

Chapter 3

Physical Infrastructure

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Chapter 3

Physical Infrastructure

The original alignment of the Trilateral Highway (TLH) is basically a domestic road in Myanmar plus minimal infrastructure to cross the borders with India and Thailand, and, therefore, the development of the TLH had been slow until 2011. Since then, the development of the TLH has been accelerated mainly in terms of physical infrastructure, such as roads, bridges, logistic facilities, such as dry ports, and border-crossing facilities.

At the end of 2018, the Asian Development Bank (ADB) released a series of reports on the comprehensive assessment of the economic corridors designated in the Greater Mekong Subregion (GMS) Economic Cooperation Program (ADB 2018a-h). As illustrated in Figure 1.1, the original alignment and southern route of the eastward extension of the TLH overlap with parts of the network of the GMS economic corridors, while the northern route of the eastward extension does not. ADB's reports are indeed full of valuable information for knowing the current status of the road network in the region. Therefore, our analysis synthesises the information by ADB (2018a-h), most of which is based on an ADB survey conducted in 2017 and up-to-date information obtained in our own survey conducted between the middle of 2019 and January 2020.

3.1. India¹

The original alignment of the TLH in India is limited to the Indo-Myanmar Friendship Bridge connecting Moreh and Tamu, and some border facilities, such as the integrated check post at Moreh.

¹ As India is not a member of the GMS economic cooperation program, it is not covered in the ADB reports (ADB 2018b-h). This subsection is based on De et al. (2020).

(1) The connecting node between South and Southeast Asia: Imphal and Moreh

Moreh is located in the Chandel district of Manipur. It lies to the southeast of Manipur on the Indo–Myanmar border. Tamu is the corresponding border town of Moreh. About 81% of the local population is involved in non-agricultural activities.² Located on the Asian Highway No. 1 (AH-1), Moreh is India's entry point to the countries in Southeast Asia. Being a small border town, however, Moreh itself is not attractive enough as a market nor a production base.

What makes the TLH attractive for Myanmar and Thailand is the vast hinterland behind Moreh. Imphal, the capital city of Manipur, is 110 kilometres (km) away from Moreh, and it constitutes a connecting node of the road network in the North Eastern Region (NER), which is connected further to the remaining large part of India. Currently, road is the only mode of transport for goods and services between Moreh and Imphal. The widening of the existing highway (NH-102) is under construction. This is the main highway, which connects India with Southeast Asia and carries the trade between them.

On the other hand, India's domestic railway network is now being extended to Imphal, with completion expected by 2021, providing another impetus to further enhance the connectivity between Imphal and mainland India. With the concept of the Trans-Asian Railway under the United Nations Economic and Social Commission for Asia and the Pacific, there is a plan to extend the railway from Imphal to Moreh, with a future plan to connect it to the rail network in Myanmar.

(2) Border trade at Moreh

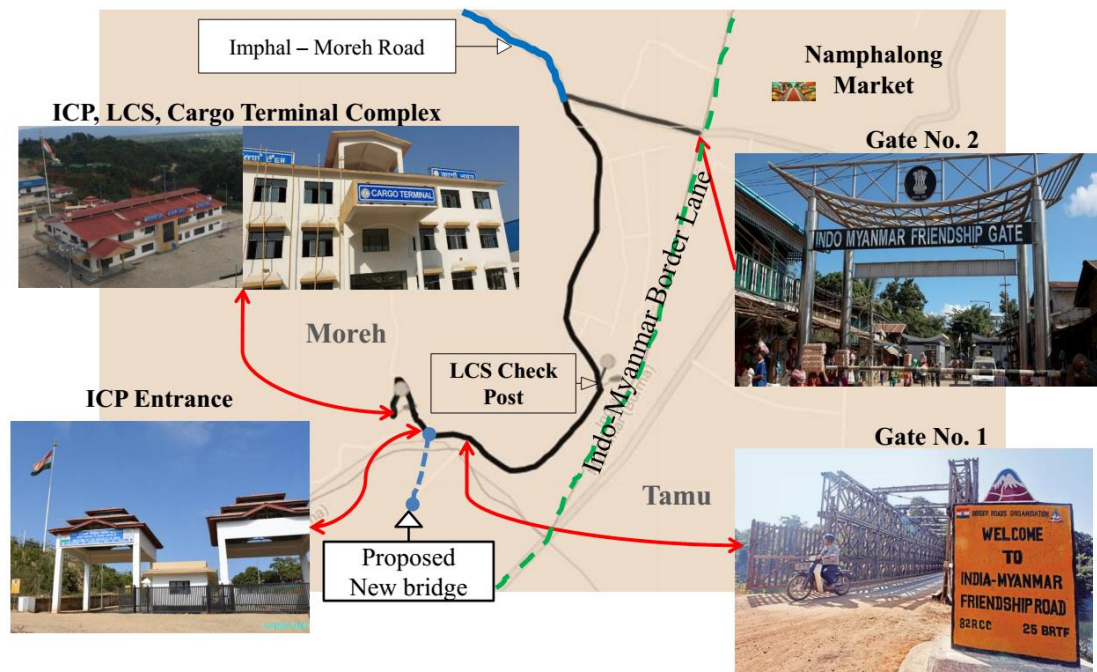
India and Myanmar signed a border trade agreement on 21 January 1994, and border trade came into effect on 12 April 1995. Under this agreement, border trade between the two countries is permitted for selected items to be routed through designated trading points. Cross-border trade is fully functional between India and Myanmar at two Land Customs Stations (LCSs): one in Moreh, facing Tamu in the Sagaing Region of Myanmar, and the other in Zokhawthar in Mizoram, facing Rihkhawdar (or Rih, Reed) in the Chin State of Myanmar.

The cross-border trade at Moreh takes place through Gate No. 1 and Gate No. 2 (Figure 3.1). Gate No.1 is the regulated trade route as per the standard operating procedure between the two countries. The LCS and the Integrated Check Post (ICP) are located near Gate No. 1. Gate No. 2 is

² According to the census in 2011.

an entry or exit point for passengers and head-load cargoes between India and Myanmar. Namphalong market in Tamu, adjacent to Gate No. 2, is a well-developed market. It sells not only goods from Myanmar but also those originating from third countries, such as China, the Republic of Korea, Japan, and Thailand, amongst others. Namphalong market has active Indian buyers that take permits from the gate for entry, pay for the goods purchased in Indian rupees, and return with head-loads. There is an absence of customs checks and a lack of health and safety checks of the products that are coming through Gate No. 2. Trade through Gate No.2 has been permitted only for local residents who are settled within a radius of 40 km on both sides of the border of India and Myanmar. Moreh's main market, commonly known as the Morning Bazaar, is located near the border of Gate No. 2.

Figure 3.1. Border Infrastructure at Moreh



Source: RIS Survey (2019).

(3) Integrated Check Post

Moreh Integrated Check Post (ICP) is a trade centre for facilitating bilateral trade between India and Myanmar as well as the movement of passengers across the border. Moreh ICP started its operations from 8 August 2018 and has a total area of 38.34 acres. The Land Port Authority of India is yet to get physical possession of the ICP from the Government of Manipur. The Government of India has approved about Rs 130 million for the development of Moreh ICP.

The operations at Moreh ICP commenced with a passenger terminal on 15 March 2018, and immigration facilities started functioning from 8 August 2018. Since then, Moreh ICP has started handling passengers coming to India. In FY2018, Moreh ICP handled 1,436 incoming passengers from Myanmar and 1,620 outgoing passengers from India to Myanmar.³ The majority of the people from Myanmar come to Manipur for medical treatment, while some of them also enter India for tourism purposes. For example, when there is a sports festival, such as for football, the inflow of tourists from Myanmar increases. Moreh ICP is expected to generate employment, promote trade between India and Myanmar, and foster connectivity and trade facilitation with the neighbouring countries.

The construction of Moreh ICP is almost at the completion stage, and includes a passenger terminal, cargo terminal, customs processing, immigration clearance, import warehouse, electric sub-station, parking, rummaging sheds, weigh bridge, security and surveillance, banks/ATM, drivers' rest area, public conveniences, and monumental national flag. The current status of facilities at ICP Moreh is given in Table 3.1.

Table 3.1. Current Status of Facilities at Moreh ICP

Facilities	Current Status
Warehousing	Cargo terminal construction is in the completion stage, with the capacity of 800 square meter storage area for dry cargo. It will be ready by end of 2019.
Cold Storage	Construction is ongoing with the capacity of 400 square meter storage area for perishable goods.
Banking	Provision for banking space is ready and rental free but not yet functional. LCS has invited SBI and UBI to open a branch.
Foreign Exchange Facility	UBI is authorised to do foreign exchange.
Weighing Bridge	Completed.
Plant Quarantine	Not ready yet.
FSSAI	Space is allotted for the laboratory of FSSAI and is yet to come. FSSAI activities are managed by Manipur State Food Safety Department. All the laboratories under FSSAI should be NABL certified.
Internet Bandwidth	Current speed of internet is only 8 mbps, which has to be enhanced further. At present, trade at Moreh through LCS is handled on manual basis. LCS planning to introduce Electronic and Data Interchange (EDI), which require more internet speed.
Human Resources	At ICP: 1 regular post and 13 people are presently working as contractual basis. At LCS: 3 inspectors, 2 havildars and 1 superintendent.
Security	4 security persons deployed by Assam Rifles
Electricity	Power supply is available but experiencing occasional power cut. In case of power cut, diesel generator is available.
Medical facility	Not yet ready.
Public Conveniences	Space for public conveniences is available and already functional.
Parking Space	Available.

Source: RIS Survey (2019).

³ See the website of the Land Port Authority of India (www.lpai.gov.in) for further details.

The Moreh LCS has been housed in a departmental building located near Gate No. 1 and is being considered to be shifted to the ICP complex. Plant and quarantine facilities are available at Moreh LCS, but they had not been used at the time of the RIS Survey (2019).

(4) Financial infrastructure

Four banks are currently operating in Moreh: State Bank of India (SBI), United Bank of India (UBI), UCO Bank, and Axis Bank. These four banks mostly cater to the demand for banking and other financial services. All of the four banks have one ATM each placed in different locations of Moreh town. Amongst the four, UBI is the officially designated foreign exchange dealer in Moreh. Banking and financial transactions are substantial, taking into account the level of economic activities in Moreh and the reported border trade taking place between the two countries through the Moreh–Tamu border.

Based on preliminary sources, the current average daily deposits of SBI and UBI are to the tune of Rs 4 million to 5 million and Rs 10 million, respectively. SBI has approximately 7,000 savings accounts and 300 current accounts, whereas UBI maintains 8,000 savings accounts and 300 current accounts. In the case of border trade, no special payment arrangement including a letter of credit (L/C) exists between India and Myanmar. Although there is no L/C provision, trade-related transactions, which are mostly conducted through current accounts, constitute a substantial part of the banking business in Moreh. The RIS Survey (2019) finds that around 90% of the total deposit mobilisation of UBI per day (approximately Rs 9 million) is linked to border trade. Likewise, the current account transactions of SBI are approximately Rs 3 million to 4 million per day.

Banks operating in Moreh expect that local business and trade will grow once the TLH becomes operational. While the need for more human resources is often highlighted, with technological modernisation and proper clearing and settlement mechanisms, banks will be able to handle the possible rise in demand for financial services associated with higher border trade.

Banks also provide financing to local traders and businesses along with mandated commitments of priority sector lending and Micro Units Development and Refinance Agency (MUDRA) loans.⁴

⁴ MUDRA is a refinancing institution. MUDRA does not lend directly to micro entrepreneurs or individuals. MUDRA loans under Pradhan Mantri Mudra Yojana (PMMY) can be availed of from a nearby branch office of a bank, NBFC, or MFI, etc.

Loans extended by SBI total approximately Rs 170 million, and about 100 small and medium-sized enterprises are financed by the bank. Similarly, UBI has provided 300 MUDRA loans, mostly for the purpose of variety stores and shops. While the lending portfolio of UBI has grown over the years, the bank does not have a large exposure to any single borrower, thereby reducing the cumulative risk of default.

In the case of trade-linked banking services, both SBI and UBI are considering the proposal of opening extension counters at Moreh ICP especially for foreign exchange-related services. Both SBI and UBI underscore the importance of improving the trade environment in the Imphal–Moreh region and suggest a number of policy and institutional reforms. As informal trade with Myanmar through Moreh continues to remain a challenge, banks believe in the positive outcomes of incentives like bank guarantees, L/C, faster payment settlement, bilateral banking arrangements, rupee trade, and so on. In particular, UBI is keen to provide bank guarantees for local traders engaged in border trade. Since foreign exchange transactions are likely to increase in the future, UBI needs proper technology for validating foreign currency notes, as the risk of fake currency circulation is high. Despite being the official dealer of foreign exchange, the bank does not sell any foreign currency to traders. Customers and traders are only allowed to convert foreign currencies to the Indian rupee.

