

Ex-Ante Evaluation

Southeast Asia Division 4
Southeast Asia and Pacific Department
Japan International Cooperation Agency (JICA)

1. Basic information

Country: The Republic of the Union of Myanmar (Myanmar)

Project: East-West Economic Corridor Highway Development Project (New Bago-Kyaikto Highway Section)

L/A signing date: November 4, 2020

2. Background and necessity of the project

(1) Current state and issues of the international trunk roadway development in Myanmar

The Greater Mekong Subregion Economic Corridor has been developed across six countries along the Mekong River, namely, Myanmar, Cambodia, Laos, Vietnam, Thailand, and China, to provide better connectivity. The East-West Economic Corridor, which passes through Vietnam, Laos, Thailand, and Myanmar, is one of the main economic corridors along with the North-South Economic Corridor and the Southern Economic Corridor, linking Myanmar with its major trading partner, Thailand, by land. In spite of the fact that most sections of the East-West Economic Corridor highway in Thailand are two-lane paved roads, there are many bottlenecks in Myanmar's section of the highway, such as weight restrictions imposed because of the age of bridges, steep slopes, sharp bends, and the highway passing through a town. The highway section between Myawaddy, which is the border with Thailand, and Thaton is to be developed to a one-lane road with Myanmar's government budgets as well as with support from JICA, the Thai government, and the Asian Development Bank (ADB), and the improved road is expected to significantly increase traffic volume going towards Yangon.

Although road and bridge infrastructure in Myanmar has been developed with limited budgets by the Ministry of Construction (MOC), the Ministry of Border Affairs, and the Ministry of Defense, other infrastructure including international arterial roads is not fully developed especially in rural areas. Particularly in the Bago-Kyaikto section, which is located about 100 km from Thaton towards Yangon, the existing road of about 86 km passes through a town center. Myanmar's future economic development will increase production facilities and consumer spending in this area and it is likely to cause serious congestion of both local traffic and through traffic as a result. This situation will pose a risk to road safety and it is imperative to separate local traffic and through traffic by building a new bypass.

As more roads and bridges are being built, it is becoming urgently necessary to train engineers who are capable of sustainably operating and maintaining them. The Thuwunna Research Laboratory and Training Center, which is under the jurisdiction of the MOC, is expected to play a pivotal role in training engineers. However, the Center was built in 1966 and its facilities and equipment are so dilapidated that they are no longer suitable to effectively provide a sufficient amount of quality training.

The Myanmar government identified the East-West Economic Corridor as a high priority

development corridor in the National Transport Master Plan (2015). The government also declared in its economic policy announced in July 2016 that the rapid development of fundamental economic infrastructure such as electricity generation, roads and ports would be prioritized. In the Myanmar Sustainable Development Plan (2018–2030) announced in August 2018, the government identified the improvement of the quality of international arterial roads as one of the action plans and declared its intention to pursue framework development including strengthened supply of human resources.

In the East-West Economic Corridor Highway Development Project (New Bago-Kyaikto Highway Section) (the “Project”), a bridge (New Sittaung Bridge) will be built on a new bypass in the Bago-Kyaikto section and the Thuwunna Research Laboratory and Training Center will be refurbished. The Project is designed to make Myanmar's domestic and international logistics more efficient and to improve road and bridge maintenance. The Project is characterized as beneficial to the development of the East-West Economic Corridor, which is the Myanmar government's priority area.

(2) Japan's and JICA's cooperation policy for the international trunk roadway development and the positioning of the Project

“Assistance for the development of infrastructure and related systems necessary for sustainable economic development” is identified as one of the priority areas in Japan's Economic Cooperation Policy for Myanmar established in April 2012. The development of the East-West Economic Corridor is one of the pillars of cooperation in the Japan-Mekong Connectivity Initiative announced by the Japanese government in July 2016. The Project is, therefore, in line with these policies. Through the development of the new bridge in the Bago-Kyaikto section, which will increase traffic demand in the East-West Economic Corridor, and the improvement of the Thuwunna Research Laboratory and Training Center, where road and bridge maintenance personnel will be trained, the Project will make Myanmar's logistics more efficient and help the country to achieve sustainable economic growth. The Project is expected to contribute to the achievement of SDG Goal 9 (Build resilient infrastructure). The Project is listed in the co-financing framework between JICA and the ADB to promote quality infrastructure investment.

(3) Other donors' activities

As an integral part of the Project, the ADB will finance the development of the new 62.5 km-long, 3.5 m-wide, two-lane bypass with a design speed of 100 km/h in the Bago-Kyaikto section that links to the New Sittaung Bridge. The road improvement and development project co-financed by JICA is being carried out in the 70 km section between Kawkareik and Eindu prior to the implementation of the Project.

