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Cross-border Transport Facilitation in Inland ASEAN and the ASEAN Economic Community

Edited by

Masami Ishida

IDE-JETRO

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Preface

In 2015, two important events took place. First, the ASEAN Economic Community (AEC) was launched on 31 December 2015. This brought the ASEAN closer towards its target of 'a single market and production base'. Such vision requires, amongst others, initiatives that will facilitate cross-border transport.

Hitherto, hard and soft road infrastructure projects have been developed under the ASEAN Connectivity Master Plan, ASEAN Highway Network, and transport-related ASEAN framework agreements, all of which are reviewed in this project. Specifically, as roads currently categorised as below Class III need to be upgraded to Class III (two- lane road with double bituminous treatment) per the master plan, we have examined some of these roads and compared their actual state with the requirements stipulated in agreements and other public documents.

The hard infrastructure projects that involve road upgrade are listed only in Lao PDR and in Myanmar. Countries such as Cambodia and Viet Nam have taken one step further by implementing road upgrades per the ASEAN Connectivity Master Plan. Thus, we interviewed provincial government officials in these two nations on the effect of their efforts and analysed the impact of such improvements.

The second important event was when all six countries of the Greater Mekong Subregion programme (i.e. Cambodia, China, Lao PDR, Myanmar, Thailand, and Viet Nam) ratified all the annexes and protocols of the Cross-border Transport Agreement (CBTA). In this project, we reviewed the CBTA, bilateral and trilateral agreements in Inland ASEAN countries as well as transport-related ASEAN framework agreements. We expect the ratification to accelerate cross-border movements in these nations.

As it is also necessary for technical standards such as maximum weights, road signs, and transport-related standards to be harmonised, this project tried to analyse the extent of such harmonisation.

Results summarised in this volume are based on a research project entitled, 'New Developments for Cross-border Transport Facilitation in the Inland ASEAN and Establishment of the ASEAN Economic Community', a collaborative research between the Economic Research Institute for ASEAN and East Asia and the Institute of Developing Economies, Japan External Trade Organization. For the implementation of the project, we collaborated with the Cambodian Research Centre for Development; National Economic Research Institute, Lao PDR; Myanmar Marketing Research and Development, Co., Ltd; and Institute of World Economics and Politics, Vietnam Academy of Social Sciences. We thank these organisations as well as the firms and government officials who responded to our requests for interviews.

Masami Ishida
Director General
Development Studies Center and
ERIA Support Office

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List of Project Members

Nguyen Binh Giang	Deputy Director, Institute of World Economics and Politics, Viet Nam Academy of Social Sciences
Masami Ishida**	Director General, Development Studies Center and ERIA Support Office, Institute of Developing Economies, Japan External Trade Organization
Ikumo Isono*	Deputy Director, Economic Geography Studies Group, Inter-Disciplinary Studies Center, Institute of Developing Economies, Japan External Trade Organization
Vanthana Nolintha	Director, Macroeconomic Research Division, National Economic Research Institute, Lao PDR
Sau Sisovanna	Researcher/Consultant, Cambodian Research Centre for Development, Phnom Penh
Ahkar Soe	Research Manager, Myanmar Marketing Research & Development Co., Ltd.
So Umezaki	Director, Economic Integration Studies Group, Inter-Disciplinary Studies Center, Institute of Developing Economies, Japan External Trade Organization

** Project Leader

* Project Coordinator

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AC	Asphalt concrete
ADB	Asian Development Bank
AEC	ASEAN Economic Community
AFAFGIT	ASEAN Framework Agreement for Facilitation Goods in Transit
AFAFIST	ASEAN Framework Agreement on the Facilitation of Inter-State Transport
AFAMT	ASEAN Framework Agreement on Multimodal Transport
AH	ASEAN Highway
AMS	ASEAN Member State
ASEAN	Association of Southeast Asian Nations
ASYCUDA	Automated System for Customs Data
B-O-T	Build-operate-transfer
B-T	Build-transfer
CBTA	Cross-border Transport Agreement
CLMV	Cambodia, Lao PDR, Myanmar, and Viet Nam
KHR	Cambodian Riel
DBST	Double bituminous surface treatment
FTA	Free Trade Agreement (Area)
GDP	Gross Domestic Product
GMS	Greater Mekong Subregion
IDE-GSM	Institute of Developing Economies-Geographical Simulation Model
II-CBTA	Initial Implementation of CBTA
₭N	Lao Kip
MK	Myanmar Kyat
MoU	Memorandum of Understanding
MPAC	Master Plan of ASEAN Connectivity
MPWT	Ministry of Public Works and Transport (Laos)
NR	National road
NH	National highway
PPP	Public-Private Partnership
RGC	Royal Government of Cambodia
RTAD	Road Transport Administration Department (Myanmar)
SEZ	Special Economic Zone
TTR	Transit Transport Route