(5) Challenges in physical infrastructure

There are several challenges to facilitating border trade through the Moreh–Tamu border, including a shortage of staff, lack of electricity, lack or absence of good quality internet, and an absence of accommodation for officials and other social infrastructure. At the moment, only the passenger terminal has been opened in Moreh ICP, and it has started accepting people coming from Myanmar to India and vice versa. The cargo terminal is not yet ready, but the construction is at the final stage. One of the biggest challenges is inadequate financial infrastructure to support border trade. Reflecting its history of barter trade, border trade at Moreh–Tamu does not happen through L/C issued by financial institutions. In order to expand border trade, there must be a formal banking facility. Transactions between the two countries should follow an L/C system.

Sagaing province of Myanmar is a big market for Indian goods. Greater cooperation to promote trade and investment is needed between Manipur and Sagaing. Completion of the construction

of the TLH, including the replacement of bridges along the Tamu–Kyigone–Kalewa road in Myanmar will strengthen the trade and investment linkages between India and Myanmar.

There are several ways to facilitate cross-border trade and the movement of people by taking advantage of the development of information and communication technology. For example, an electronic mode for trade, instead of a manual system, must be introduced. E-visas are also yet to be accepted at the Moreh border by Indian immigration. However, border passes are pending from the Indian side, whereas the Myanmar side has already started border passes.

In view of international trade at Moreh and Tamu, food safety should be strengthened, both at the Moreh border and Imphal. The activities of the Food Safety and Standards Authority of India (FSSAI) are managed by the Manipur State Food Safety Department. All the laboratories under the FSSAI should be certified by the National Accreditation Board for Testing and Calibration Laboratories (NABL). The micro-biology section of the FSSAI Lab is not yet developed. A small office opened in Moreh in December 2018 to check chemicals in processed food items. However, the office is now closed. FSSAI's Manipur office is issuing NABL certificates from time to time.

3.2. Myanmar

As pointed out above, most of the original alignment of the TLH is in Myanmar's territory. Although road infrastructure in Myanmar has improved year by year, several sections still require repair or upgrading works. At the end of 2018, ADB released a series of reports comprising a comprehensive assessment of the economic corridors designated in the GMS Economic Cooperation Program (ADB 2018a-h). As illustrated in Figure 1.1, the original alignment of the TLH in Myanmar overlaps with parts of the network of the GMS economic corridors, while the northern route of the eastward extension does not. ADB's country report for Myanmar (ADB 2018e) is indeed full of valuable information on the current status of the road network in the country. Therefore, our analysis below synthesises the information in ADB (2018e), most of which is based on the ADB survey conducted in 2017, and up-to-date information obtained in our own survey conducted between the middle of 2019 and January 2020.

As one of the main objectives of this field survey is to update the information relative to ADB (2018e), the team made an assessment based on the following.

- The physical condition is reported in five assessments, such as ‘very good’ ‘good’, ‘fair’, ‘bad’, and ‘very bad’. Observations regarding road conditions are based on factors such as the state of the road surface, road maintenance, and adequacy of road signs and drainage facilities.
- The road classification is based on the Asian Highway standards: Primary (four or more lanes, control access); Class I (four or more lanes); Class II (two lanes); and Class III (two lanes). Pavement is asphalt or cement for Primary, Class I, and Class II, and double bituminous treatment for Class III.

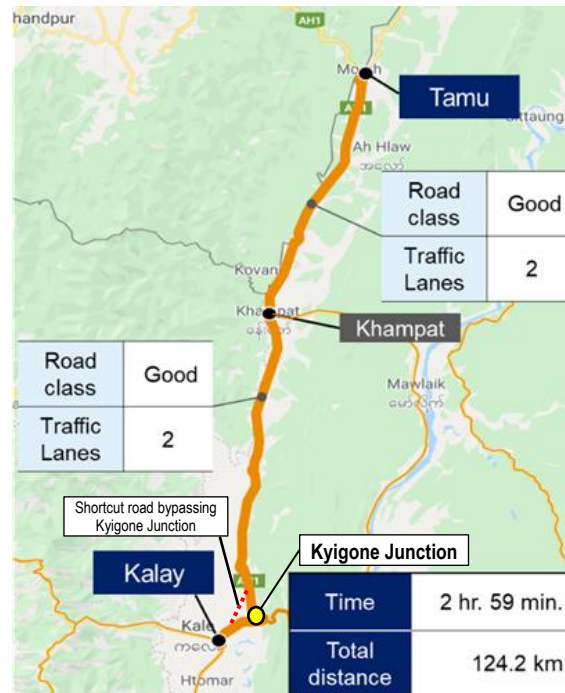
In the following subsections, the TLH route in Myanmar is assessed in four sections, namely (1) Tamu–Kyigone–Kalay; (2) Kyigone–Mandalay; (3) Mandalay–Yangon; (4) Yangon–Myawaddy; and (5) Mandalay–Keng Lap (Lao PDR border).

3.2.1. Tamu–Kyigone–Kalay

Tamu is a town in the Sagaing Region adjacent to the city of Moreh in the Manipur State of India and serves as the largest trading point with India, amongst three main border points, namely Tamu, Rhi (Reed), and Htan Ta Lan. The Tamu border customs post was opened in 1995 after Myanmar and India signed a border trade agreement.

The entire route between Tamu and Kalay (Kalemyo) is a two-lane road. There is one lane on both sides, and each lane is wide enough to have a shoulder. When the MSR conducted a field survey in January 2020, it took 2 hours and 58 minutes from Kalay to the India–Myanmar Friendship Bridge in Tamu, excluding break times and stops. The surface condition was ‘good’ throughout the road (Figure 3.2 and Photo 3.1).

Figure 3.2. Tamu–Kalay Section



Source: Drawn by MSR based on ©GoogleMap 2020.

Departing from Kalay to Tamu, at the 8 km point from Kalay along the AH-1 is the Kyigone Junction. The road diverges to the north heading to Tamu and also eastward to Kalewa. But when going directly from Kalay to Tamu, a shortcut road is available to bypass Kyigone Junction.

Departing from Tamu to the south, the first 160 km stretch of the TLH is also known as the India–Myanmar Friendship Highway (IMFH) and was ‘first built in 2001 by the Border Roads Organisation (BRO) under a bilateral pact with Myanmar. The BRO maintained the road until 2009, when it was handed over to Myanmar.’⁵ Because of this difference from other Built-Operate-Transfer (BOT) projects, the entire route of the IMFH is toll-free. Along the route between Tamu to Kalay, there remain a total of 49 small one-lane bridges, the construction of which dates back to the 1940s (Photo 3.1). These bridges cause long waiting times for vehicles from both sides (Photo 3.2).

⁵ ‘The Road to East: Connecting India, Myanmar and Thailand; Gateway to ASEAN’, by Nirupama Subramanian, *The Indian Express*, 5 September 2018.

Photo 3.1. Condition of Roads and Bridges between Kalay–Tamu



Note: The distances in the photos are measured from Kalay.

Source: MSR (2020).

Photo 3.2. A bridge Causing Waiting Time (Kalay–Tamu)



Source: MSR (2020).

3.2.2. Kyigone–Mandalay

(1) Three routes connecting Kyigone and Mandalay

There are three optional routes connecting Mandalay and Kyigone, which is a major junction to go to Tamu from Mandalay (Figure 3.3). The first route through Gangaw overlaps with AH-1. The second route goes through Shwebo, Ye-U, and Kalewa. The third is through Monywa and Yargyi, which is under upgrading work with the assistance from India and constitutes a part of the TLH.

Figure 3.3. Three Routes between the Tamu–Mandalay Section



Source: Created by MSR based on ©GoogleMap 2020.

Table 3.2. Comparison of Three Routes from Mandalay to Tamu

Road Utilisation	Pros	Cons
Gangaw route (613km, 13h16m): Mandalay – Monywa – Gangaw – Kale – Kyigone – Tamu		
Most used road among the 3 routes for both passenger vehicle and trucks. About 90% ⁽¹⁾ of the trucks use this route.	Road condition is good and logistic companies that carry goods from Mandalay–Tamu utilise the Gangaw Route ⁽²⁾ .	Longest distance and time among the 3 routes.
Ye-U/Shwebo route (478km, 12h10m): Mandalay – Shwebo – Ye-U – Kalewa – Kyigone – Tamu		
About 10% ⁽¹⁾ of trucks are utilising it as the shortest route to Mandalay.	Shortest distance directly from Mandalay to Tamu through Ye-U. Compared to Yargi Route, the road condition is better ⁽²⁾ .	Some sections are in poor road conditions with mountainous curves and unpaved surface. Without passing Monywa, the capital of Sagaing State.
Yargyi route (480km, 11h57m): Mandalay – Monywa – Yargyi – Kalewa – Kyigone – Tamu		
Only used by inhabitants on the Yargyi route or trucks and vehicles for upgrading/ construction work.	Shortest route through from Mandalay going through Monywa, the capital of Sagaing State.	Many sections are in poor road conditions with mountainous curves and unpaved surface, logistic companies do not use this road. Inaccessible during rainy season.

Notes: (1) MSR interview with a Ministry of Commerce official. (2) MSR interview with logistics companies based in Mandalay. (3) Distance and time are measured with ©GoogleMap 2020 from the Mandalay–Tamu section taking each route (January 2020).

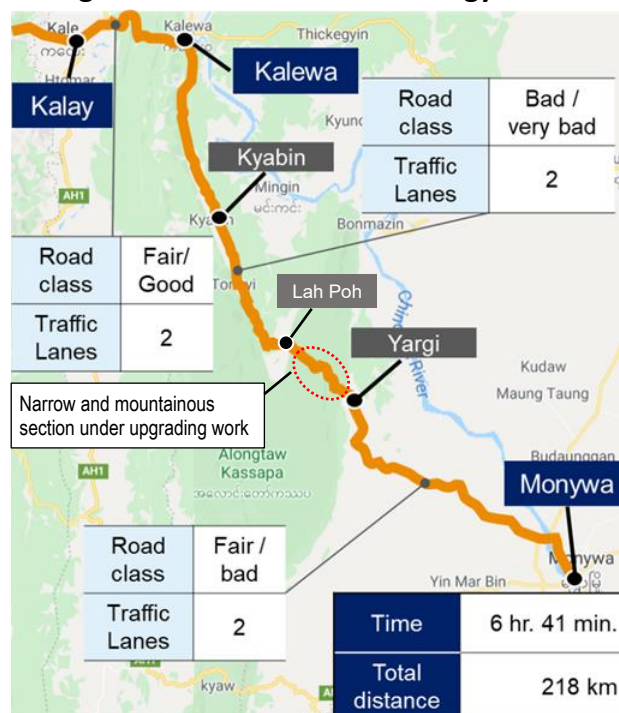
Source: MSR (2020).

For commercial use, the most used route is the one through Gangaw because of its relatively well-maintained road condition. From interviews with logistics companies based in Mandalay,⁶ about 90% of them use the Gangaw route when sending goods to Tamu. Logistics companies have refrained from taking the Yargyi route as there are mountainous sections with many steep curves and unpaved segments that can cause damage to the vehicles. For the Ye-U/Shwebo route, the Mandalay–Shwebo section is easy to travel. However, the Kaduma–Kalewa section is a difficult road section to travel due to its mountainous terrain. During the rainy season, which generally runs from June to September, the Myanmar government does not prohibit vehicles taking any of its routes. The Ye-U–Shwebo route is also accessible during the rainy season. Logistics companies on their own accord stay away from the Yargyi route in both seasons.

Designated as a part of the TLH, the Government of India is actively providing aid to upgrade the section between Kalewa and Yargyi, which is currently avoided by logistics services providers because of its mountainous terrain and poor road conditions. From the Indian perspective, the Kalewa–Yargyi section is a natural extension of the existing IMFH from Tamu to Kalewa. As the updating work is ongoing, the current status of the road condition is largely very bad (Figure 3.4). The Yargi–Monywa section was developed and managed by the Myanmar side (Monywa Group of Companies) under a BOT arrangement.

⁶ The MSR team interviewed Mandalay-based logistics companies, such as Shwe Pyi Tan Logistics and Tint Tine Aung Logistics, etc. in January 2020.

