmar, which opened Zone A [about 400 ha] in September 2015), is spanned by the Thanlyin Bridge and the Dagon Bridge. The Thanlyin Bridge has a truck weight limit due to aging, which prohibits the passage of large trucks weighing 32 tons or more. The Dagon Bridge, located about 6.4 kilometers north of Yangon City, is underused due to inconvenient access. In 2013, the number of users of the Thanlyin Bridge was about ten times that of the Dagon Bridge. The gross traffic demand between Yangon City and Thanlyin Township in 2018 is estimated to be about 46,000 PCU/day. The Thanlyin Bridge, which is expected to meet about 90% of the gross traffic demand as compared to about 10% for the Dagon Bridge, will become continuously congested. The traffic capacity of the Thanlyin Bridge, which was 29,490 PCU/day in 2015, is expected to grow 1.39 times by 2018 and 2.03 times by 2025. It is therefore difficult for the Thanlyin Bridge to meet all the growing traffic demand between Yangon City and Thanlyin Township. This underdeveloped traffic infrastructure is likely to hamper smooth access to and active investment in the Thilawa SEZ.

(2) Development Policies for the Urban Transportation Sector and the Yangon Region

in Myanmar and the Priority of the Project

The July 2016 economic policy announced by the National League for Democracy, which came to power in March 2016, attaches importance to "swift development of basic economic infrastructures." The Project for Strategic Urban Development Plan of the Greater Yangon ("SUDP") was planned with the help of JICA in 2013 and approved by the cabinet of the Yangon Region Government in May 2013. This Project whose target year is set at 2040, aims to decentralize the functions of the Greater Yangon currently concentrated in the central business district (CBD), into several sub-centers, including the Thanlyin Township and areas surrounding the Thilawa SEZ. The Project is considered a priority projects since it helps divert traffic to the subcenters.

(3) Japan and JICA's Policy and Operations in the Urban Transportation Sector and the Yangon Region

Japan's economic cooperation policy for Myanmar established in April 2012 considers it important to "assist in the development of infrastructures and related systems necessary for sustainable economic growth." The Japan-Myanmar Cooperation Program announced in November 2016 also considers urban development and transportation an important field for cooperation. The Project is consistent with this policy and program since it aims to construct a bridge over the Bago River, a vital point of transportation, to meet the traffic demand between Yangon City and the Thanlyin Township which is expected to grow along with progress in the Thilawa SEZ development progress jointly conducted by the Japanese and Myanmarese governments.

(4) Other Donors' Activities

The Asian Development Bank (ADB) has started to assist in the construction of roads in Myanmar of the East-West Economic Corridor (section between Thaton and Kawkareik and the section between Mawlamyine and Kawkareik).

(5) Necessity of the Project

While the development of the Thilawa SEZ is expected to increase the traffic flow between Yangon City and the Thanlyin Township, it is necessary to construct a new bridge over the Bago River, a vital point of transportation, in order to further promote investment in Thanlyin Township, including the Thilawa SEZ. The Project, which will bring about smooth traffic and logistics networks in Yangon City and Thanlyin Township has been assessed as helping to achieve Sustainable Development Goal 9--build a resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Since the Project is consistent with the country's development challenges and policies and Japan's priority fields of cooperation, it is essential that JICA assist in the Project.

3. Project Description

(1) Project Objective

The objective of the Project is to satisfy increasing traffic demand between Yangon city and Thanlyin township, especially the Thilawa Special Economic Zone by constructing a bridge over the Bago river and facilitating smooth traffic and logistic network, thereby contributing to the promotion of foreign direct investment for Thilawa SEZ and economic development of Myanmar. Project Site/Target Area

(2) Project Site/Target Area

Yangon City and Thanlyin Township in Yangon Region

(3) Project Components

Construct a bridge over the Bago River connecting Yangon City and Thanlyin Township

1) Construct the Bago Bridge and its approach roads

2) Construct a straight flyover in Yangon City and its approach roads

3) Provide consulting services (including review of detailed design, tender assistance, construction supervision, assistance in social environment monitoring, and technical transfer)

(4) Estimated Project Cost

35,520 million yen (including an ODA loan of 31,051 million yen)

(5) Schedule

From March 2017 to March 2022 (61 months). The Project is considered to have been completed when the facility is put into service (March 2021).

(6) Project Implementation Structure

1) Borrower: The Government of Republic of the Union of Myanmar

2) Guarantor: N/A

3) Executing Agency: Department of Bridge, Ministry of Construction

4) Operation and Maintenance System: Since the Myanmarese authorities have little experience of maintaining and managing special bridges including steel cable-stayed bridges, JICA will create inspection and diagnosis manuals for bridge maintenance and management through technical assistance related to the ODA loan to help them improve their maintenance and management capacity.