Chapter 1

Inland ASEAN Road Connectivity: Challenges and Prospects

Masami Ishida

This chapter presents the background of the research project entitled 'New Developments for Cross-border Transport Facilitation in the Inland ASEAN and Establishment of the AEC'. It first reviews the history of the ASEAN Highway and Master Plan on ASEAN Connectivity. Subsequently, it looks at the state of the identified road projects due for an upgrade in Lao PDR and Myanmar. This study also examines the economic impact of newly developed roads, including an expressway in Cambodia and in Viet Nam. Moreover, it summarises the regulations on technical standards and road signs, and laws on transport or traffic in Cambodia, Lao PDR, Myanmar, and Viet Nam. Finally, it reviews the results of this chapter and introduces the coverage of subsequent chapters.

Introduction

The year 2015 was a great milestone for the ASEAN with the establishment of the ASEAN Economic Community (AEC). There, too, was the release of the Master Plan on ASEAN Connectivity (MPAC), a set of strategic documents that details how to achieve overall ASEAN connectivity and identifies projects that need to be immediately implemented for the period 2011–2015. This master plan aims to connect the ASEAN through enhanced physical infrastructure development (physical connectivity), effective institutions, mechanisms and processes (institutional connectivity), and empowered people (people-to-people connectivity).

The first purpose of the research project of the Economic Research Institute for ASEAN and East Asia (ERIA) and the Institute of Developing Economies, Japan External Trade Organization's (IDE–JETRO) entitled, "New Developments for Cross-border Transport Facilitation in the Inland ASEAN and Establishment of the ASEAN Economic Community" is to review the efforts in the MPAC. Chapter 2 presents the transport facilitation undertaken in Inland ASEAN including

ASEAN Framework Agreement on the facilitation of Goods in Transit (AFAFGIT) and Cross-Border Transport Agreement (CBTA) under the scheme of Greater Mekong Subregion (GMS) Economic Cooperation Program. Chapters 4 and 5 analyse Lao PDR and Myanmar's efforts to eliminate missing road links and to upgrade certain roads to the Class III level. On the other hand, Chapters 3 and 6 look at some roads that have been upgraded recently in Cambodia and in Viet Nam, although these improvement initiatives were not listed in the MPAC.

Section 1 of this first chapter summarises the road infrastructure efforts of Cambodia, Lao PDR, Myanmar, and Viet Nam (altogether referred to here as the CLMV) and the effects of the road enhancements as estimated by the simulation study in Chapter 7.

Part of the most important challenges of the AEC and MPAC is how these will simplify the various procedures and harmonise rules at border checkpoints. For instance, in Inland ASEAN – which is composed of Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam – efforts are already being made to facilitate cross-border movement of vehicles and align transport rules.

Efforts conducted under the scheme of ASEAN are represented by the transport-related ASEAN framework agreements that cover the 10 ASEAN countries, while the scheme under the Economic Cooperation Program of Greater Mekong Subregion has the CBTA, which covers the Yunnan Province and Guangxi Zhuang Autonomous Region in China, in addition to the five countries mentioned above. The CBTA annexes and protocols were ratified by all countries in 2015, which then paved the way for cross-border movements of vehicles to be accelerated in the Inland ASEAN (As discussed in Chapter 2).

With the ratification, cross-border land transport is estimated to increase in the coming years. Without the harmonisation of transport rules, however, drivers might face difficulties in their destination territories (e.g., struggles with unfamiliar traffic signs). Thus, the second purpose of this project is to examine the current status of the harmonisation efforts on technical standards such as the width, height, length of vehicles, maximum weight of vehicles, traffic signs, and related traffic or transport laws in Cambodia, Lao PDR, Myanmar, and Viet Nam (Chapters 3 through 6).