Figure 3.4. Overview of the Yargyi Route

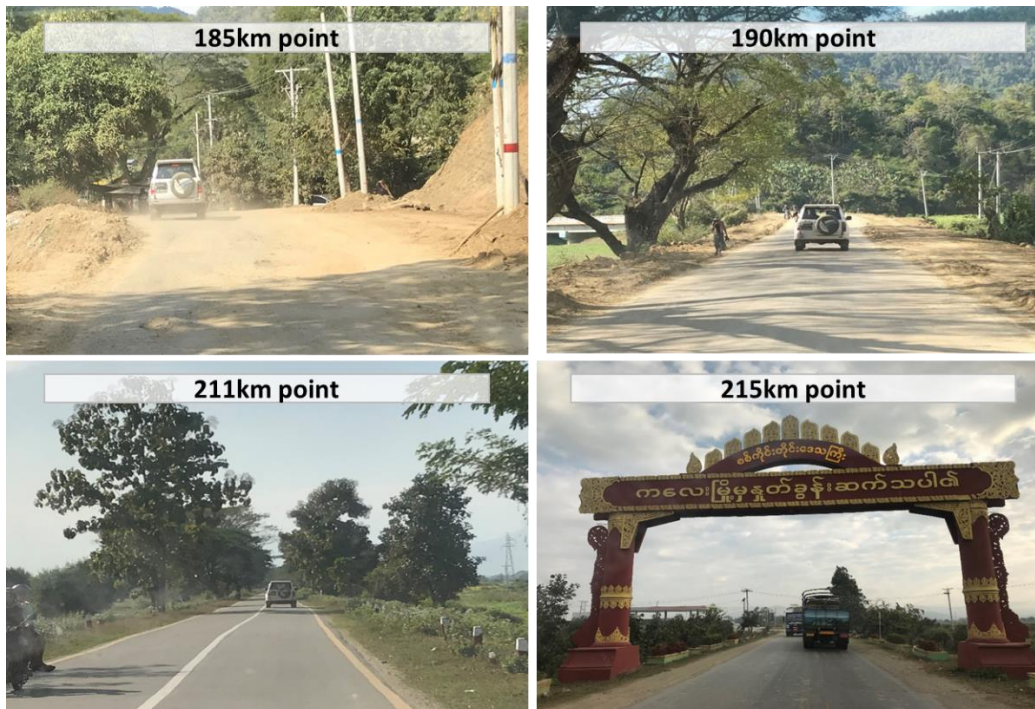


Source: Drawn by MSR based on own assessment and ©Google Map 2020.

(2) Kalay–Kyigone–Kalewa

The road section between Kalewa and Kalay comprises two narrow lanes, with the Myit Thar River on one side and rocky mountains on the other side. Moreover, there are 21 old bridges, which have a load-bearing capacity of 13 tons along the road. It takes about 1 hour between Kalay and Kyigone and 50 minutes between Kyigone and Kalewa. The surface conditions are largely 'good' except for 21 narrow and old bridges along the road, which do not allow two vehicles to pass each other (Photos 3.3 and 3.4).

Photo 3.3. Road Condition at the Kalay–Kalewa Section



Source: MSR (2020). The distances in the photos are measured from Monywa.

Photo 3.4. Old and Narrow Bridges at the Kalewa–Kyigone Section



Source: MSR.

(3) Kalewa–Yargyi

The ongoing upgrading work on the Kalewa–Yargyi section is a challenging attempt to exploit the potential of the Yargyi route. As summarised in Table 3.2, the Yargyi route is an effective way to connect Monywa, the capital city of Sagaing Region, to Tamu by the shortest distance. However, the mountainous terrain of the Yargyi–Lar Poh section, the topographical vulnerability of the

Kalewa–Lar Poh section to rain,⁷ as well as the scarcely populated roadside areas have long kept the Yargyi route underdeveloped, underutilised, and behind the Gangaw route. The upgrading of the Kalewa–Yargyi section is expected not only to open wide economic opportunities to the roadside areas but also to establish the shortest route connecting the capital cities of the adjacent regions, Sagaing in Myanmar and Manipur in India, as well as enhancing the resiliency of the TLH by offering another alternative route.

As the upgrading work is ongoing, the Kalewa–Yargyi section is currently inadequate for long-haul transportation for large trucks in particular. However, once completed, it could change the flow of goods, vehicles, and people.

Photo 3.5. Upgrading Work on the Kalewa–Yargyi Section



Source: MSR (2020), on 13 January 2020.

⁷ As Figure 3-3 indicates, the Kalewa–Lar Poh section passes straight through a narrow and flat area sandwiched by steep mountain ranges. During the rainy season, the rain that falls on the mountains pours into the valley floor and makes the road impassable.

Photo 3.6. Mountainous Section between Lah Poh and Yargyi



Source: MSR, on 13 January 2020.

(4) Yargyi–Monywa

Throughout the road, the Monywa–Yargyi section is two lanes, which are in relatively good condition and mostly paved with asphalt. The remaining gravel roads have been under upgrading work.

Photo 3.7. Road Conditions at the Monywa–Yargyi Section



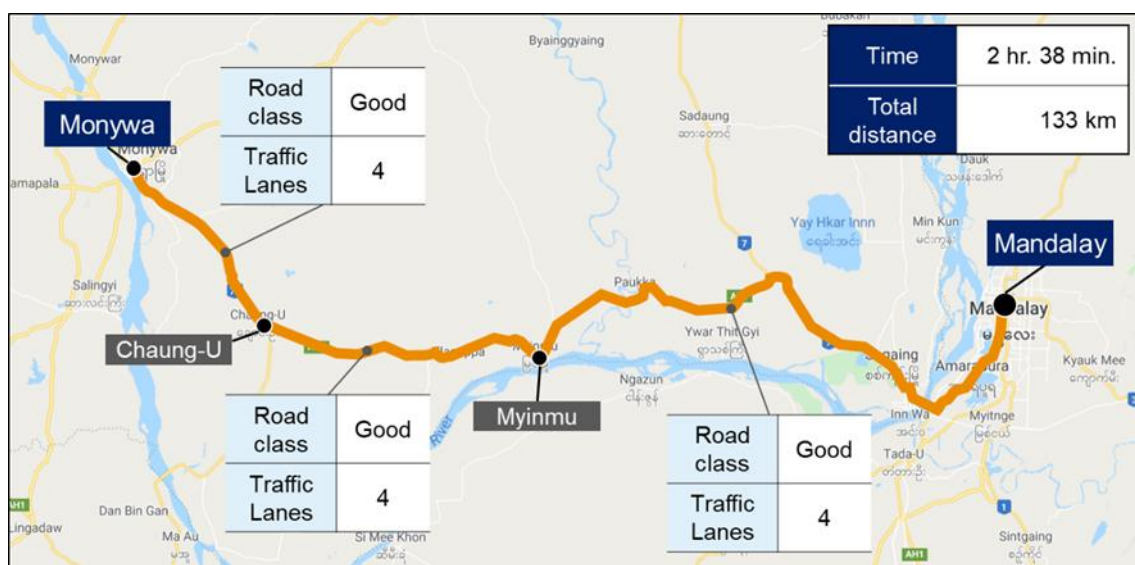
Source: MSR (2020). The distances in the photos are measured from Monywa.

(5) Monywa–Mandalay

The Mandalay–Monywa route, which also serves as AH-1,⁸ is smooth and commercial vehicles including trucks can easily travel on both lanes.

It takes 2 hours and 38 minutes from Mandalay Airport to the centre of Monywa city, excluding break times and stops. Throughout the route, there are two lanes on both sides. The team assessed the road condition as ‘good’ throughout the road (Figure 3.5).

Figure 3-5. Monywa–Mandalay Section



Source: Drawn by MSR based on own assessment and ©Google Map 2020.

(6) India’s commitment to the IMFH⁹

The upgrading plans for the road and bridge infrastructure between Tamu and Monywa missed their original deadlines and were modified in recent years. In 2012, during bilateral talks, former Myanmar President Thein Sein and Indian Prime Minister Singh agreed that India was to undertake the repair and upgrading of 71 bridges on the IMFH and the upgrading of the Kalewa–Yargi road segment to highway standard. While Myanmar was to undertake upgrading the Yargi–Monywa stretch to highway standard by 2016¹⁰ that was not completed as planned.

⁸ AH-1 is from Ayeyarwady Bridge in Yadanarpon to before entering Chaung-U.

⁹ This subsection is based on De et al. (2020).

¹⁰ ‘Joint Statement by India and Myanmar on the State visit of Prime Minister of India to Myanmar’, 28 May 2012, available at the website of Ministry of External Affairs, Government of India.

The current Modi administration of India is aligned with the decision made by the previous administration. In 2015, the newly elected Modi government approved the construction of 69 bridges on the Tamu–Kyigone–Kalewa (TKK) section¹¹ at the cost of Rs 3,710 million (approximately US\$ 52 million¹²) and this was projected to be completed by mid-2019,¹³ however again, the route was not completed on schedule.

In 2019, the Ministry of Road Transport & Highways in India announced the upgrade and construction of bridges along the TTK section (149.7 km) and the construction of the Kalewa–Yargyi section (120.7 km) of the TLH. These were planned in accordance with a grant from the Indian government (Press Information Bureau, India and Ministry of Road Transport & Highways, 2019). According to information from meeting with the Department of Highways, Ministry of Construction, the Kalewa section was supported by grant aid from India amounting to Rs 11.77 billion (US\$ 200 million). For the Myanmar side, the Yargyi–Monywa section is being upgraded by Monywa Group of Companies under a BOT system.

The construction has been scheduled to be completed in 2021, three years from the date of commencement in 2018.¹⁴ The Ministry of Road Transport & Highways in India approved a total of Rs 14.59 billion (US\$ 205 million) for the Kalewa–Yargyi section and Rs 3,715.8 million (US\$ 51.8 million) for the TTK section. From the total amount, in 2019, Rs 1,883.2 million (US\$ 26 million) for the Kalewa–Yargyi section and Rs 48.4 million (US\$ 0.7 million) for the Kalewa–Yargyi section was released from the Indian government fund (Press Information Bureau, India and Ministry of Road Transport & Highways, 2019).

The project owner, Ministry of External Affairs (MEA), India, hired the National Highways Authority of India (NHAI) as a consultant and authority engineer for both the owner and client sides. There is also a contractor with an engineering procurement construction (EPC) type, which does all the engineering tasks and procurement and construction work. Until now, about 20% has been completed.

¹¹ The TTK section is identical to the original alignment of the IMFH. As the Kalewa–Yargyi section is regarded as an extended part of the IMFH, the original IMFH is sometimes called the TTK section in India's official documents.

¹² Converted to US dollars by applying the rate of US\$1.00 = Rs71.385.

¹³ 'Construction of 69 Bridges including Approach Roads on the Tamu-Kyigone-Kalewa road section of the Trilateral Highway in Myanmar', Press Information Bureau, India, 20 December 2015.

¹⁴ The commencement date is according to the interview with the border official.

3-2-3. Mandalay–Yangon

There are two main routes connecting Yangon and Mandalay (Figure 3-6).

The old route is along the National Highway No. 1, which was built before 1945. The route passes through major cities, such as Bago, Taungoo, Pyinmana, and Meiktila. As a National Highway, it is administered by the Ministry of Construction, but the actual operation, including toll collection, has been done by seven private companies under respective BOT contracts.¹⁵ This route is also a part of AH-1¹⁶ as well as the No. 5 sub-corridor of the GMS North–South Economic Corridor (NSEC-5).

The new route, known as the Yangon–Mandalay Expressway, was constructed from October 2005 to December 2010. The high specification of the new expressway, in terms of the number of lanes and carriageways, the surface condition based on the International Roughness Index, and the shorter stretch, cut the travel time in half from 14 hours to 7 hours. However, the use of the Yangon–Mandalay Expressway by trucks has been strictly restricted, mainly from the viewpoint of road safety. The conditions are as follows. (1) Only trucks carrying perishable items such as agriculture products, fish, meat, and so on, can apply for permission. (2) Trucks have to be equipped with a telematics system, which enables the control centre to trace where the trucks are. (3) Trucks that have over 22 wheels and 6 axels cannot apply for permission. (4) The maximum weight for trucks with load is 48 tons in the rainy season and 50.5 tons in the dry season. Because of these restrictions, the numbers of trucks applying for permission to legally use the Yangon–Mandalay Expressway have not increased much. As a result, most of the trucks serving the nation’s arterial road between Yangon and Mandalay still drive on the older, longer, and rougher Yangon–Mandalay Highway. According to a policy note prepared by ADB for the Ministry of Transport and Communications, ‘allowing trucks on the expressway would immediately save US\$ 110 million a year – more than 10% of total road freight costs. With some additional investment in the road, this figure could rise to US\$ 200 million’ (Manch and Kyaw Lin Htoon 2017).

¹⁵ Toll gates along the Yangon–Mandalay Highway have been operated by seven private companies, namely (1) Oriental Highway (Asia World), (2) Max Myanmar, (3) Shwe Than Lwin, (4) Shwe Taung, (5) Kanbawza, (6) Yuzana, and (7) Thawdawin, under respective BOT contracts. Trucks have to pay tolls of about MK300,000 per return trip, which is much more expensive than MK22,500 for buses making a full trip on the Yangon–Mandalay Expressway.

