

**REPUBLIC OF THE UNION OF MYANMAR
MINISTRY OF CONSTRUCTION**

**DATA COLLECTION SURVEY
ON
NATIONWIDE ROAD AND
BRIDGE PRIORITY PROJECTS
IN
THE REPUBLIC OF
THE UNION OF MYANMAR

FINAL REPORT**

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JAPAN INTERNATIONAL COOPERATION AGENCY

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1. Introduction

1.1 Background

One of the Myanmar's priority tasks for achieving the Sustainable Development Goals (SDGs) is to develop the rural roads contributing to reducing poverty in the region and reducing economic inequality. The Government of Myanmar has received several assistance from international donor agencies to promote the development of rural roads and bridges since its democratization in 2011. In 2013, Japan International Cooperation Agency (JICA) provided loan assistance in the “**Poverty Reduction Rural Development Project (Phase I)**”, and from 2017, further support has been provided for the development of Rural Road bridges through the “**Poverty Reduction Rural Development Project (Phase II)**”. The Asian Development Bank (ADB), the World Bank (WB), KfW, UK Aid and other donor agencies have provided similar supports. In order to boost the rural road development efficiently, the **National Strategy for Rural Roads and Access** was formulated in 2017 by Ministry of Agriculture, Livestock and Irrigation (MoALI) as a guide of rural road development, which targets that 80% of villages will have access to all-season roads by 2030.

On the other hand, Myanmar has experienced many types of geologic hazards such as earthquakes and landslides and to a lesser extent, subsidence (e.g.: landslide disaster in Chin State in 2015). In recent years, landslides have been a major form natural disaster in Myanmar, especially in the country's mountainous regions. Steep slopes, unstable geologic conditions, and heavy monsoon rains make these regions the most landslide-prone areas in Myanmar. Therefore, prevention or mitigation of natural disasters is recognized as one of the most important issues on road network development but the development of roads and bridges tends to be delayed in each state/region with ethnic diversity near the country's border.



Floodwaters submerged areas of Ye township in Mon State
 Source: Sai Aung Main/Agence France-Presse — Getty Images
<https://www.nytimes.com/2019/08/11/world/asia/myanmar-landslide.html>



A mudslide in Hakha, the capital city of Chin State, destroyed several buildings.
<https://www.heavensfamily.org/urgent-need-in-myanmar/>

Figure 1.1 Natural Disasters occurred in the Survey Area

In these regards, the Government of Myanmar has requested JICA to provide financial support for upgrading of arterial roads and bridges (with its total length of 1,720 km) in 3 states and 4 regions for the purpose of building disaster-resilient road network. In order to apply the proposed project for Japanese ODA loan, it is necessary to understand the details of the current situations around the proposed projects and justify the reasonableness and implementability of the projects under Japanese ODA loan.

1. Introduction

1.2 Objective of the Survey

(1) Purposes of the Survey

The purpose of this Survey is to collect, analyze and examine information on rural roads and bridges in the whole nation of Myanmar for examining how Japanese ODA can support road sector development in the country in terms of reduction of poverty and regional economic inequality, and prevention or mitigation of natural disasters, which will contribute to the Sustainable Development Goals No. 1, 9, 10 and 11.



Source: United Nations

Figure 1.2 Related Sustainable Development Goals

(2) Counterpart Agencies

Department of Highways (DOH) under the Ministry of Construction (MOC) is the main counterpart of this Survey but some of the road components may fall in the jurisdiction of the **Department of Bridge** (DOB) or the **Department of Rural Road Development** (DRRD), both are under the MOC. Thus, it is necessary to closely coordinate with the relevant organizations and clarify the ownership of each road component during this Survey.

(3) Target Area

This survey covers the whole nationwide road network in Myanmar.

1.3 Scope of the Survey

The scope of the Survey comprises the following five (5) activities.

- (1) Review of national strategy for rural road development and preparation of supplemental development concept for building disaster-resilient rural road network;
- (2) Identification of the needs of road developments in the whole nation of Myanmar and review of the proposed projects for future Japanese ODA loan and screening them into the project long-list;
- (3) Coordination with other donor agencies and confirmation of no-overlapping of project implementation;
- (4) Confirmation of jurisdiction and technical capacity of project executing agencies; and
- (5) Examination of the long-listed projects and selection of priority projects.

2. Current Road Network in Myanmar

2.1 Road Conditions

As summarized in **Table 2.1**, the jurisdiction of the road network in Myanmar is classified into 3 institutional categories; MOC (26%), Ministry of Border Affairs (63%) and City Development Committees, etc. (11%). MOC manages the main road network in the country which plays the most important role for road administration. Due to the following three (3) situations, the road network has low-reliability in terms of connectivity and accessibility:

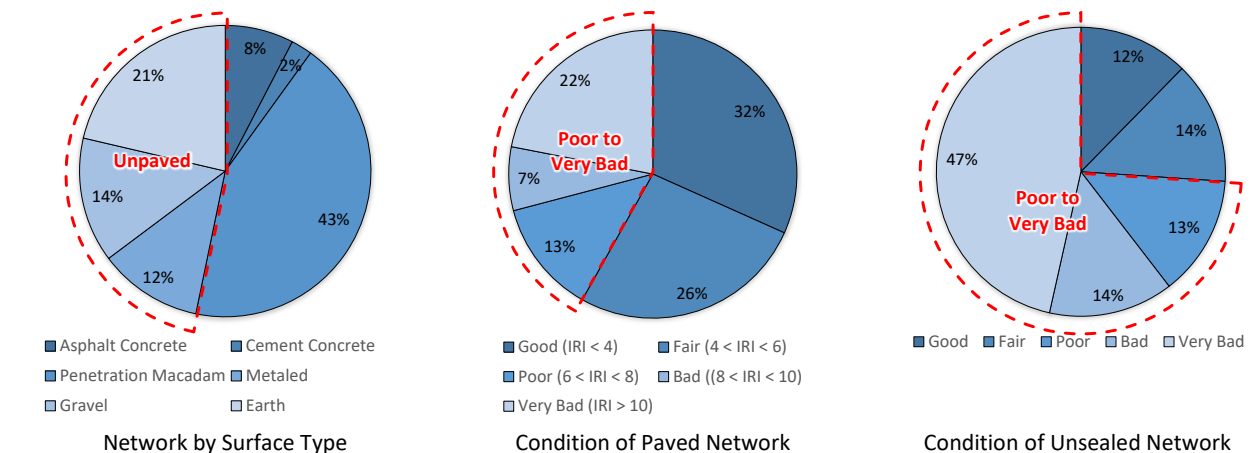
- Substandard road structure (narrow carriageway, impassable of heavy vehicles, unpaved)
- Poor condition of road surface (impassable during rainy season)
- Vulnerability against natural disasters (landslide, flood)

Table 2.1 Road Network in Myanmar

Responsible Agency	Concrete (km)	Asphalt (km)	Gravel (km)	Stone (km)	Earth (km)	Trail (km)	Total (km)
Ministry of Construction	661	17,185	5,740	5,642	8,471	1,384	39,083
• Expressways							583
• Union Highways	612	11,733	2,441	2,700	1,974	44	19,503
• Regional and State Roads	50	5,452	3,300	2,941	6,497	1,340	19,580
Ministry of Border Affairs	136	8,954	19,261	5,638	59,398	-	93,373
• Trunk Road	7	4,881	2,216	661	3,509	-	11,273
• Regional/Feeder Road	129	4,073	17,046	4,977	55,889	-	82,100
City Development Committee, etc.	1,938	2,601	1,323	1,356	9,016	-	16,235
• Yangon	1,240	1,748	13	455	473	-	3,928
• Mandalay	11	573	120	-	310	-	1,014
• Nay Pyi Taw	246	129	43	735	1,131	-	2,284
• Military	393	62	605	166	6,823	-	8,050
• MOEE	48	89	542	-	280	-	959
Total	2,735	28,739	26,324	12,635	76,885	1,384	148,690

Note: MOEE: Ministry of Electricity and Energy
 Source: MOC. 2015

According to the Myanmar Transport Sector Policy Note (Trunk Roads) prepared by ADB as of 2015, close to half of the highway network (47%) remain unpaved. Several state capitals lack a fully paved road connection to the rest of the network (such as Rakhine, Thaninthary, Kachin, and Chin). Even the paved roads, 42% of the sections are deteriorated in poor to very bad conditions. Furthermore, 74% of unpaved roads are in poor to very bad conditions because such roads are susceptible to be deteriorated by rainfalls if the road is not properly maintained.

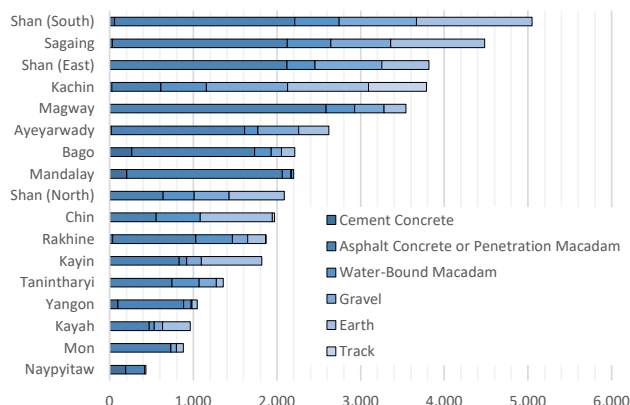


Source: ADB. 2016. Myanmar Transport Sector Policy Note (Trunk Roads)

Figure 2.1 Paved Road Network Condition

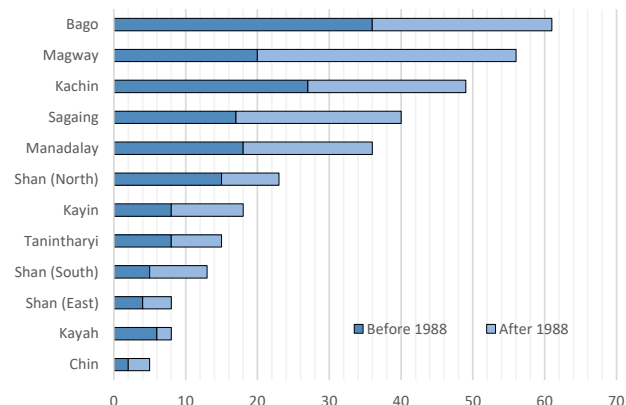
2. Current Road Network in Myanmar

As shown in **Figure 2.2** the trunk roads in mountainous states/regions are less paved than the other states/regions. Also, as shown in **Figure 2.3**, approximately 500 bridges with the length of over 54 m and countless small bridges exist in Myanmar. Around 40% of the recognized bridges were constructed before 1988 and aged more than 30 years. Therefore, it is necessary to maintain such road asset properly to keep them in good condition.



Source: ADB. 2016. Myanmar Transport Sector Policy Note (Trunk Roads)

Figure 2.2 Trunk Road Lengths by Surface Type (2014)



Source: MOC

Figure 2.3 Number of Bridges (over 54 m in Length)

2.2 International Connections

(1) Asian Highway Network

The Asian Highway Network (AH) is a cooperative project among countries in Asia and Europe and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), to improve the highway systems in Asia. It is one of the three pillars of the Asian Land Transport Infrastructure Development (ALTID) project, endorsed by the ESCAP commission at its 48th session in 1992, comprising Asian Highway, Trans-Asian Railway (TAR) and facilitation of land transport projects. Agreements have been signed by 32 countries to allow the highway to cross the continent and also reach to Europe. The project aims to make maximum use of the continent's existing highways to avoid the construction of newer ones, except in cases where missing routes necessitate their construction.

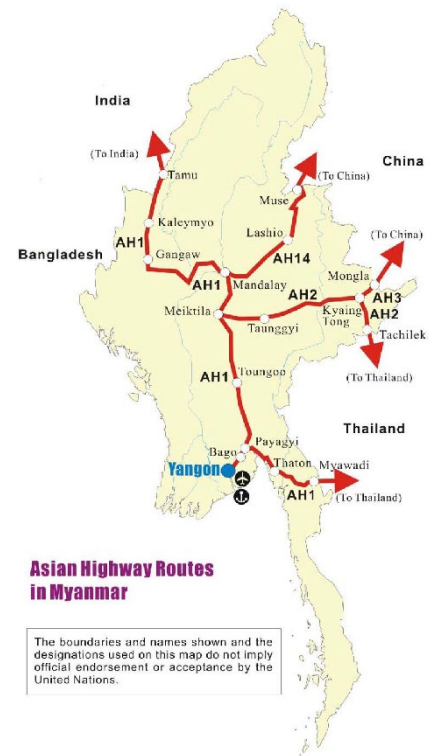
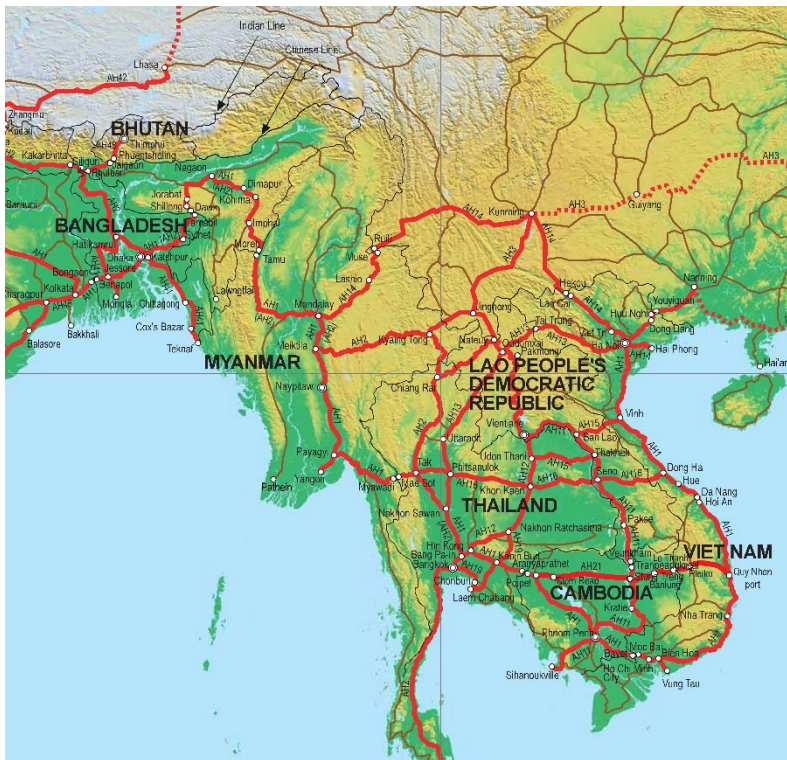
The formalization of the regional road network through the Intergovernmental Agreement on the Asian Highway Network mapped out the main existing and potential road transport corridors that support regional economic growth and intraregional and interregional trade. As of June 2019, the network spans more than 143,000 km, covering the subregions of East and North-East Asia, North and Central Asia, South-East Asia and South and South-West Asia. To date, 30 ESCAP member States are Parties to the Agreement.

In addition to defining the network itself, the Agreement sets out minimal technical design standards and classifications to ensure the quality of the road infrastructure along the Asian Highway routes. While initially focused primarily on the road design for accommodating increasing freight and traffic volumes, the technical standards have been expanded to road safety facilities.

In Myanmar, the following road sections have been designated as the Asian Highways. AH1, AH2 and AH3 are Asian Highway routes substantially crossing more than one Subregion. AH14 is an Asian Highway route within subregions, including those connecting to neighboring subregions, and Asian Highway routes located within member States. AH111, AH112 and AH123 are ASEAN Southeast Asia routes designated by the Association of Southeast Asian Nations as part of an extension to the Asian Highway Network, known as the ASEAN Highway Network.

- **AH1:** Payagyi – Thaton – Myawaddy (border of Thailand)
Yangon – Payagyi – Toungoo – Meiktila – Mandalay – Gangaw – Kaleymyo – Tamu (border of India)
- **AH2:** Meiktila – Loilen – Kengtung – Tachileik (border of Thailand)
- **AH3:** Kengtung – Mongla (border of China)
- **AH14:** Mandalay – Hsipaw – Muse (border of China)
- **AH111:** Loilen – Hsipaw
- **AH112:** Thaton – Mawlamyine – Dawei – Kawthoung
- **AH123:** Dawei – Phu Nam Ron (border of Thailand)

According to DOH, the route of AH1 from Mandalay to Tamu was changed to the road section from Mandalay through Monywa, Kalewa, Kale to Tamu, which is consistent with the GMS corridor NSEC-6, which is described in the next section (Figure 2.4 is the latest Asian Highway Map updated by UN-ESCAP in 2019 but this change has not been reflected to the map).



Note: The road section of AH1 from Mandalay to Tamu on these two maps passes through Gangaw and Kaleymyo but DOH has authorized the AH1 route as the road section of Mandalay – Monywa – Kalewa – Kale – Tamu.

Source: UN-ESCAP. 2019. Asian Highway Route Map

Figure 2.4 Asian Highway Route Map in Myanmar

(2) Greater Mekong Subregion Economic Corridors

The Greater Mekong Subregion (GMS) countries adopted the economic corridor approach at the Eighth GMS Ministerial Conference in Manila in 1998 to accelerate subregional development. The East–West Economic Corridor (EWEC), North–South Economic Corridor (NSEC), and Southern Economic Corridor (SEC) were subsequently designated as flagship programs under the Ten-Year GMS Strategic Framework, 2002–2012. Thus, complementary efforts such as trade and transport facilitation, border and corridor town development, investment promotion, and enterprise development have been largely focused on EWEC, NSEC, and SEC. The development of GMS corridors as economic corridors continued to be at the center of the GMS Program under the succeeding GMS Strategic Framework, 2012–2022.

The primary considerations for including specific routes as part of EWEC, NSEC, and SEC in the configuration of GMS Corridors 2006–2015 were their potential to become trade, investment, tourism, and transit corridors, and the presence of significant sections that can be developed into hubs for regional trade, investment, and tourism. The primary concern in reviewing their configuration in 2018 was to ensure that: i) developments arising from the opening up of Myanmar were taken into account; ii) corridors include and link all GMS capitals and major economic centers; iii) corridors are connected to key GMS maritime gateways and industrial hubs; and iv) major trade flows are reflected in the alignment of the corridors.

Based on these requisites, the following glaring gaps needed to be addressed through extension and/or realignment of the economic corridors:

- There was relatively limited coverage of the Lao People’s Democratic Republic (Lao PDR) and Myanmar in the economic corridors.
- Yangon, Nay Pyi Taw, and Vientiane were not included in any economic corridor.
- Yangon Port was not linked to any economic corridor.
- The principal cross-border trade routes between China and Myanmar; Myanmar and Thailand; and China, the Lao PDR, and Thailand were not reflected in the alignment of the economic corridors.

2. Current Road Network in Myanmar

To address these gaps, some of the changes in the configuration of the GMS economic corridors were made as shown in **Figure 2.5** and **Figure 2.6** and the following changes are related to Myanmar:

- **East–West Economic Corridor:** Include an extension at the western end of EWEC to Yangon – Thilawa using the Myawaddy – Kawkareik – Eindu – Hpa – An – Thaton – Kyaikto – Payagi – Bago – Yangon – Thilawa route, with a possible extension to Patheingyi.
- **North–South Economic Corridor:** Include the Kunming – Dali – Ruili – Muse – Mandalay – Nay Pyi Taw – Yangon route in NSEC and add an extension to the route to link Mandalay to Tamu at the border with India, using the Mandalay – Kalewa – Tamu route via Monywa or Shwebo.

The report of the Review of Configuration of the Greater Mekong Subregion Economic Corridors (ADB, 2018) emphasized that the road sections in Myanmar require substantial improvement such as the following:

- NSEC-5, Kunming – Muse – Mandalay – Yangon – Thilawa Subcorridor (road sections in the Myanmar)
- NSEC-6, Mandalay – Tamu Subcorridor
- SEC-1, Dawei – Bangkok – Phnom Penh – Ho Chi Minh City – Vung Tau Subcorridor (road section from the Thai-Myanmar border to Dawei)

The report also recommended that the following needs require special consideration to facilitate the transformation of transport corridors into economic corridors and maximize the benefits from this initiative:

- accelerating and creating a momentum for the implementation of the Cross-Border Transport Facilitation Agreement and broader transport and trade facilitation measures, given that all countries have now ratified the Cross-Border Transport Facilitation Agreement;
- extending the benefits of economic corridor development to as many areas as possible through the development of feeder roads and national networks that are effectively connected to GMS economic corridors; and
- addressing unmitigated migration from vulnerable GMS economies like Cambodia and the Lao People’s Democratic Republic by expanding employment opportunities in these countries along and around economic corridors through the development of industrial clusters, special economic zones, and small and medium-sized enterprises that are linked to subregional or regional production networks and value chains.

According to DOH, the following sections are the latest GMS corridor routes in Myanmar authorized by DOH:

East-West Economic Corridor (EWEC):

- Myawaddy- Kawkareik – Eindu – Hpaan- Thaton – Beilin – Kyaikto – Theinzayat – Waw – Bago - Yangon

North-South Economic Corridor (NSEC)

- NSEC-1: Mongla – Kengtung – Monghpyak – Tarlay – Tachileik
- NSEC-6: Tamu – Kalewa – Ye U – Shwebo – Mandalay
- NSEC-6: Tamu – Kalewa – Monywa – Mandalay
- NSEC-5: Mandalay – Hsipaw – Lashio – Muse
- NSEC-5: Mandalay – Yangon (Thilawa)

Southern Economic Corridor (SEC)

- Htikhi – Sinphyudaing – Myitta – Harmacyinkyi – Nabulel – Dawei



Source: ADB. 2018. Review of Configuration of the Greater Mekong Subregion Economic Corridors

Figure 2.5 Configuration of GMS Economic Corridors 2006-2015

2. Current Road Network in Myanmar



Source: ADB. 2018. Review of Configuration of the Greater Mekong Subregion Economic Corridors

Figure 2.6 Revised Configuration of GMS Economic Corridors

2.3 Traffic Conditions

Despite road transport being the dominant mode of transport, traffic volumes remain low on most of the arterial road network. Roads provide 85% of passenger and 88% of freight trips over land in Myanmar¹. Nevertheless, traffic levels remain quite low on most arterial roads and the network is generally underutilized. Only 4,000 km of roads carry more than 1,000 vehicles per day (excluding motorcycles). These are the expressway and the highways connecting Yangon to Mandalay (AH1), Yangon to Pyay, Yangon to Patheingyi, Yangon to Myawaddy (AH1), Yangon to Mawlamyine (AH112), Mandalay to Muse (AH14), Mandalay to Monywa (AH1) and to Schwedon, Meiktila to Taunggyi (AH2), as well as some roads near Yangon (see **Figure 2.7**).

In the medium term, the ADB's Transport Sector Policy Note recommended that technical standards for highways should therefore be mainly determined by traffic volumes rather than by the function of the road. Only 5,300 km of Myanmar's roads have traffic above 500 vehicles per day.

Most bituminous roads are very narrow. Of the 21,400 km of bituminous roads, 60% (12,500 km) are only 12 ft wide (3.7 m). Even in roads with relatively low traffic volumes, the presence of oxcarts, two-wheel tractor and/or trailers and other slow-moving traffic can slow down the rate of speed to 20–30 km/h. This is made even worse where the condition of the pavement and road shoulder is poor, which complicates overtaking. The DOH is widening these roads to at least 18 ft (5.5 m) and there are currently 4,800 km of road with 24 ft (7.3 m) wide pavements. In part, this widening is also aimed at complying with the Brunei Action Plan to bring the Asian/Association of Southeast Asian Nations (ASEAN) Highways to at least Class III standard (22 ft in width).

In hilly areas, roads are particularly sinuous and in poor shape, making transport very slow and costly. The average vehicle speed in the hilly states of Myanmar is around 30 km/h, and often down to 20 km/h. This is primarily because the roads were built to low geometric standards and are in poor condition rather than because of congestion. Improving the situation will require complete reconstruction to higher standards on better alignments. The associated costs of an upgrading can be high, so that improvement standards should be chosen to closely match traffic levels.

¹ ADB. 2016. Myanmar Transport Sector Policy Note: How to Reduce Transport Costs.