To provide the context for the per-country discussion, Chapter 1 reviews the history of the ASEAN Highway and MPAC. The first section looks at the challenges of the MPAC in Lao PDR and Myanmar as well examines the improvements on road infrastructure and their economic

benefits to Cambodia and Viet Nam. Sections 2 through 4 summarise the technical standards, road traffic signs, and transport-related laws in CLMV, respectively. This chapter concludes by introducing the succeeding chapters.

1. Elimination of Missing Road Links; Upgrade of Roads

1.1. ASEAN Highway

The ASEAN Transport Ministers (ATM) Meeting was launched on 18 March 1996 in Bali, Indonesia. The Second ATM Meeting, which was held in Chiang Mai, Thailand on 28 February 1997 succeeded to solicit participating nations' agreement to 'develop a complete system of highway network to link ASEAN member countries together and where technical standards of design and road traffic safety are compatible'. At the Third ATM Meeting at Cebu, Philippines on 5 September 1997, it was agreed that 'Thailand convene the meeting of ASEAN Highway Experts to follow-up the proposed development of the ASEAN Highway Network Project as the country coordinator'.

The coordinated results were brought to the Second Unofficial Summit in Kuala Lumpur on 15 December 1997, and the development of an integrated and harmonised trans-ASEAN transportation network was stipulated in the ASEAN Vision 2020. As a result, the Ministerial Understanding on the Development of the ASEAN Highway Network Project was agreed to be adopted during the Fifth ATM Meeting in Hanoi, Viet Nam on 15–16 September 1999 (Ishida, 2015; ASEAN Secretariat, 1999; ASEAN Secretariat, 1997).

The ministerial understanding's objectives are:

1) To provide an institutional mechanism to formalise the strategic route configuration and the uniform technical design standards of the ASEAN Highway Network;
2) To formulate the ASEAN Highway Infrastructure Development Plan;
3) To promote cooperation with other international and regional organisations so as to ensure technical compatibility of ASEAN's road standards and road safety requirements, and create stronger links and connection within ASEAN and with neighbouring or adjoining regions;

4) To intensify cooperation in the facilitation of international road traffic throughout the ASEAN region.

Annex B of the ministerial understanding classifies the highways into four classes, as shown in Table 1.1. Article 3 of the understanding requests the ASEAN member countries to improve or upgrade the designated national sections of the ASEAN Highway Network in line with the phased development timeframe, as shown in Table 1.2.

Table 1.1. Road Classification of ASEAN Highway

	Description	**Pavement Type**	**Designated Speed**
Primary	Access controlled motor way with four or more lanes	Asphalt or cement concrete	60–120 km/h
Class I	Four or more lanes	Asphalt or cement concrete	50–110 km/h
Class II	Two lanes	Asphalt or cement concrete	40–100 km/h
Class III	Two lanes	Double bituminous treatment	40– 80 km/h

Note: Desired speed is differently stipulated by geographical conditions: level terrain (L), rolling terrain (R), and mountainous terrain (M).
Source: ASEAN Secretariat (1999).