¹⁶ Google Maps shows that the AH-1 section between Mandalay and Nay Pyi Taw passes through the Yangon–Mandalay Expressway (new) instead of the Yangon–Mandalay Highway (old). According to the Asian Highway Database, submitted by the Myanmar Government, however, the section of the AH-1 passes through the Yangon–Mandalay Highway (old).

Figure 3.6. New Expressway and Old Highway Connecting Yangon and Mandalay



Source: Manch and Kyaw Lin Htoon (2017).

Regarding the quality of road infrastructure, even the old highway is good enough to accommodate long-haul large trucks and vehicles throughout the route, although there are sections under upgrading work (Photo 3.8). However, the new expressway is of course in a better condition (Photo 3.9).

Photo 3.8. Road Condition at the Yangon–Mandalay Highway (Old Route)



Source: MSR (2020).

Photo 3.9. Toll Gates at the Yangon–Mandalay Expressway (New Route)



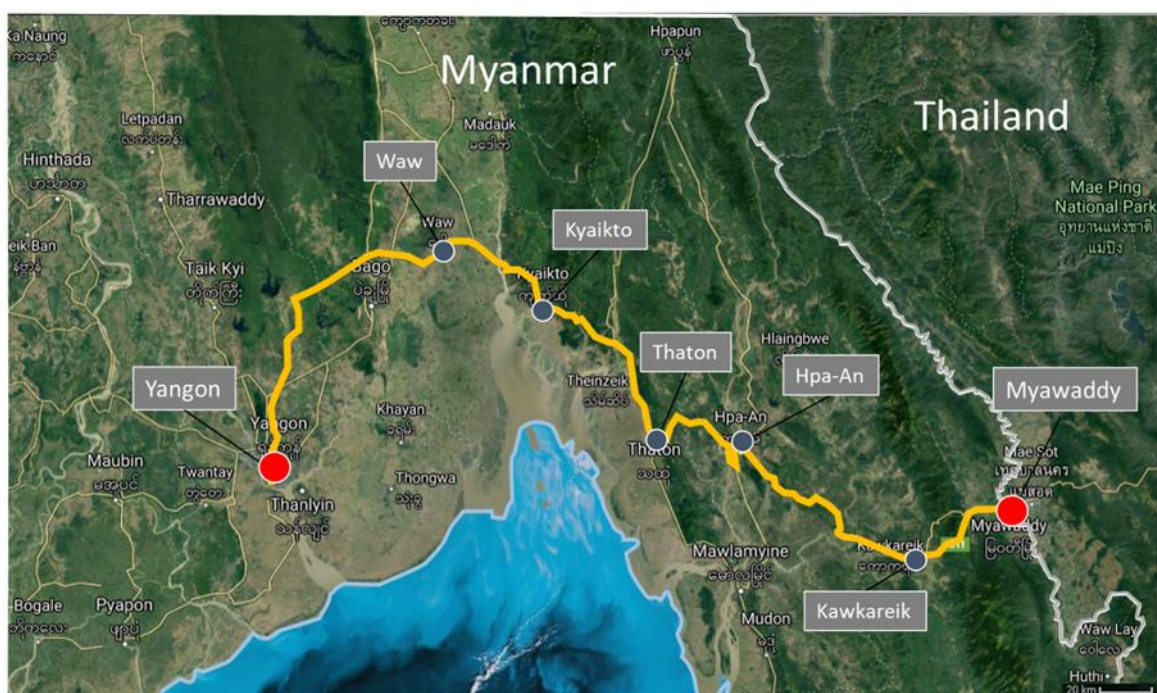
Source: MSR (2020).

3-2-4. Yangon–Myawaddy section

(1) Overview

The GMS East–West Economic Corridor in Myanmar, which starts from Thilawa adjacent to Yangon and ends in Myawaddy bordering Thailand, lies on a 457 km route through Bago, Hpa Yar Gyi, Waw, Kyaukto, Bilin, Thaton, Hpa-An, and Kawkareik (Figure 3.7). This section overlaps with the original alignment of the TLH.

Figure 3.7. Overview of the Yangon–Myawaddy Section



Source: Drawn by MSR based on ©Google Map 2020.

The importance of this route has increased particularly since the inauguration of the Second Thai–Myanmar Friendship Bridge in 2019, with the expectation of enhancing physical connectivity between Thailand and the Thilawa Special Economic Zone (SEZ) in the outskirts of Yangon. Moreover, this route will be the bloodline of Myanmar as far as trade and commerce are concerned since it connects regional hubs like Bago and Mawlamyine with the business capital of Myanmar, Yangon. The linkages to major infrastructure, such as Hanthawaddy New International Airport in Bago and the SEZs in Thilawa and Dawei, are also expected to accelerate economic development along the route.

(2) Yangon–Hpa Yar Gyi

Our route survey started from Yangon Central Railway Station, which is located downtown, and used the No. 3 main road to exit Yangon (Figure 3.8). Trucks mostly use this road as it reaches to the old Yangon–Mandalay Highway, due to the abovementioned ban on the Yangon–Mandalay Expressway, without passing through the city of Bago, according to our interview with a logistics company. Max Highway Co., Ltd. manages this part of the road under a BOT scheme, and it is well maintained and the road condition is ‘good’. Then, we entered the Yangon–Mandalay Expressway, which is four-lane and asphalt-paved, with a ‘good’ surface condition throughout the section. The travel time from Yangon to Hpa Yar Gyi was approximately 2 hours, excluding break times and stops. Throughout the route, mostly there are two lanes on both sides, which are in good condition. Some parts are asphalt-paved and others are concrete road (Photo 3.10).

Figure 3.8. Yangon–Hpa Yar Gyi Section



Source: Drawn by MSR based on own assessment and ©Google Map 2020.

A ground-breaking ceremony was held on 13 February 2019 for the New Bago Bridge, which is to be opened in 2021 with the objective of enhancing connectivity between Yangon and the Thilawa SEZ by complementing the existing Thanlyin Bridge, which is too old to accommodate heavy trucks.

Photo 3.10. Road Conditions in Hpa Yar Gyi



Source: MSR (2020).

(3) Hpa Yar Gyi–Thaton

The road section between Hpa Yar Gyi and Thaton, which is also a part of AH-1 and the GMS-EWEC, is in good condition and is mostly four-lane asphalt road that is upgraded and maintained regularly. After exiting Waw, our team crossed Sittaung River by Sittaung Bridge at Moke Pa Lin before reaching Kyaikto. The road segment between Moke Pa Lin and Kyaikto is in very good condition. From Kyaikto, AH-1 passes through Bilin and Theinzeik and reaches Thaton (Figure 3.9, Photo 3.11).

There are several infrastructure projects in the pipeline related to the connectivity in this section. First, a new arterial highway between Bago and Kyaikto (76.6 km) is to be developed as a part of ADB's 2nd GMS Highway Modernization Project (No.50381-006), which will be completed by the end of 2024. The new arterial highway is designed to be 32 km shorter than the current alignment, and the travel time will be halved by not passing through Hpa Yar Gyi, where various

problems caused by increased urbanisation and traffic congestion call for a bypass road. A tender for a consulting service for detailed technical preparation was closed on 20 December 2019. This process is expected to be completed in Q1 2021, presumably followed by physical construction work. Second, as a part of the new arterial highway between Bago and Kyaikto, a new bridge (2.3 km) over the Sittaung River will be constructed by the Ministry of Construction with assistance from the Japan International Cooperation Agency. The expected year of completion is 2026.¹⁷

Figure 3.9. Hpa Yar Gyi–Thaton Section



Source: Drawn by MSR based on own assessment and ©Google Map 2020.

¹⁷ According to Myanmar Times (2020), ‘work is expected to start soon on a new road link connecting Thanlyin in the Yangon Region to Bago in the Bago Region. The project, expected to cost US\$160 million (MK228.5 billion), will be built with help from JICA.’

Photo 3.11. Road Conditions in Hpa Yar Gyi–Thaton

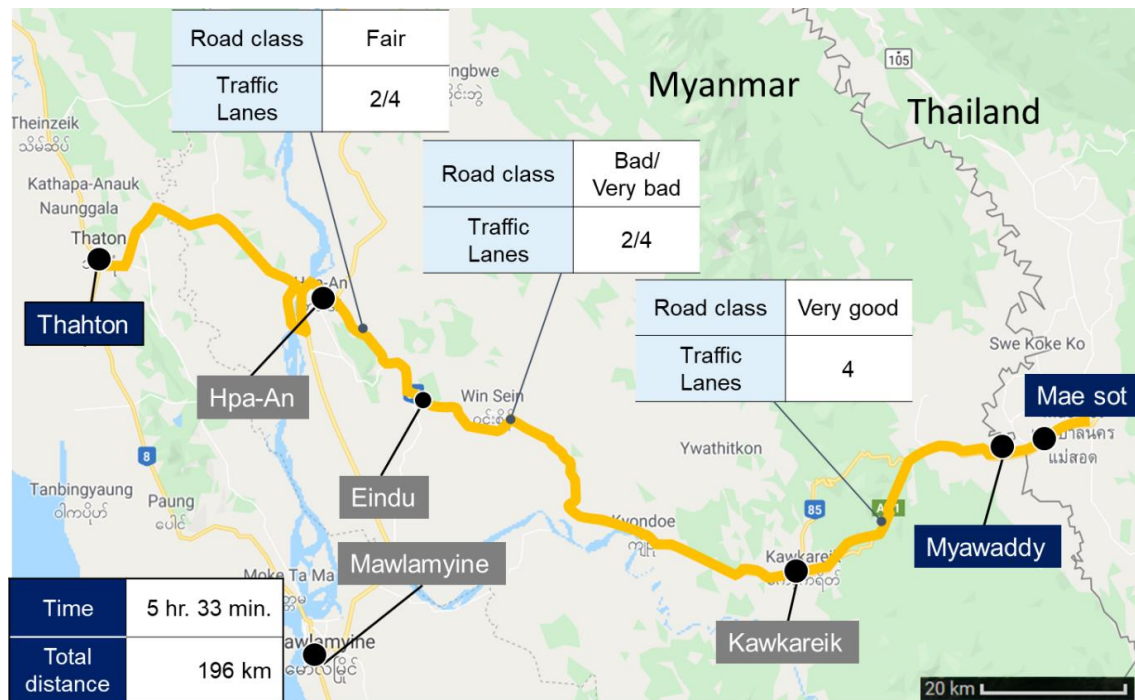


Source: MSR (2020).

(4) Thaton–Myawaddy

The road section between Thaton and Myawaddy can be divided into two. The road condition from Thaton through Hpa-An until Eindu is ‘good’, including some ‘fair’ sections. The section between Eindu and Kawkareik road is still under upgrading and therefore the surface condition is ‘bad’. The Kawkareik–Myawaddy road, which was upgraded in 2015 with help from Thailand, is considered one of the highest quality highway roads in Myanmar (Figure 3.10).

Figure 3.10. Thaton–Myawaddy Section



Source: Drawn by MSR based on own assessment and ©Google Map 2020.

Thaton–Eindu

In 2017, the Myanmar government approved a proposal allowing the Thai government to help improve the condition of a 68 km road that serves as an important link in the GMS–EWECE transport route. The Thai cabinet endorsed a plan to help Myanmar improve the 68 km section of the road linking Eindu and Thaton in southern Myanmar at a cost of B 1.8 billion that will be shouldered by the Thai government (Bangkok Post 2017). However, after numerous negotiations between both sides, Myanmar decided on a BOT agreement with a Chinese contractor. Currently, there are problems with the Chinese contractor as it is not able to complete the project as per the agreed upon time. Photo 3.12 shows the condition of the road linking Eindu and Thaton as of September 2019.

Photo 3.12. Road Conditions in Thaton–Eindu

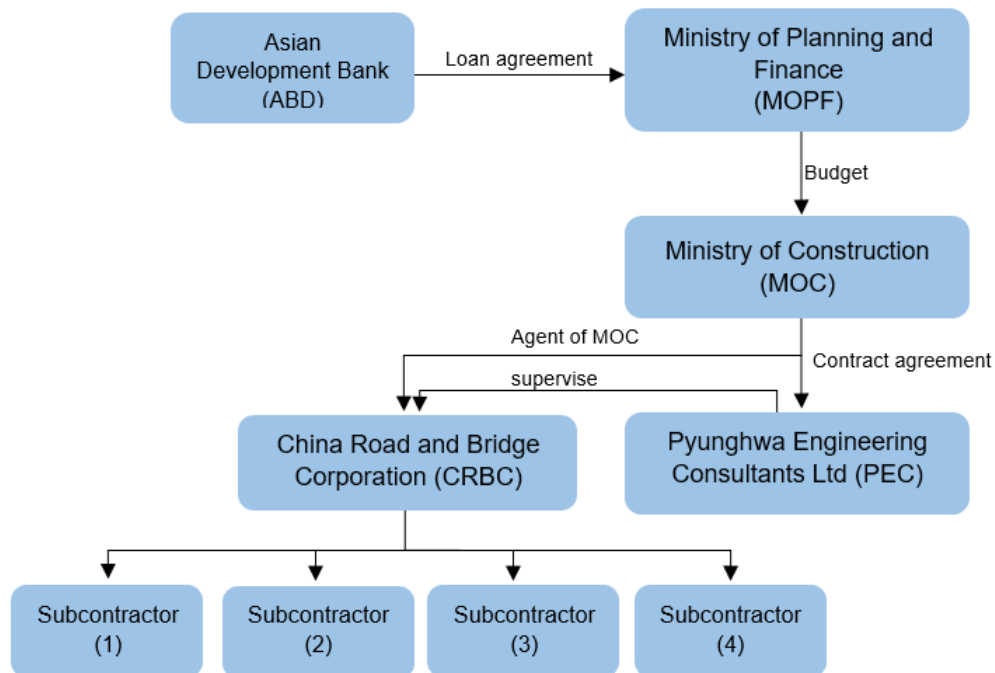


Source: Banomyong (2020), based on Department of Highway (DoH), Thailand.