3. Project overview

(1) Project objective

The objective of the Project is to ensure efficient transportation of people and logistics in the Bago-Kyaikto section of the East-West Economic Corridor where traffic demand is expected to rapidly increase in the near future, by the construction of a new bridge, and the upgrade of related facilities, thereby contributing to increasing socio-economic benefit of the people, and to stimulating domestic and international trade of Myanmar.

(2) Project site/Target area

Mon State and Bago Region (New Sittaung Bridge)

(3) Project components

- 1) Construction of New Sittaung Bridge (with a main bridge of about 800 m, an approach bridge of about 1.2 km, and an approach road of about 500 m)
- 2) Equipment Procurement for Thuwunna Research Laboratory and Training Center
- 3) Building Works for Thuwunna Research Laboratory and Training Center
- 4) Consulting services (detailed design, tender assistance, construction supervision, disbursement management, environmental and social considerations, technology transfer)

(4) Total project cost

JPY30.268 billion (of which JPY27.779 billion is a yen loan)

(5) Project implementation schedule

The Project is scheduled to last for a total of 82 months from November 2020 to August 2027 and will be completed when the facilities become operational in August 2026.

(6) Project implementation framework

- 1) Borrower: The Government of the Republic of the Union of Myanmar
- 2) Guarantor: None
- 3) Executing Agency: Ministry of Construction (MOC)
- 4) Operation and Maintenance Agency: Department of Bridge, MOC

(7) Cooperation and sharing of roles with other projects and donors

1) Japan's Assistance activities

East-West Economic Corridor Improvement Project (2015) (ODA loan) co-financed by the ADB is being implemented in which three bridges are to be improved in the Kawkaik-Mawlamyine section. A JICA technical cooperation, Project for Capacity Development of Road and Bridge Technology (2016–2019) was provided to the MOC, the Executing Agency of the Project, to develop capabilities of its bridge and concrete structure construction supervision. In addition, the Project for Strengthening Capacity for Maintenance of Roads and Bridges has started in 2020 in order to improve engineers' capacity in MOC, by providing training and developing a range of training manuals.

2) Other donors' aid activities

The Project will be co-financed by the ADB. JICA will finance the development of the New Sittaung Bridge while the ADB will finance the development of the new 62.5 km-long bypass linking the New Sittaung Bridge.

(8) Environmental and social considerations, cross-cutting issues, and gender category

1) Environmental and social considerations

1. Category: B

2. Reason for choosing this category: The Project is not a large-scale road and bridge project listed in the JICA Guidelines for Environmental and Social Considerations (implemented in April 2010). It is not considered to have a serious adverse impact on the environment and does not have any sensitive characteristics or is not in a sensitive area listed in the Guidelines.

3. Environmental permits: An Environmental Impact Assessment (EIA) Report for the

Project was submitted by the MOC to the Environmental Conservation Department (ECD) of the Ministry of Natural Resources and Environmental Conservation (MONREC) in January 2019. It should be approved by January 2021.

4. Anti-pollution measures: Measures which will be taken during construction include regular water sprinkling and road cleaning, appropriate wastewater treatment, and restricted hours of construction work. After the facilities become operational, speed and other restrictions will help reduce noise, vibration, and air pollution and the negative impacts on the environment will be minimized.
 5. Natural environment: The Project site is not in a sensitive area such as a national park or in a nearby area and the Project's adverse impacts on the natural environment is thought to be minimal. A part of the bridge will be in the Important Bird Area/Key Biodiversity Area though it is not a legally defined conservation area. According to the ecological survey and an expert's advice, it has been confirmed that no rare species were found in the areas and thus, the project site is not an important habitat area specified in the JICA Guidelines. Ecological monitoring will be performed from the detail design stage. If any impact of the Project is identified, measures to reduce the impact will be taken.
 6. Social environment: The Project will require the acquisition of 25.3 ha land and affect 20 households (106 people) including four households (24 people) who will be required to relocate. These residents will be properly compensated and the land will be acquired based on a resident relocation plan made in accordance with Myanmar's law and the JICA Guidelines. None of these residents has made an objection to the Project.
 7. Monitoring and others: In the Project, water, air, noise, vibration, and ecology monitoring will be performed by the construction company under the supervision of the Executing Agency during the construction period and by the Executing Agency after the facilities become operational. The construction of the bypass financed by the ADB is an integral part of the Project. It has been confirmed that necessary documents are in place according to possible impacts on the natural and social environment.
- 2) Cross-cutting issues: The Project will help reduce greenhouse gas (GHG) emissions by easing traffic congestion. The Project and the whole of the Bago-Kyaikto section including the section financed by the ADB are estimated to reduce GHG emissions by about 336,049 tCO₂/year.
 - 3) Gender category: GI (S) (Gender Informed (Significant))
<Activities/Reason for choosing this category> It has been agreed between MOC and JICA, that women's perspectives will be reflected in the Project design and that the allocation of female staff to a project management unit, which will be established in the Department of Bridge, MOC, will be promoted (a female staff member has already been appointed as project director). Furthermore, it has also been agreed that, in order to promote women's employment in the construction work, the percentage of unskilled female workers will be at least 10%.
- (9) Other important issues: Japanese technologies (e.g. steel pipe sheet pile foundation method) will be used.