2. Current Road Network in Myanmar

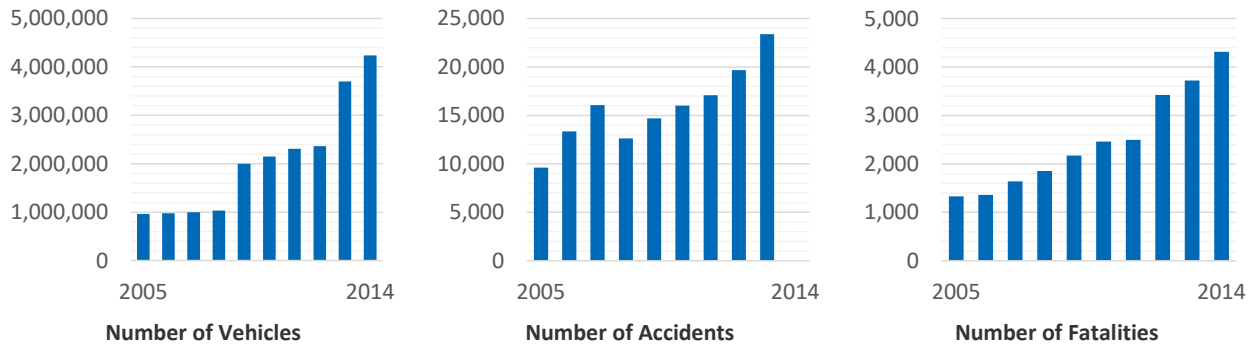


Source: ADB. 2016. Myanmar Transport Sector Policy Note (Trunk Roads)

Figure 2.7 Average Daily Traffic on Main Roads

2.4 Road Safety

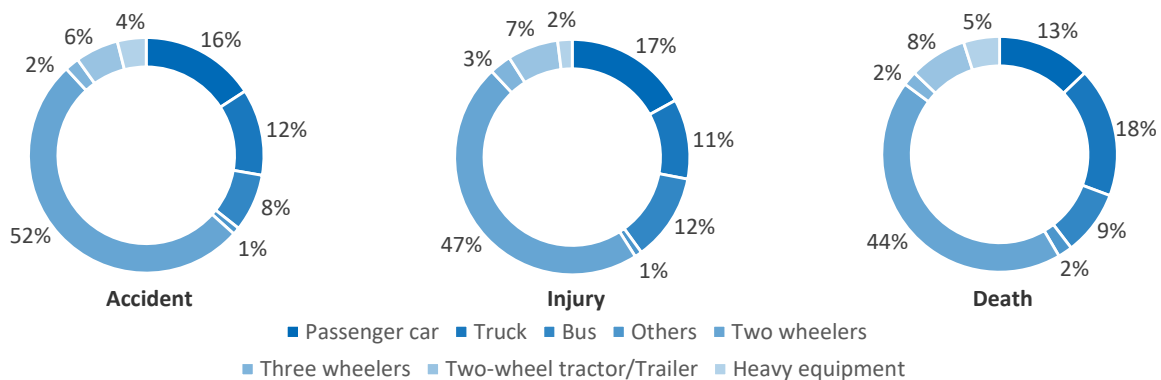
According to ADB’s Transport Sector Policy Note, the road accident rates have closely followed motorization rates in Myanmar. Road fatalities reached 4,314 in 2014, a 16% increase compared with 2013 and a more than 70% increase compared with 2011. ADB estimated that the number of fatalities from road accidents could rise to 7,500 by 2020, and 13,000 by 2025. Unaddressed, the road safety issue could result in 75,000 fatalities between 2015 and 2024.



Source: ADB. 2016. Myanmar Transport Sector Policy Note: Trunk Roads.

Figure 2.8 Road Accidents and Fatalities

Over half of the accidents and 44% of fatalities involve motorcycles, compared with 13% of fatalities involving passenger cars. Trucks are involved in 12% of accidents, resulting in 18% of fatalities. Fatality rates per vehicle for a car are three times that of a motorcycle. Rates for trucks are 13 times higher, and the proportion reaches 37 times higher for buses. The number of fatalities involved two-wheel tractor and/or trailers (8% in 2012), suggesting these accidents are related to overtaking on narrow roads.



Source: ADB. 2016. Myanmar Transport Sector Policy Note: Trunk Roads.

Figure 2.9 Distribution of Road Accidents by Vehicle Type in 2012

The different rates of speed of vehicles using trunk roads coupled with the narrow width of most trunk roads combine to create safety risks when overtaking. Roads are also lacking proper safety design and basic safety features. The Yangon–Mandalay Expressway has become famous for its poor safety. High speeds and poor safety design caused hundreds of fatalities after its opening, despite low traffic volumes.

Another issue is that responsibility for road safety is spread over various ministries, with weak coordination. Road safety is governed by the 1964 Motor Vehicle Law and 1989 Motor Vehicle Rules. Under MOC, the DOH is responsible for implementing road safety measures in the trunk road network. The Road Transport Administration Department (RTAD) under the Ministry of Transport and Communications (MOTC) is responsible for issuing traffic regulations related to road safety, for vehicle inspection and registration, and for issuing driver’s licenses. The Myanmar Traffic Police under the Ministry of Home Affairs is responsible for the enforcement of traffic regulations and collection of accident data. In 1998, the government established the Traffic Rules Enforcement Supervisory Committee for education, legislation, and enforcement. This committee is also responsible for improving coordination among the different agencies involved in road safety. In 2013, a National Road Safety Action Plan was approved and a National Road Safety Council was created, chaired by the Vice-President. There is no separate budget for road safety, however, and the different ministries are each responsible for mobilizing funding for road safety.

2.5 Private Sector Participation in Road Operation

Private sector has been participated in road operation since 1996 under the Laws for Highways in Myanmar (2000). The scheme of the participation is called Build-Operate-Transfer (BOT) and the role of the BOT contractors are daily operation, rehabilitation and upgrade of existing roads by the finance from toll collection. The assets of the infrastructures still belong to the government (DOH).

BOT contractors receive tax exemptions on the import of construction materials, oil, vehicles, and machines with official certificates. The government provides construction materials according to the government price ratio. BOT contractors can also secure loans from domestic banks in Myanmar.

The BOT contracts all involve initial repair and widening works to be completed within a maximum of 3 years, followed by regular maintenance for the full contract period of 40 years, extendable to 55 years by 5-year increments. All investments are financed by the BOT contractor, who is able to collect toll revenue after completion of the initial works (in practice toll collection appears to start before the initial works are completed). Specifications relate to pavement type and width, shoulders, and embankments. These do not include safety features and do not define the road geometry, ruling out road realignments. The definition of the scope of works is generic to all contracts.

During the operational period, further widening and upgrading to asphalt concrete pavement is required if traffic volumes reach specified thresholds (see **Table 2.2**).

The contractor is required to maintain the road for the full contract period. However, the contract does not include specifications regarding activities to be carried out or the standards to be achieved. The contractor is only responsible for “continuously maintaining the proper condition of the road and bridges,” so that “transportation not to be cut off” and bears the “expenses of repairing.”

Table 2.2 Build-Operate-Transfer Contract Works Standards

Traffic Level (AADT)	Width (ft)	Width (m)	Lanes	Surface Type
200 – 500	18	5.4	1.5	Penetration macadam
500 – 1,000	22	6.6	2	Penetration macadam
1,000 – 2,500	24	7.2	2	AADT < 2,000: Penetration macadam AADT > 2,000: Asphalt concrete
2,500 – 5,000	48	14.4	4	Asphalt concrete
Over 5,000	72	21.6	6	Asphalt concrete

AADT = Annual average daily traffic

Source: ADB. 2016. Myanmar Transport Sector Policy Note: Trunk Roads.

As of June 2020, 60 road sections are operated by BOT contractors with its total length in 4,752 km, which accounts for 11% of DOH’s road network (see details in **Table 2.3** and **Figure 2.10**).

Table 2.3 List of BOT Contracted Roads

No.	Company	Road	Length (km)	
1	Oriental Highway	1-1 Mandalay – Lashio – Muse – Namhkham	480	1,030
		1-2 Mong Yu – Kyugok	19	
		1-3 Thenni – Kunlong – Chinshwehaw	106	
		1-4 Yangon – Bago – Meiktila – Mandalay (Yedashe – Pyinmana)	64	
		1-5 Yangon – Bago – Meiktila – Mandalay (Pyinmana – Yemethin)	73	
		1-6 Myitnga – Htonbo – Pyin Oo Lwin	15	
		1-7 Pathein – Ngwe Saung	48	
		1-8 Yangon – Pathein	166	
		1-9 Maubin – Hsamalaot	34	
		1-10 Lashio Bypass Road	25	
2	Max Highway	2-1 Yangon – Pyay – Mandalay (Yangon – Pyay – Magway)	549	701
		2-2 Yangon – Bago – Meiktila – Mandalay (Htaukkyant – Bago, Bago Bypass Road)	62	
		2-3 No. 2 Highway (Thingangyun – Zayatkwun Junction)	37	
		2-4 No. 3 Highway	15	
		2-5 Htaukkyant Bypass Road	3	
		2-6 Dagon Bridge – Thilawa Industrial Zone (Thanlyin – Kyauktan)	35	
3	Myat Noe Thu Construction	3-1 Meiktila – Kyaukpadaung – Nyaung U - Bagan	151	344
		3-2 Bagan – Nyaung U – Myingyan (Nayaung U – Myingyan)	65	
		3-3 Latpanchaepor – Pakokku – Monywa	128	
4	Shwe Than Lwin Highway	4-1 Yangon – Myeik (Payargyi – Kyikhto, Motepalin Approach Road)	104	338
		4-2 Thaton – Hpa-an (Thaton – Myine Kalay)	42	
		4-3 Yangon – Myeik ((Kyaikhto – Thahton – Mawlamyine)	115	
		4-4 Yangon – Bago – Meiktila – Mandalay (Bago – Naunglaypyin)	77	
5	Thaw Tar Win Construction	5-1 Kengtung – Tachileik	164	341
		5-2 Yangon – Bago – Meiktila – Mandalay (Meiktila – Mandalay, Kyaukse Bypass Road)	162	
		5-3 Meiktila Bypass Road	15	
6	Highland Road Construction	6-1 Meiktila – Taunggyi – Kengtung – Tachileik (Meiktila – Taunggyi)	226	226
7	Shwe Taung Highway	7-1 Mandalay – Sagaing – Monywa – Ye U (Sagaing – Monywa) Myinmu Bypass Road (Sagaing Circle – Yadanar Pone Bridge)	120.5	189.5
		7-2 Mandalay – Sagaing – Shwebo (Ohntaw – Shwebo)	69	
8	Kaung Mon Construction	8-1 Yangon – Pyay – Mandalay (Magway – Yenangyaung – Gway Cho – Kyaukpadaung)	106	175
		8-2 Yaynanchaung Bypass Road	14	
		8-3 Magway – Minbu – Pwintphyu	55	
9	Htun Nyo Lu Construction	9-1 Chaung Oo – Pakokku	85	174
		9-2 Meiktila – Mahlaing – Taungtha - Myingyan	89	
10	Aye Ko Family Construction	10-1 Hpa-an – Kawkareik – Myawaddy	47	151
		10-2 Mawlamyine – Eaindu – Zartapyin	44	
		10-3 Mawlamyine – Mudon – Thanbyuzayat	60	
11	Nadi Shwe War	11-1 Pyawbwe – Natmouk – Kanbya (Magway)	147	147
12	Su Htoo Pan Construction	12-1 Mandalay – Phottaw, Phottaw – Thabeikkyin, Letpanhla – Sintgu	65	141
		12-2 Monywa – Ye U	76	
13	Nay Min Yaung Construction	13-1 Taunggyi – Loilem – Namhsan	117.5	117.5
14	Thayar Oo Construction	14-1 Yangon – Pyay – Mandalay (Myothar – Tada U) Palate – Tada U	27	86
		14-2 Myingyan – Myothar	59	
15	Myeik Corporation Public	15-1 Taintharyi – Mawtaung	76	76
16	Hi-star	16-1 Yangon – Bago – Meiktila – Mandalay (Naunglebin – Zeyyawaddy)	77	77
17	Kanbawza	17-1 Yangon – Bago – Meiktila – Mandalay (Zayyawaddy – Yedashe)	77	77
18	Yu Za Na Construction	18-1 Yangon – Bago – Meiktila – Mandalay (Yamethin – Meiktila)	77	77
19	Thanti Thitsa	19-1 Mandalay – Phottaw	67	67
20	Monywa Group Construction	20-1 Monywa – Yargyi	64	64
21	Hnin Thazin Construction	21-1 Gway Cho – Chauk – Seikphyu – Pakokku	61	61
22	Soe Lwin Aung Construction	22-1 Shwenyaung – Yatsauk	58	58
23	Gulf Power Construction	23-1 Myingyan – Myitthar – Yewone (Myingyan – Myitthar – Latnyoehtoe)	34	34
Total			4,752	4,752

Source: DOH. 2020. Road Implemented by Company with B.O.T Scheme

2. Current Road Network in Myanmar



Source: JICA Study Team based on DOH's Map of B.O.T Roads in State & Region

Figure 2.10 BOT Road Map

2.6 Accessibility to Rural Areas

According to the Myanmar Transport Sector Policy Note: Rural Roads and Access prepared by ADB in 2016, the following issues are identified in Myanmar's rural accessibility and mobility:

- About two-thirds of rural people in Myanmar are physically isolated during part or all of the year;
- It was estimated that 20 million people live in villages without access to an all-season road;
- Seen differently, 24 million people are likely to live more than 2 km away from an all-season road.

Rural roads and rural transport services are fundamental to reducing rural poverty and enabling social and economic development. Evidence from Myanmar, and from around the world, makes it clear that access to markets and services is crucial for stimulating rural productivity and development. International examples show how lack of access leads to unsatisfactory medical care (and mortality), poor educational attainment, low agricultural production with little marketing, and insufficient economic activity. Replacing footpaths and seasonal tracks with properly maintained all-season roads greatly increases rural mobility, productivity, and economic activity and improves educational attainment and health care. Despite the clear problems and the available solutions, the issues of poor rural access tend to be "invisible" to urban-based decision makers, so that connecting isolated villages may not receive adequate attention or resources.

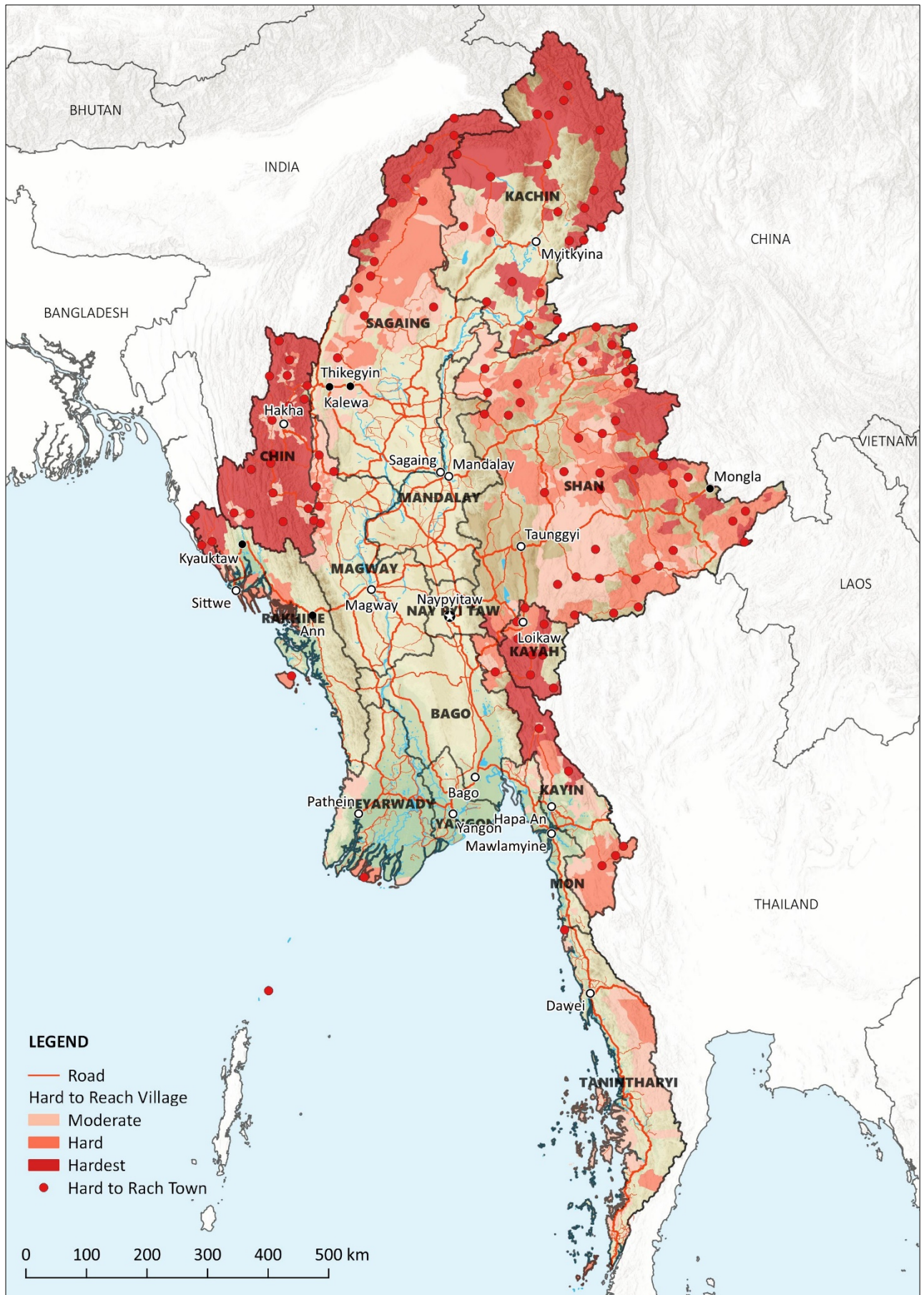
A very large portion of the village road network is earthen, and becomes impassable during the rainy season. At the same time, funds are being invested to improve village roads to a bituminous standard where these already provide all-season access (without traffic volumes necessarily warranting such improvement). The use of more basic standards of improvement, consisting of the improvement of drainage systems, basic water crossings (causeways and drifts), and protective measures (retaining walls) complemented by low-cost surfacing where necessary, would allow a greater length of the village road network to be brought to an all-season standard using the same budget.

There are three (3) government institutions designated by law as responsible for construction and maintenance of village road infrastructure:

- The **Department of Rural Development (DRD)** under the Ministry of Agriculture, Livestock and Irrigation is currently the main government agency responsible for village roads.
- The **Department of Progress of Border Areas and National Races Development (DPBANRD)** under the Ministry of Border Affairs carries similar activities in designated townships, accounting for 32% of Myanmar's territory.
- The **town development committees (TDCs)** are placed under the General Administration Department of the Ministry of Home Affairs. The 285 TDCs are local executive bodies with power to raise tax, and spend on infrastructure and other rural development activities.

The ADB's Myanmar Transport Sector Policy: Rural Roads and Access pointed out that there is no comprehensive overview of the needs for the country as a whole and for each state and/or region, and as a consequence resources and needs are not properly matched. In practice, influential villages are better able to get their project placed at the top of the list than less influential ones. This situation is not largely noticed by DRD staff because they scrutinize lists that have already been compiled by the village development committees.

2. Current Road Network in Myanmar



Source: JICA Study Team base on MIMU. 2019. Hard to Reach Village Tract May 2019, Hard To Reach Towns May 2019

Figure 2.11 Hard to Reach Villages

2.7 Landslide and Collapse in Mountainous Areas

According to the JICA's Preparatory Survey Report on the Project for Improvement of Road Construction and Maintenance equipment in Kachin State and Chin State (2015), the slopes of the road section from Hakha to Kale are in a received board structure as a basic geological structure and thus collapse is not occurred at many slopes even though the slope is steeper than 60 degrees without any protective measure. However, large-scale landslides and rock collapses have occurred at many places where is vulnerable and less vegetation due to its climate and ground conditions. In order to achieve long-term slope stabilization at such places, it was recommended that the weak parts or loose area such as fault zone be excavated and removed, and large-scale preventive measure be implemented.



Source: JICA. 2015. Preparatory Survey Report on the Project for Improvement of Road Construction and Maintenance equipment in Kachin State and Chin State.

Figure 2.12 Example of Landslides in Chin state

3. Road Development Plans in Myanmar

3.1 MOC's 30-year Long Term Plan

21,943 km (13,635 mile) of roads were built in Myanmar before 1988 and repairing and upgrading of roads and bridges were implemented under the successive short-term plans for providing smooth transportation as a major objective during the time of the State Law and Order Restoration Council. At the end of FY 2000/2001, the roads in Myanmar were summed up as follows:

- Asphalt road: 12,920 km (8,028 mile, 45%)
- Rock road: 4,814 km (2,991 mile, 17%)
- Firm ground road: 5,029 km (3,125 mile, 18%)
- Earthen road: 60,014 km (3,729 mile, 20%)
- Total: 28,764 km (17,873 mile, 100%)

The 30-year long term plan (2001-2030) was prepared for upgrading roads and bridges in Myanmar to meet international standard in order to improve accessibility to and across neighboring countries by achieving the following conditions:

- International arterial roads will have 14.6 m (48 feet) wide 4-lane asphalt concrete pavement;
- Major union highways will have 7.3 m (24 feet) wide 2-lane asphalt concrete pavement;
- Other union highways will have 3.65 m (12 feet) asphalt concrete pavement; and
- Short and long bridges on the above roads will have been constructed as permanent bridges according to the width of respective roads.

Table 3.1 Actual Appropriation during 5 Years from FY2001/2002 to 2005/2006

	Budget (Kyat Million)	Load Length (km)					
		Asphalt	Rock	Firm Foundation	Earth	Single Route	Total
Road Upgrading	28,804	1,056	1,394	1,536	1,694	0	5,680
On-going Projects	24,082	359	589	1,433	1,624	318	4,323
Build New Roads	2,382	0	0	22	348	1,053	1,423
Total	55,267	1,415	1,983	2,991	3,666	1,371	11,426

Source: MOC

Table 3.2 Actual Appropriation during 5 Years from FY2006/2007 to 2010/2011

	Budget (Kyat Million)	Load Length (km)					
		Asphalt	Rock	Firm Foundation	Earth	Single Route	Total
Road Upgrading	98,074	4,351	3,745	2,595	1,367	0	12,059
On-going Projects	44,620	1,943	2,278	2,104	1,786	584	8,696
Build New Roads	1,901	0	0	0	71	1,030	1,101
Total	144,595	6,295	6,023	4,699	3,224	1,614	21,855

Source: MOC

Table 3.3 Accomplishment of Improvements during 10 Years from 2001 to 2011

	Load Length (km)				
	Asphalt	Rock	Firm Foundation	Earth	Total
Condition in 2001	7,710	8,006	7,705	9,876	33,297
Accomplishment during 2001-2011	9,900	1,093	2,519	3,687	17,199
Condition in 2011	17,610	6,914	5,186	6,189	35,899

Source: MOC

3. Road Development Plans in Myanmar

The following are the road development policy of the 30-year long term plan from FY 2011/2012 to FY 2030/2031:

- Upgrading of roads in the country as the roads of international standard in accordance with changes in political system in the country.
- Construction of the roads based on the following conditions by the end of 2030 long term plan on the routes with international connection linked to Myanmar:
 - Roads with average daily traffic less than 50: 3.65 m (12 feet) wide macadam road
 - Roads with average daily traffic 50 to 200: 4.88 m (16 feet) wide macadam road
 - Roads with average daily traffic 200 to 500: 5.5 m (18 feet) wide macadam road
 - Roads with average daily traffic 500 to 1,000: 6.7 m (22 feet) wide macadam road
 - Roads with average daily traffic 1,000 to 2,500: 7.3 m (24 feet) wide asphalt concrete road
 - Roads with average daily traffic 2,500 to 5,000: 14.6 m (48 feet) wide asphalt concrete road
 - Roads with average daily traffic over 5,000: 22.0 m (72 feet) wide asphalt concrete road
- Upgrading of existing roads that were built during successive eras in the country into the roads of international standard.
- To construct bridges as permanent reinforced concrete bridges according to the width of traffic way of the upgraded roads.
- Construction of the bridges according to the width of respective traffic ways under the following priorities:
 - First priority: less than 15 m (50 feet)
 - Second priority: more than 15 m (50 feet) and less than 30 m (100 feet)
 - Third priority: more than 30 m (100 feet) and less than 55 m (180 feet)
 and construction of the bridges of over 55 m (180 feet) as permanent reinforced concrete bridges requesting authorization from the Union Government.
- To expand the nationwide road network under the jurisdiction of MOC from 35,899 km in 2011 to 52,305 km by FY 2030/2031 with 2% growth rate per year.
- To construct buildings if other union ministries assign to do so.
- To construct airports if other union ministries assign to do so.
- To develop technical capacity of the MOC's engineers through training programmes both in the country and oversea so that they are skilful in world class technology and to incorporate with IT technologies.
- To provide assistance in technical know-how and to protect rights and entitlements to promote private sector involvement for BOT system under the Public Private Partnership programme in order to support technologies.
- To implement road and bridge projects in the country by inviting foreign direct investment. To upgrade roads and bridges with the loans from Asian Development Bank and World Bank.
- To upgrade roads and bridges all over the country to fully implement objectives of the three main national causes, namely "non-disintegration of the union", "non-disintegration of national solidarity", and "perpetuation of national solidarity".
- To upgrade roads and bridges to facilitate defense of the state, security and national unity.
- To upgrade roads and bridges to help eliminate poverty to facilitate smooth transportation of goods and to create job opportunities for local people.