Eindu–Kawkareik

ADB has approved US\$ 100 million together with US\$ 20 million from the ASEAN Infrastructure Fund (AIF) and US\$ 1.8 million from the Myanmar government to improve a 66.4 km road segment connecting Eindu and Kawkareik in Kayin state, the missing link in the GMS–EWEC. The contractual arrangement for project implementation is illustrated in Figure 3.11.

Figure 3.11. Contractual Structure of Eindu–Kawkareik Road Project



Source: MSR (2020), based on ADB (2018e).

Pyunghwa Engineering Consultants (PEC) is the representative of Myanmar to supervise the project, and the construction itself is done by China Road and Bridge Corporation (CRBC) as the main contractor. Initially, the upgrade was to be completed by 2019. However, as of September 2019, the overall progress was 57.4% according to ADB¹⁸. The main delay is due to the non-compliance of contractors on environmental issues.

Kawkareik–Myawaddy

The Kawkareik–Myawaddy road, for which the upgrading was completed in 2015 with help from Thailand, is considered one of the highest quality highway roads in Myanmar (Photo 3.13).

Photo 3.13. Road Conditions in Hpa-An–Myawaddy



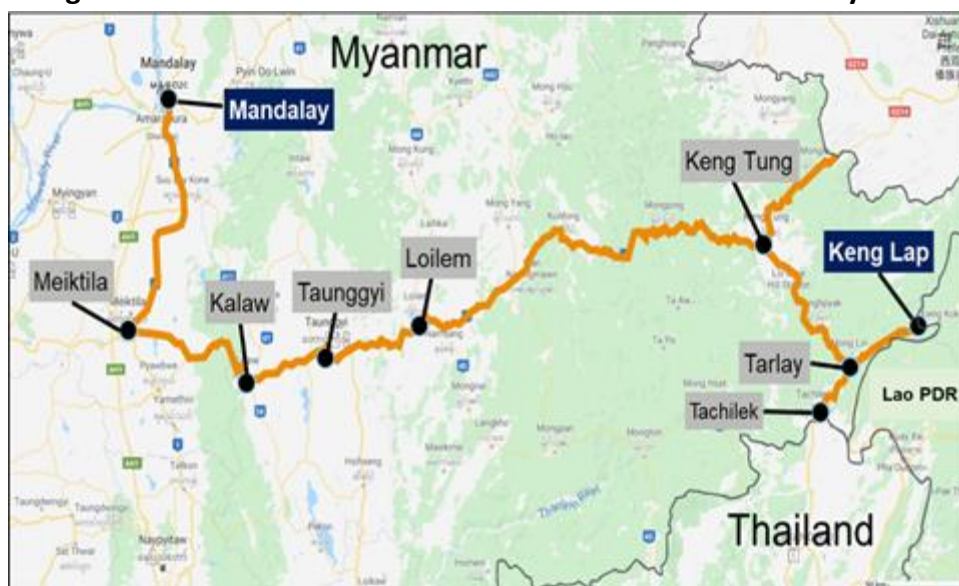
Source: MSR (2020).

¹⁸ Refer to the ADB website titled 'Myanmar: Greater Mekong Subregion East–West Economic Corridor Eindu to Kawkareik Road Improvement Project' (<https://www.adb.org/projects/46422-003/main#project-pds>), accessed on 22 May 2020.

3.2.4. Mandalay–Keng Lap: Northern route of the eastward extension

According to Google Maps, the Mandalay–Keng Lap route, via Taunggyi, Loilem, Keng Tung, and Tarlay, is 935 km long and takes around 21 hours and 24 minutes. The road can be divided into three sections, namely (1) Mandalay–Meiktila–Taunggyi, (2) Taunggyi–Loilem–Keng Tung, and (3) Keng Tung–Tarlay–Keng Lap (Figure 3.12). The Mandalay–Meiktila section overlaps with AH-1 as well as National Highway No. 1 (NH-1), while the Meiktila–Taunggyi section serves as AH-2, and the Taunggyi–Tachilek route serves as AH-2 as well as NH-4. There is no GMS economic corridor designated on this route. Furthermore, the border section between Tarlay and Keng Lap has not been a part of any international initiatives, including the Asian Highway, the GMS economic corridor, or the ASEAN Highway Network, despite the establishment of physical connectivity by the completion of the Myanmar–Lao PDR Friendship Bridge in 2015.

Figure 3.12. Northern Route of the Eastward Extensions in Myanmar



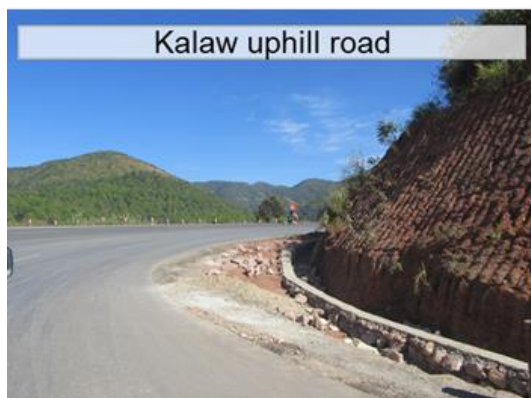
Source: Drawn by MSR based on ©Google Map 2020.

(1) Mandalay–Taunggyi

There are two routes from Mandalay to Meiktila. The first is through the Yangon–Mandalay Expressway, and the second is through NH-1, which is also designated as AH-1. Considering the

Over 190 out of 200 bridges along the Meiktila–Kalaw road were built by 2019, and the Highland Road Construction Company is to complete the remaining bridges in the open season at the beginning of 2020, according to a construction director of the Highland Road Construction Co., Ltd. The company was granted to build the Meiktila–Kalaw–Taunggyi road under a 40-year agreement through a BOT system, and the opening ceremony of the Kalaw–Taunggyi road was held on 1 May 2019. A 45 mile (72.4km) Kalaw–Taunggyi section is complete, and a 17 mile (27.3 km) Nantpantat–Kalaw section is yet to be built.²⁰ Only six out of 200 bridges are left to be built along the road, and the longest bridge that is left to be built is a 40-meter long bridge near Makway village adjacent to Nanphantat along the Kalaw uphill road. The cost of a mile-long road is usually over MK1.7 billion, and as the Nantphantat–Kalaw section has many bends, it could cost more than MK2 billion per mile (Eleven, 2019).

Photo 3.14. Road Conditions in Mandalay–Taunggyi



Source: MSR (2020), in December 2019.

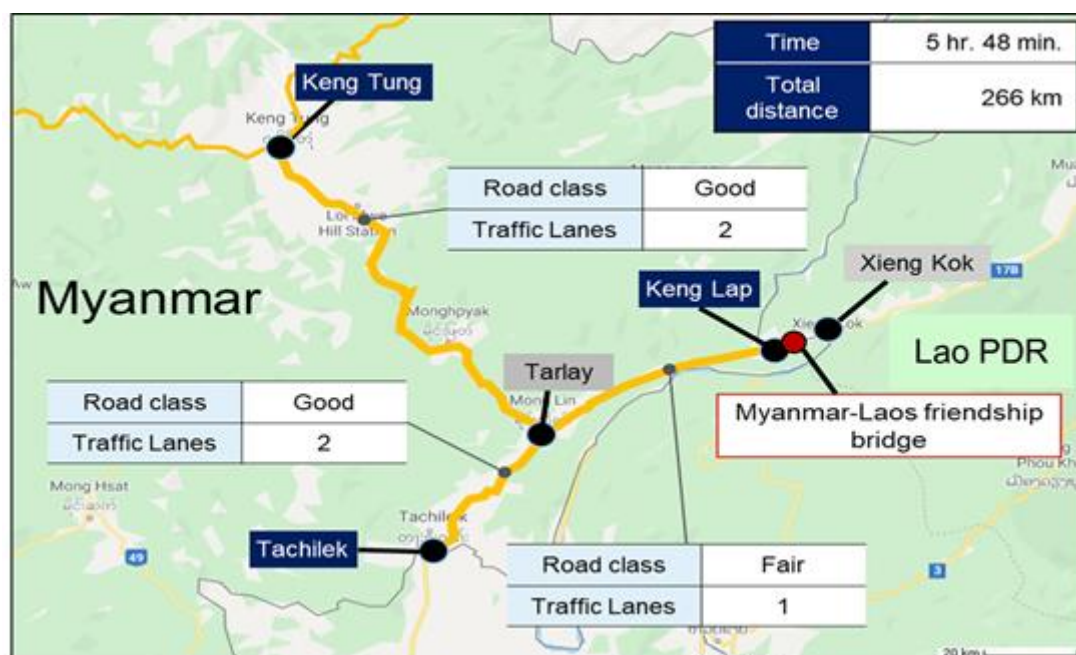
²⁰ Nantpantat is a village near Shan Yoma Elephant Camp on the Meiktila–Taunggyi road.

(2) Taunggyi–Keng Tung

There are some restricted areas in Shan State where foreigners are not allowed to enter. Generally, due to the existence of several ethnic armed forces, foreigners and tourists travelling in Shan State need permission to visit rural and remote areas.²¹ Because of this restriction, the Myanmar Study Team for this TLH study could not conduct a route survey on the Taunggyi–Keng Tung segments of the route.

According to a Keng Tung border trade official, the road condition between Taunggyi and Keng Tung is similar to the section between Keng Tung and Tachilek. The road from Taunggyi to Keng Tung is 48 feet wide with two lanes of asphalt road and has many turns and some narrow curves. The Tachilek–Keng Tung route takes about 13 hours by car and it is 488 km long (Figure 3.14).

Figure 3.14. Taunggyi–Keng Tung Section



Source: Drawn by MSR based on ©Google Map 2020.

²¹ According to the website of Ministry of Labour, Immigration and Population (<http://www.mip.gov.mm/restricted-areas-for-foreigners-tourist-travelling-in-the-country/>), the restricted areas for foreigners in Shan State include 24 townships namely Yatsauk, Loilin, Panglong, Namhsam, Kholan, Kunhing, Karli, Lechar, Linkhe, Mone, Lashio, Theinni, Tanyan, Kunlon, Mineye, Kyaukme, Hsipaw, Naung Hkio, Namtu, Momeik, Mabane, Minesat, Mine Tung, and Makman. Amongst these, Loilin (Loilem), Namhsam (Namsan), Kholam (Kho Lam), Kunhing, and Karli (Kar Li) are townships along NH-4, which we consider as a potential route for the eastward extension of the TLH. Township names in parentheses are the spellings used in Google Maps.

According to officials from the Ministry of Construction, the main bottleneck of that route is the Wa Ta Lone hill, a rocky mountain near Loilem. Also, there are sand hills in the eastern part of Keng Tung, which make the existing road impossible to expand because they tend to collapse whenever it is done. The Government of Myanmar is now trying to conduct a feasibility study to receive loans from ADB to upgrade the current road.

The Takaw Bridge, which crosses Thanlyin River, is situated on NH-4 (AH-2), the only route that connects the southern part of the Shan State to the eastern part (Photo 3.14). Takaw Bridge is closed during the night time, from 6 pm to 6 am, because of security concerns. The limited opening hours of the bridge are inconvenient for long-haul transportation. In addition, the bridge is heavily guarded by the Myanmar military for security concerns. There is no official document that shows the night-time closure of Takaw Bridge. The bridge was constructed in 1973, and the maximum weight that is allowed for trucks to cross is 24 tons. The Department of Bridges has already started to build a Nang Seng–Takaw bridge at a different location from the old Takaw bridge to cross the Thanlyin River. It is expected that the bridge construction will be completed by the year 2022.