4. Project outcomes

(1) Quantitative outcomes

1) Outcomes (operational/effectiveness indicators)

Bago-Kyaikto section (including New Sittaung Bridge)

Indicator	Baseline (2017 actuals)	Target* ³ (2028) (2 years after project completion)	
	Existing roads	Existing roads	New bypass
Traffic volume (PCU/day)* ¹	15,579	33,288	19,998
Average travel time (hour)	2.27	2.12	0.80
Average travel speed (km/h)	41.3	44.4	83.1
Traffic congestion (V/C)* ²	0.91	1.08	0.25

*1: Weighted average of each section (Bago South Interchange – Kyaikto Interchange)

*2: Volume-to-Capacity (V/C) ratio: This measures the level of congestion on a roadway. It is the ratio of daily traffic volume to design traffic capacity.

*3: The targets have been set on the assumption that the construction of the section financed by the ADB and the section financed by JICA will be completed at the same time and that tolls recommended by the ADB will be charged. The tolls recommended by the ADB have been calculated by increasing the current tolls according to willing-to-pay tolls (WTP) for cars and small trucks only.

Thuwunna Research Laboratory and Training Center

Indicator	Baseline (2017 actuals)	Target (2028) (2 years after project completion)
Prospective number of MOC staff trained at the Training Center per year	1,061 pers.	2,000 pers.
Prospective number of workers trained at the Training Center per year	Training: 150 pers. Assessment course: 160 pers.	Training: 1,440 pers. Assessment course: 960 pers.

(2) Qualitative outcomes

Revitalization of Myanmar's socioeconomic activities, logistics, and trade with its neighboring countries, improved road safety, and contribution to the achievement of SDG Goal 9 (Build resilient infrastructure) and SDG Goal 13 (Climate action)

(3) Internal rate of return

Based on the following assumption, the economic internal rate of return (EIRR) is 24.6% and the financial internal rate of return (FIRR) is -7.8%. The internal rate of return has been calculated based on the new 65 km-long bypass in the Bago-Kyaikto section, including the section financed by the ADB, which is an integral part of the Project (but excluding the Thuwunna Research Laboratory and Training Center).

[EIRR]

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

Benefits: Reduced travel costs, reduced traveling time

Project life: 28 years (20 years after the facilities become operational)

[FIRR]

Cost: Project costs, operation and maintenance costs

Benefits: Tolls collected (Toll amount will be recommended by the ADB)

Project life: 28 years (20 years after the facilities become operational)

5. Preconditions and external factors

- (1) Preconditions: The construction of the bypass financed by the ADB, which is an integral part of the Project, must be completed as planned.
- (2) External factors: None

6. Lessons learned from similar past projects and application to the Project

In the ex-post evaluation of the “Second Magsaysay Bridge and Butuan City Bypass Road Construction Project”, an ODA loan project for the Republic of the Philippines (evaluation year FY2012), issues related to design and construction supervision were identified. They include subsidence of the approach to the bridge caused by soft soils and potholes on the bridge. We have learned the importance of design and construction and supervision.

A preliminary geological survey conducted in the Project reveals the presence of soft soil layers in the project site. Ground improvement measures will be taken to deal with the soft soil issue. Another geological survey will be conducted at the detail design stage.

7. Evaluation results

In the Project, the new bridge will be built in the Bago-Kyaikto section and the Thuwunna Research Laboratory and Training Center, where road and bridge maintenance personnel will be trained, will be refurbished and its facilities will be developed. The Project will make Myanmar's domestic and international logistics more efficient and is in line with Myanmar's development tasks and policy as well as Japan's economic cooperation policy. In addition, the Project is expected to contribute to the achievement of SDG Goal 9 (Build resilient infrastructure) and SDG Goal 13 (Climate action). For these reasons, there is a significant need for JICA to support the implementation of the Project.

8. Plan for future evaluation

- (1) Indicators used in future evaluation
As indicated in Section 4.
- (2) Future evaluation schedule
Ex-post evaluation to be carried out two years after project completion.