The total budget required for road and bridge project during the last 20 years from FY 2011/2012 to 2030/2031 was estimated at 7,313 billion Kyat.

Table 3.4 Estimated Budget for FY 2011/2012 – 2030/2031

	Road Projects (Kyat Million)	Bridge Projects (Kyat Million)	Total (Kyat Million)
FY 2011/2012 to 2015/2016	1,834,893	1,345,973	3,180,866
FY 2016/2017 to 2020/2021	401,662	147,024	548,686
FY 2021/2022 to 2025/2026	1,821,154	577,097	2,398,251
FY 2026/2027 to 2030/2031	1,113,802	71,494	1,185,296
Total	5,171,510	2,141,588	7,313,099

Source: MOC

FY 2011/2012 – 2015/2016

The targets of the improvements during FY 2011/2012 – 2015/2016 are as follows:

- Improvement of 5,765 km-long international arterial roads as 7.3 m (24 feet) wide asphalt concrete road
- Improvement of 7,214 km-long union highways as 3.65 m (12 feet) wide macadam road
- Construction of 1,694 km-long new roads as 3.65 m (12 feet) wide macadam road

Table 3.5 International Arterial Roads to be Improved by FY 2015/2016 (1)

No.	ASEAN	Asian Highway	Name	Road Length (km)		
				BOT	MOC	Total
1	AH-1	A-1	Myawady-Kawkayeik-Phaan-Thahton-Phayagyi_Taunggoo	923.4	560.5	1,483.8
	AH-2	A-2	Pyinmana-Meikhtila-Mandalay-Monywa-Gangaw-Kalay-Tamu			
2	AH-2	A-2	Tachilek-Kengtung-Taunggyi- Meikhtila-Mandalay-Monywa	719.2	801.9	1,521.0
	AH-1	A-1	Gangaw-Kalay-Tamu			
3	AH-3	A-3	Kengtung-Mongla	0.0	90.1	90.1
4	AH-14	A-14	Mandalay-Lashio-Theinni-Kutkhaing-Muse road	463.9	0.0	463.9
5	AH-111	R-7	Loilin-Lesha-Pankaytu-Thipaw road	0.0	240.2	240.2
6	AH-112	-	Thahton-Mawlamyaing-Yay-Dawei-Myeik-Kawthaung road	353.5	768.7	1,122.1
7	AH-112	-	Laynha-Thai border (Khalonloi)	0.0	60.4	60.4
8	AH-113	-	Dawei- Thai border (Minthamee pass)	0.0	141.8	141.8
Total				2,459.9	2,663.5	5,123.3

Source: MOC

Table 3.6 International Arterial Roads to be Improved by FY 2015/2016 (2)

No.		Road Name	Road Length (km)		
			BOT	MOC	Total
1	Triparite	Tamu-Bagan-Myawady road	489.6	843.9	1,333.5
2	BIMSTEC	Tamu- Gangaw- Htilin-Mandalay-Meikhtila- Taunggyi -Kengtung- Tachilek road	702.9	867.8	1,570.7
3	G.M.S	Tachilek- Kengtung-Mongla road	164.6	90.1	254.7
4	G.M.S	Lashio-Muse road	164.8	0.0	164.8
5	G.M.S	Kengtung-Loilin-Thipaw- Lashio road	55.5	601.5	657.0
Total			1,577.4	2,403.3	3,980.7

Source: MOC

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Table 3.7 Priority Union Highways to be Improved (FY 2011/2012 – 2015/2016)

No.	Road Name	Road Length (km)			Region/State
		BOT	MOC	Total	
1	Yangon-Sittway road	0.0	486.8	486.8	Magway/Rakhine
2	Shwebo-Myitkyina road	186.9	232.1	419.0	Kachin/Sagaing
3	Shwebo-Sabe Nantha-Kantbalu-Kyunhla road	0.0	40.2	40.2	Sagaing
4	Myitkyina-Sunprabon-Putao road	0.0	350.8	350.8	Kachin
5	Monywa-Yagyi-Kalaywa road	64.4	121.5	185.9	Sagaing
6	Thetkayyin-Phaungpyin-Homalin-Khanti road	0.0	531.1	531.1	Sagaing
7	Shwebo-Kyaukmyaung road	0.0	24.9	24.9	Sagaing
8	Letpanhla-Sintku road	8.9	0.0	8.9	Mandalay
9	Yangon-Mandalay express road	0.0	590.2	590.2	Bago/ Mandalay/Yangon
10	Mandalay-Takaung-Bamo- Myitkyina road	96.2	186.3	282.4	Kachin/Sagaing/ Mandalay
11	Aungpan-Pinlaung-Moebye-Loikaw road	0.0	147.3	147.3	Kayah/Shan
12	Taunggoo-Laiktho-Yado-Loikaw-Hopone road	0.0	334.7	334.7	Kayah/Kayin/Bago/Shan
13	Kalay-Phalam-Haka road	0.0	185.3	185.3	Chin
14	Pakhukku-Pauk-Kyauk Htu-Mindet road	13.7	143.8	157.5	Chin/Magway
15	Haka-Ganggaw road	0.0	113.5	113.5	Chin/Magway
16	Hanmyintmo-Myogyi-Ywangan-Aungpan road	0.0	127.3	127.3	Mandalay /Shan
17	Namsan-Moene-Linkhe-Mongpan-Tahsan-Mongtung-Mongset-Tachileck road	0.0	404.5	404.5	Shan
18	Ayethaya-Nyaungshwe-Mongthauk-Nangpan-Tonghone-Pinlaung road	0.0	92.4	92.4	Shan
19	Nyaungshwe-Yetsauk-Eintaw-Kyaukku-Naungcho road	57.9	175.2	233.2	Shan
20	Teddin-Reid road	0.0	50.9	50.9	Chin
21	Yayoo-Kalaywa road	0.0	169.8	169.8	Sagaing
22	Thityakauk-Malun-Minhla road (the approach road of Malun Bridge)	0.0	32.2	32.2	Magway
23	Naypyitaw-Kintha-Kokwae-Laneli-Pinlaung road	0.0	106.8	106.8	Mandalay/Shan
24	The approach road of Yadanathienga Bridge (Singu side bank)	0.0	5.4	5.4	Mandalay
25	Yangon-Kyaukphyu road (Taunggup-Maei-Kyaukphyu road)	0.0	192.9	192.9	Rakhine/Yangon
26	Hinthada-Sonkone- Myanaung road	0.0	105.0	105.0	Ayeyawady
27	Kyeinpainse-Setkaw-Danuphu-Zalun road	44.1	0.0	44.1	Ayeyawady
28	Phapon-Kamamaung road	0.0	92.5	92.5	Kayin
29	Khamti-Sinthe-Lahe road	0.0	86.9	86.9	Sagaing
30	Kyauktan-Kawlin-Wingyi-Pinlebu-Phaung-Pyin road	0.0	174.0	174.0	Sagaing
31	Twingne-Moemeik road	0.0	74.0	74.0	Mandalay/ Shan
32	Kentung-Mongkhat-Mongyan road	0.0	117.5	117.5	Shan
33	Lasha-Mongnaung-Mongshu-Mongkaung-Tanyang-Mongye road	0.0	181.9	181.9	Shan
34	Mongnaung-Mongsan road	0.0	36.4	36.4	Shan
35	Maubin-Yaykalay-Shwetaunghmaw-Kyaikpi-Mawlmayingkyun road (including 7-mile Kyunhteik-Yondaungkyi-Taungbogyi road)	0.0	83.3	83.3	Ayeyawady
36	Mawlmayingkyun-Hlaingbon-Thitpoke-Kyunpauk-Pyinsalu road	0.0	116.5	116.5	Ayeyawady
37	Laputta-Thingankyi- Pyinsalu road	0.0	56.7	56.7	Ayeyawady
38	Laputta(Kyaukphyalay)-Thonkwa-Oaktwin-Hteiksun road	0.0	100.4	100.4	Ayeyawady
39	Bokalay-Kyeinchaung-Kadonkani road	0.0	66.4	66.4	Ayeyawady
40	Bokalay-Setsan-Htawpaing-Amar road	0.0	62.2	62.2	Ayeyawady
41	Phyapon- Kyunkadon-Dawnyein- Amar road	0.0	83.1	83.1	Ayeyawady
42	Kyunkadon-Setsan road	0.0	30.8	30.8	Ayeyawady
43	Pathein-Thaletkwa-Mawtinsyun road	0.0	154.5	154.5	Ayeyawady
44	Bokalay- Mawlmayingkyun-Kyonemangay-Wakhema-Myaungmya road	0.0	106.2	106.2	Ayeyawady
45	Kali-Mongsan-Mongshu road	0.0	109.4	109.4	Shan
46	Namsang-Mansan road	0.0	53.3	53.3	Shan
47	Kanbalu detour road)	0.0	4.6	4.6	Sagaing
Total		471.9	6,741.8	7,213.7	

Source: MOC

Table 3.8 New Road Construction (FY 2011/2012 – 2015/2016)

No.	Name of Road	Road Length (km)			Region/State
		BOT	MOC	Total	
1	Kyaukse-Pyinoowin-Moegoke road	0	213.6	213.6	Mandalay/ Shan
2	Minhla-Seinkanlant-Myochaung-Phado-Peinzaloke road	0	144.4	144.4	Bago
3	Koebin- Thagara road	0	155.1	155.1	Bago/ Magway
4	Katha-Sinkhan road	0	104.6	104.6	Kachin/ Sagaing
5	Thilon-Tapaung-Pata-Nabu-Aukbote road	0	87.3	87.3	Kayin
6	Mongpyin-Metmeng road	0	117.5	117.5	Shan
7	Mongpan-Monhta-Monhtaw road	0	104.6	104.6	Shan
8	Punnakyun-Yathedaung road	0	36.6	36.6	Rakhine
9	Kyauktaw-Platwa road	0	54.1	54.1	Chin/ Rakhine
10	Myaypon-Kantha-Kapaing road	0	14.1	14.1	Rakhine
11	Pauktaw-Minbya road	0	33.4	33.4	Rakhine
12	Tale-Pacho-Kyainglet road	0.0	59.5	59.5	Shan
13	Kyutkhaing-Tamoenye-Monsee-Tapaa road	0.0	106.2	106.2	Shan
14	Thipaw-Panlon-Namhsan road	0.0	78.1	78.1	Shan
15	Mentong-Namhsan road	0.0	59.5	59.5	Shan
16	Pathein-Ngaputaw road	0.0	33.8	33.8	Ayeyawady
17	Kyunhla-Chatthin-Kawlin road	0.0	61.2	61.2	Sagaing
18	Sisnow- Yaynanma-Kyaukpon-Kantook road	0.0	45.1	45.1	Magway
19	Moontaekhun-Kyitaung-Khawma-Naypyitaw ring road	0.0	35.4	35.4	Mandalay
20	Monywa-Kani-Minkin-Taungtwingchaung road	0.0	150.1	150.1	Sagaing
Total		0.0	1,694.2	1,694.2	

Source: MOC

3. Road Development Plans in Myanmar

FY 2016/2017 – 2020/2021

The target of the improvements during FY 2016/2017 – 2020/2021 is improvement of 4,461 km-long union highways as 3.65 m (12 feet) wide macadam road as summarized in **Table 3.9**.

Table 3.9 Priority Union Highways to be Improved (FY 2016/2017 – 2020/2021)

No.	Road Name	Road Length (km)			Region/State
		BOT	MOC	Total	
1	Hopin-Kontha-Lontong-Nyaungpin road	64.4	0.0	64.4	Kachin
2	Lawa-Karmine-Longkhin-Phakant road	0.0	69.2	69.2	Kachin
3	Minbu-Salin-Tanyaung-Seikphyu road	110.1	32.8	142.9	Magway
4	Ywamon-Zeephyukone-Kyaupantaung road	0.0	34.2	34.2	Magway/Mandalay
5	Mandalay -Moegoke road	117.5	78.9	196.3	Mandalay
6	Bagan-Nyaungoo-Myingyan road	64.8	0.0	64.8	Mandalay
7	Twantay-Kawhmu-Kungyankon road	44.9	0.0	44.9	Yangon
8	Kungyankon -Dedaye road	12.9	0.0	12.9	Yangon
9	Halinhaya-Dala- Twantay road	17.7	0.0	17.7	Yangon
10	Laputta-Myaungmya-Einme-Kyaungkon-Kyonpyaw road (Laputta-Myaungmya section)	0.0	74.4	74.4	Ayeyawady
11	Padaung-Taunggup road	164.2	0.0	164.2	Bago/Rakhine
12	Gangaw-Saingdu-Hanthawady-Netchaung road	0.0	133.6	133.6	Sagaing/Magway
13	Pyawbway-Ywamon-Natmauk-Kanpya road	0.0	147.3	147.3	Magway/Mandalay
14	Pakokkhu-Myaing road	0.0	42.2	42.2	Magway
15	Myitnge-Htonbo-Pyinoowin road	15.1	0.0	15.1	Mandalay
16	Paleik-Tadaoo road	0.0	10.9	10.9	Mandalay
17	Ann-Padekyaw-Maei road	0.0	67.0	67.0	Rakhine
18	Taunggup-Thandwe road	71.4	0.0	71.4	Rakhine
19	Phyapon-Bokalay road	0.0	31.0	31.0	Ayeyawady
20	Mudon-Myawady road	0.0	95.0	95.0	Kayin/Mon
21	Ngathaingchaung-Gwa road	79.3	0.0	79.3	Rakhine/Ayeyawady
22	Putao-Naungkahing-Machanbaw road	0.0	22.5	22.5	Kachin
23	Entrance road of Khawbude	0.0	5.8	5.8	Kachin
24	Chebwe-Sawlaw-Makyi-Welton road	0.0	144.8	144.8	Kachin
25	Phasaung-Maesenan-Nanman road	0.0	64.4	64.4	Kayah
26	Thanphuzayat-Phayathonzu road	0.0	104.0	104.0	Kayin/Mon
27	Haka-Htantalan-Sasichauk road	0.0	105.0	105.0	Chin
28	Katha-Inndaw-Mansi road	19.3	96.2	115.5	Sagaing
29	Htamathi-Leishi road	0.0	66.0	66.0	Sagaing
30	Seikphyu-Saw-Kanpalet road	0.0	138.0	138.0	Chin/Magway
31	Meikhtila-Mahlaing-Taungtha road	65.2	0.0	65.2	Mandalay
32	Maei-Peinnetaung-Yanbye road	0.0	15.1	15.1	Rakhine
33	Kanbae-Pyawbwey-Dala road	14.5	0.0	14.5	Yangon
34	Mongset-Mongpuoan-Mongpyin road	0.0	143.2	143.2	Shan
35	Maehan-Mongyay-Kaythee road	0.0	148.1	148.1	Shan
36	Theinni-Kunlon-Hopan-Mongmaw road	0.0	137.4	137.4	Shan
37	Myitkyina-Pansauk-Lido road	366.9	0.0	366.9	Kachin/ Sagaing
38	Waingmaw-Sadon-Kanpaiktee road	123.9	0.0	123.9	Kachin
39	Machanbaw-Pharukha-Naungmoon road	0.0	103.0	103.0	Kachin
40	Yapbaw- Ngalondan-Khaunglanphu road	0.0	105.4	105.4	Kachin
41	Manmin-Chibwe-Lawchaung-Htawgaw-Phimaw road	0.0	197.9	197.9	Kachin
42	Loikaw-Ponchaung-Shataw-Tatamaw road	0.0	80.3	80.3	Kayah
43	Bawlache-Ywathit-Swetpaing road	0.0	44.1	44.1	Kayah
44	Kawkayaik-Metharaw-Kokekwa road (Metharaw-Kokekwa section)	0.0	22.9	22.9	Kayin
45	Haka-Matupi road	0.0	278.2	278.2	Chin
46	Teddin-Tunzan-Kyikha road	0.0	128.7	128.7	Chin
47	Myingyan-Myittha-Yaywun road	86.7	0.0	86.7	Mandalay
48	Twantay detour	6.0	0.0	6.0	Yangon
49	Twantay-Maubin road	0.0	48.5	48.5	Yangon
Total		1,444.6	3,015.9	4,460.5	

Source: MOC

FY 2021/2022 – 2025/2026

The target of the improvements during FY 2021/2022 – 2025/2026 is improvement of 6,256 km-long international arterial roads from 7.3 m (24 feet) wide asphalt concrete road into 14.6 m (48 feet) wide asphalt concrete road.

Table 3.10 International Arterial Roads to be Improved by FY 2025/2026 (1)

No.	ASEAN	Asian Highway	Name	Road Length (km)		
				BOT	MOC	Total
1	AH-1	A-1	Myawady-Kawkeyeik-Phaan-Thahton-Phayagyi_Taunggoo	923.4	560.5	1,483.8
	AH-2	A-2	Pyinmana-Meikhtila-Mandalay-Monywa-Gangaw-Kalay-Tamu			
2	AH-2	A-2	Tachilek-Kengtung-Taunggyi- Meikhtila-Mandalay-Monywa	719.2	801.9	1,521.0
	AH-1	A-1	Gangaw-Kalay-Tamu			
3	AH-3	A-3	Kengtung-Mongla	0.0	90.1	90.1
4	AH-14	A-14	Mandalay-Lashio-Theinni-Kutkhaing-Muse road	463.9	0.0	463.9
5	AH-111	R-7	Loilin-Lesha-Pankaytu-Thipaw road	0.0	240.2	240.2
6	AH-112	-	Thahton-Mawlamyaing-Yay-Dawei-Myeik-Kawthaung road	353.5	768.7	1,122.1
7	AH-112	-	Laynha-Thai border (Khalonloi)	0.0	60.4	60.4
8	AH-113	-	Dawei- Thai border (Minthamee pass)	0.0	141.8	141.8
9	Lido road		Kanpaiktee-Sadon-Waimaw-Myitkyina-Pansauk-Lido road	490.8	0.0	490.8
Total				2,950.7	2,663.5	5,614.2

Source: MOC

Table 3.11 International Arterial Roads to be Improved by FY 2025/2026 (2)

No.		Road Name	Road Length (km)		
			BOT	MOC	Total
1	Triparite	Tamu-Bagan-Myawady road	489.6	843.9	1,333.5
2	BIMSTEC	Tamu- Gangaw- Htilin-Mandalay-Meikhtila- Taunggyi -Kengtung- Tachilek road	702.9	867.8	1,570.7
3	G.M.S	Tachilek- Kengtung-Mongla road	164.6	90.1	254.7
4	G.M.S	Lashio-Muse road	164.8	0.0	164.8
5	G.M.S	Kengtung-Loilin-Thipaw- Lashio road	55.5	601.5	657.0
Total			1,577.4	2,403.3	3,980.7

Source: MOC

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FY 2026/2027 – 2030/2031

The target of the improvements during FY 2026/2027 – 2030/2031 is improvement of 5,300.6 km-long union highways from 3.65 m (12 feet) wide macadam road into 7.3 m (24 feet) wide macadam road as summarized in **Table 3.12**.

Table 3.12 Priority Union Highways to be Improved (FY 2026/2027 – 2030/2031)

No.	Road Name	Road Length (km)			Region/State
		BOT	MOC	Total	
1	Yangon-Sittway road	0.0	486.8	486.8	Magway/Rakhine
2	Shwebo-Myitkyina road	186.9	183.9	370.8	Kachin/Sagaing
3	Monywa-Yagyi-Kalaywa road	64.4	121.7	186.1	Sagaing
4	Shwebo-Kyaukmyaung road	0.0	24.9	24.9	Sagaing
5	Letpanhla-Sintku road	8.9	0.0	8.9	Mandalay
6	Myitkyina-Sunprabon-Putao road	0.0	350.8	350.8	Bago/ Mandalay/ Yangon/ Kachin
7	Mandalay-Takaung-Bamo- Myitkyina road	96.2	186.3	282.4	Kachin/Sagaing Mandalay
8	Aungpan-Pinlaung-Moebye-Loikaw road	0.0	147.3	147.3	Kayah/Shan
9	Kalay-Phalam-Haka	0.0	185.3	185.3	Chin
10	Salin-Kanpya-Saytoketaya road (Kanpya-Saytoketaya)	0.0	34.6	34.6	Magway
11	Hanmyintmo-Myogyi-Ywangan-Aungpan road	0.0	127.3	127.3	Mandalay/Shan
12	Namsan-Moene-Linkhe-Mongpan-Tahsan-Mongtung-Mongset-Tachileck road	0.0	404.5	404.5	Shan
13	Ayethaya-Nyaungshwe-Mongthauk-Nangpan-Tonghone-Pinlaung road	0.0	92.5	92.5	Shan
14	Shwenyaung-Yetsauk-Eintaw-Kyaukgu-Naungcho road	57.9	175.2	233.2	Shan
15	Theinni-Kunlon-Chinshwehaw road	106.2	0.0	106.2	Shan
16	Tapa-Tashehtan-Lukkaing road	0.0	19.3	19.3	Shan
17	Mandalay-Moegoke-Moemeik-Mabein-Sioo road (Konwut- Sioo section)	0.0	142.8	142.8	Shan
18	Mandalay-Lashio-Bamo- Myitkyina road	668.9	102.4	771.3	Kachin/Mandalay/Shan
19	Monywa-Ayataw-Shwebo shortcut road	0.0	70.8	70.8	Sagaing
20	Koepin-Sanmagyi-Thityakauk road	31.2	0.0	31.2	Magway
21	Thityakauk- =Malun-Minhla road (Malun bridge approach road)	0.0	32.2	32.2	Magway
22	Naypyitaw-Kintha-Kokwae-Laneli-Pinlaung road	0.0	106.8	106.8	Mandalay/Shan
23	Letpanhla-Sinkuu	8.9	0.0	8.9	Mandalay
24	The approach road of Yadanathienga Bridge (Singu side bank)	0.0	5.4	5.4	Mandalay
25	Thandwe-Gwa road	0.0	133.6	133.6	Rakhine
26	Yangon-Kyaukphyu road (Taunggup-Maei-Kyaukphyu road)	0.0	192.9	192.9	Rakhine/Yangon
27	Aungpan-Pindaya-Yetsauk road	0.0	90.1	90.1	Shan
28	Hinthada-Sonkon-Myanaung road	0.0	105.0	105.0	Ayeyawady
29	Kyeinpainse-Setkaw-Danuphu-Zalun road	44.1	0.0	44.1	Ayeyawady
30	Taunggoo-Laiktho-Yado-Loikaw-Hopone road	0.0	334.7	334.7	Kayah/Kayin/Bago/Shan
31	Yayoo-Kalawa road	0.0	169.8	169.8	Sagaing
Total		1,273.4	4,027.2	5,300.6	

Source: MOC

3.2 National Transport Master Plan

The National Transport Master Plan (NTMP) was formulated by technical assistance of JICA and approved by the Cabinet as the national development plan for the transport sector on 4th January 2014. The objectives of the NTMP are designed to provide guidance for a long-term investment program for the transport sector in general that will help the Government to achieve its economic growth targets by 2030. In addition, this Master Plan provides the guidelines that are adaptable to other industrial sectors for promotion of private investment, to assist the investment planning and decision making for a variety of transport sector related investment projects.