Photo 3.15. Takaw Bridge across Thanlyin River

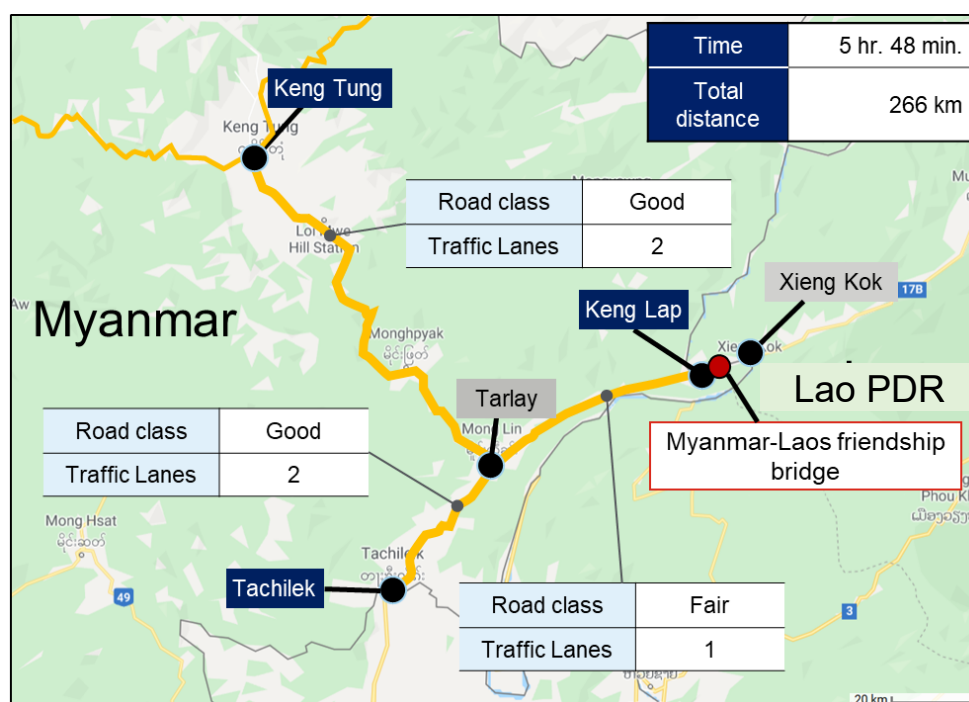


Source: MSR (2020), originally taken by Fatima Martin.

(3) Keng Tung–Keng Lap

The Keng Tung–Keng Lap section can be divided into two. First, the Keng Tung–Tarlay section is on NH-4 and designated as a part of AH-2. The 111.0 km long segment is a two-lane, asphalt paved road, and the condition is ‘good’. Both trucks and passenger cars going in opposite directions can easily pass each other at the same time. Second, the Tarlay–Keng Lap section is labelled as National Highway No. 29 (NH-29) and attracted no international initiatives, such as the Asian Highway, GMS economic corridors, or the ASEAN Highway Network, until the section was listed as one of 19 initial pipeline infrastructure projects under MPAC 2025 in November 2019 (World Bank et al. 2019a and b). The Tarlay–Keng Lap section is a 56.2 km long single-lane road, and the road condition is largely ‘fair’ with some narrow or damaged segments, which can be assessed as ‘poor’.

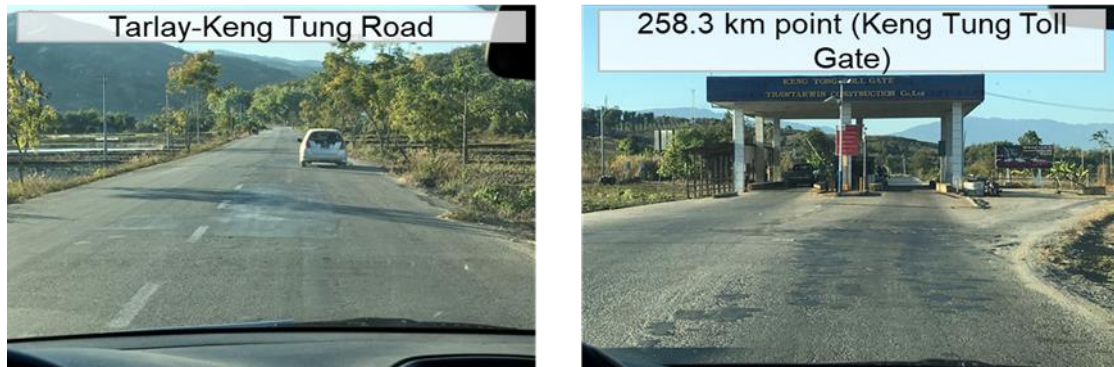
Figure 3.15. Keng Tung–Keng Lap Section



Source: Drawn by MSR based on own assessment and ©Google Map 2020.

The Keng Tung–Tarlay section is a wide two-lane road with a ‘good’ surface condition, allowing vehicles, including trucks, to pass by each other. Even though the location is in a mountainous area, the road is smooth with only small curves. It is a comfortable road to drive, taking around three hours by car (Photo 3.16).

Photo 3.16. Road Conditions in Keng Tung–Tarlay



Source: MSR (2020). The distance is measured from Tachileik.

The Tarlay–Keng Lap section is largely in a fair condition with narrow asphalt coverage (Photo 3.17). There are some small curves along the road. Trucks and passenger cars may find it a little difficult to pass each other at the same time. Some small parts are being upgraded by the Ministry of Construction. A widening of the road is desirable, but there are villages along the road where houses are built close to the road, which hinder the road upgrade.

Photo 3.17. Road Conditions in Tarlay–Keng Lap



Source: MSR (2020).

The Myanmar–Lao PDR Friendship Bridge links Keng Lap in the Tachileik district of Shan State of Myanmar and Xieng Kok in the Luang Namtha Province of the Lao PDR. The 691.6-meter-long bridge, which runs across the Mekong River, was inaugurated on 9 May 2015 (Mizzima, 2015). The construction cost of US\$26 million was borne equally by Myanmar and the Lao PDR. The bridge is capable of withstanding 75 tons of load per vehicle. Currently, local people who are

from Xieng Kok and Keng Lap are allowed to cross the bridge. The road condition between the two border checkpoints in Keng Lap in Myanmar and Xieng Kok in Lao PDR is 'very good', including the approach roads and the bridge.

According to information from the Department of Highways, Ministry of Construction of Myanmar, the Myanmar–Lao PDR Friendship Bridge was first conceptualised for boosting bilateral trade, and construction was started in 2013. At the initial stage, both governments agreed to build the bridge based on the water border line, and each country took responsibility to construct their own side. But, actually, the use of this bridge has long been limited to crossings by local people, instead of full-scale vehicle traffic for bilateral trade. It is understood that there are disagreements over the border points. According to officials of the provincial government of Luang Namtha, Lao PDR, however, the Lao PDR views the lack of bilateral cross-border transport agreement to be the root cause of the underutilisation of the bridge, without pointing out the disagreement on the border point.²² From the viewpoint of establishing this route as a part of the eastward extension of the TLH, this problem is of critical importance and can be resolved through bilateral talks.

As already discussed in Chapter 2, Myanmar's exports through the Myanmar–Lao PDR Friendship Bridge started in October 2019 (Photo 3.18). The border station started issuing licenses and permits for Myanmar exporters to enable them to trade with not only Lao PDR but mainly with China. According to a Keng Lap border official, exports from Myanmar started in FY2018, but there have been no imports from the Lao PDR to date. Currently, Myanmar exporters are waived to pay export taxes to the internal revenue department. Export items have been limited to rice, maize, livestock (goats), and rubber. Rice is the main export item from Myanmar. According to the Ministry of Commerce, the trade value was US\$18,000 in FY2018 and US\$81,000 in September–November 2019.

²² Based on an interview with officials of the Luang Namtha Province of Lao PDR by the Myanmar Study Team in January 2020.

Photo 3.18. Myanmar–Lao PDR Friendship Bridge: Myanmar side



Source: MSR (2020). Photos were taken on 18 December 2019.

According to a Keng Lap border official, the export quota of rice from Myanmar to China, which goes through Muse, reached its limit in 2019.²³ As a result, the Keng Lap border trade station became the main alternative transit gate for rice from Myanmar to China. On the other side of the Myanmar–Lao PDR Friendship Bridge, Chinese trucks arranged by Chinese importers are waiting to pick up commodities directly from Myanmar trucks. The official also added that starting from 2019, Myanmar traders are exporting rice directly to China without using the bypass route via the Lao PDR. However, they may again use the bypass route in the latter half of 2020 when they have used up all the export quota to China. There have been no customs officials assigned on the Lao PDR side of the Friendship Bridge, because the Lao PDR does not recognise that the border gate is operational due to the lack of a bilateral cross-border transport agreement.²⁴

²³ Based on an interview by MSR in December 2019.

²⁴ Based on an interview with officials from the Luang Namtha Province of the Lao PDR by the Myanmar Study Team in January 2020.

3.3. Thailand²⁵

After completion of the four-lane highway linking Tak and Mae Sot in 2019, this is one of the most beautiful roads in Thailand. The budget for building the road is B4 billion. Thailand has been developing not only domestic infrastructure but also infrastructure in neighbouring countries, such as new highways linking Myawaddy and Kawkaeik in Myanmar. This new highway cuts the transit time drastically to Mawlamyine and enables faster access to Yangon. Photo 3.19 shows the new four-lane highway linking Tak to Mae Sot. The quality of the road is good, thus supporting faster transit times for trucks going to and from the Thai–Myanmar border.

Photo 3.19. Road Condition in Mae Sot–Tak



Source: Banomyong (2020), based on Department of Highway, Thailand (2019).

The Thai government has approved a concessional loan of B777 million to Myanmar for infrastructure development in Myawaddy (Bangkok Post, 2019a). The conditions include a low-interest rate (1.5%), long-term contract (30 years), and a grace period of 10 years. This is important for the TLH as Myawaddy is a key connecting node with Thailand. This loan is based on a proposal by the NEDA to provide financial assistance to Myanmar to fund the third phase of the GMS development project for Myawaddy town.

The loan conditions require goods and services to be from Thailand for at least 50% of the value of the contract. Constructors and project advisers must hold Thai nationality, and Thai laws will be enforced in the loan contract. Myawadee town plays an important role in the economic development of Myanmar and Thailand because it is a major border trading area between

²⁵ This subsection is based on Banomyong (2020).

Myanmar and Thailand through the Mae Sot district of Tak. The border town serves as a transport route for goods and people from Thailand to other important towns in Myanmar.

The Thai government has already spent B1.1 billion for the construction of the Second Thai–Myanmar Friendship Bridge over the Moei River to relieve traffic congestion at the Mae Sot checkpoint and to resolve the load-bearing constraint of the old Friendship Bridge. The new bridge, which has already opened, is part of a larger plan to connect Mae Sot and Yangon, Myanmar, and improve access to the Indian Ocean, according to the Thai Minister of Transport (Bangkok Post, 2019b).

3.4. Lao PDR

Road transportation is a highly important mode of transportation in the Lao PDR as a landlocked country. Road transportation covers more than 80% of the total volume of transportation, followed by river transport and air transport, and, therefore, the development of road infrastructure has been a priority for the country. The total length of road has been extended 27.1% from 47,492 km in 2010 to 60,340 km in 2018 (Table 3.3). Although all types of road have increased, the increasing rates of broadly defined paved road, namely concrete, asphalt paved, and paved, are higher than those of gravelled and earthen roads. As a result, the share of broadly defined paved road increased from 14.8% in 2010 to 19.4% in 2018, while the share of earthen road decreased by 6.1 percentage points.

The northern route of the eastward extension passes through the Lao PDR, from Xieng Kok at an end of the Myanmar–Lao PDR Friendship Bridge inaugurated in 2015, Muang Sing, Luang Namtha, Nateuy, Oudomxay, Pak Nam Noy, Muang Khua, and to Pang Hoc at the border with Viet Nam (Figure 3.16).

As reported above, the condition of the road between the two border checkpoints in Keng Lap in Maymar and Xieng Kok in Lao PDR is ‘very good’, including the approach roads and the bridge (Photo 3.21).

Table 3.3. Road Development in the Lao PDR

	2010		2018		Change in length	Contribution rate	Change in share
	km	share	km	share			
Concrete	83	0.2%	552	0.9%	565.1%	3.7%	0.7%
Asphalt paved	614	1.3%	1,203	2.0%	95.9%	4.6%	0.7%
Paved	6,324	13.3%	9,973	16.5%	57.7%	28.4%	3.2%
Gravelled	17,556	37.0%	23,179	38.4%	32.0%	43.8%	1.4%
Earthen	22,915	48.3%	25,433	42.1%	11.0%	19.6%	-6.1%
Total	47,492	100.0%	60,340	100.0%	27.1%	100.0%	0.0%

Source: Ministry of Public Works and Transportation.

Figure 3.16. Northern Route of the Eastward Extensions in the Lao PDR



Source: Drawn by So Umezaki, based on Google Map ©2020.