(7) Environmental and Social Considerations/Poverty Reduction/Social Development

1) Environmental and Social Considerations

① Category: B

② Reasons for Categorization:

The Project is not considered to have significant adverse impacts on the environment because it is not a large-scale road/bridge construction project as described in the JICA Guidelines for Environmental and Social Considerations (put into effect as of April 2010; the "JICA Guidelines"). The Project is not associated with sensitive characteristics or areas as described in the JICA Guidelines, neither.

③ Environmental Permit:

The laws of Myanmar do not require preparing an environmental impact assessment (EIA) report for the Project.

④ Anti-Pollution Measures:

During construction work, measures to protect air and water quality and prevent noise, vibrations and other problems will be taken. These measures will include use of low-dust equipment, appropriate wastewater treatment, use of soundproof walls, and avoidance of nighttime construction work. After the start of service, the impact of noise and other problems will be countered by regulations prohibiting overloading and by creation of green belts. These measures are expected to minimize the adverse environmental impacts of the Project.

⑤ Natural Environment:

Since the project site is not or near sensitive areas such as national parks, the Project is considered to have minimal adverse impacts on the natural environment.

⑥ Social Environment:

The Project will involve the acquisition of 10.55-ha (hectares) of land and affect 80 households (182 residents), including 34 resettling households (136 residents). Under the laws of Myanmar and the JICA Guidelines, appropriate compensation will be provided to the affected residents and the land will be acquired in line with the resettlement action plan. No objection to the Project has been raised by the affected residents.

⑦ Other/Monitoring

During construction work, the constructors and executing agency will monitor air and water quality, noise, and other problems. After the startup of service, the executing agency will monitor air quality, noise, and other problems.

2) Promotion of Poverty Reduction

Additional compensation for involuntary resettlement will be provided to female-headed households and other vulnerable households.

3) Promotion of Social Development

Compensation for resettlement will be monitored to ensure that special consideration will be given to female-headed households and other vulnerable households.

(8) Collaboration with Other Schemes and Donors

JICA will conduct basic and detailed design in technical assistance related to ODA loan (from September 2016 to March 2018).

4. Target Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (recorded in 2016) (data for the existing Thanlyin Bridge)	Target (2023) 【2 years after project completion】
Annual average daily traffic volume(PCU/day) Annual average daily traffic volume of trucks (from Yangon City to Thanlyin Township)	18,207 2,208	30,594 2,528
Annual average daily traffic volume (PCU/day) Annual average daily traffic volume of trucks (from Thanlyin Township to Yangon City)	18,582 2,999	30,603 3,689
Average traveling speed (km/h)	4.7	18.8
Traffic congestion (V/C)	1.3	1.0

∗ Average traveling speed: A simple average of the distance of a section divided by the time necessary for traveling the distance, which is calculated at the maximum speed of 80 km/h and during the peak daily traffic hours

∗ Volume/capacity ratio: Value indicating the degree of congestion of a road, which is calculated based on designed traffic and measured traffic

(2) Qualitative Effects

Increased direct foreign investment in the Thilawa SEZ, the economic development of the entire country, and other effects

(3) Internal Rate of Return

The economic internal rate of return (EIRR) and the financial internal rate of return (FIRR) for the Project are 24.9 and 2.0 percent, respectively, if the following preconditions apply:

【EIRR】

Cost: Project cost (excluding tax) and operation and maintenance cost

Benefits: Travel cost Savings, Vehicle operating cost savings

Project life: 30 years

【FIRR】

Cost: Project cost and operation and maintenance cost

Benefit: Revenue from tolls

Project life: 30 years

5. External Factors and Risk Control

・Failure to use the existing Thanlyin Bridge as a BRT (bus rapid transit) lane might affect the target goals (2023) of the operation and effect indicators.

・Failure to improve the Thaketa roundabout might affect the targets (2023) of the operation and effect indicators.

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

(1) Lessons Learned from Past Projects

The ex-post evaluations of the Nonthaburi and Pathumthani Bridges Construction Project in Thailand, the Second Magsaysay Bridge and Bypass Road Construction Project in the Philippines, and other large bridge construction projects show that the projects required extra time for reviewing their plans during construction work due to floods and soft ground. These projects taught JICA the lesson that it is necessary to conduct appropriate geological surveys at the preliminary or preparatory study and detailed design stages.

(2) Application of Lessons Learned to the Project

Since a geological survey in the preparatory study found weak strata at the project site, work for correcting the weak strata is included in the construction work. At the detailed design stage, another geographical survey will be conducted.

7. Plan for Future Evaluation

(1) Indicators to be Used

1) Annual average daily traffic (PCU/day)
2) Average traveling speed (km/h)
3) Volume/capacity ratio (V/C)
4) Economic internal rate of return (EIRR) (%)
5) Financial internal rate of return (FIRR) (%)

(2) Timing of the Next Evaluation

Two years after the completion of the Project