(1) Vision and Policy Statements

The National Transport Vision is ***“to develop an efficient, modern, safe, and environmentally-friendly transportation system in a coordinated and sustainable manner that embraces all transport modes for the benefit of the country and people of Myanmar.”*** To this development vision, the following transport policies are formulated:

- | | |
|--|--|
| Better Planning and Coordination | <ul style="list-style-type: none"> • To prepare and periodically update the transport statistics for better planning work; • To establish explicit and systematic coordination mechanisms among transport-related stakeholders and further strengthen these in order to achieve higher investment efficiency; • To inform Myanmar’s citizens and international societies of future transport development plans and corresponding actions in order to encourage the private sector’s investment and to attract investors more widely; • To enable community/public participation in transport planning and project design, as well as in environmental and social impact assessments; and • To strengthen and increase human resources in the transport planning and administration sector in order to monitor, review and update integrated transport policies, strategies, and corresponding projects and actions needed to meet changing domestic and international transport needs. |
| Infrastructure Development | <ul style="list-style-type: none"> • To maintain and improve the existing transport infrastructure, and to extend them in order to fully support increasing economic activities and meet growing public and social transport needs; • To maximize the use of transport capabilities in the road, rail, air, maritime and inland waterway sectors to save costs in the transport infrastructure sector and achieve higher investment efficiencies; • To strengthen connectivity along the designated development corridors and contribute to urban and regional development along the corridors. • To ensure connectivity of higher capacity and faster speeds between major transport hubs and growth centers, providing robust transport infrastructure and reliable and cost-effective services. • To upgrade trunk transport infrastructure and services to international standards, and conforming ASEAN transport agreements; • To develop integrated domestic and international transportation networks in order to facilitate seamless multi-modal transport services; and |
| Better Environment, Safety and Security | <ul style="list-style-type: none"> • To ensure smooth and secured rural and cross-border transport systems in order to contribute toward • To encourage the use of environmentally-friendly transport systems (e.g. less noise, less vibration, less emission gases, and fuel-efficient), especially in built-up areas, including the progressive use of modern fuel-efficient (low carbon) technologies in the transport industry; • To improve traffic safety significantly and reduce the growing number of traffic accidents on roads as soon as possible; • To raise awareness in the population of the need to achieve environmentally friendly and safer transport behaviors; • To upgrade the level of safety and security in transporting fuels and other hazardous goods along designated corridors; • To develop all-weather and natural disaster preventive land transportation by programmed upgrading and maintenance of existing railway, road, bridge and drainage structures; • To improve the level of security in the transport sector in order to ensure cross-border trade and other economic activities with neighboring countries; and • To monitor and enforce national standards for security, safety and integrated emergency planning for all transport modes and operations. |
| Institutional and Regulatory Development: | <ul style="list-style-type: none"> • To clearly define the role of each transport related agency in terms of assets (land and infrastructure) ownership, planning, development, operation, and maintenance; • To remove barriers and update regulations and/or customs to international standards to enhance private sector’s investment in transport sector infrastructure and service; • To plan and define the role of the private sector in investing, operating and maintaining transport infrastructure; • To provide accountable and fair investment opportunities for domestic and international investors in the transport industry by updating necessary regulatory framework (e.g. PPP law, etc.); • To improve efficiency of State Owned Enterprise by reforming organizational structure and with Public-Private Partnership (PPP); • To improve the knowledge and skills of civil servants and further increase human resources in transport planning, administration and management sector to achieve higher levels of transport system development; and |

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- To adhere to international conventions, acts, laws, rules and regulations with respect to the transport sector.
- Reasonable transport pricing and secured budgeting**
- To implement a “Market-oriented Mechanism” that provides transport infrastructure and services, and further enhances efficiencies in the transport business and service;
 - To apply a “Beneficially Pay Principle” to the transport market and industry;
 - To apply “Affordable Pricing” to improve transport accessibility for all citizens; and
 - To secure the needed funds in the annual budget for transport infrastructure development.

To address the cross-sector issues, the following strategic objectives and corresponding strategies and actions are proposed, as follows:

- **T-01: Statistics:** Develop an initial mode of transport database, including databases for: a) road and road traffic (vehicle, passenger, and freight movement), b) rail (rail asset inventory, track condition, operation, passenger, and freight movement, etc.), c) maritime and inland water (vessel statistics, passenger and cargo movement data, maritime accidents, etc.), and d) civil aviation (air craft data, passenger and cargo movement, business performance of air lines, etc.) by the end of 2015.
- **T-02: Enhanced Coordination Mechanism:** Establish a high-level planning coordination mechanism by the end of 2014 to implement the Myanmar National Transport Master Plan (MYT-Plan), using 2015 as the base year.
- **T-03: Participatory Planning:** Establish a mechanism for people and communities to join in the planning process.
- **T-04: Capacity building in the public sector:** Increase the number of high level experts in transport planning administration and management for better management of the transport sector.
- **T-05: Human Resources Development:** Increase the number of skilled people in the transport sector.
- **T-06: Enhanced environmental management:** Increase public awareness of transport industry work to improve environmental sustainability, in the context of the transport system.
- **T-07: Sustainable funding:** Secure the needed funding to meet annual budget requirements and allocate to MOT, MORT, MOC and region/state government to improve and develop infrastructure.
- **T-08: Research and Development:** Develop appropriate and cost-effective infrastructure development technologies, based on environmental and local conditions.

(2) Strategic Objectives of Road Sector

In line with the above vision statement, policy statement and strategic objective, Road Transport Sector Vision was also formulated as *“Develop all-weather and safe road transport infrastructure in order to fulfill social and economic transport needs of the nation in a coordinated manner with other modes of transport; and build robust foundation for land transport industries in terms of road infrastructure and regulatory framework; and achieve environmentally-friendly land transport system development throughout the country.”*

In order to address the identified sector issues, the following strategic objectives are suggested as follows:

- **RD-01:** Update and establish safe, environmentally-friendly and modern motorways, highways and bridge designs to international standards.
- **RD-02:** Plan and build a hierarchical union highway and motorway network to support regional development along the designated transport corridors and major transport nodes, conforming to the ASEAN transport agreement.
- **RD-03:** Develop an all-weather and disaster-free trunk road network along designated transport corridors.
- **RD-04:** Develop cost-effective asset management measures and mechanisms.
- **RD-05:** Reduce the number of road accidents to the level of advanced countries as soon as possible.
- **RD-06:** Establish clear institutional and organizational frameworks in the road transport planning administration and management sector, establishing lines of demarcation between the central government and the region / state governments.
- **RD-07:** Maintain and further encourage the participation of the private sector in developing road transport infrastructure and providing transport services.
- **RD-08:** Improve and enhance the road and land transport industry to increase business performance.

Table 3.13 Strategic Objectives and Corresponding Strategies and Actions (NTMP)

Sector Strategy	Action
<p>RD-01-1: Urgent design standard updates.</p> <p>The existing design standards used in the road and bridge sector are reviewed by the end of year 2014, and consequently updated / improved with technical support from advanced countries.</p>	<ul style="list-style-type: none"> • Formulate a special task force in PW to review the existing road and bridge design standards. • Invite specialists / senior engineers from advanced countries to support the task force. • Update existing standards before starting a series of major works in the road and bridge sector. • Establish a new road classification system urgently, including a new numbering system proposed by MYT-Plan, and corresponding geometric standards. • Finalize a series of road designs, construction, and maintenance manuals. • Establish a Road Safety Audit System (MRT).
<p>RD-02-1: Priority trunk road network development.</p> <p>Improve trunk road networks along the designated priority development corridors: the Central North-South Corridor (Yangon – Nay Pyi Taw – Mandalay), the East-West Corridor (Yangon – Hpa-An- Myawaddy), the Northern Corridor (Mandalay – Muse) and the Western North-South Corridor (Yangon – Pyay – Magway).</p>	<p>Action RD-02-1a: Effective use of the expressway</p> <ul style="list-style-type: none"> • Allow heavy vehicles (e.g. trucks) to use the expressway before 2018, based on the demand forecast. • Provide more opportunities for drivers to stop and take rests to reduce accidents. • Add more service areas along the expressway for the convenience of expressway users. <p>Action RD-02-1b: Improvement of the priority union highways</p> <ul style="list-style-type: none"> • Improve infrastructure (e.g. surface condition improvement, widening, etc.) on the union highway(s) along the priority corridors (e.g. Thaton – Eindu – Kawkaeik – Myawaddy Road, etc.). • Introduce the “Michi-no-eki” (roadside service areas) along the union highways to provide residents with business opportunities and road users (e.g. travelers) with opportunities to interact with local people and understand their products. • Designate “heavy loaded highways” and improve these to appropriate standards, to support major freight movement that conforms to ASEAN Highway standards.
<p>RD-02-2: Strengthen connectivity between major traffic generators.</p> <p>Provide a high-speed and high-capacity road network and services to/from major dry ports, sea and river ports, and airports.</p>	<ul style="list-style-type: none"> • Extend the existing expressway to connect international airports to ports, and between major inland river ports (e.g. Yangon – Ywathargyi - Thilawa Port Expressway, Yangon City - Hanthawaddy Airport Expressway, etc.) (PW/MOC). • Develop outer ring roads along designated urban growth boundaries of major growth centres, such as Yangon and Mandalay (MOC/YCDC/MCDC). • Relocate the existing truck terminal near the Bayint Naung bridge to Ywathargyi, East Dagon township, together with relocation of MR facilities and development of a rail-based ICD (YCDC, MR/MORT).
<p>RD-02-3: Develop a high capacity road network and support regional development projects such as SEZs and Industrial Zones.</p>	<ul style="list-style-type: none"> • Support industrial development projects by providing direct and nearby access to highway on-and off ramp and expressway interchanges.
<p>RD-02-4: Develop cross border transport facilities and improve access to these facilities.</p>	<ul style="list-style-type: none"> • Improve access roads to international cross borders at Myawaddy and Three Pagodas Pass. • Provide a single window service at international cross border points. • Extend operational hours of cross border services.
<p>RD-02-5: Gradually upgrade the existing road infrastructure to conform to ASEAN transport agreements.</p>	<ul style="list-style-type: none"> • Complete a total of 3,000 km of ASEAN Highway Network in Myanmar (e.g. AH-1: Yangon- Mandalay- Tamu, AH-2: Mandalay-Taunggyi-Tachileik) by the year 2030. • Install road signs and a route numbering system that are compatible with the ASEAN highway network. • Identify freight movement patterns and volumes via ASEAN dry port network (e.g. dry ports in Yangon, Mandalay, Muse, Pyay, Monywa, Mawlamyine, Bago, and Tamu) and develop corresponding facilities. • Develop an ICT and ITS master plan and introduce advanced technology to achieve higher efficiency in use of road infrastructure. • Fully implement ASEAN Framework Agreements on Transport Facilitation.
<p>RD-02-6: Improve regional, state and township roads to access tourist attraction sites, such as Bagan and Taunggyi.</p>	<ul style="list-style-type: none"> • MOC and local governments to designate and improve major access roads to tourist attraction areas such as Bagan, Pyin Oo Lwin, Inle Lake, Kyaiktiyo. • Install road signs in English and Myanmar language for visitors. • Local governments to improve local access roads to tourist attraction areas, such as along the beach in Rakhine State.
<p>RD-03-1: The existing road infrastructure is not engineered to function in all weather conditions and is prone to damage from natural disasters. Economic growth in development corridors requires</p>	<ul style="list-style-type: none"> • Prepare a hazard map and identify road networks and other transport facilities that are likely to be damaged by natural disasters. • Implement slope protection measures in landslide prone road sections. • Implement measures to avoid flooding along the designated coarse ways. • Carry out a series of disaster-resistant (cyclone and earthquake-resistant) improvements of existing bridges.

3. Road Development Plans in Myanmar

Sector Strategy	Action
efficient, consistent and safe service from connected infrastructure.	<ul style="list-style-type: none"> • Develop an emergency transport plan, to be implemented during emergencies, such as a large-scale earthquake.
<p>RD-04-1: Properly design a maintenance mechanism for the existing road transport infrastructure and minimize the life cycle cost.</p>	<ul style="list-style-type: none"> • Carry out technical inspection of the existing road and bridge infrastructure and develop a database / inventory. • Develop an asset management system, such as HDM, and a maintenance program. • Implement preventive (proactive) measures before undertaking full-scale replacement or rehabilitation works. • Conduct Research and Development (R&D) on cost-effective maintenance technologies. • Provide trainings with regard to inspection, evaluation and implementation of the maintenance for transport infrastructures. • Enforce regulations against overloading trucks.
<p>RD-05-1: Controlled use of the existing expressway In order to reduce the number of traffic accidents on the expressways, use of these roads should be controlled (limited) to permit only lower levels of road class users, until full-scale improvements can be completed.</p>	<ul style="list-style-type: none"> • Carry out a comprehensive road accident study on the expressway. • Install necessary equipment to control behavior of drivers, such as speed limit notification devices. • Provide crossing facilities for domestic animals.
<p>RD-05-2: Upgrade the existing expressway Upgrade the existing expressway to international motorway standards and encourage economic activities that reduce the number of fatal accidents.</p>	<ul style="list-style-type: none"> • Establish a special task force team to improve safety on expressways. • Inspect road conditions and identify critical locations/sections for improvement. • Rehabilitate/replace expressway facilities to meet international motorway standards.
<p>RD-05-3: Upgrade the union highway The union highways require urgent upgrading as industry standards are difficult to apply in some cases, due to physical constraints. However, it is suggested that the Government follow the improved design standard as much as possible.</p>	<ul style="list-style-type: none"> • Establish a special safety improvement task force team for union highways. • Urgently implement safety measures (e.g. installation of guardrails, lighting, road signs, weight bridges, segregated pedestrian crossings, traffic signal installation at major intersections, etc.) at critical road sections. • Develop highway design standards and a design manual.
<p>RD-05-4: Safety Improvement Plan and Programs Develop a long-term plan for safety improvement in the road transport sector.</p>	<ul style="list-style-type: none"> • Develop a Road Transport Safety Improvement Master Plan. • Develop National Road Safety Action Plan (2014 – 2020). • Review and revise the existing laws/acts/regulations with regard to vehicle inspection/registration and introduce an advanced vehicle inspection system. • Develop Road Safety Audit System. • Introduce Intelligent Transport System (ITS). • Upgrade public transport.
<p>RD-05-5: Public awareness and capacity development Increase public awareness regarding road safety improvements and increase the capacity of experts/specialists in the field of road safety improvement.</p>	<ul style="list-style-type: none"> • Develop and disseminate road transport safety guidelines for bus and truck operators, drivers, pupil and students. • Establish a Road Traffic Accident Research Center. • Increase the number of road transport safety specialists.
<p>RD-06-1: Decentralization of role of Public Works PW region/state offices should be strengthened in terms of their institutional, organization and technical capacity and transformed into part of the region/state government body.</p>	<ul style="list-style-type: none"> • Conduct a comprehensive study on possible decentralization of road planning, administration, and management roles. • Develop a road and road traffic database of region/state roads. • Develop a fully computerized communication (data transfer) system between the central government (PW) and region/state PW offices. • Increase road planning, administration and management capacity of region/state offices by providing training to central and local staff.
<p>RD-07-1: Promote fair and accountable business opportunities with the private sector by inviting them to partner on road infrastructure development, corresponding maintenance work and related service provision.</p>	<ul style="list-style-type: none"> • Establish a special PW task force for toll road and bridge business operation. • Review the existing procurement system and BOT contract documents, including specifications for road maintenance, and identify technical issues to be addressed. • Update or improve the existing standard contract form for road operation and maintenance, used under the BOT scheme. • Build a typical business model for a toll road construction project, using a PPP scheme. • Provide business opportunities for road construction, operation, and maintenance to wider range of business entities through deregulation.

Sector Strategy	Action
RD-08-1: Core road transport business improvement	<ul style="list-style-type: none"> • Establishment of a special business unit in MOC for public transport business development, based on YUTRA. • Establish a JV or a similar partnership with the private sector (local and foreign) for both freight and passenger transportation at an initial stage, which can be transformed to a company (corporatization) and a Government Linked Company (GLC), with a phased approach.
RD-08-2: Non-road transport business improvement Encourage effective use of road transport opportunities for other types of business such as service areas and michi-no-eki and strategic use of lands owned by MOC.	<ul style="list-style-type: none"> • Establish a special business unit in MOC for studying and implementing a series of non-road transport businesses, using road transport facilities and other MOC assets. • MOC to run the real estate business jointly with private sector. • Road Transport (MRT) work on the non-road transport business development jointly.

Source: JICA. 2014. The Survey Program for the National Transport Development Plan.

(3) Corridor Development Strategy

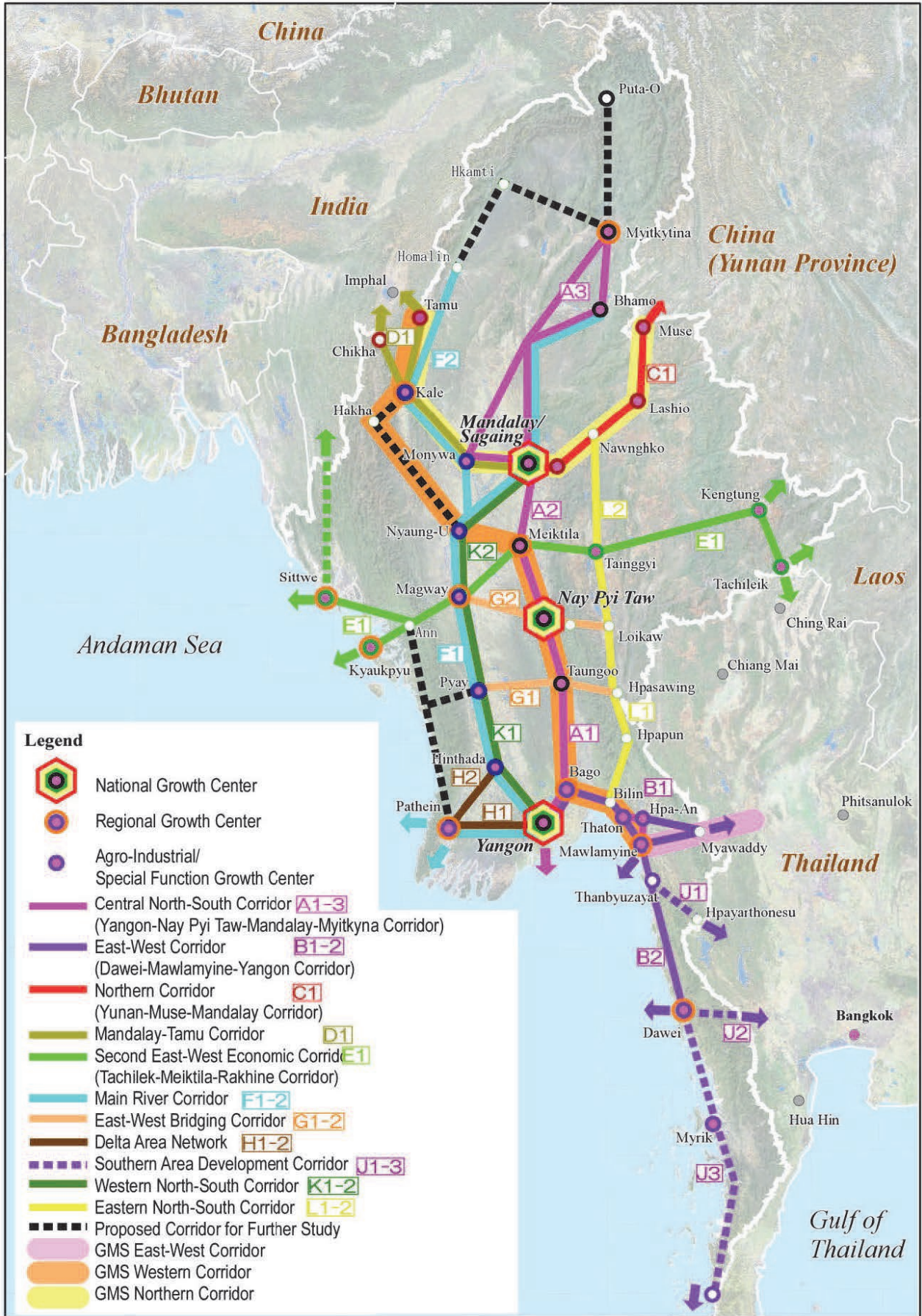
The key development strategy adopted for the preparation of NTMP was the corridor-based transport infrastructure development strategy. This strategy is basically in line with the corridor development strategy prepared and presented by the Asian Development Bank in 2010 for the Greater Mekong Sub-region Corridor Development Plans and also the regional transport development strategy of ASEAN, Brunei Action Plan (ASEAN Strategic Transport Plan) in 2010. The advantages of the proposed corridor development in the NTMP are to:

- Provide a spatial focus to transport improvement, connecting growth centers and catalyzing the development of surrounding locations;
- Open up many opportunities for various types of investment;
- Promote synergy and enhance the impact on regional economy;
- Provide a mechanism for prioritizing and coordinating investments; and
- Generate tangible demonstration effects.

This corridor development approach mainly for the GMS countries in the region was adapted to both the transport sector development of Myanmar and the development of the logistics system in Myanmar as well. **Figure 3.1** shows the strategic linkages (corridors) of the transport development in the NTMP. The priority development corridors identified by NTMP include:

- A: Central North-South Corridor (Yangon – Nay Pyi Taw – Mandalay)
- B: East-West Corridor (Yangon – Hpa An- Myawaddy)
- C: Northern Corridor (Mandalay – Muse)
- K: Western North-South Corridor (Yangon – Pyay – Magway)
- H: Delta Area Network

3. Road Development Plans in Myanmar



Source: JICA. 2014. The Survey Program for the National Transport Development Plan.

Figure 3.1 Priority Development Corridors (NTMP)

(4) Proposed Infrastructure Development

The NTMP proposed the transport infrastructure projects based on the development strategy for each corridor, as summarized in **Table 3.14** and **Table 3.15**.

Table 3.14 Proposed Major Project Component (NTMP)

Development Corridor	Proposed Major Project Component
A: Central North-South Corridor	<ul style="list-style-type: none"> • Provide high-speed, high capacity, safe and reliable transport network and services as the primary corridor element • Enable multi-modal transport • Make efficient use of existing transport facilities • Segregate inter- and intra-city traffic
B: East-West Corridor	<ul style="list-style-type: none"> • Improve connectivity (land transport, freight movement) between Myanmar and Thailand • Contribute to the coastal development between Yangon and Mawlamyine • Integrate the corridor with the new transport hub (Hanthawady International Airport) • Use the existing transport facilities efficiently • Provide safe/reliable transport network/service, particularly for freight transport
C: Northern Corridor	<ul style="list-style-type: none"> • Improve connectivity (land transport, freight movement) between Myanmar and Yunnan Province • Contribute to the industrial development in Muse, Lashio, Mandalay / Sagain area • Integrate the corridor with the new transport hub (Mandalay and Muse Dry port) • Use the existing transport facilities efficiently • Provide safe/reliable transport network/service, particularly for freight transport.
K: Western North-South Corridor	<ul style="list-style-type: none"> • Provide high-speed, high capacity, safe and reliable transport network and services as the primary corridor element • Alternative routes for the central north-south corridor (to form two primary elements in the North-South network) • Enable multi-modal transport • Make efficient use of the existing transport facilities • Segregate inter- and intra-city traffic
H: Delta Area Network	<ul style="list-style-type: none"> • Provide a safe and reliable transport network and related services, as the primary corridor element • Enable intermodal-modal transport between water and land transport • Make efficient use of existing water transport routes • IWT to play a vital role in providing the water transport services

Source: JICA. 2014. The Survey Program for the National Transport Development Plan.

3. Road Development Plans in Myanmar

Table 3.15 Proposed Priority Road Projects (NTMP)

Sector Strategy	Project	Time Frame			Project Cost (Bil. MMK)
		Short	Mid	Long	
A: Central North-South Corridor	R007 Shwebo – Myitkyina Road		✓		462.0
	R009a Bago – Mandalay Road		✓		880.0
	R009b Yangon (from toll gate) - Bago Road		✓		84.0
	R013 Mandalay – Thabeikkyin – Tagaung – Bhamo Road		✓		274.0
	R027 2 bridges on Yangon-Mandalay Road	✓			10.0
	R041 Yangon - Mandalay Expressway	✓			676.0
	R042 Yangon City - Thilawa Port Expressway	✓			243.0
	R043 Yangon City - Hanthawaddy - Existing Expressway		✓		388.0
	R044 Mandalay Circular Expressway		✓		340.0
B: East-West Corridor	R001 Thaton – Eindu – Kawkareik – Myawaddy Road	✓			192.0
	R003 Thanbyuzayat – Dawei – Myeik – Kawthonng Road	✓			907.0
	R016 Payagyi – Mawlamyaine - Thanbuzayat Road		✓		393.0
	R021 Gyaing (Kawkareik) Bridge	✓			21.0
	R024 Don Tha Mi and Naung Lon Bridge	✓			16.0
	R025 Gyaing (Zarthapyin) Bridge	✓			34.0
	R026 Attran Bridge	✓			17.0
	R038 Thanlwin (Chaungstone) Bridge			✓	23.0
	R039 Chaungnitkwa Bridge		✓		14.0
	R042 Yangon City - Thilawa Port Expressway	✓			243.0
	R043 Yangon City - Hanthawaddy - Existing Expressway		✓		388.0
C: Northern Corridor	R012 Mandalay – Lashio – Muse Road		✓		440.0
	R033 New Goat twin Viaduct		✓		35.0
K: Western North-South Corridor	R010 Yangon – Pyay - Mandalay Road		✓		1,139.0
	R011 Monywa – Pathein Road		✓		700.0
H: Delta Area Network	R011 Monywa – Pathein Road		✓		700.0
	R018 Yangon – Pathein Road		✓		124.0
	R028 Hinthata Bridge	✓			141.0
	R032 Hlaing River Bridge		✓		58.0
	R037 Thetkal Thoung Bridge		✓		29.0
D: Mandalay - Tamu Corridor	R006 Monywa - Pale - Gangaw – Kalaymyo Road		✓		302.0
	R011 Monywa – Pathein Road		✓		700.0
	R017 Monywa – Yargyi – Kalewa Road		✓		181.0
	R029 Yaw Chaung (Yapyar) Bridge		✓		39.0
	R030 Yaw Chaung (Ohn Taw) Bridge		✓		29.0
	R036 Chindwin (Kalaywa) Bridge		✓		23.0
E: Second East - West Corridor	R004 Taunggyi – Loilim – Kyaington Road	✓			658.0
	R005 Kyaington – Mongla Road	✓			90.0
	R008 Minbu – Ann – Kyauktaw – Sittwe Road		✓		463.0
G: East - West Bridging Corridor	R048 Loikaw - Magway Road			✓	363.0
	R049 Hapasawing - Pyay Road			✓	283.0
J: Southern Area Development Corridor	R002 Three Pagoda Pass	✓			101.0
	R003 Thanbyuzayat – Dawei – Myeik – Kawthonng Road	✓			907.0
	R015 Dawei – Phunamron Road			✓	128.0
	R020 Tanintharyi – Mawtaung Road			✓	107.0
	R034 Tha Mouk Bridge			✓	14.0
L: Eastern North - South Corridor	R014 Thibaw – Loilem Road			✓	232.0
	R019 Taunggyi – Loikaw – Hpapun – Pha an Road		✓		660.0

Source: JICA. 2014. The Survey Program for the National Transport Development Plan.