Table 1.2. Original Development Targets for ASEAN Highway Network

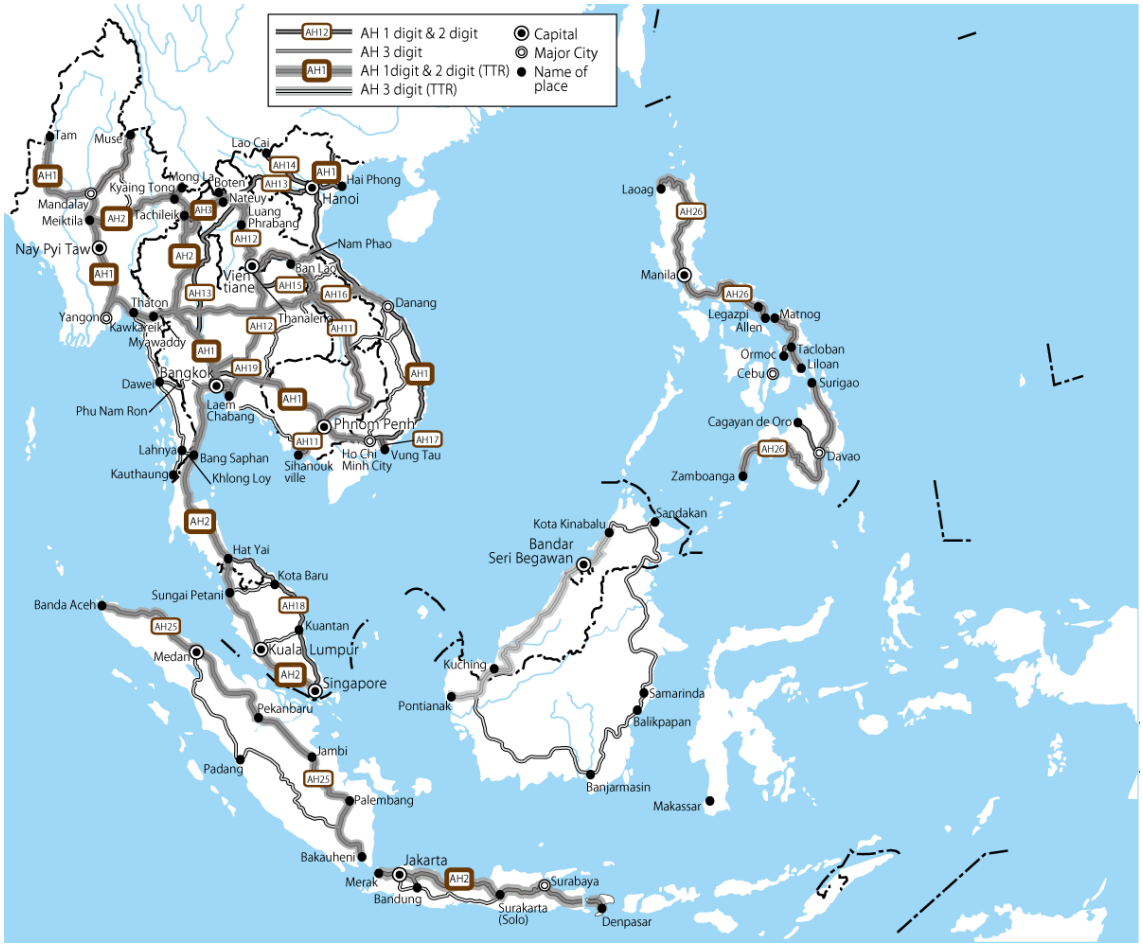
Phase	**Tentative Completion Year**	**Technical Requirements**
Stage 1	2000	Completion of network configuration and designation of national routes
Stage 2	2004	Road signs and all designated routes upgraded to at least Class III
Stage 3	2020	All designated routes upgraded to at least Class I or Primary Class

Source: ASEAN Secretariat (1999).

Annex A of the ministerial understanding shows the designated concrete highways from ASEAN Highway 1 (AH1) to AH16 with a total length of 38,400 km (ASEAN Secretariat, 1999).

The highways are designated according to the Trans-Asian Highway Network by the United Nations Economic Social Commissions for the Asia–Pacific Region, although the designated numbers and routes are slightly different. However, after the signing of Protocol 1 of the ASEAN Framework Agreement for Facilitation Goods in Transit (AFAFGIT) on 16 December 1998, the ASEAN highways have been following the numbers and routes of the Trans-Asian Highway (Ishida, 2015) as indicated in the MPAC, while the map in the MPAC was originally created by JETRO (2008) (Figure 1.1). The Transit Transport Route in Figure 1.1 is designated in Protocol 1 of the AFAFGIT that was signed on 8 February 2007 and has a total length of 21,206 km.

Figure 1.1. Routes of the ASEAN Highway



Source: Created by the author based on JETRO (2008) and Hayashi (2004).

1.2 Master Plan on ASEAN Connectivity

The ASEAN connectivity started as a concept discussed at the 15th ASEAN Summit in Cha-am, Hua Hin, Thailand on 24 October 2009. At the 17th ASEAN Summit in Hanoi, Viet Nam on 10 October 2010, the MPAC, which was developed by the High-Level Task Force on ASEAN Connectivity, was adopted.

The scope of MPAC is broad, covering not only physical connectivity such as transport, information and communication technology, and energy, but also institutional connectivity and people-to-people connectivity. The ASEAN Highway Network is one of the most important parts of the MPAC.