Photo 3.20. Lao PDR–Myanmar Friendship Bridge



Source: So Umezaki on 16 January 2020.

The border checkpoint at the foot of the Lao PDR–Myanmar Friendship Bridge is about 14 km west of the centre of Xieng Kok. This 14 km road segment was developed together with the Friendship Bridge, and the condition is ‘good’. Heading from the border to Xieng Kok, the road runs to the left side of the Mekong River, which draws the national border between Lao PDR and Myanmar (Photo 3.21).

Photo 3.21. Road Conditions at the Border–Xieng Kok and a Cargo Ship on the Mekong River



Source: So Umezaki on 16 January 2020.

About 70 km long, the Xieng Kok–Muang Sing road is mostly unpaved and in a very poor condition. According to officials of the Ministry of Public Works and Transportation, the earthen road was developed and partly paved with assistance from the World Bank about 20 years ago. The road has not been maintained adequately due to budget constraints and has been badly

damaged until now. A large part of the Xieng Kok–Muang Sing section runs through agricultural landscape, most of which is currently used for contract farming for growing bananas, rubber, sugarcane, bloom grass, and so on. Many villagers in Luang Namtha have been engaged in contract farming, exporting their products to China via local and Chinese traders. ‘Constraints faced by the farmers in this area include the high costs of cross-border trading; fluctuating prices; limited access to technology, market information, and credit; and weak negotiating positions with traders on process’ (Manorom et al. 2011: 10). Due to the inadequate capability of domestic logistics services providers, a number of Chinese trucks arranged by Chinese traders come to this area, based on the bilateral cross-border transport agreement, to pick up products along the road and bring them back to China (Photo 3.22).

The road condition of the Muang Sing–Luang Namtha section is largely ‘fair’ or ‘good’, and most of it is two-lane paved road with several damaged segments. The inter-city part of the remaining sections from Luang Namtha to Pang Hok, via Nateuy, Oudomxay, Pak Nam Noy, and Muang Khua, is also two-lane paved road, and the condition is ‘good’. In the downtowns of the major cities, such as Luang Namtha and Oudomxay, there are four-lane road sections that are in ‘good’ condition²⁶ (Photo 3.23 and 3.24).

Photo 3.22. Road Conditions in Xieng Kok–Luang Namtha



²⁶ The MSR made this assessment based on its own route surveys on the entire route, between Pang Hok and Oudomxay in December 2019 and between Oudomxay to Xieng Kok in January 2020.



Source: So Umezaki on 16 January 2020.

Photo 3.23. Road Conditions in Luang Namtha–Oudomxay



Source: So Umezaki on 15 January 2020.

Photo 3.24. Road Conditions in Oudomxay–Pang Hok





Source: So Umezaki on 11 December 2019.

3.5. Viet Nam²⁷

(1) Road Quality

The Hai Phong–Tay Trang route runs along AH-14 (Hai Phong–Ha Noi) and AH-13 (Ha Noi–Tay Trang) with five main sections, including Hai Phong–Ha Noi (87.7 km), Ha Noi–Hoa Binh (66.0 km), Hoa Binh–Son La (237.2 km), Son La–Dien Bien (154.8 km), and Dien Bien–Tay Trang (33.5 km). In general, the quality of roads from Hai Phong to Tay Trang border check point is good except for a few sections that need to be improved. Based on the Asian Highway Standards, all the road sections along Hai Phong–Tay Trang are of Class III paved with asphalt or concrete, of which 93.5% is in ‘fair’ surface condition and 6.5% in ‘good’ surface condition; and 80% are two-lane roads while the rest are four-lane highways.

²⁷ This subsection is based on the relevant parts of Nguyen et al. (2020), which provides further details.

The Hai Phong–Ha Noi section is relatively well developed and in good condition, in the sense that the entire section is flat terrain and a four-lane highway or expressway. Yet due to geographical features, there are several bottlenecks along this route, such as NH-6 from Long Luong in Son La to Tuan Giao in Dien Bien, in particular the Pha Din Mountainous Pass (50 km long); and NH-279 from Dien Bien Phu to the Tay Trang border gate, in particular the Na Loi Mountainous Pass (7 km long) and the Tay Trang Mountainous Pass.

The worst route is NH-279 from Dien Bien Phu to the Tay Trang border gate (33 km long) and linking to NH-2E in the Lao PDR. This section is 100% mountainous terrain with narrow lanes and carriageways, tight horizontal curves, and no sidewalk. These specifications are in fact below the required standards of Class III. Despite being maintained and resurfaced every year, the road surface remains in poor condition and is often damaged due to the high traffic volume of overloaded trucks passing by. The road quality of the Dien Bien–Tay Trang route is even worse than the adjacent NH-2E in the Lao PDR, which was repaired and upgraded by the Vietnamese government's fund. The roads from Dien Bien Phu to Tay Trang are not only curved, steep, and dusty with a lot of potholes but also appear to be directly exposed to much damage.

(2) Quality of infrastructure

According to officials from the Directorate for Roads of Vietnam, traffic volume along the Ha Noi–Tay Trang route has been growing recently since China closed some border crossing points with Viet Nam in the northern provinces in 2019. In the fourth quarter of 2019, at the Mai Chau station in Son La on NH-6, the average daily number of vehicles was estimated at 2,024.²⁸ Despite the poor road quality of NH-279, in Muong Ang district, this figure reached 1,369 vehicles, of which more than 30% were heavy trucks.

Based on the Asian Highway Database, the road surface of the Hai Phong to Chui Bridge (Ha Noi) is good, as for 37% of the route the road surface is in good condition and the rest in a fair condition. At the same time, the surface of all the roads along Ha Noi to the Tay Trang border check point section is classified as being in 'fair' condition; however, the road condition between Dien Bien Phu and Tay Trang border check point is in fact 'bad'. The road has been severely damaged by the high frequency of overloaded trucks carrying stone and cement from quarries and cement plants; stone mining activities at the roadside of the Tay Trang Mountainous Pass;

²⁸ Vehicles with four or more wheels, excluding motorcycles and bicycles.

and weather conditions, especially during the rainy season. The local authority seems to poorly manage these activities and road quality (Photo 3.23).

Photo 3.25. Road Conditions in Tay Trang–Dien Bien



Source: So Umezaki on 9 and 11 December 2019.

The Dien Bien Phu–Tay Trang section is also vulnerable to weather conditions. From June to the end of September, drivers face a high risk of landslides from the long-lasting and erratic rainy season. During the dry season, the roads are dusty, and during the rainy season they are slippery. Sometimes it takes 3–4 hours for a trailer to get to the Tay Trang border gate from Dien Bien Phu. If a driver is either not good enough or not familiar with the route, he cannot pass bad curves and may cause congestion. In winter, from September to December, fog also usually hampers drivers' vision on the road.

(3) Border facilities at border check points

The working times for the procedures for trade, transited vehicles, and immigration vary across border check points and depend on the agreement between the governments of Viet Nam and Lao PDR. For example, at the Lao Bao border gate, the working hours are from 7:00 am to 10:00 pm, while the Tay Trang border check point opens at 7:00 am and closes at 7:30 pm, but there are staff working overnight in case of emergency, particularly for medical emergencies as patients from the Lao PDR are sometimes sent to Viet Nam's hospitals for treatment.

The number of officials working at the Tay Trang Customs Sub-Department is 22, including tenure and contract staffs. Since the Tay Trang Customs Sub-Department is in charge of three border gates, namely the Tay Trang international border gate, Huoi Puoc national border gate, and A Pa Chai local border gate, these staff also have responsibilities for the Huoi Puoc and A Pa Chai border check points.

The procedures for cross-border trade on customs, inspection, supervision, and control procedures are stipulated in Decree No. 59/2018/ND-CP dated on 20 April 2018 of the Government.²⁹ In addition, the procedures for customs declaration are specified in Article 16 of Circular No.38/2015/TT-BTC by the Ministry of Finance, which was amended in Circular No.39/2018/TT-BTC dated on 20 April 2018. Procedures for declaration of transited vehicles are specified in Article 74 and Article 75 of Decree No.08/2015/ND-CP and amended in Article 74 of Decree No. 59/2018/ND-CP dated on 20 April 2018. In terms of immigration activities, since 1 February 2019, the Tay Trang international border gate has become a checkpoint for foreigners holding e-visas upon entry or exit under Decree No.17/2019/ND-CP. The Tay Trang Customs Sub-Department and Border Safeguard Station are responsible for controlling and supervising goods and vehicles through the border.

²⁹ Amended Decree No.08/2015/ND-CP dated on 21 January 2018 of the Government.

The average time for cargo clearance and transited vehicles or passengers ranges from around 10 to 30 minutes.³⁰ The Tay Trang Customs Sub-Department has applied e-customs (VNACCS) since 2014.

(4) Future plans for physical infrastructure development

AH-13: NH-279 was decided to be renovated and upgraded from Class V (mountainous) to Class IV (mountainous) by the Ministry of Transport in 2015 with a total investment of D1,054 billion. Capital allocation for site clearance was completed, but capital allocation for project implementation has been delayed. This project has been postponed since 2015 in accordance with Resolution No. 11/NQ-CP dated on 24 February 2011 by the Government.

The mid-term public investment plan 2021–2025: The Ministry of Transport has a plan regarding the road rehabilitation and upgrading of the Dien Bien–Tay Trang section, including bypass roads in both Dien Bien Phu and the Muong Ang district, according to Decision No.1943/QD-BGTVT dated on 14 October 2019 by the Ministry of Transport. In addition, the Dien Bien Phu–Tay Trang section is annually budgeted for the regular maintenance and repair of heavily damaged roads to ensure safe and smooth transportation.

NH-6: The road linking Hoa Binh–Son La–Dien Bien is expected to be upgraded into a highway and put into Viet Nam’s expressway network development plan for 2020 and vision towards 2030, approved by the Prime Minister in Decision No. 326/QD-TTg dated on 1 March 2016. Moreover, there is a proposal to rehabilitate and upgrade the AH-13 component in Viet Nam via the left bank of the Da River.

AH-14: The Ministry of Transport has plans to upgrade some sections along the AH-14 to meet the requirements of the AH Standard Class III, especially in developing a new NH-5 between Hai Phong and Ha Noi.

The financial source for the repairing of the road surface and drainage is the Road Maintenance Fund. Yet the plans for improvement and maintenance of road quality in Viet Nam face difficulties related to regulations on the Road Maintenance Fund. This fund is used only for road maintenance rather than road extension,³¹ which hampers the possibility of upgrading the road

³⁰ The clearance time depends on the results of the certificate of origin classification and the duration of the specialised inspection, which sometimes takes about 30–50 hours.

³¹ For example, it cannot be used to expand the width of a lane from 3.5 m to 4 m.

quality according to AH Standards. Additionally, the Central Road Maintenance Fund has not enough capital to run the management and maintenance of roads.

Tay Trang–Pang Hok border economic zone: The Tay Trang Customs Sub-Department plans to develop a border economic zone between Tay Trang and the Pang Hok border check point.

3.6. Cambodia

The southern route of eastward extension of the TLH is assumed to enter Cambodia at the Poipet border check point from Aranyaprathet in Thailand, and runs along National Road No. 5 (NR-5) to Phnom Penh, changes to National Road No. 1 (NR-1), crosses the Tsubasa Bridge over the Mekong River in Neak Loung, and exits at the Bavet border check point to Moc Bai in Viet Nam. In addition, the route is expected to extend from Phnom Penh to Sihanoukville, the biggest international port in Cambodia. The entire route overlaps with sub-corridor No.1 of the GMS Southern Economic Corridor (SEC-1).

According to the recent comprehensive assessment by ADB, Poipet–Sisophon (47.0 km; Class II), Preach Kdam–Phnom Penh (30.0 km; Class I), the Phnom Penh–Neak Loung (60.0 km; Class II), Neak Loung–Svay Rieng (65.0 km; Class III), and Svay Rieng–Bavet (42.0 km; Class III) sections and the branch route from Phnom Penh to Sihanoukville are all in ‘good’ condition (ADB 2018b; 2018c). Although the remaining sections between Sisophon and Preach Kdam (330.0 km; Class III) is assessed as being in ‘fair’ condition, upgrading works, including the construction of new road sections to bypass the downtowns of cities along the route, have been ongoing in these sections.

3.7. Conclusions

Most of the original alignment of the TLH has been recently upgraded or has been undergoing upgrading, improvement, or repair work. Recently completed projects include the bypass road connecting Myawaddy and Kawkaleik (Thailand) and the second friendship bridge connecting Myawaddy and Mae Sot. The ongoing projects include the road upgrading between Kalewa and Yargyi (India), the road upgrading between Yargyi and Monywa (BOT), the new Bago bridge (Japan), and the construction of an arterial road connecting Bago and Kyaikto (ADB). Assuming the timely completion of the ongoing projects, the remaining bottlenecks are the replacement

of 69 bridges along the Tamu–Kyigone–Kalewa road, which is expected to resume as the legal case at the Manipur High Court was concluded in favour of the Government of India in October 2019, and the upgrading of the Thaton–Eindu road, which has been stuck under a BOT arrangement with a Chinese company.