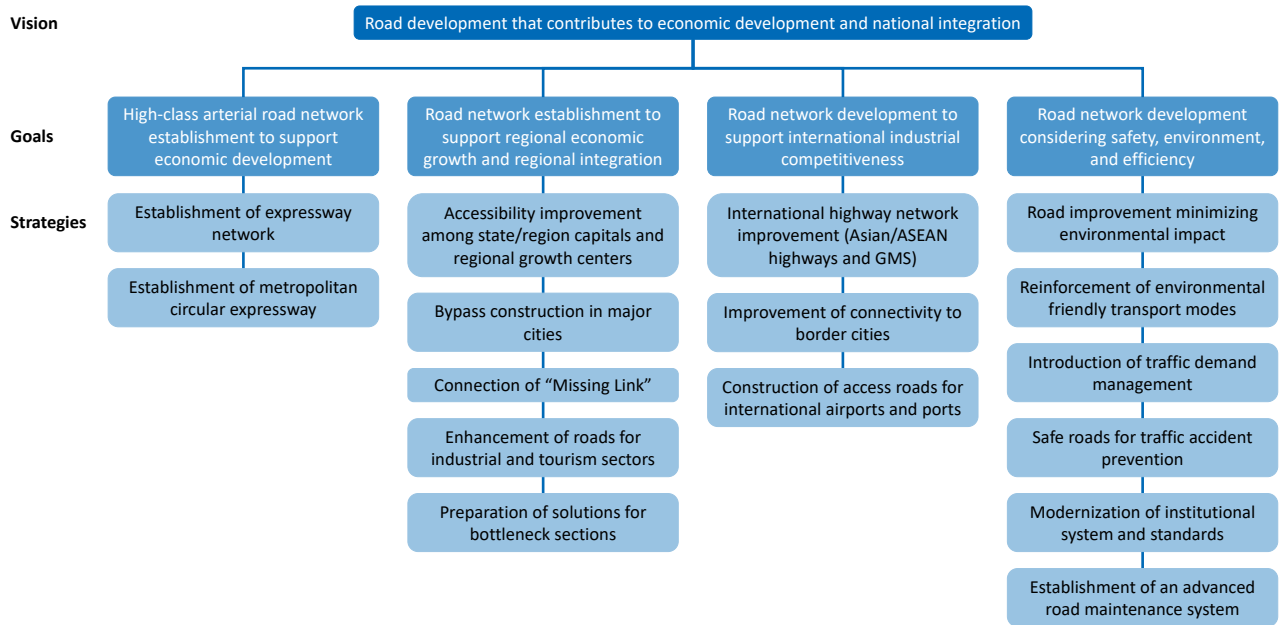


Source: JICA Study Team based on the Survey Program for the National Transport Development Plan (JICA, 2014).

Figure 3.2 Proposed Priority Road Projects (NTMP)

3.3 Master Plan for Arterial Road Network Development

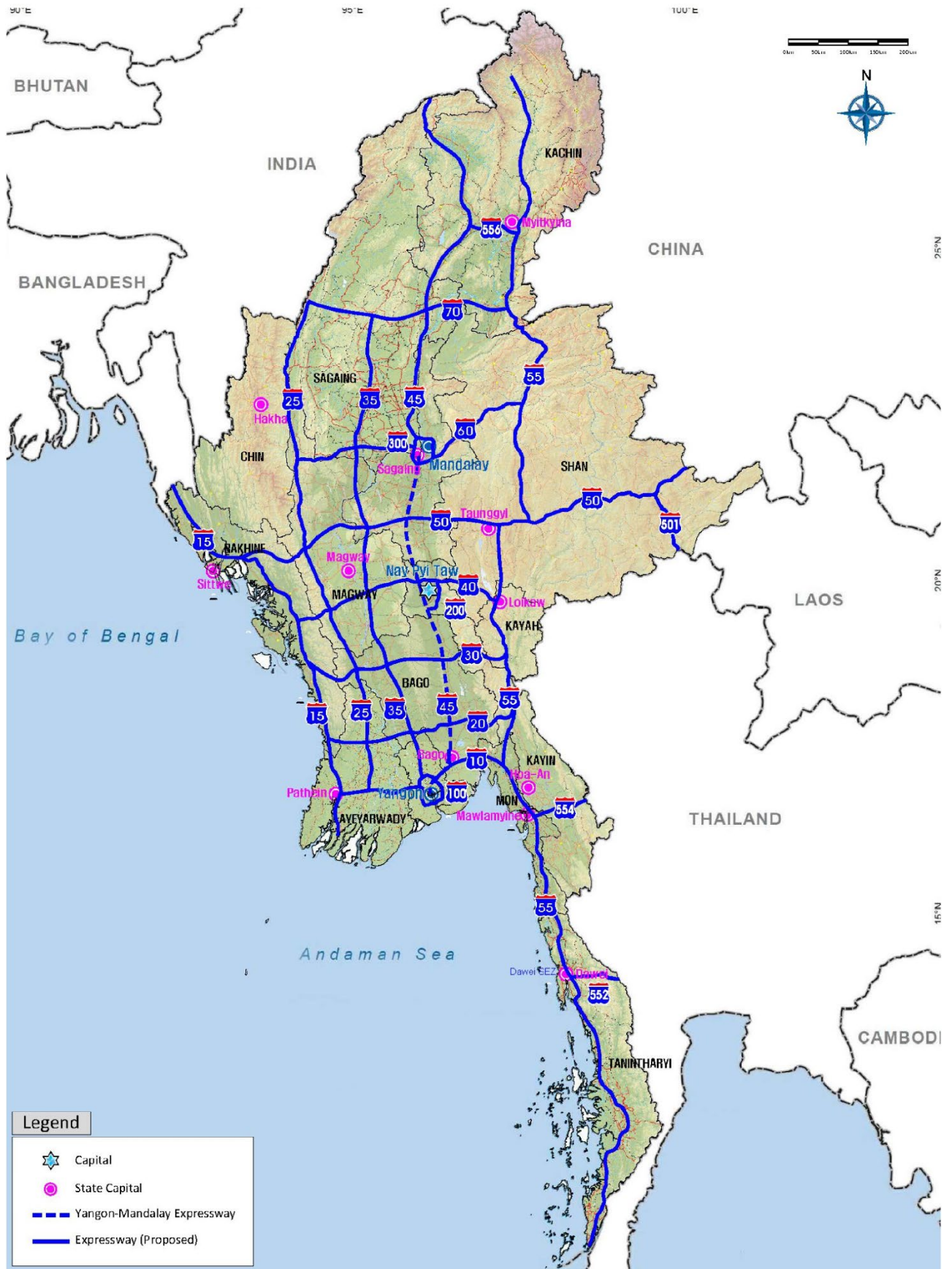
Korea International Cooperation Agency (KOICA) provided a technical assistance for formulation of the Master Plan for arterial road network development in Myanmar with the target year of 2035. The study was conducted from July 2013 until July 2015 and the master plan (KOICA MP) and feasibility study reports were prepared. The master plan recommended the development policy summarized in **Figure 3.3**.



Source: KOICA. 2015. Master Plan for Arterial Road Network Development in Myanmar.

Figure 3.3 Arterial Road Development Policy (KOICA MP)

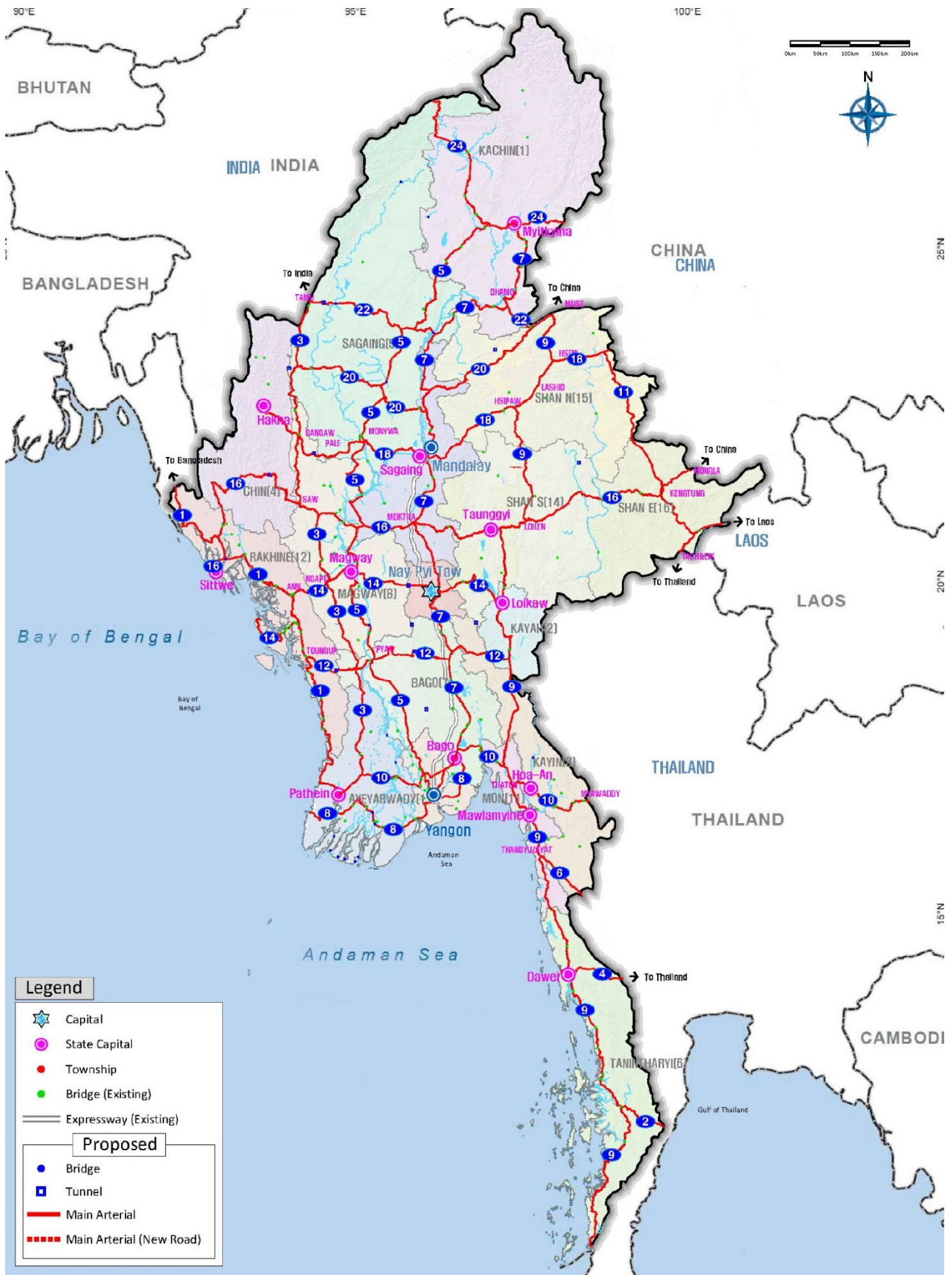
The master plan proposed the development of arterial road network by construction of 3,254 km-long new expressways and improvement of over 10,000 km-long arterial roads within 20 years but it plan seems too ambitious to implement the plan in consideration of the financial situation of Myanmar. Therefore, it would be necessary to review the plan from realistic point of view.



Source: KOICA. 2015. Master Plan for Arterial Road Network Development in Myanmar.

Figure 3.4 Proposed Expressway Network (KOICA MP)

3. Road Development Plans in Myanmar



Source: KOICA. 2015. Master Plan for Arterial Road Network Development in Myanmar.

Figure 3.5 Proposed Arterial Road Network (KOICA MP)

3.4 Myanmar Transport Sector Policy Note

Since 2010, the Government of Myanmar has dedicated more resources into road widening. However, widening is often carried out without changing the alignment, and often without improving the existing pavement. This gradual improvement strategy is low-cost and generally efficient, but tends to spread resources and does not raise the quality of the roads to modern standards. At some point, it needs to be abandoned to provide for better alignments and pavement strength.

Looking ahead, there is little doubt that Myanmar's road network needs modernization. In the long term, most of the trunk network should be brought to Class II-IV standards with asphalt concrete surfacing, following better alignments in hilly areas. However, very few links currently have sufficient traffic to justify such high standards, meaning that resources would be poorly used if spent without prioritization criteria. The issue is what should come first and what can be postponed to a later time when traffic has picked up and more resources are available.

In these regards, the ADB's Myanmar Transport Sector Policy Note provided some priority principles for trunk road development in Myanmar as an implementable investment plan in terms of financial capability of the Government of Myanmar.

(1) Pavement Improvement and Maintenance

The ADB asset management technical assistance (TA8327) suggested that the threshold for paving roads was around 200 AADT and the threshold for using asphalt concrete rather than penetration macadam was about 1,000 AADT. In the medium term, the proposed basic strategies that minimize the long-term life-cycle costs and optimize the use of MOC resources are summarized in **Table 3.16**.

Table 3.16 Proposed Road Maintenance and Improvement Strategy (MTSPN)

Priority	Strategies
High Priority	<ul style="list-style-type: none"> Roads in poor condition with high traffic (more than 1,000 vehicles per day) should be rehabilitated, and if these currently are paved with penetration macadam, the surface should be improved to asphalt concrete. After rehabilitation, these should receive periodic maintenance. Roads still in fair condition with high traffic should receive preventive asphalt overlays (at IRI 4 for traffic above 2,500 vehicles per day, at IRI 6 for traffic between 1,000 and 2,500 vehicles per day). Penetration macadam roads in very poor condition with medium traffic (500–1,000 vehicles per day) should be rehabilitated, but keeping their current surface. Unsealed roads reaching traffic of 500 vehicles per day should be paved.
Medium Priority	<ul style="list-style-type: none"> Periodic maintenance of medium traffic bituminous roads (500–1,000 AADT) in poor condition. Rehabilitation of low traffic bituminous roads (200–500 AADT) in very poor condition. Periodic maintenance of unsealed medium traffic roads (200–500 vehicles/day).
Low Priority	<ul style="list-style-type: none"> Any significant work on roads with less than 50 AADT except routine maintenance. Periodic maintenance of medium traffic bituminous roads (200–500 AADT) Rehabilitation of low traffic bituminous roads (50–200 AADT). Periodic maintenance of unsealed low traffic roads (50–200 AADT).

Source: ADB. 2016. Myanmar Transport Sector Policy Note: Trunk Roads.

If applied consistently over the next 5 years (2016–2020), this strategy would require MOC to spend about US\$ 1.45 billion over 5 years (US\$ 280 million/year) for the periodic maintenance and pavement improvements of about 11,600 km roads. Within 5 years, all pavements of roads hosting high volumes of traffic should receive periodic maintenance and rehabilitation.

(2) Widening Requirements

ADB recommended that about 1,550 km roads require widening to accommodate current traffic and 8% of the roads have reached traffic levels that exceed capacity. As traffic grows, the share of trunk roads that requires widening will rise. Within the next 10 years, an additional 9% of the paved road network (1,900 km) would likely require widening, assuming a 5% traffic growth rate.

(3) Major Improvements

As the National Transport Master Plan (2015-2030) recommended, the following major investment needs were reiterated by the Transport Sector Policy:

- Improvement of Yangon–Mandalay Expressway with the purpose being to allow trucks
- Improvement of GMS North Road Corridor to China
- Improvement of Road Corridor to Thailand

3. Road Development Plans in Myanmar

(4) Short- to Medium-Term Investment Priorities

This policy note suggested that economic considerations in short- to medium-term should dominate decision-making given the gap between needs and resources and the need to support accelerated national economic growth. Under a strategy to use road investments to support economic growth, this policy note suggested (i) investments should, in the medium term, be concentrated on the road sections with the highest traffic; (ii) standards should be based on the traffic levels; and (iii) selection of upgrading, rehabilitation, and even periodic maintenance works should be primarily based on economic returns. The proposed operational priorities are summarized in **Table 3.17**.

Table 3.17 Proposed Operational Priorities (MTSPN)

Operational Priority	Strategies
Prioritize the upgrading to modern standards of roads with very high traffic levels that can foster economic growth, over investments that mainly contribute to national integration.	<ul style="list-style-type: none"> Roads with the highest traffic levels should be rehabilitated or reconstructed as needed, paved with asphalt concrete, and where required, alignments should be improved. Standards should initially remain moderate. The widening to four lanes or more seems unnecessary given the volumes of traffic on the network except around a few urban areas. Priority segments would be <ul style="list-style-type: none"> the Yangon–Mandalay corridor (improvement of the expressway and its opening for trucks) the GMS Northern Corridor between Mandalay and Muse (options for improvement of the alignment and strengthening of the pavement should be analyzed), and the GMS corridor between Myawaddy and its connection with the Yangon–Mandalay corridor (improvement to international corridor standards with better alignments, and the potential upgrade to four lanes of the section between Payagyi and Thaton). This program would initially concern about 2,000 km of road and expressway that already have traffic levels of 2,000 or more vehicles/day, potentially increasing to 6,000 km within 15 years. The construction of short segments of expressway should also be considered near Yangon and Mandalay urban areas.
Prioritize periodic maintenance or rehabilitation of road sections with high traffic levels over reconstruction and upgrading.	<ul style="list-style-type: none"> Candidates would be trunk roads with traffic levels of 500–2,000 vehicles/day. Asphalting should be considered for roads with traffic above 1,000 vehicles/day. Either scheduled periodic maintenance (if the pavement is still maintainable) or asphalt improvements (if the pavement is in poor condition) would be carried out as part of their rehabilitation. Most of the roads meeting these criteria already do not require widening, but do need proper shoulders. However, with time, the need for widening from 12 ft to 18 or 24 ft pavements will become necessary. As of 2014, 2,250 km roads meet the criteria, of which 820 km also need widening. This will increase to 5,000 km in the medium term. Sections with the highest traffic levels may later become candidates for upgrading to modern standards. Pavement standards should be chosen to gradually allow higher truck loadings.
Prioritize mechanized periodic maintenance of road sections with moderate traffic before they deteriorate too much, over rehabilitation with hand-laid penetration macadam.	<ul style="list-style-type: none"> This would typically involve roads utilized by 200–500 vehicles/day. Mechanized maintenance techniques should be used increasingly (machine-laid macadam and surface dressing). The sections under worst condition should also be rehabilitated. This program could potentially cover 4,000 km of road sections, initially.
For unsealed roads, priorities should be to pave any road with traffic reaching 500 vehicles per day, and the grading of those with traffic above 200 vehicles per day.	<ul style="list-style-type: none"> When resources allow it, paving could be considered for unsealed roads with traffic above 200 vehicles/day. Periodic maintenance extended to those with traffic above 50 vehicles/day.
A limited number of exceptions to these priorities may be needed to improve access to states and/or hilly areas and achieve social and/or national objectives even though current traffic levels are still low (below 200 vehicles per day).	<ul style="list-style-type: none"> This may be particularly important in postconflict areas. A few low-volume paved roads in very poor condition (<200 AADT) will also need rehabilitation. Low-cost improvements on roads with low traffic could also be considered part of a rural road improvement program.

Source: ADB. 2016. Myanmar Transport Sector Policy Note: Trunk Roads.

(5) Possible Minimum Five-Year Program

Table 3.18 summarizes the investments suggested by this policy note for the period 2016–2020. It amounts to US\$ 3 billion, or about 1% of Myanmar’s gross domestic product (GDP). This is similar to what has been spent to date. However, because it focuses exclusively on high-return investments, the economic impact are estimated to be higher.

This program is similar in magnitude to what is allocated by the National Transport Development Master Plan, but priorities differ. The master plan focuses in the 2016–2020 period on the paving of long corridors in remote areas. It does not consider rehabilitation and periodic maintenance needs. This review suggests giving a higher priority to the trunk network, and to launch a program of periodic maintenance and rehabilitation.

Table 3.18 Minimum Five-Year Program (MTSPN)

		Length (km)	Cost (US\$ million)
Paved Network	Major Improvements	1,300	850
	Widening	1,000	520
	Rehabilitation	2,500	500
	Periodic Maintenance	4,000	480
	Routine Maintenance	19,000	80
Unpaved Network	Paving	890	125
	Periodic Maintenance	3,200	145
	Routine Maintenance	21,000	75
Bridges			240
Total		12,890	3,015

Notes: (i) Major improvements include the Yangon-Mandalay Expressway, Mandalay-Lashio-Muse, and Thaton-Eindu-Kawkareik-Myawaddy; (ii) widening considered only of roads with traffic exceeding capacity; (iii) periodic maintenance and rehabilitation requirements are based on the results of TA8327, and adjusted as some roads are already planned for improvements; and (iv) bridge requirements draw on the master plan figures

Source: ADB. 2016. Myanmar Transport Sector Policy Note: Trunk Roads.

ADB also suggested the following investment targets to be achieved by 2030:

- 1,000 km of expressway or four-lane roads,
- 6,000 km of trunk roads meeting modern Class III or Class II standards,
- additional 5,000 km of trunk roads with asphalt concrete surfacing,
- 10,000–15,000 km of paved roads with machine-laid surface dressing surfacing and proper shoulders, and
- proper maintenance of this 22,000–27,000 km trunk road network to keep it in good condition.

(6) Trunk Road Classification and Standards

Myanmar has long had a classification system based on technical standards, which have been used to assign administrative responsibilities between central government and the states and/or regions. Until 2014, the trunk road classification was based on technical standards (traffic levels, design speed, number of lanes, etc.).

The classification was revised as part of the preparation of the Master Plan for Arterial Road Network Development. It includes the classes of Expressway, National Highway, Regional/State Road, District Road, and Township Road. Although the names of the classes are similar, the basis for classification is formally different. The new classification looks at the function of the road—whether a road runs within a township, a district, a state and/or region, or connects multiple states and regions. The new classification system introduces a strong link between functional, technical, and administrative classes. According to the new standard, a road connecting multiple states (function) is a national highway (administrative), which needs to have two or four lanes and an asphalt concrete surfacing (technical design standard).

In consideration the above situation, this policy note suggested the following:

- **The new classification and standards may lead to overinvestment and reduce the scope for efficient planning.** Under the new classification system, some technical characteristics such as lane width depend on the administrative class, while others such as the number of lanes depend on the traffic volumes. This results in a mix of technical and administrative classification principles (including the classification of expressways as an administrative class). It may cause inappropriate technical standards to be applied in certain cases (e.g., asphalt concrete for state and/or regional roads with low traffic volumes, or penetration macadam for district roads with high traffic volumes). It may also make planning more difficult because of the link between functional, administrative, and technical class, it seems most roads should be considered underclass, requiring immediate upgrade.