The MPAC covers Article 3 of the Ministerial Understanding on the Development of the ASEAN Highway Network Project in 1999 and the Transit Transport Routes, but recognises that its implementation of the ministerial understanding is behind schedule. In particular, the MPAC clarifies that the total length of 227 km of missing road links in Myanmar and 2,069 km of Transit Transport Routes in Lao PDR and Myanmar are classified as below Class III roads (Table 1.3). The situation of these roads as of 2012 is shown in Table 1.4.

Table 1.3. Missing Road Links and Below-Class III Road Sections Needing Upgrade Based on the MPAC

'Missing Links' As Designated in the MPAC.

AH No.	**National Road**	**Section**	**Distance**
AH112	Myanmar No. 8	**Lahnya–Khlong Loy**	60 km
AH123	Myanmar	**Dawei–Maesamepass (Phu Nam Ron)**	141 km

Sections to Be Upgraded to Class III.

AH No.	National Road	Section	Distance
AH12	Lao PDR No. 13	**Vientiane–Luang Prabang**	393 km
AH15	Lao PDR No. 8	**Ban Lao–Namphao**	98 km
AH1	Myanmar No. 1 & No. 8	**Tamu–Mandalay–Bago–Myawaddy**	781 km
AH2	Myanmar No. 4	**Meiktila–Loilem–Kyaing Tong–Tachileik**	593 km
AH3	Myanmar	**Kyaing Tong–Mong La**	93 km

Source: P74, ASEAN Connectivity Master Plan (MPAC).

Table 1.4. State of Road Sections as of 2012

State of Sections Categorised as 'Missing Links'.

AH No.	National Road	Section	Distance	Road Class
AH1	Myanmar	Tamu–Mandalay	610 km	3 or Below 3
AH1	Myanmar	Thaton–Myawaddy	195 km	3 or Below 3
AH2	Myanmar	Meiktila–Loilem	276 km	2, 3 or Below 3
AH2	Myanmar	Loilem–Kyaingtong	367 km	Below 3
AH111	Myanmar	Thibaw–Loilem	239 km	
AH112	Myanmar	Mawlamyaine–Thanbyuzayat	64 km	2 or Below 3
AH112	Myanmar	Thanbyuzayat–Lahnya	695 km	Below 3
AH112	Myanmar	Lahnya–Khamaukgyi	260 km	Missing Link
AH123	Myanmar	Dawei–Phu Nam Ron	150 km	Missing Link

Situations of Sections to Be Upgraded to Class III.

AH No.	National Road	Section	Distance	Road Class
AH13	Lao PDR No. 13S	Vientiane–Nong Nokkhien	861 km	3 (completed)
AH12	Lao PDR No. 13N	Thanaleng–Nateuy	682 km	3 (completed)
AH15	Lao PDR No. 8	Banlao–Nam Phao	132 km	3 (65% completed)
AH3	Lao PDR No. 3	Houayxay–Boten	251 km	3 (65% completed)
AH16	Lao PDR No. 9	Seno–Dansavanh	240 km	3 (completed)
AH13	Lao PDR No. 2	Oudomxay – Tay Trang (V)	202 km	Need funding

Source: Based on ASEAN Connectivity Master Plan Information Sheet, 2012.

Amongst the roads in Table 1.3, the author has examined AH112, AH12 (or National Road [NR] No. 13) in Lao PDR, AH15 (or NR No. 8) in Lao PDR, and AH1 (or NR No. 8) in Myanmar.

In particular, the section between Phonhong and Phou Khoun of AH12 was examined twice: on 24 July 2011 and 8 November 2015. According to Table 1.3, the section was classified as below Class III in 2010, and the upgrade to Class III was completed in 2012. In reality, the road condition was not below Class III in 2011. In 2015, on the other hand, no 'upgrade' was noticed since 2011. In fact, the condition of a section was worse than it was in 2011. As such, it was difficult to assess whether the section between Vientiane and Luang Prabang needs to be designated as 'to be upgraded to Class III'.

It is likewise difficult to establish whether the correct recognition of the real road conditions was shared amongst government officials (at both provincial and national levels), as this requires multiple viewings. Additionally, for roads in mountainous sections, there is a need to decide whether it is realistic to upgrade them to at least Class III. After all, it is more difficult to maintain the Class III condition in mountainous sections, where landslides and rock falls occur during the rainy season (Figure 1.2).