The northern extension route still has a lot of bottlenecks, some of which are beyond the scope of infrastructure development. Although the Myanmar–Lao PDR Friendship Bridge already opened in 2015, its utilisation is still very limited, mainly because of the lack of a bilateral agreement for cross-border transport. The most significant bottlenecks in Myanmar are the restrictions on foreigners for entering some parts of Shan State and the night-time closure of the Thanlyin Bridge in Takaw for security reasons. The road connecting Tarlay and Keng Lap is narrow, and the surface has been damaged. In the Lao PDR, the road section between Xieng Kok and Muang Sing is still unpaved. Although most of the road infrastructure in the Lao PDR has not been severely damaged, some sections may require minor repair works or expansion to accommodate large trucks. The Lao PDR ceased issuing on-arrival visas at the Pang Hok border check point, facing Tay Trang in Viet Nam, at the end of 2019. Although the mountainous section between Tay Trang and Na Thin in Viet Nam was heavily damaged, repair and expansion work have been in progress.

In comparison, the southern extension route has been better developed as parts of the GMS economic corridors, including the already well-developed road networks in Thailand and the construction of Tsubasa Bridge over Mekong river in Neak Loung, Cambodia. At least in terms of physical infrastructure, the southern route for the eastward extension of the TLH will not require a large amount of additional investment, although the critical issue of institutional arrangement still remains.

Given the limited government revenue, Myanmar has a large dependence on foreign assistance in order to meet the vast demand for infrastructure investment in roads and other infrastructure. The role of the private sector, through BOT arrangements, has been significant for construction and maintenance. In addition, local townships along trunk roads, including the TLH, have been playing an important role for maintenance, using the funds collected as the wheel tax.

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Annex Table 3.1. Current Status of the TLH: Original Alignment

Country	Start	End	GMS	AH	NR	Distance	Condition	Remarks
Border I/M	Moreh	Tamu	-	AH-1	Border Belt	0.3	Bad	The Friendship Bridge is old and narrow.
Myanmar	Tamu	Kyigone	NSEC-6	AH-1	IMFH	121.5	Fair	[India] Bridge replacement project has been stalled.
Myanmar	Kyigone	Kalewa	NSEC-6	-	IMFH	27.9	Fair/Good	
Myanmar	Kalewa	Lah Poh	NSEC-6	-	IMFH, MKH	91.7	Poor	[India] Ongoing upgrading work to be completed by May 2021.
Myanmar	Lah Poh	Yargyi	NSEC-6	-	IMFH, MKH	28.9	Poor	
Myanmar	Yargyi	Monywa	NSEC-6	-	IMFH, MKH	64.4	Fair/Poor	Some sections are being upgraded or repaired by Monywa Group of Companies under BOT contract.
Myanmar	Monywa	Mandalay	NSEC-6	AH-1	NR-71, 7	130.0	Good	Upgrading work is ongoing by by Monywa District Rural Road Development Department.
Myanmar	Mandalay	Meiktila	NSEC-5	AH-1	YME	134.4	Good	Upgrading of Yangon-Mandalay Expressway is one of 19 initial pipeline of ASEAN infrastructure projects for MPAC 2025. Trucks need special permission to use YME.
Myanmar	Meiktila	Yamethin	NSEC-5	AH-1	YME	62.8	Good	
Myanmar	Yamethin	Nay Pyi Taw	NSEC-5	AH-1	YME	90.3	Good	
Myanmar	Nay Pyi Taw	Taunggoo	NSEC-5	AH-1	YME	87.9	Good/Fair	
Myanmar	Taunggoo	Bago	NSEC-5	AH-1	YME	172.8	Good	[ADB] New arterial highway to be developed by 2024. [JICA] New bridge (2.3km) over the Sittaung River will be constructed by 2026.
Myanmar	Bago	Kyaikto	EWEC	AH-1	NR-8	72.7	Good	
Myanmar	Kyaikto	Thaton	EWEC	AH-1	NR-8	67.3	Good	[Myanmar] BOT project has been stalled.
Myanmar	Thaton	Eindu	EWEC	AH-1	NR-85	70.9	Fair	
Myanmar	Eindu	Kawkareik	EWEC	AH-1	NR-85	67.0	Poor	[ADB and AIF] Upgrading work on 66.4km section to be completed by March 2020. [JICA] Gyaing Kawkareik Bridge (580m) to be completed by July 2021.
Myanmar	Kawkareik	Myawaddy	EWEC	AH-1	MKR	45.2	Good	[Thailand] A bypass road was constructed and opened in 2015.
Border M/T	Myawaddy	Mae Sot	EWEC	AH-1	Border Belt	2.5	Good	[Thailand] The 2nd Friendship Bridge was opened on 30 October 2019.
[Branch route]								
Myanmar	Bago	Yangon	EWEC, NSEC-5	AH-1	YME	97.6	Good	[JICA] A new road connecting Yangon (Thanlyin) and Bago will be built.
Myanmar	Yangon	Thilawa SEZ	NSEC-5	AH-1		27.8	Good	[JICA] New Bago Bridge is being developed to be opened in 2021.

Annex Table 3.2. Current Status of the TLH: Northern Route of Eastward Extension

Country	Start	End	GMS	AH	NR	Distance	Condition	Remarks
Myanmar	Meiktila	Thazi	-	AH-2	NH-4	19.7	Good	
Myanmar	Thazi	Payangazu	-	AH-2	NH-4	24.3	Good	
Myanmar	Payangazu	Yin Mar Bin	-	AH-2	NH-4	12.4	Good	
Myanmar	Yin Mar Bin	Kalaw	-	AH-2	NH-4	58.8	Fair/Poor	Repair and upgrade works ongoing.
Myanmar	Kalaw	Taunggyi	-	AH-2	NH-4	113.5	Good	
Myanmar	Taunggyi	Loilem	-	AH-2	NH-4	78.9	<i>unknown</i>	Unable to enter due to security concerns. The condition is "fair" according to officials.
Myanmar	Loilem	Ta Kaw	-	AH-2	NH-4	177.1	<i>unknown</i>	
Myanmar	Ta Kaw	Keng Tung	-	AH-2	NH-4	179.0	<i>unknown</i>	
Myanmar	Keng Tung	Tarlay	-	AH-2	NH-4	111.0	Good	
Myanmar	Tarlay	Keng Lap	-	-	NH-29	56.2	Fair/Poor	Some narrow sections and damaged surface.
Border M/L	Keng Lap	Border CP		-		1.6	Good	Friendship bridge opened in 2015, but the utilization is low due to lack of bilateral transport agreement.
Lao PDR	Border CP	Xieng Kok	-	-	-	14.0	Good	Upgraded with the Friendship Bridge.
Lao PDR	Xieng Kok	Muang Sing	-	-	NR-17B	70.3	Poor	Mostly unpaved.
Lao PDR	Muang Sing	Luang Namtha	-	-	NR-17A	57.8	Fair/Good	Some damaged segments.
Lao PDR	Luang Namtha	Nateuy	NSEC-1	AH-3	NR-3	36.4	Good	
Lao PDR	Nateuy	Oudomxay	NSEC-2	AH-12	NR-13N	78.3	Good	
Lao PDR	Oudomxay	Pak Nam Noy	-	AH-13	NR-2E	63.4	Good	
Lao PDR	Pak Nam Noy	Muang Khua	-	AH-13	NR-2E	37.8	Good	
Lao PDR	Muang Khua	Muang Mai	-	AH-13	NR-2E	35.9	Good	
Lao PDR	Muang Mai	Pang Hok	-	AH-13	NR-2E	25.7	Good	
Border L/V	Pang Hok	Tay Trang	-	AH-13	Border belt	5.4	Good	
Vietnam	Tay Trang	Na Thin	-	AH-13	QL-279	16.9	Bad	Repair and upgrading work in progress.
Vietnam	Na Thin	Dien Bien Phu	-	AH-13	QL-6	16.6	Fair	Some narrow sections.
Vietnam	Dien Bien Phu	Son La	-	AH-13	QL-6	154.8	Fair	
Vietnam	Son La	Hoa Binh	-	AH-13	QL-6	237.2	Fair	
Vietnam	Hoa Binh	Hanoi (Thanh Xuan)	-	AH-13	QL-6	66.0	Good	
Vietnam	Hanoi (Thanh Xuan)	Hanoi (Hoang Mai)	-	-	CT-20	5.2	Good	
Vietnam	Hanoi (Hoang Mai)	Hanoi (Thach Ban)	-	AH-1	CT-20	22.7	Good	
Vietnam	Hanoi (Thach Ban)	Hai Duong	NSEC-3	AH-14	QL-5B	43.0	Fair	
Vietnam	Hai Duong	Hai Phong	NSEC-3	AH-14	QL-5B	44.7	Good	
Vietnam	Hai Phong	Lack Huyen	-	-	DT-356	32.6	Good	

Annex Table 3.3. Current Status of the TLH: Southern Route of Eastward Extension

Country	Start	End	GMS	AH	NR	Distance	Condition	
Thailand	Mae Sot	Tak	EWEC	AH-1	NH-12	7.0	Good	
Thailand	Tak	Nakhon Sawan	NSEC-1	AH-1	NH-1	181.0	Good	
Thailand	Nakhon Sawan	Bangkok	NSEC-1	AH-1	NH-1A, 32	15.0	Good	
Thailand	Bangkok	Chachoengsao	SEC-1	AH-1	NH-7	84.6	Good	
Thailand	Chachoengsao	Sakao	SEC-1	AH-1	NH-304, 359, 33	120.0	Good	
Thailand	Sakao	Aranyaprathet	SEC-1	AH-1	NH-33	57.7	Good	
Border T/C	Aranyaprathet	Poipet	SEC-1	AH-1	Border belt			
Cambodia	Poipet	Sisophon	SEC-1	AH-1	NR-5	47.0	Good	
Cambodia	Sisophon	Battambang	SEC-1	AH-1	NR-5	70.0	Fair	Road is being widened from 2-lane to 4-lane. Development of new road segments to bypass down towns of Battambang, Pursat, Kampong Chhnang, and Preach Kdam is ongoing with expected completion in 2018.
Cambodia	Battambang	Pursat	SEC-1	AH-1	NR-5	104.0	Fair	
Cambodia	Pursat	Kampong Chhnang	SEC-1	AH-1	NR-5	95.0	Fair	
Cambodia	Kampong Chhnang	Preach Kdam	SEC-1	AH-1	NR-5	61.0	Fair	
Cambodia	Preach Kdam	Phnom Penh	SEC-1	AH-1	NR-5	30.0	Good	
Cambodia	Phnom Penh	Neak Loeung	SEC-1	AH-1	NR-1	60.0	Good	
Cambodia	Neak Loeung	Svay Rieng	SEC-1	AH-1	NR-1	65.0	Good	
Cambodia	Svay Rieng	Bavet	SEC-1	AH-1	NR-1	42.0	Good	
Border C/V	Bavet	Moc Bai	SEC-1	AH-1	Border belt			
Viet Nam	Moc Bai	Go Dau	SEC-1	AH-1	QL-22	10.0	Good	
Viet Nam	Go Dau	An Suong (HCMC)	SEC-1	AH-1	QL-22	48.0	Good	
Viet Nam	An Suong (HCMC)	J [AH-1/AH-17]	SEC-1	AH-1	QL-1A	31.0	Good	
Viet Nam	J [AH-1/AH-17]	Ba Ria	SEC-1	AH-17	QL-51	77.6	Good	
Viet Nam	Ba Ria	Vung Tau	SEC-1	AH-17	QL-51	14.0	Good	
[Branch route]								
Thailand	Bangkok	Laem Chabang	SEC-3	AH-19	NH-7	127.0	Good	
Cambodia	Phnom Penh	Thnol Toteung	SEC-4	AH-11	NR-4	30.0	Good	
Cambodia	Thnol Toteung	Kampong Speu	SEC-4	AH-11	NR-4	18.0	Good	
Cambodia	Kampong Speu	Sihanoukville	SEC-4	AH-11	NR-4	182.0	Good	

Note: GMS = Greater Mekong Subregion; AH = Asian Highway; NR = National Road, National Route, etc.); IMFH = India Myanmar Friendship Highway; MKH = Monywa Kalewa Highway; YME = Yangon Mandalay Expressway; MKR = Myawaddy Kawkareik Road; NSEC = North South Economic Corridor; EWEC = East West Economic Corridor; and SEC = Southern Economic Corridor.
Source: Author's assesment in December 2019 and January 2020; ADB (2018b-h); and the Asian Highway Database (UNESCAP).