3. Road Development Plans in Myanmar

- **Preferably, technical and administrative standards should be made independent.** The administrative classification should remain linked to the function of the road. The purpose is to allocate the responsibility for funding and management of the road to those having the most interest. The technical classification system should depend on traffic volumes, and determines necessary width, surface type, number of lanes, etc. In such a system, the Yangon–Mandalay expressway would administratively be classified as a National Highway under the responsibility of the central government, but technically be classified as an Expressway with high speeds and access control. At the early stages of network development, planning should attempt to make all roads meet their necessary technical classifications. This is the most cost-efficient way to allocate resources, and can remain the leading planning strategy. At some point, planning can target to bring all roads of a given functional and/or administrative class to similar technical standards (e.g., targeting to connect all townships with a Class III road), but this is less economically efficient and is based more on equity considerations. Such dual classification systems and planning strategies have been extensively used in the PRC. However, technical and administrative standards can never be fully aligned, even in a developed country.
- PW/DOH should take the lead in establishing a single road classification system applicable to other ministries (rural) and committees and/or councils (urban). The new classification system appears to create some overlap in responsibilities with the Ministry of Agriculture, Livestock and Irrigation (MOALI), which is responsible for rural roads linking villages to the township capitals. Under the new classification, such roads would be classified as township roads and form part of the trunk road network under the responsibility of the region and/or states, and would be managed by PW/DOH. A national road classification system classifying all roads would be preferable, avoiding such overlap and clarifying responsibilities between different ministries and councils.
- **PW/DOH could also attempt using a unified definition of the international highway network.** The various international highways signed up to by Myanmar largely overlap, but follow slightly different alignments in some cases. The improvement of these parallel highway networks is putting an unnecessary burden on the trunk road budget, limiting the funding available for other trunk roads. A coordinated approach would allow the selection of a single international highway network complemented by additional links to nearby cities, facilitating planning and freeing up funds for other trunk roads. MOC would have to propose the changes to the international bodies.
- **For instance, Myanmar could propose revising the alignment of the Northern and East–West GMS corridors.** In 2012, a review of the corridors proposed that the Myanmar section of the Northern corridor could run from Muse to Mandalay and then South to Yangon (instead of heading to Tamu), and that the Myanmar section of the East–West corridor could run from Myawaddy to Payagyi where it would connect with the Northern Corridor (instead of heading to Mawlamyine). These changes would make the GMS corridors run along Asian Highways (AH1 and AH14), align GMS corridors with Myanmar’s most important international transport corridors, and eliminate duplicate alignments. A similar review of the Tripartite Highway would be useful, particularly to eliminate the duplicate sections south of Tamu and along the expressway South of Taungoo.

(7) Rural Roads and Access

Whereas the National Development Plan envisages providing road access to all villages by 2030, Myanmar Transport Sector Policy: Rural Roads and Access recommended to launch a Nationwide Rural Access Improvement Program with the following features:

- Apply objective-driven approach to achieve universal all-season road access in rural areas, by gradually achieving higher levels of access, as measured in the share of communities connected and the quality of their connection (or the share of rural people living less than 2 km from an all-season road).
- Centralization of management and funding by the central government (DRD) who should allocate resources based on needs, assist in local planning and prioritization efforts, and manage works execution.
- Establishment of a core village road network, which would include the key roads needed to provide minimum road access to connect all villages to the trunk road network. The identification of the core village road network should be carried out at the township level, but could be compiled at the district and state and/or regional level. Operational priorities and standards would be required. For instance, the program could initially focus on basic access (spot improvements, footpaths) for unconnected communities of a given size, and all-season road access for larger ones. Targets could be periodically revised.
- Identification of the importance of the improvement based on national priorities (e.g., first priority: establishing core network access for large communities), and prioritization of all improvements needed in the medium term should be made by the township level (township and village development committees) under assistance of DRD. This identification and screening should be done with local participation, but the choice of standards (and hence

budgets) should follow nationwide guidelines. At the village tract level, DRD could help identify village-based road infrastructure needs using a form of integrated rural accessibility planning, specifically the participatory mapping methodology. DRD would then allocate resources to townships and villages based on needs (e.g., funding x% of needs within 5 years), potentially differentiating by subprograms and priority levels, and following priority lists.

- Works delivery would still be contracted out by DRD. Design would likely be contracted out. Supervision could be done by DRD, by contracted teams, or with support from Public Works.
- DRD would need to set up a database of village roads, needs, and works as a tool of monitoring.
- Some resources should be dedicated to research and innovation to identify the most cost-effective planning strategies, operational priorities, standards, and technologies. Different pavement techniques could be piloted. An observatory or research team could carry out surveys and studies with regard to rural travel patterns and rural transport services, and maintain a link with nongovernment organizations.

In addition to the above, it was also stated that the need of clarification of responsibility allocation of the government entities as follows:

- Gradually make DRD the only national entity managing village roads,
- Formally make the MOC the only entity responsible for classifying and establishing standards for Myanmar's roads, and identifying which ones it is directly responsible for; the responsibility for classification may be delegated to region and/or state governments in the case of lower-level roads, and DRD could receive a delegation for setting standards for village roads,
- Make region and/or state governments the formal owners of lower-level roads holding ultimate responsibility (which could be further decentralized to township development committees in the case of village roads); DRD would then manage village roads on their behalf. This setup would clearly allocate responsibility to maintain village roads to DRD, but facilitates further decentralization.

3.5 National Logistics Master Plan

(1) Priority Projects

Following the NTMP, the National Logistics Master Plan was formulated by JICA's Data Collection Survey on National Logistics and the priority projects as a short-term implementation program were identified. Based on the corridor development strategy of the NTMP, the logistics corridors were determined with its role and function as shown in **Table 3.19**.

Table 3.19 Major Role and Function of Logistics Corridors (NLMP)

Logistic Corridor	Role and Function
Myanmar-India Logistics Corridor	<ul style="list-style-type: none"> • Linking Mandalay with India through the border town of Tamu • Facilitation of trade with India • Supporting the rural areas in the north western part of Myanmar for the trade with India • Major transport modes are road, railway and inland water transport modes. • This corridor is a part of regional corridor linking Thailand.
North-South Logistics Corridor	<ul style="list-style-type: none"> • Major transport axis linking north and south of Myanmar (Yangon-Mandalay via Bago) • Main stay for industrial development at and surrounding areas of major cities i.e. Yangon, Mandalay, Bago • Major transport modes are road, railway, and inland waterway
South-East Logistics Corridor	<ul style="list-style-type: none"> • Regional links with Thailand • Provision of diversified cargo transport routes • Major transport modes are road and railway. • Firstly the road link to be developed and secondary the railway link will be developed. • Another transport link is expected to be developed connecting • Bangkok and Dawei in straight line by highway and railway.
Main River Logistics Corridor	<ul style="list-style-type: none"> • Major logistics corridor along the Ayeyarwaddy and Chindwin River served mainly by inland water transport but linked closely with railway and road for transporting bulky cargoes such as rice, fuel and building materials through the rural and farming areas • Major transport modes are inland waterway, railway and road. • Multimodal transport hubs planned to be created at each major ports for inland water transportation. • Support regional development along rivers by low cost transport by IWT
Trans Myanmar Logistics Corridor	<ul style="list-style-type: none"> • Logistics corridor linking the western coastal area along the Indian Ocean and the eastern mountainous area via plain central areas (i.e. Kyaukpyu – Magway – Lao PDR, Northern Thailand and China through Shan), enhancing the timely transportation of such special local products like vegetables. • Major transport mode is road transport. • At the gateway terminal node, the international port is planned to be provided together with the industrial zone or SEZ in Kyaukpyu.
Coastal Marine Logistics Corridor	<ul style="list-style-type: none"> • Major logistics corridor served by coastal shipping services for transporting bulky cargoes such as rice, fuel, building materials, along the coastal cities and rural areas. • Major transport mode is the coastal shipping that links with road network.

Source: JICA. 2018. Data Collection Survey on National Logistics.

All projects listed in NTMP were re-evaluated by This JICA's study and the road projects shown in **Table 3.20** are high-priority projects in terms of national logistics development. Through the evaluation of logistics corridor, the following sequence was determined as the priorities among the corridors:

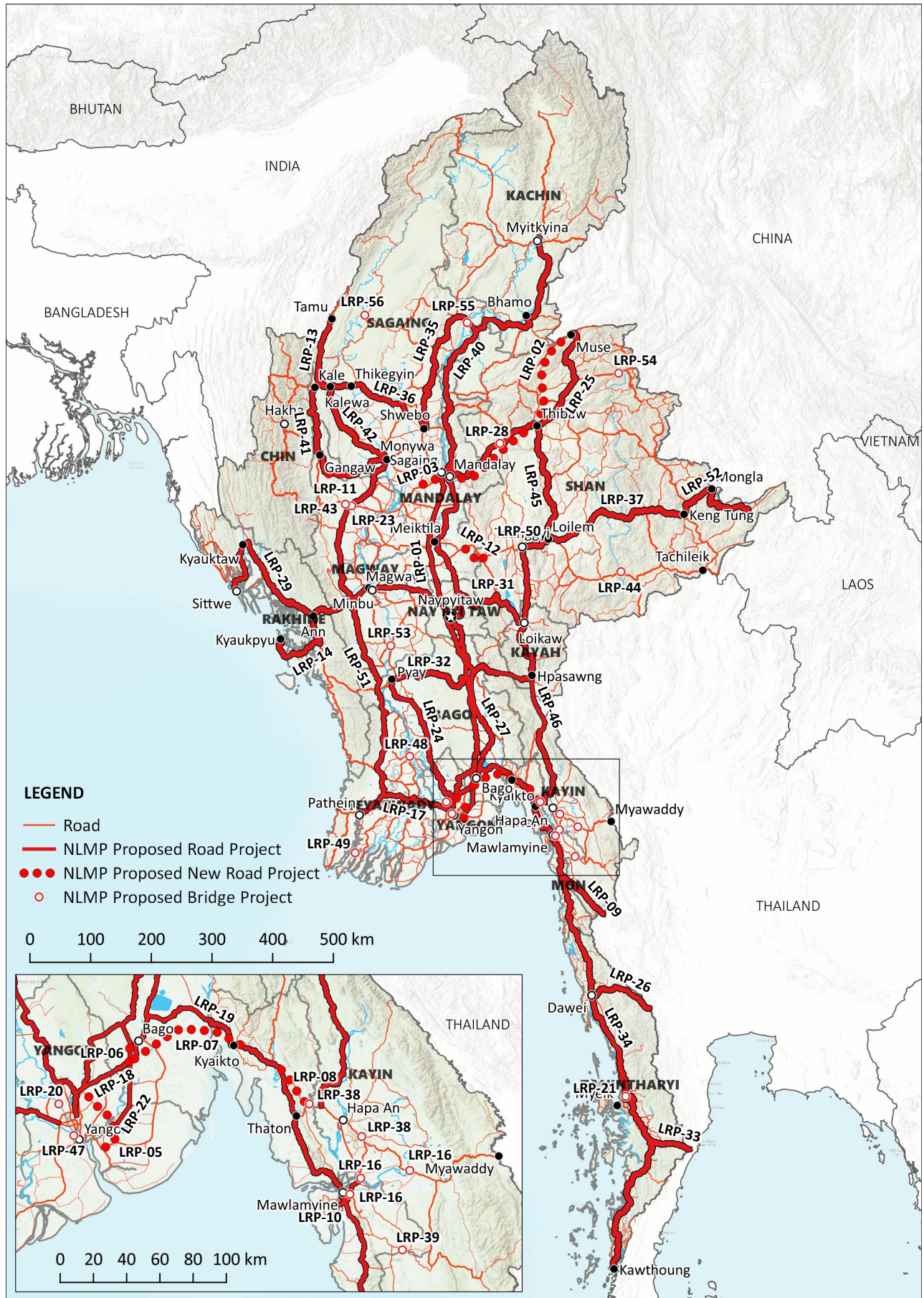
- (1) South-East Logistics Corridor
- (2) North-South Logistics Corridor
- (3) Main River Logistics Corridor
- (4) Coastal Marine Logistics Corridor
- (5) Trans Myanmar Logistics Corridor
- (6) Myanmar-India Logistics Corridor

Table 3.20 High-Priority Road Projects (NLMP)

Logistics Corridor	Project	Priority	Time Frame		Project Cost (Bil. MMK)	
			Short	Mid-Long		
1. South-East Logistics Corridor	LRP-07 New Expressway between Bago-Kyaikhto	★★★★	✓		1,053	
	LRP-09 Three Pagoda Pass Road (Upgrading)	★★★★	✓		445	
	LRP-08 Thaton Bypass Road	★★★★	✓		274	
	LRP-15 Thaton – Eindu – Kawkareik – Myawaddy Road	★★★★	✓		192	
	LRP-16 Gyaing (Kawkareik) Bridge	★★★★	✓		105	
	LRP-16 Gyaing (Zarthapyin) Bridge	★★★★	✓		141	
	LRP-16 Atran Bridge	★★★★	✓		95	
	LRP-10 Mawlamyine Peripheral Road	★★★★☆	✓		11	
	LRP-26 Dawei – Phunamron Road	★★★★☆		✓	1,127	
	LRP-19 Payagyi – Mawlamyine - Thanbuzayat Road	★★★☆☆	✓		393	
	LRP-33 Tanintharyi – Mawtaung Road	★★★☆☆		✓	107	
	LRP-34 Thanbyuzayat – Dawei – Myeik – Kawthonng Road	★★★☆☆		✓	907	
	LRP-21 Tha Mouk Bridge	★★☆☆☆	✓		14	
	LRP-38 Don Tha Mi and Naung Lon Bridge	★★☆☆☆		✓	14	
LRP-39 Chaungnitkwa Bridge	★★☆☆☆		✓	274		
2. North-South Logistics Corridor	LRP-01 Yangon-Nay Pyi Taw-Mandalay Expressway (Upgrading)	★★★★	✓		676	
	LRP-03 Myotar-Tada U Road	★★★★	✓		126	
	LRP-06 Hanthawaddy Airport Access Road	★★★★	✓		108	
	LRP-05 Yangon Outer Ring Road (YORR) East Section	★★★★	✓		780	
	LRP-22 Yangon City - Hanthawaddy - Existing Expressway	★★★★	✓		388	
	LRP-04 Yangon Urban Expressway (YUEX)	★★★★		✓	2,382	
	LRP-18 Yangon (from toll gate) - Bago Road	★★★★☆	✓		115	
	LRP-02 Alternative Route of Mandalay - Muse Road	★★★★☆		✓	908	
	LRP-25 Mandalay – Lashio – Muse Road	★★★★☆		✓	440	
	LRP-27 Bago – Mandalay Road	★★★★☆		✓	880	
	LRP-28 New Goat Twin Viaduct	★★★★☆		✓	130	
	LRP-30 Mandalay Circular Expressway	★★★★☆		✓	329	
	LRP-35 Shwebo – Myitkyina Road	★★★★☆		✓	462	
	LRP-20 Watayar Bridge	★★☆☆☆	✓		238	
	LRP-40 Mandalay – Thabeikkyin – Tagaung – Bhamo Road	★★☆☆☆		✓	274	
	LRP-47 Hlaing River Bridge	★★☆☆☆		✓	58	
	LRP-49 Thetkal Thoung Bridge	★★☆☆☆		✓	29	
	3. Main River Logistics Corridor	LRP-17 Yangon – Patheingyi Road	★★★★	✓		124
		LRP-24 Yangon – Pyay - Mandalay Road	★★★★☆		✓	1,139
LRP-32 Hapasawing - Pyay Road		★★★★☆		✓	283	
LRP-48 Hinthada Bridge		★★☆☆☆		✓	276	
LRP-51 Monywa – Patheingyi Road		★★☆☆☆		✓	700	
LRP-53 Ayeyarwaddy (Thayat-Aunglan) Bridge		★★☆☆☆		✓	157	
LRP-55 Ayeyarwaddy (Kathar) Bridge		★★☆☆☆		✓	127	
LRP-56 Chindwin (Phaungbyin) Bridge	★★☆☆☆		✓	34		
4. Coastal Marine Logistics Corridor	LRP-29 Minbu – Ann – Kyauktaw – Sittwe Road	★★★★☆		✓	463	
5. Trans Myanmar Logistics Corridor	LRP-12 Fast Shan Plateau Access Road (Yin Mar Bin-Kalaw)	★★★★☆		✓	499	
	LRP-14 Ann-Kyaukpyu Road	★★★★☆		✓	629	
	LRP-31 Loikaw - Magway Road	★★★★☆		✓	363	
	LRP-37 Taunggyi – Loilim – Kyaington Road	★★☆☆☆		✓	658	
	LRP-45 Thibaw – Loilem Road	★★☆☆☆		✓	232	
	LRP-46 Taunggyi – Loikaw – Hpapun – Pha an Road	★★☆☆☆		✓	660	
	LRP-50 Watalone Tunnel	★★☆☆☆		✓	137	
	LRP-52 Kyaington – Mongla Road	★★☆☆☆		✓	90	
LRP-54 Thanlwin (Kunlone) Bridge	★★☆☆☆		✓	20		
6. Myanmar-India Logistics Corridor	LRP-13 Construction of Bridges on India-Myanmar-Thailand Trilateral Highway (Tamu-Kyigone-Kalaywa Road)	★★★★☆	✓		74	
	LRP-11 Pong Taung-Pone Nyar Tunnel between Magway and Sagain	★★★★☆		✓	260	
	LRP-23 Yaw Chaung (Yepyar) Bridge	★★★★☆		✓	39	
	LRP-36 Shwebo - Ye U - Kalaywa Road	★★★★☆		✓	283	
	LRP-41 Monywa - Pale - Gangaw – Kalaymyo Road	★★★★☆		✓	302	
	LRP-42 Monywa – Yargyi – Kalewa Road	★★★★☆		✓	181	
	LRP-43 Yaw Chaung (Ohn Taw) Bridge	★★★★☆		✓	29	
LRP-44 Thanlwin(Tarsotpha) Bridge	★★★★☆		✓	12		

Source: JICA. 2018. Data Collection Survey on National Logistics.

3. Road Development Plans in Myanmar



Source: JICA. 2018. Data Collection Survey on National Logistics.

Figure 3.6 High-Priority Road Projects (NLMP)

(2) Logistic Sector Development Roadmap

Based on the priority evaluation of road projects, the vision, strategic objectives and the action plans of road sector were determined as follows:

Road Sector's Vision: ***“To develop safe, efficient, internationally standardized, road infrastructure systematically integrated with all modes of transport to support the economic development of Myanmar in a sustainable manner.”***

Strategic Objectives:	LRS-1	Development of high-standard highways as the fundamental backbone of the cargo transport network
	LRS-2	Determine to use the Yangon-Mandalay Expressway for major freight transport route and implement project LRP-01 Upgrading Yangon – Nay Pyi Taw – Mandalay Expressway
	LRS-3	Development of by-pass routes to detour congested areas, reduce transport time and the number of traffic accidents in urban areas
	LRS-4	Provision of redundancy and robustness for the main logistics corridors to strengthen national logistics lifelines
	LRS-5	Improvement of awareness of traffic safety and upgrading of road infrastructure to reduce traffic accidents
	LRS-6	Improvement of accessibility to promote effective use of primary logistics facilities
	LRS-7	Execute LRP-04 in the south eastern part of Myanmar
	LRS-8	Execute LRP-02 and LRP-03 in the northern part of Myanmar
	LRS-9	Upgrading of rural road networks to strengthen the cargo transport network and to provide market access for rural areas
Action Plans:	LRP-13	Construction of Bridges on India-Myanmar-Thailand Trilateral Highway (Tamu – Kyigone – Kalewa Road)
	LRP-01	Upgrading of Yangon – Nay Pyi Taw – Mandalay Expressway
	LRP-04	Construction of Yangon Urban Expressway (YUEX)
	LRP-05	Construction of Yangon Outer Ring Road (YORR) East Section: Thilawa Area to NH-1
	LRP-15	Road Safety Improvement Program
	LRP-08	Construction of Thaton Bypass Road
	LRP-07	Construction of the New Expressway between Bago and Kyaiktiyo
	LRP-09	Upgrading of Three Pagoda Pass Road
	LRP-10	Construction of Mawlamyine Peripheral Road
	LRP-02	Construction of Alternative Route of Mandalay-Muse Road
	LRP-03	Construction of Myota – Tada U Road
	LRP-06	Construction of Hanthawaddy Airport Access Road
	LRP-11	Pong Taung – Pone Nyar Tunnel between Magway and Sagaing Region
	LRP-12	Construction of Fast Shan Plateau Access Road (Yin Mar Bin – Kalaw)
	LRP-14	Ann – Kyaukpyu Road

3. Road Development Plans in Myanmar



Source: JICA. 2018. Data Collection Survey on National Logistics.

Figure 3.7 Proposed Road Projects to be Implemented by 2030 (NLMP)

3.6 National Strategy for Rural Roads and Access

The strategic objective of the National Strategy for Rural Roads and Access is **to provide year-round access to approximately 90% of the rural population in Myanmar by connecting at least 80% of all registered villages in each state/region by all-season road by 2030** in order to maximize the number of rural people benefitting equally.

Table 3.21 Target of the Strategic Plan

Priority	Population Size of Village	Targetted Situations	Target Year
1st	more than 1,000 people	all of these villages to be connected by all-season road	by 2020
2nd	more than 500 people	at least 95% of these villages to be connected by all-season road	by 2025
3rd	more than 250 people	at least 75% of these villages to be connected by all-season road	by 2030
4th	less than 250 people	at least 50% of these villages to be connected by all-season road	by 2030

Source: National Strategy for Rural Roads and Access

Whereas there were 57,228 registered villages spread over the country as well as non-registered villages as of March 2015, GOM aims to provide the registered villages with road access of an all-season standard. The minimum specifications of the all-season standard was expected to be defined in detail in the **National Rural Road Standards and Specifications (NRRSS)** so that the Consultant will collect the NRRSS in this Survey as a reference for determining the extent of improvement. For effective use of funds for rural roads and access, the concept of a **Core Rural Road Network (CRRN)** was proposed as the minimum rural road network in a township required to connect all villages to each other and to the higher-level road network:

If a village is connected directly by a higher-level road, it does not require a CRRN road.

If a village is connected by only one rural road, that road forms part of the CRRN.

If a village is connected by more than one road, the best road is selected to form part of the CRRN.

If a village is not connected by a road, a tentative alignment is selected to form part of the CRRN for new construction.

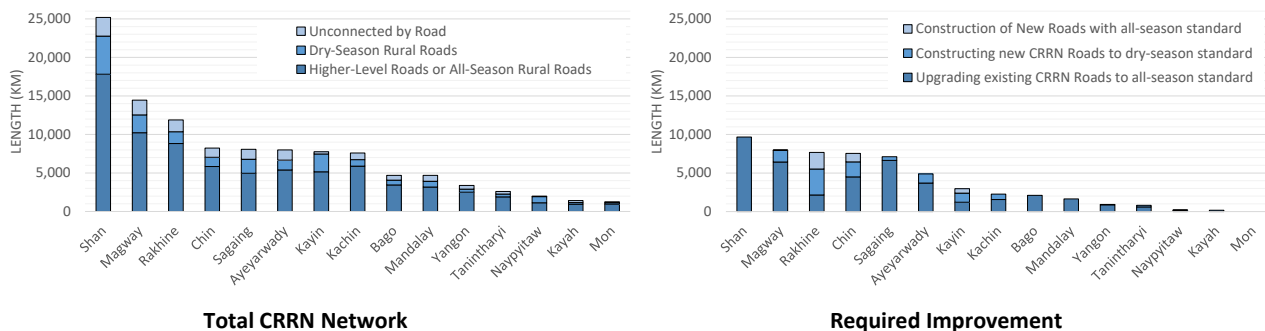
In the CRRN concept, rural roads are classified into 3 classes and its functionality is defined as shown in **Table 3.22**.

Table 3.22 Minimum Rural Road Standards

Class	Surface Type	Carriageway Width	Side Drains	Bridges	Bridge Carrying Capacity
A	Sealed surface	12 feet (3.65 m)	Earthen/Lined	Steel/Concrete	AASHTO HS20-44 (36 tons)
B	Improved, unsealed surface	12 feet (3.65 m)	Earthen/Lined	Steel/Concrete	20 tons
C	Earthen	6-12 feet (1.8-3.65 m)	Earthen/Lined	Timber	N/A

Source: National Strategy for Rural Roads and Access

Approximately 56,000 km (50%) sections out of 111,000 km of total CRRN network require a certain improvement and the road network in the target states and regions under this Survey account for 49% of nationwide. Since these areas are mainly located in mountainous area, climate resilience and sustainability (flood risk, erosion risk, rainfall, drought, etc.) in the various parts of the country are also emphasized in the National Strategy for Rural Roads and Access.



Source: National Strategy for Rural Roads and Access

Figure 3.8 Total Length of CRRN Network and Section Length of Required Improvement

3.7 Road Design Criteria

The Road Design Criteria in Myanmar was updated in 2015 under the KOICA-assisted Project on Establishing Master Plan for Arterial Road Network Development in Myanmar.

(1) History of Road Design Criteria

- In 1954, **Road Classification and Design Criteria** were made by the Department of Highways;
- In 1969, **Design Criteria for Roads (Revised Version)** was approved by the Road Planning Committee of Ministry of Public Works & Housing (the contents were limited to the geometric features of rural roads);
- In 1993, **Geometric Design Criteria for Roads** was made by Ministry of Construction (some features were added and super highway concept was introduced);
- In 2015, Road Design Criteria in Myanmar was updated.