Meanwhile, in AH1 (or NR No. 8) in Myanmar, the section between Myawaddy (a border city of Myanmar with Thailand) and Yangon was evaluated by the author twice (i.e., on 1–3 December 2013 and on 27 January 2016).

The section between Thaton and Myawaddy was classified as 'Class III or below Class III' as of 2012. The evaluation was correct when the section between Thingan–Nyinaung and Kawkareik used to be one way (i.e., only automobiles from Thingan–Nyinaung to Kawkareik could pass on one day; the next day, only the automobiles from the other direction could pass).

Figure 1.2. Rock Falls and Landslides in a Section of AH12

Source: Taken by the author on 24 July 2011.

Source: Taken by the author on 8 November 2015.

Figure 1.3. Before and After the Road Upgrade at Y-Junction

Source: Taken by the author on 1 December 2013.

Source: Taken by the author on 27 January 2016.

On 30 August 2015, a new Class II road was developed with assistance from the Thai government (Figure 1.3). The new road section measures 44 km – or 21 km shorter than the older one. One can traverse this upgraded section within one hour only as compared to the four hours in 2013.

Figure 1.4. A Shopping Mall in Mae Sot with Signs in the Burmese Language

Source: Taken by the author on 26 January 2016.

With the completion of the project, the number of Myanmar visitors who enjoy shopping at Mae Sot has increased. In this border town of Thailand,[1] one shopping centre even welcome

[1] An interview at Tak Chamber of Commerce at Mae Sot.

customers from Myanmar in the Burmese language (Figure 1.4). However, the economic impact of the new road in Tak Province, which includes Mae Sot, is not substantial, according to the simulation results in Chapter 7 of this report.

1.3 Other Road Improvements

Certain roads have been improved although their upgrade was not listed in the MPAC. Amongst these are projects along the designated economic corridors under the Greater Mekong Subregion Economic Cooperation Programme. This section thus presents road improvement cases specifically in Cambodia and Viet Nam.

In Viet Nam, a bridge over Cai Lon River, 22 km away from Rach Gia, in Kieng Giang Province, was formally opened on 7 February 2014. With its completion, the Southern Coastal Sub-Corridor of the Southern Economic Corridor can now be traversed without the need for ferryboats. Meanwhile, the bridge over the Mekong River at Sutung Treng, Cambodia along the northern subsection of the Southern Economic Corridor was completed in 2014 with assistance from China and opened on 1 April 2015.

The NR No. 9 between Cambodia's Soutr Nikom and Stung Treng (273 km) is a newly developed section, which includes the Stung Treng Bridge. When the author passed through the section on 4–5 November in 2015, he found the road to be in good condition, although the number of cars passing through was limited. The simulation analysis (See Chapter 7) also shows that the impact of the road improvements on both Siem Reap and Preah Vihear Provinces – areas of the road network the author passed by – are smaller than the overall improvement on NR No. 9.

Another bridge over the Mekong River called the Tsubasa Bridge at Neak Loeung, Cambodia (along the central subsection of the Southern Economic Corridor) was completed through a grant from the government of Japan and opened on 6 April 2015.

In Viet Nam, new by-pass roads have been developed mainly along NR No. 1 through the Build-Operate-Transfer scheme. There are also several recently completed expressways such as those between:

- Lang and Hoa Lac (3 October 2010)
- Cau Gie and Ninh Binh (30 June 2012)

- Ha Noi and Thai Nguyen (13 July 2013);
- Ho Chi Minh City and Long Thanh (29 August 2014);
- Long Thanh and Dau Giay (8 February 2015);
- Noi Bai and Lao Cai (21 September 2014); and
- Ha Noi and Hai Phong (5 December 2015).

Of the above areas, the author passed through the Noi Bai–Lao Cai Expressway on 21 January 2015 and noted that road improvements had substantial effects on the communities. First, industrial estates developed around interchanges of the expressway attracted more foreign investment into Phu Tho and Yen Bai Provinces in 2015. In particular, the impact on Phu Tho Province was substantial – a conclusion supported by the simulation analysis in Chapter 7.

Second, the marketing area for agricultural products has expanded while transport time was reduced.