(2) Classification on Urban and Rural

The definitions of **Urban Area** and **Rural Area** were newly added from the 2015 Road Design Criteria as follows:

- Urban Area: An area where more than 5,000 people live in the present and/or will live within 10 years;
- Rural Area: Outside of urban area

(3) Classification of Road

The definitions of the road classification was revised by the 2015 Road Design Criteria as shown below. However the relationship between the function and the feature is not so clear.

Table 3.23 Classification of Road

Function		Feature
Arterial Road	Expressway	High-speed with access control
	Main Arterial	Across Regions/States
	Sub Arterial	Run within a Region/State
Collector Road		Run within a District
Local Road		Run within a Township

Source: Road Design Criteria in Myanmar, DOH (MOC), 2015

(4) Design Speed

The design speed for each road classification was defined as shown below. Exception to reduce 20 km/h from each of the standard minimum design speed is allowed depending on the necessity.

Table 3.24 Design Speed

Road Classification		Minimum Design Speed (km/h)							
		Rural Area						Urban Area	
		Flat		Rolling		Mountainous			
		Standard	Exception	Standard	Exception	Standard	Exception	Standard	Exception
Arterial Road	Expressway	120	(100)	100	(80)	80	(60)	100	(80)
	Main Arterial	100	(80)	80	(60)	60	(40)	80	(60)
	Sub Arterial	80	(60)	70	(50)	50	(30)	70	(50)
Collector Road		70	(50)	60	(40)	50	(30)	60	(40)
Local Road		60	(40)	50	(30)	40	(20)	50	(30)

Source: Road Design Criteria in Myanmar, DOH (MOC), 2015

(5) Road Widths

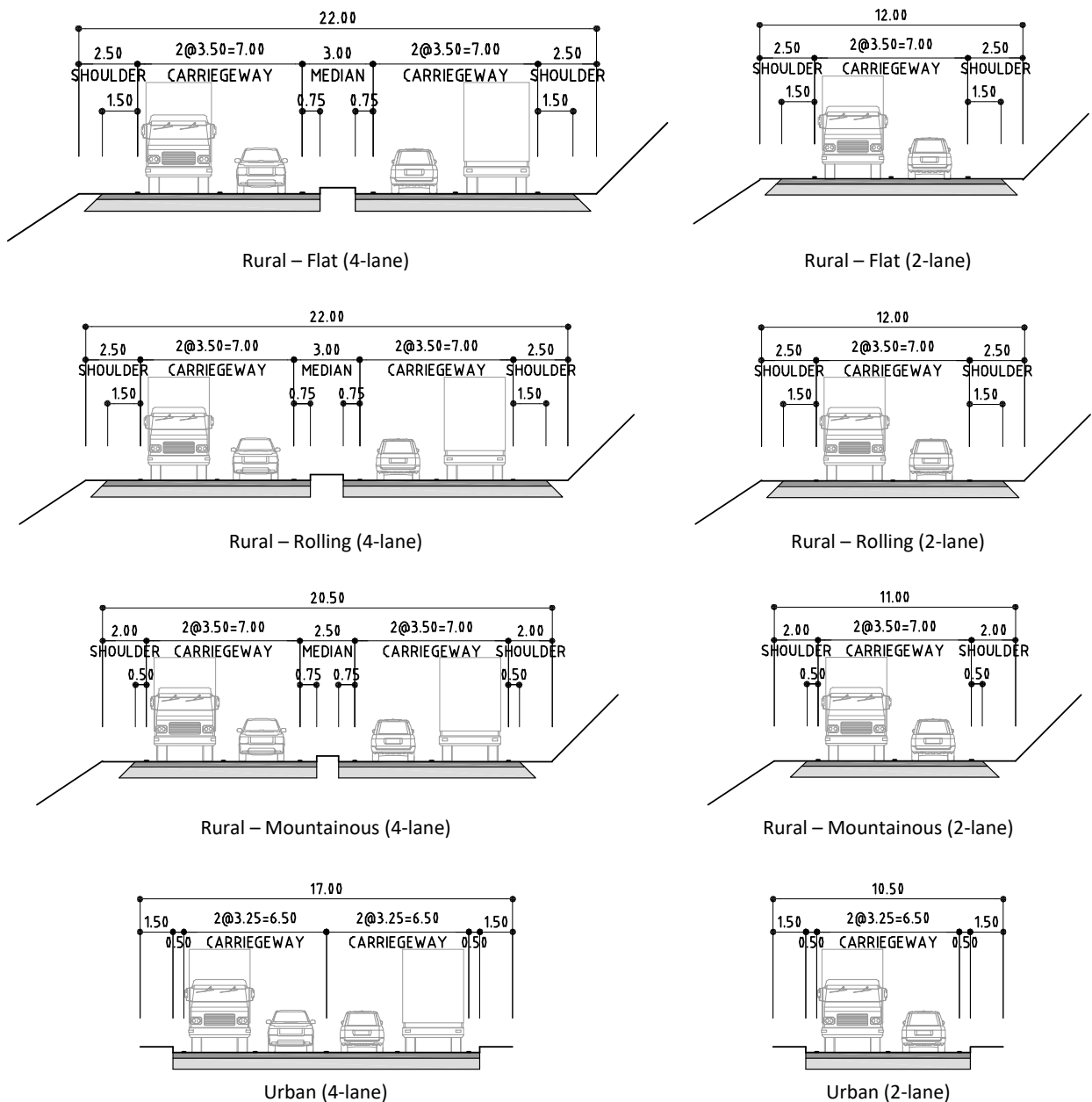
The minimum widths of the cross section elements are defined as shown below. There are some exceptions as follows:

- The minimum lane width for single lanes is 3.7 m.
- If sidewalk is placed, outer shoulder can be reduced to 0.5 m as minimum.
- Width of outer shoulder on tunnel, bridge, overpass or underpass can be reduced to 1.0 m for expressways and 0.5 m for other roads. However, lay-bys (or called emergency parking bays) should be placed at an interval of 750 m in minimum for tunnel or underpass section where outer shoulder width is less than 2.0 m.
- Provision of median is recommended for arterial roads with four (4) lanes or more.
- 70 m of Right of Way width should be provided for international corridors (Main Arterial Roads).

Table 3.25 Road Width

Road Classification		Road Widths (m)													
		Carriageway		Outer Shoulder				Inner Shoulder		Median (incl. Inner Shoulders)				Right of Way	
		Rural	Urban	Rural			Urban	Rural	Urban	Rural			Urban	Rural	Urban
				F	R	M				F	R	M			
Arterial Road	Expressway	3.60	3.50	3.00	3.00	2.50	2.00	1.00	1.00	4.00	4.00	3.00	3.00	122	-
	Main Arterial	3.50	3.25	2.50	2.50	2.00	2.00	0.75	0.75	3.00	3.00	2.50	-	45.75	-
	Sub Arterial	3.50	3.25	2.50	2.50	2.00	2.00	0.75	0.75	2.00	2.00	2.00	-	45.75	-
Collector Road		3.25	3.00	2.00	2.00	1.50	1.50	0.50	0.50	-	-	-	-	45.75	-
Local Road		3.00	3.00	1.50	1.50	1.00	1.50	0.50	0.50	-	-	-	-	30.50	-

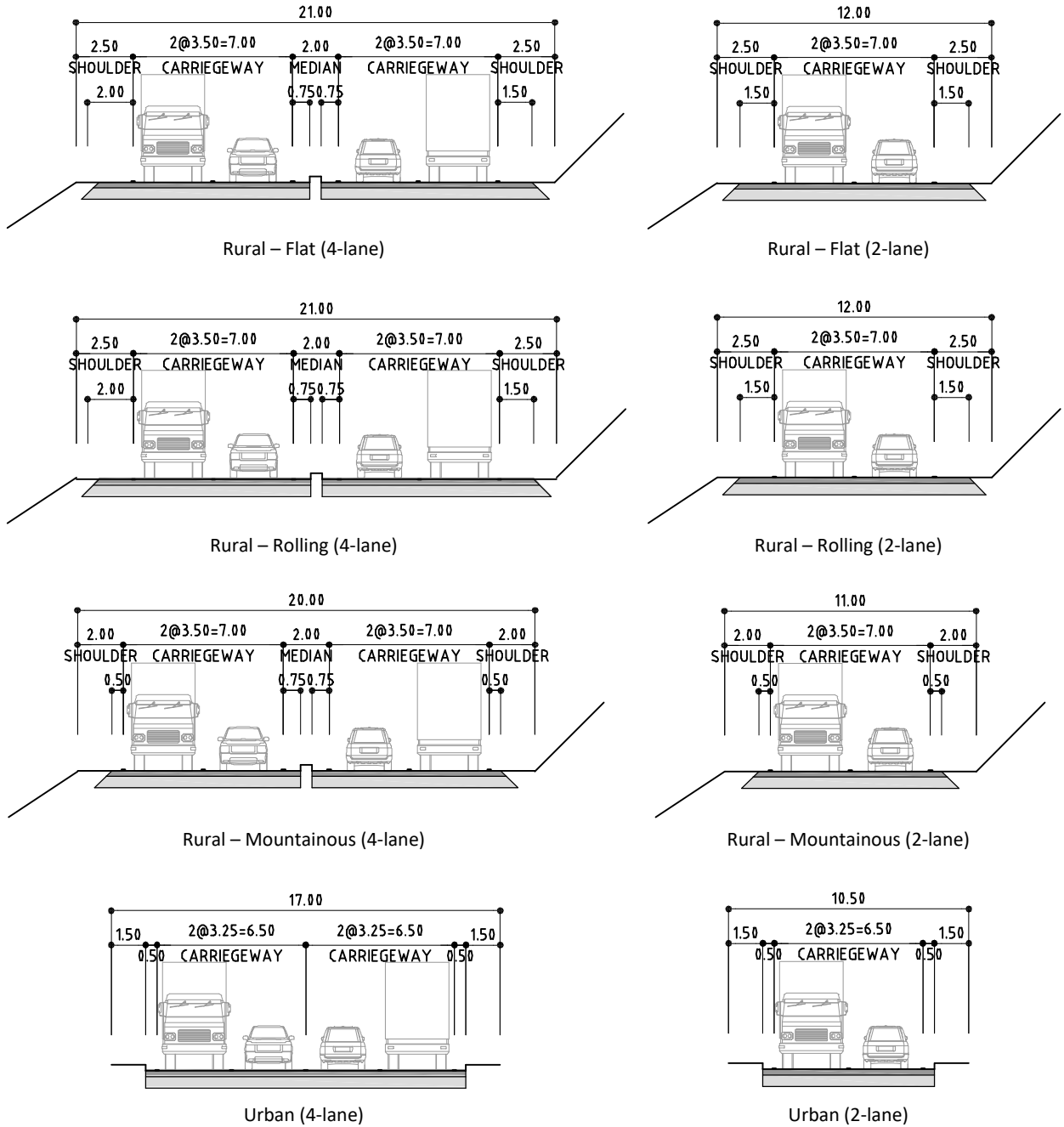
Note: F represents Flat, R represents Rolling, M represents Mountainous
 Source: Road Design Criteria in Myanmar, DOH (MOC), 2015



Source: JICA Study Team, based on Road Design Criteria in Myanmar, DOH (MOC), 2015

Figure 3.9 Typical Cross Sections (Main Arterial Roads)

3. Road Development Plans in Myanmar



Source: JICA Study Team, based on Road Design Criteria in Myanmar, DOH (MOC), 2015

Figure 3.10 Typical Cross Sections (Sub Arterial Roads)

4. On-going and Planned Projects

4.1 Assistance by Donor Agencies

Due to the budgetary constraint of MOC, major road and bridge projects rely on the assistances by donor agencies including JICA as summarized in Table 4.1. According to these tables, JICA is the highest contributor to the road and bridge sector in Myanmar and ADB and the government of India follow it. Technical assistance projects are also implemented by ADB, JICA and KOICA as summarized in Table 4.2.

Table 4.1 Major Road and Bridge Projects assisted by Donor Agencies

Donor Agency	Project	Period	Cost (US\$ million)
ADB	Maubin–Phyapon Road Rehabilitation Project	2014–2018	80.0
	GMS EWEC Eindu–Kawkareik Road Improvement Project	2015–2019	120.0
	GMS Highway Modernization Project	2019–2024	202.1
	Rural Roads and Access Project	2020–2025	52.4
Government of India	Trilateral Highway: (i) Construction of 69 Bridges, including approach roads in the Tamu–Kyigone–Kalewa Section, and (ii) Construction and Upgrading of the Kalewa–Yargi Road Section	2017–2020	245.0
	Rih–Tedim Road	2017–2020	60.0
	Kaladan Transport Project: Paletwa to India-Myanmar Border Road	2017–2020	287.0
JICA	Regional Development Project for Poverty Reduction Phase I	2013–2017	
	Regional Development Project for Poverty Reduction Phase II	2017–2022	
	Project for Improvement of Road Construction and Maintenance Equipment in Rakhine State	2015–2016	6.7
	Project for Improvement of Road Construction and Maintenance Equipment in Kachin State and Chin State	2015–2017	24.9
	East–West Economic Corridor Improvement Project	2015–2023	307.9
	Project for Construction of New Thaketa Bridge	2014–2018	38.3
	Project for Construction of Bago River Bridge	2016–2019	282.3
KfW	Rural Development Program	2014–2016	33.8
	Rural Roads Rehabilitation Program	2016–2018	11.3
NEDA	Myawaddy–Kawkareik Road Project	2013–2017	40.0
World Bank	Flood and Landslide Emergency Recovery Project	2016–2022	200.0
KEXIM	New Dala Bridge	2016–2021	137.8

ADB: Asian Development Bank, EWEC: East–West Economic Corridor, GMS: Greater Mekong Subregion, KEXIM: Export-Import Bank of Korea, NEDA: Neighbouring Countries Economic Development Cooperation Agency

Source: ADB. 2020. Sector Assessment (Summary): Transport, Second GMS Highway Modernization Project

Table 4.2 Technical Assistance by Donor Agencies

Donor Agency	Project	Period
ADB	Preparing the Asset Management Program for Myanmar Roads	2013–2015
	Preparing the GMS EWEC Eindu–Kawkareik Road Improvement Project	2013–2016
	Transport Sector Reform and Modernization	2014–2019
	Improving Road Network Management and Safety	2015–2018
	Preparing the Rural Roads and Access Project	2016–2018
	Project Restructuring Support for Ministry of Construction Road Concessions	2017–2018
	Preparing the GMS EWEC Highway Development Project	2017–2018
	Road Safety for Highway Development in the Greater Mekong Subregion East-West Economic Corridor	2019–2021
JICA	The Survey Program for National Transport Development Plan of the Republic of the Union of Myanmar	2012–2014
	Project for Comprehensive Urban Transport Plan of the Greater Yangon	2012–2014
	Project for Capacity Development of Road and Bridge Technology	2016–2019
	Technical Cooperation Project to Myanmar Government and Local People for Their Sustainable and Self-reliant Implementation of Labor-intensive-type Road Pavement Works	2016–2021
	Updating the Urban Transport Development Plan in Greater Yangon	2016–2017
KOICA	Master Plan for Arterial Road Network Development Plan in Myanmar	2013–2015
	Pre-Feasibility Study on Expressway Network Development in Myanmar	2016–2018

Source: ADB. 2020. Sector Assessment (Summary): Transport, Second GMS Highway Modernization Project

4. On-going and Planned Projects

4.2 JICA-assisted Projects

4.2.1 Regional Development for Poverty Reduction Project Phase I and Phase II

The Regional Development for Poverty Reduction Project Phase I was the first Japanese ODA Loan project in Myanmar after democratization in 2011. This project aimed to develop basic infrastructures (roads & bridges, electricity and water supply) especially in rural areas of Myanmar and thereby contribute to poverty reduction.

Table 4.3 and Table 4.4 summarize the project scopes of the Phase I and Phase II respectively.

Table 4.3 Project List of Phase I

No.	Road Section	Length (km)	Pavement Width (m)	Pavement Type	Contract Amount (Kyat million)
1	Makyeekan – NhatAwwSan – KyaikHtaw Road (KawHmu West Road)	21.1	5.5	PCCP	5,738.0
2	KawHmu – WarPaloutThout – Thout – ThaYeyTaw Road (KawHmu East Road)	18.4	5.5	PMP	7,616.0
3	KyeinPinSae – SatKaw – Danupyu – ZaLun Road (Danupyu – ZaLun Road)	38.8	5.5	ACP	12,247.1
4	Tayanar – Phayargone Road	50.4	3.65	PMP	12,520.6
5	Minhla – Tayet Road	20.8	3.65	PMP	2,346.6
6	Daik U – Sittaung Road	14.5	5.5	PMP	3,770.4
7	Monywa - Ayartaw - ShweBo Road	19.2	5.5	PMP	2,165.8
8	Mandalay – Moegoke (PhawTaw – Moegoke) Road	12.8	5.5	PMP	1,312.4
9	Yangon - KyaukPhyu Road	23.6	5.5	PMP	6,293.7
10	Taunggoo – Mawchi – Loikaw Road	9.9	3.65	PMP	3,428.4
11	HanMyintMo – MyoGyi – YwarNgan – Pintaya – AungPan Road	23.3	5.5	PMP	10,759.1
12	KaLay – PhaLan – HarKhar Road	11.5	3.65	PMP	6,677.2
13	Hakha – Gangaw Road	31.0	3.65	PMP	3,964.9
14	ThineNgin – TeeTain Road	30.2	3.65	PMP	6,255.5
Total		325.5			85,095.7

PCCP: Portland Cement Concrete Pavement, ACP: Asphalt Concrete Pavement, PMP: Penetration Macadam Pavement

Source: DOH. Construction Completion Report (Road Sector)

Table 4.4 Project List of Phase II

No.	Road Section	Length (km)	Pavement Width (m)	Pavement Type	Contract Amount (Kyat million)
1A	NgaThineChaung – Gwa Road (KM 0-18)	18.1	5.5	PCCP	9,523.1
1B	NgaThineChaung – Gwa Road (KM 18-35.9)	17.8	5.5	PCCP	12,074.1
2	Taungoo - Leiktho - Yar Do Road	16.9	5.5	PCCP	7,140.9
4A	Taungoo - Leiktho - Yar Do - Loikaw - Hopone Road (km 146.0-145.0)	9.0	5.5	PCCP	5,108.2
4B	Taungoo - Leiktho - Yar Do - Loikaw - Hopone Road (Km 145.0-154.0)	9.0	5.5	PCCP	4,463.8
5A	Mandalay - Dagaung - Bhamaw - Myitkyina Road (Km 141.9-160.1)	18.2	5.5	PMP	6,848.1
5B	Mandalay - Dagaung - Bhamaw - Myitkyina Road (Km 163.2-190.8)	27.6	5.5	PMP	7,135.1
6	Gan Gaw - AiKa Road (Km 9-21.3)	12.3	5.5	PMP	2,606.0
7A	HanmyintMo – MyoGyi – YarNgan – AungPan Road (Km 33.4-51.8)	18.4	5.5	PMP	3,431.5
7B	HanmyintMo – MyoGyi – YarNgan – AungPan Road (Km 51.8-63.4)	11.6	5.5	PMP	3,615.6
Total		158.9			61,946.4

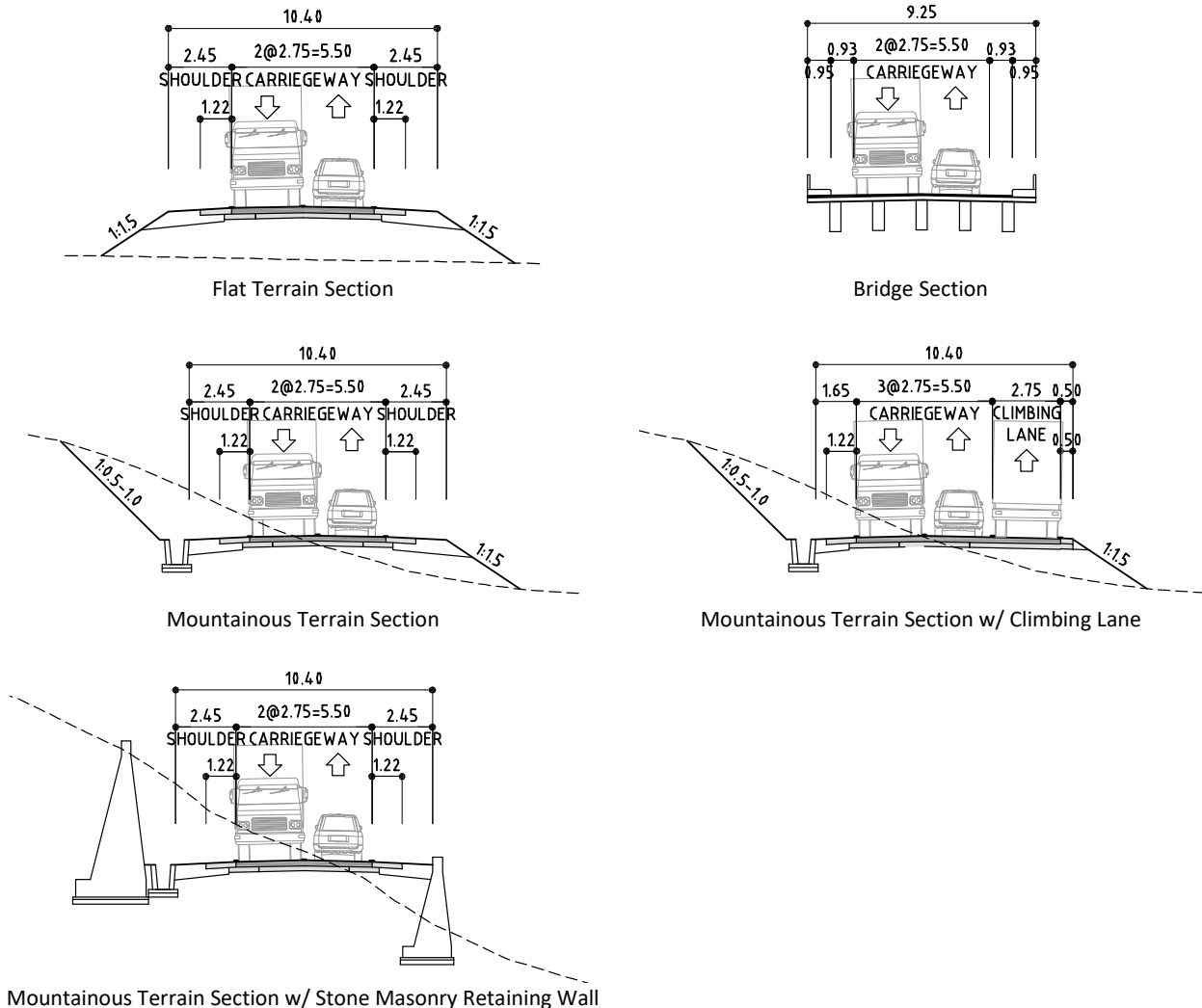
Source: JICA.

In order to maximize the length of road improvement, the width of roadway was limited to the minimum requirement (3.65 m or 5.5 m of pavement width), which is narrower than the design standard of DOH as shown in Figure 4.1. Asphalt concrete pavement, Portland cement concrete pavement and penetration macadam pavement were applied depending on the traffic conditions.

Table 4.5 Applied Pavement Thickness

Asphalt Concrete Pavement	Portland Cement Concrete Pavement	Penetration Macadam Pavement
Surface course (AC): 50 mm	Surface course (PCC): 200 mm	Surface course: 50-100 mm
Granular base course: 175-350 mm	Granular sub-base: 150 mm	Granular base course: 100-350 mm
Granular sub-base course: 150-450 mm		Granular sub-base course: 100-350 mm

Source: JICA.



Source: MOC. 2018. Pilot Project for Regional Development Project for Poverty Reduction Phase II

Figure 4.1 Typical Cross Sections of Regional Development Project for Poverty Reduction Phase II

According to the Construction Completion Report (Road Sector) of the project Phase I, the following issues have been identified:

- Higher driving speeds (exceeding speed limits) are induced due to the improvement of road conditions and thus safety for pedestrian is worsen. Road safety measures need to be carefully considered and incorporated in the design;
- The most of the pavement type applied under the project was low-cost pavement (penetration macadam pavement) and is not sufficient for high-traffic volume roads. Rapid deteriorations of pavement were observed soon after the completion of the construction works due to increase in heavy vehicle traffic (some of the vehicles may have been overloaded). Application of asphalt concrete pavement or Portland cement concrete pavement should be considered if higher traffic volume is expected;
- Detailed design was undertaken by DOH but topographic survey and geotechnical investigations were not properly carried out during the design stage. There were gap between design and actual site conditions, and adjustment of the quantities were required during the construction stage. However, the contract was made by Lump Sum-basis and had difficulty in design changes. BOQ-based contract should be considered.

4. On-going and Planned Projects

4.2.2 JICA's Data Collection Survey on Regional Infrastructure in Myanmar (2018-2019)

This survey was intended to ascertain the needs for regional infrastructure development (road, bridge, electricity supply and water supply) and collect basic data for examining possibilities of assistance for new infrastructure development that can be expected to generate synergistic development effects with past Japanese assistance and contribute to achieving stable socio-economic development in regional areas. This data collection survey was conducted in Kayin, Mon, Rakhine, Chin, and Tanintharyi. The loan agreement was signed on 21 January 2020 and successful implementation of sub-projects are expected.

Table 4.6 table summarizes of short-listed roads/bridges to be included in the project.

Table 4.6 Project List of Regional Infrastructure Improvement (Arterial Roads)

No.	Road Name	State/Region	Length (km)	Pavement Width (m)	Pavement Type	Estimated Amount (Kyat million)
DoH 1	Taungoo-Leik Tho - Yar Do - Loikaw - HoPone	Kayin	59.4	5.5	ACP	25,502
DoH 2	District Link Road No (2) (Kyarpan-Winkan section)	Mon	49.6	5.5	ACP	24,239
DoH 3	Rathedaung-Buthidaung	Rakhine	40.0	5.5	ACP	15,413
DoH 4	Kyauk Pan Du-Inn Din-Zay Di Pyin	Rakhine	17.5	5.5	ACP	11,491
DoH 7	Yebyu-Kamyaw Kin	Tanintharyi	30.57	7.5	ACP	12,355
DoH 8	Palatwa – Kyauk Taw Road	Rakhine	24.6	5.5	ACP	13,200

ACP: Asphalt Concrete Pavement

Source: JICA. 2019. Data Collection Survey on Regional Infrastructure in Myanmar - Final Report

Table 4.7 Project List of Regional Infrastructure Improvement (Bridges)

No.	Bridge Name	State/Region	Bridge Length (m)	Pavement Width (m)	Bridge Type	Estimated Amount (Kyat million)
DoB 2	Don Tha Mi Bridge on Tha Hton - Pha Ann Road Section (8/1 - 8/2)(Mile) (2 Lane)	Mon	182.9	7.5	RC	2,961
DoB 3	Bee Linn Chaung Bridge on Yangon-Myaik Road Section (127/0) Mile (2 Lane)	Mon	198.1	7.5	RC	3,227
DoB 8	Bridge No.(1/5), Pu Lu Kon Chaung Bridge on Dawel-Yay Road Section (8.0Km-8.5Km)	Tanintharyi	27.4	7.5	RC	503
DoB 9	Bridge No.(1/6), Za Har Chaung Bridge on Dawel-Yay Road Section (9.5Km-10.00Km)	Tanintharyi	27.4	7.5	RC	503
DoB 10	Bridge No.(1/20), Ta Line Yar Bridge on Dawel-Yay Road Section (33.00 Km-43.0Km)	Tanintharyi	91.4	7.5	RC	1,762
DoB 11	Bridge No.(5/26), Thet Kal Kauk Bridge on Dawel -Yay Road Section (42.5 Km-43.0Km)	Tanintharyi	97.5	7.5	RC	1,658
DoB 12	Maung Taw-Kyee Kan Pyin-Kyein Chaung Road Section Total Small bridges and Box Culvert (67 Nos)	Rakhine	91.4	7.5	RC	7,662
DoB 13	Bu thee Taung-Maung Taw Road Section Total Small bridges and Box Culvert (22 Nos)	Rakhine	-		RC	946
DoB 14	Thel Phyu Chaung Bridge (2 Lanes), Phayar Kyi-Tha Hton Road Section	Mon	54.8	7.5	RC	888
DoB 15	Bridge No.(1/22), Kyauk Kyi Bridge on Than Twel-Gwa Road Section (2 Lanes)	Rakhine	91.4	7.5	RC	1,332
DoB 16	Bridge No.(1/55), Kywe Chaing Bridge on Than Twel-Gwa Road Section (2 Lanes)	Rakhine	18.3	7.5	RC	114
DoB 17	Bridge No.(1/58), Bagan Taung Bridge on Than Twel-Gwa Road Section (2 Lanes)	Rakhine	30.5	7.5	RC	486
DoB 18	Bridge No.(9/76), Ywar Thit Kone Bridge on Than Twel-Gwa Road Section (2 Lanes)	Rakhine	18.3	7.5	RC	114
DoB 19	Bridge No.(4/80), Shawl Phyu Taung Bridge on Than Twel-Gwa Road Section (2 Lanes)	Rakhine	18.3	7.5	RC	292

Source: JICA. 2019. Data Collection Survey on Regional Infrastructure in Myanmar - Final Report

Table 4.8 Project List of Regional Infrastructure Improvement (Rural Roads)

No.	Area	State/Region	Length (km)	Pavement Width (m)	Pavement Type	Estimated Amount (Kyat million)
DRRD 1	Hpa An	Kayin		5.5	PCCP/ACP	9,187
DRRD 5	Kowtkayait	Kayin		3.65-5.5	PCCP/ACP /PMP	4,424
DRRD 6	MyaWaddy	Kayin		5.5	PCCP/ACP	2,261
DRRD 10	Yay	Mon		3.65-5.5	PMP	7,481
DRRD 13	Kyeikhtoo	Mon		5.5	ACP	1,858
DRRD 14	Ya Thae Taung	Rakhine		3.65-5.5	PCCP/PMP	3,581
DRRD 16	Sittwe	Rakhine		5.5	PCCP	3,652
DRRD 17	Ponenar Kyun	Rakhine		5.5	PCCP	2,375
DRRD 18	Pauk Taw	Rakhine		3.65	PMP	2,767
DRRD 21	Gwa	Rakhine		3.65	PMP	5,321
DRRD 25	Kyauk Taw	Rakhine		5.5	PCCP	1,538
DRRD 26	Kyauk Pyu	Rakhine		3.65	PMP	1,548
DRRD 30	Yayphyu	Tanintharyi			-	1,980
DRRD 31	Myeik	Tanintharyi			-	7,920
DRRD 32	Tanintharyi	Tanintharyi			-	25,302

PCCP: Portland Cement Concrete Pavement, ACP: Asphalt Concrete Pavement, PMP: Penetration Macadam Pavement

Source: JICA. 2019. Data Collection Survey on Regional Infrastructure in Myanmar - Final Report

4.3 Other Donors’ Projects

4.3.1 ADB’s GMS Highway Modernization Project

GMS Highway Modernization Project will improve transport conditions along Myanmar's East-West Economic Corridor (EWEC) and North-South Economic Corridor (NSEC) by (i) improving about 99 km of Bago-Thanyin Highway sections along GMS corridors, (ii) improving the safety of about 65 km of Hlegu-Bawnetgyi section Yangon-Mandalay expressway, and (iii) preparing detailed designs for other highway projects on the GMS corridors (Yangon-Pathein highway and a new Bago-Kyaikto highway).

- **Improvement of the Bago to Thanlyin highway (99 km):** The road will be reconstructed over its existing alignment to two lanes (7 m) with 1.5 m paved shoulders, with an asphalt concrete pavement. Road sections with more commercial activity will be resurfaced either with asphalt or cement concrete pavement with drainage work if necessary. Fifteen (15) bridges will be replaced.
- **Yangon-Mandalay Expressway (Km 0 to Bawnetgyi section) Improvement:** The project will (a) improve the expressway Hlegu-Bawnetgyi section (65 km); and (b) prepare detailed designs for a second phase, which includes the improvement of the interchange at Bawnetgyi and of the access road between the interchange and Phaygyi (about 10 km). Following the improvement works, the government may open the improved section to use by trucks, which are presently prohibited from using the expressway.
- **Safety improvement program (Bawnetgyi-Mandalay):** For the remaining length of the expressway (about 530 km) the improvements will generally be limited to signage and line marking, and installation of safety barriers wherever necessary including at bridge approaches. Areas prone to frequent crashes, or blackspots, improvement medians, and removal of hazardous concrete barriers will be identified, and where feasible improved under the project. The scope of the works will be determined early in the project implementation period and may also depend upon the availability of financing.
- **Detailed design for other highway projects:** The project will finance consulting services to carry out detailed design, safeguards planning, procurement support, and other studies required to prepare technically and economically viable other highway projects. (a) **Upgrading the existing Yangon-Pathein Highway** will include widening of the road from around Km 10+000 to Pathein to two lanes (7 m width) with 1.5 m paved shoulders on each side and overlaid with asphalt pavement. A 20-km section located in a flood-prone area will be raised by about 2 m, with appropriate cross-drainage. Four bridges will be replaced, several bridges will be rehabilitated or improved, and a new rail overpass will be constructed. (b) **New Bago-Kyaikto Highway** will be a new highway alignment between Bago and Kyaikto.

Table 4.9 Project List of Road Improvement

No.	Road Section	Estimated Amount (US\$)
CW1	Improvement of Bago – Thanlyin Highway	87,000,000
CW2	Improvement of Yangon – Mandalay Expressway	57,000,000
CW3	Civil Works for Safety Improvements (Km 65 to Km 570)	19,000,000

Source: ADB. 2018. GMS Highway Modernization Project – Project Administration Manual

4.3.2 ADB’s Rural Roads and Access Project

This project is a Myanmar’s national rural road and access program aiming to connect 80% of registered villages by all-weather roads by 2030. ADB plans to support the government’s program through a series of investment projects, and as the first proposed project, it will improve rural road access in two (2) regions in Myanmar, Ayeyarwady and Magway by (i) improving about 152 km of rural roads to paved standard; (ii) improving the rural roads’ maintenance management regime and respond to disaster risk affecting the rural road network, and (iii) improving rural road safety. This project is expected to systematically upgrade the much-needed country’s Core Rural Roads Network (CRRN) to increase rural access and inclusive economic growth in Myanmar, by preparing the future project during its implementation.

This project will be implemented over a 6-year period, from 2020 to 2025, which comprises one year of detailed design and procurement, three years of civil works including one year of defect liability period, and nine months to a year of monitoring period before the scheduled loan closing date. The executing agency of the proposed project will be the MOC acting through its DRRD. In 2019, DRRD established a PMU to oversee the project’s implementation. The works will be undertaken by contractors selected following the international procurement provisions of procurement regulations for ADB Borrowers.

4.3.3 World Bank's Flood and Landslide Emergency Recovery Project

This project supports the resilient recovery in priority areas and sectors affected by the 2015 floods and landslides. Myanmar's transport infrastructure was extensively damaged by the floods and landslides, with access to essential services in large towns and state capitals cut off. Road infrastructure remains vulnerable until permanent repair works can be completed. MOC oversees the overall project coordination and management of this project, including the implementation of the following two (2) components:

- Component 1: Resilient Rehabilitation of National Roads** (US\$105 million) which supports the rehabilitation of damaged national road infrastructure predominantly in Chin and Rakhine States, including the Kalay-Falam-Hakha Road and the Ngathaingyaung-Gwa Road. In Chin State, this project will finance road rehabilitation and improvements on the road connecting the capital of Chin State, Hakha, to the nearest airport in Kalaymyo across the Manipul River. The length of the road is about 200 km, situated in difficult morphological and geological conditions. The segment proposed for project financing represents 148 of the 200 km from Kalay to Hakha in Chin State while remaining length of the road shall be along Thandwe-Gwa road in Rakhaine State identified and selected by DOH. Due to the variability of the ground profiles and the high degree of weathering there are slope stability issues and various landslide locations along the Kalay-Falam-Hakha road for which slope protection and retaining measures are required. The target areas will benefit from improved connectivity and restored access to markets and social services, contributing to economic growth. The restored roads and bridges will serve as supply and rescue lines in the event of natural disaster. Critical sections of the national roads including bridges will be rehabilitated/reconstructed with designs to withstand floods and landslides, by taking into consideration drainage systems, road pavement /bridge improvements, traffic safety, climate resilience, and improved maintenance practice.
- Component 2: Resilient Rehabilitation of Rural Roads** (US\$70 million) supports the rehabilitation, reconstruction and maintenance of selected rural roads and bridges that have been damaged during the floods. The component will be implemented by DRRD in Ayeyarwady, Bago, Magway, Sagaing and Yangon approximately 300 km. The initial roads identification and prioritization process has been completed by DRRD and a further review is required for the investment which will be subject to a number of criteria including targeting communities most-affected by the disaster, contribution to ending extreme poverty and boosting shared prosperity, vulnerability of households, social inclusion, cost-effectiveness, access to the road networks, schools, health facilities, and markets, exposure to disaster risk, as well as results from participatory/consultative planning approaches. The construction of roads under this project is expected to create work opportunities by adopting labor-based construction approaches and use of intermediate type of construction equipment's while simultaneously repairing rural infrastructure. The detailed design of the roads and structures will include construction methods that optimize the use of local labor and local materials through labor-based appropriate technology (LBAT). A build-back-better approach will be taken for the investments, whereby sound engineering designs will be applied to enhance the resilience to natural hazards. Design standards of roads and drainage structures will be reviewed and capacity-building to Government staff and local/international contractors will be provided. The rehabilitation of roads will be complemented by routine maintenance to ensure sustainability of project investments.

Table 4.10 Project List of Rural Roads

No.	Road Section	Estimated Amount (US\$)
C2-W01	San Kin - Ka Lot Thauk Road, Ayeyawady Region	1,500,000
C2-W02	Shan Zu - Chaung Zauk to Hle Zeik Road, Ayeyawady Region	2,800,000
C2-W01-2-01	Sai Naign Gwe - Main The – Kumseik Road, Sagaing Region	2,285,721
C2-W01-2-02	Sai Naign Gwe - Main The – Kumseik Road, Sagaing Region	2,372,637
C2-W01-2-03	Kant BaluHtan Gone - Kabo Road, Sagaing Region	2,669,504
C2-W01-2-04	Kant BaluHtan Gone - Kabo Road, Sagaing Region	2,094,274
C2-W01-3-01 Lot1	San Kin - Kalot Thauk Road (6 km), Danuphyu Township	1,500,000
C2-W01-3-01 Lot2	Construction of Multicell Box culvert (12.5m) and Bridges (60m+30m+39m) in Danuphyu Township and Kyone Pyaw Township	1,800,000
C2-W01-4 Lot 1	Taw Lathi - Kalot Tout Road, Chainage 0+000 to 8+385 (8.385 Km), Taik Kyi Township, Yangon Division.	3,200,000
C2-W01-4 Lot 2	Taw Lathi - Kalot Tout Road, Chainage 8+385 to 14+400 (6.015 Km), Taik Kyi Township, Yangon Division.	2,950,000

Source: World Bank. 2020. Myanmar Flood and Landslide Emergency Recovery Project - Procurement Plan

4. On-going and Planned Projects

4.4 Status of Proposed Projects

Table 4.11 and Table 4.12 show current status of project implementation of the proposed priority projects under NTMP and NLMP.

Table 4.11 Current Status of NTMP's Priority Road Projects

Sector Strategy	Project	Project Type	Time Frame	Status	Financial Source
A: Central North-South Corridor	R007 Shwebo – Myitkyina Road	Improvement	Mid	***	
	R009a Bago – Mandalay Road	Improvement	Mid	BOT	
	R009b Yangon (from toll gate) - Bago Road	Improvement	Mid	BOT	
	R013 Mandalay – Thabeikkyin – Tagaung – Bhamo Road	Improvement	Mid	***	
	R027 2 bridges on Yangon-Mandalay Road	Replacement	Short	BOT	
	R041 Yangon - Mandalay Expressway	Improvement	Short		
	R042 Yangon City - Thilawa Port Expressway	New	Short		
	R043 Yangon City - Hanthawaddy - Existing Expressway	New	Mid		
	R044 Mandalay Circular Expressway	New	Mid		
B: East-West Corridor	R001 Thaton – Eindu – Kawkareik – Myawaddy Road	Improvement	Short	***	
	R003 Thanbyuzayat – Dawei – Myeik – Kawthonng Road	Improvement	Short	***	
	R016 Payagyi – Mawlamyaine - Thanbuzayat Road	Improvement	Mid	BOT	
	R021 Gyaing (Kawkareik) Bridge	Replacement	Short	On-going	JICA
	R024 Don Tha Mi and Naung Lon Bridge	Replacement	Short	Implemented	
	R025 Gyaing (Zarthapyin) Bridge	Replacement	Short	On-going	JICA
	R026 Attran Bridge	Replacement	Short	On-going	JICA
	R038 Thanlwin (Chaungson) Bridge	New	Long		
	R039 Chaungnitkwa Bridge	New	Mid	Implemented	
	R042 Yangon City - Thilawa Port Expressway	New	Short		
	R043 Yangon City - Hanthawaddy - Existing Expressway	New	Mid		
C: Northern Corridor	R012 Mandalay – Lashio – Muse Road	Improvement	Mid	BOT	
	R033 New Goat twin Viaduct	New	Mid		
K: Western North-South Corridor	R010 Yangon – Pyay - Mandalay Road	Improvement	Mid		
	R011 Monywa – Pathein Road	Improvement	Mid	***	
H: Delta Area Network	R011 Monywa – Pathein Road	Improvement	Mid	***	
	R018 Yangon – Pathein Road	Improvement	Mid	BOT/On-going	
	R028 Hinthata Bridge	New	Short	***	
	R032 Hlaing River Bridge	New	Mid	***	
	R037 Thetkal Thoung Bridge	New	Mid	***	
D: Mandalay - Tamu Corridor	R006 Monywa - Pale - Gangaw – Kalaymyo Road	Improvement	Mid	***	
	R011 Monywa – Pathein Road	Improvement	Mid	***	
	R017 Monywa – Yargyi – Kalewa Road	Improvement	Mid	***	
	R029 Yaw Chaung (Yapyar) Bridge	Replacement	Mid	Implemented	
	R030 Yaw Chaung (Ohn Taw) Bridge	Replacement	Mid	Implemented	
	R036 Chindwin (Kalaywa) Bridge	New	Mid	Implemented	
E: Second East - West Corridor	R004 Taunggyi – Loilim – Kyaington Road	Improvement	Short	***	
	R005 Kyaington – Mongla Road	Improvement	Short	***	
	R008 Minbu – Ann – Kyauktaw – Sittwe Road	Improvement	Mid	***	
G: East - West Bridging Corridor	R048 Loikaw - Magway Road	Improvement	Long		
	R049 Hapasawing - Pyay Road	Improvement	Long		
J: Southern Area Development Corridor	R002 Three Pagoda Pass	Improvement	Short	Implemented	
	R003 Thanbyuzayat – Dawei – Myeik – Kawthonng Road	Improvement	Short	***	
	R015 Dawei – Phunamron Road	Improvement	Long		
	R020 Tanintharyi – Mawtaung Road	Improvement	Long	BOT	
	R034 Tha Mouk Bridge	New	Long		
L: Eastern North - South Corridor	R014 Thibaw – Loilem Road	Improvement	Long		
	R019 Taunggyi – Loikaw – Hpapun – Pha an Road	New	Mid		

Source: JICA. 2014. The Survey Program for the National Transport Development Plan.

Table 4.12 Current Status of NLMP's High-Priority Road Projects

Logistics Corridor	Project	Project Type	Time Frame	Status	Financial Source	
1. South-East Logistics Corridor	LRP-07 New Expressway between Bago-Kyaikhto	New	Short	F/S Completed	ADB/JICA	
	LRP-09 Three Pagoda Pass Road	Improvement	Short	Implemented		
	LRP-08 Thaton Bypass Road	New	Short	F/S Completed		
	LRP-15 Thaton – Eindu – Kawkareik – Myawaddy Road	Improvement	Short			
	LRP-16 Gyaing (Kawkareik) Bridge	Replacement	Short	On-going	JICA	
	LRP-16 Gyaing (Zarthapyin) Bridge	Replacement	Short	On-going	JICA	
	LRP-16 Atran Bridge	Replacement	Short	On-going	JICA	
	LRP-10 Mawlamyine Peripheral Road	Improvement	Short			
	LRP-26 Dawei – Phunamron Road	Improvement	Mid-Long			
	LRP-19 Payagyi – Mawlamyine - Thanbuzayat Road	Improvement	Short	BOT		
	LRP-33 Tanintharyi – Mawtaung Road	Improvement	Mid-Long			
	LRP-34 Thanbyuzayat – Dawei – Myeik – Kawthonng Road	Improvement	Mid-Long			
	LRP-21 Tha Mouk Bridge	New	Short			
2. North-South Logistics Corridor	LRP-38 Don Tha Mi and Naung Lon Bridge	Replacement	Mid-Long	Implemented		
	LRP-39 Chaungnitkwa Bridge	New	Mid-Long	Implemented		
	LRP-01 Yangon-Nay Pyi Taw-Mandalay Expressway	Improvement	Short			
	LRP-03 Myotar-Tada U Road	New	Short			
	LRP-06 Hanthawaddy Airport Access Road	New	Short			
	LRP-05 Yangon Outer Ring Road (YORR) East Section	New	Short	F/S On-going (JICA)		
	LRP-22 Yangon City - Hanthawaddy - Existing Expressway	New	Short			
	LRP-04 Yangon Urban Expressway (YUEX)	New	Mid-Long			
	LRP-18 Yangon (from toll gate) - Bago Road	Improvement	Short			
	LRP-02 Alternative Route of Mandalay - Muse Road	New	Mid-Long			
	LRP-25 Mandalay – Lashio – Muse Road	Improvement	Mid-Long	BOT		
	LRP-27 Bago – Mandalay Road	Improvement	Mid-Long	BOT		
	LRP-28 New Goat Twin Viaduct	New	Mid-Long	BOT		
	LRP-30 Mandalay Circular Expressway	New	Mid-Long			
	LRP-35 Shwebo – Myitkyina Road	Improvement	Mid-Long			
	LRP-20 Watayar Bridge	New	Short			
	3. Main River Logistics Corridor	LRP-40 Mandalay – Thabeikkyin – Tagaung – Bhamo Road	Improvement	Mid-Long		
LRP-47 Hlaing River Bridge		New	Mid-Long			
LRP-49 Thetkal Thoung Bridge		New	Mid-Long			
LRP-17 Yangon – Patheingyi Road		Improvement	Short	BOT/On-going		
LRP-24 Yangon – Pyay - Mandalay Road		Improvement	Mid-Long	BOT		
LRP-32 Hapasawing - Pyay Road		Improvement	Mid-Long			
LRP-48 Hinthada Bridge		New	Mid-Long			
4. Coastal Marine Logistics Corridor	LRP-51 Monywa – Patheingyi Road	Improvement	Mid-Long			
	LRP-53 Ayeyarwaddy (Thayat-Aunglan) Bridge	New	Mid-Long			
	LRP-55 Ayeyarwaddy (Kathar) Bridge	New	Mid-Long			
	LRP-56 Chindwin (Phaungbyin) Bridge	New	Mid-Long			
	LRP-29 Minbu – Ann – Kyauktaw – Sittwe Road	Improvement	Mid-Long			
	5. Trans Myanmar Logistics Corridor	LRP-12 Fast Shan Plateau Access Road (Yin Mar Bin-Kalaw)	New	Mid-Long		
		LRP-14 Ann-Kyaukpyu Road	Improvement	Mid-Long		
		LRP-31 Loikaw - Magway Road	Improvement	Mid-Long		
LRP-37 Taunggyi – Loilim – Kyaington Road		Improvement	Mid-Long			
LRP-45 Thibaw – Loilem Road		Improvement	Mid-Long			
LRP-46 Taunggyi – Loikaw – Hpapun – Pha an Road		Improvement	Mid-Long			
LRP-50 Watalone Tunnel		New	Mid-Long			
LRP-52 Kyaington – Mongla Road		Improvement	Mid-Long			
6. Myanmar-India Logistics Corridor	LRP-54 Thanlwin (Kunlone) Bridge	New	Mid-Long			
	LRP-13 Construction of Bridges on India-Myanmar-Thailand Trilateral Highway (Tamu-Kyigone-Kaleywa Road)	Replacement	Short	On-going		
	LRP-11 Pong Taung-Pone Nyar Tunnel between Magway and Sagain	New	Mid-Long			
	LRP-23 Yaw Chaung (Yepyar) Bridge	Replacement	Mid-Long	Implemented		
	LRP-36 Shwebo - Ye U - Kalaywa Road	Improvement	Mid-Long			
	LRP-41 Monywa - Pale - Gangaw – Kalaymyo Road	Improvement	Mid-Long			
	LRP-42 Monywa – Yargyi – Kalewa Road	Improvement	Mid-Long			
LRP-43 Yaw Chaung (Ohn Taw) Bridge	Replacement	Mid-Long	Implemented			
LRP-44 Thanlwin(Tarsotpha) Bridge	New	Mid-Long				

Source: JICA. 2018. Data Collection Survey on National Logistics.