Third, the number of domestic tourists who are using their own cars to travel from Ha Noi to Sa Pa has dramatically increased. Today, travel time by car takes four hours, whereas the only means of transport to Sa Pa used to be the night trains. With the increase in tourism, the supply of hotels and parking spaces could not meet the increasing demand.

Finally, there are now lesser overloaded trucks. In the past, drivers are given incentives to carry more goods in one trip so as to reduce the transport cost per weight. Today, following the completion of the expressway, transport time has reduced, thereby lessening the need to incentivise drivers to bring in as much goods in one trip as possible.[2]

2. Comparing Technical Standards

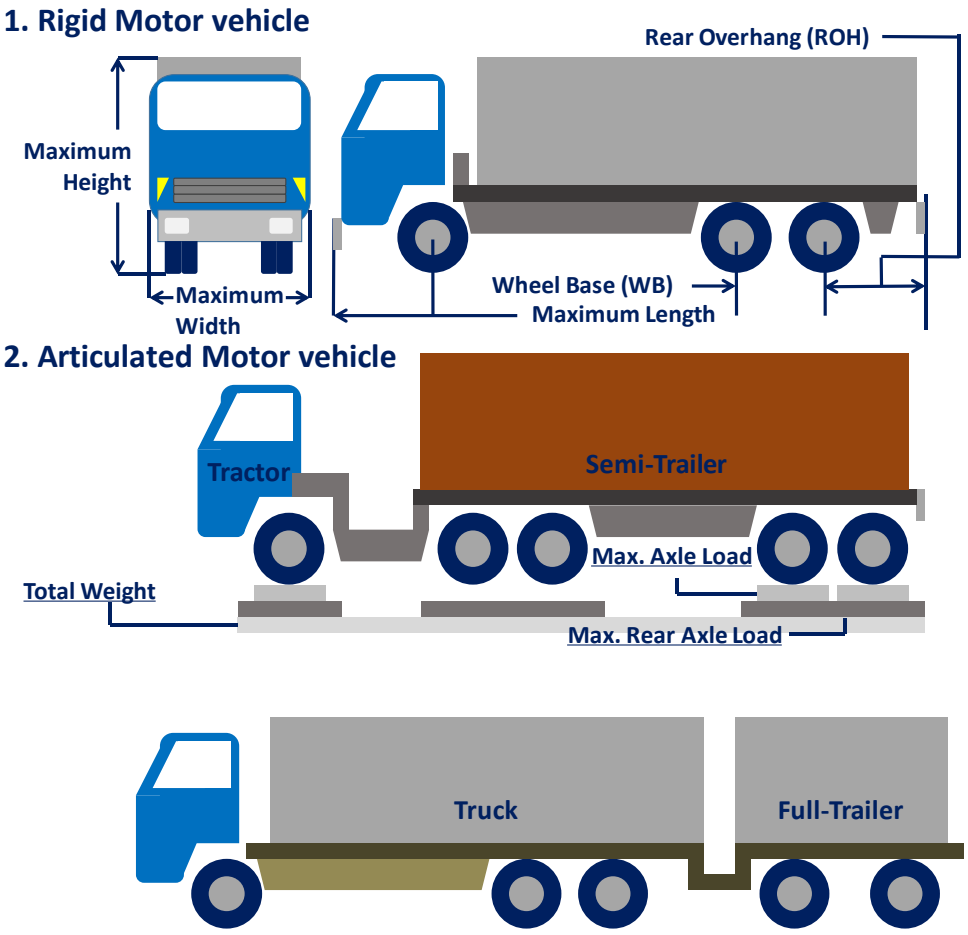
The technical standards on road transport stipulate the maximum values on such factors as length, width, height (Figure 1.5), and weight. The maximum length and weight are regulated differently by types of vehicle, such as a truck or a rigid motor vehicle and an articulated vehicle. The articulated vehicle is divided into tractor (motor vehicle) and trailer. A semi-trailer is a trailer without (a) front wheel(s) such as vehicle No. 2 in Figure 1.5, and the tractor for the

[2] This information is based on interviews with the people's committee of Yen Bai and Phu Tho on 21 January 2016 and of Lao Cai Province on 22 January 2016.

semi-trailer does not have its own bed. A full-trailer is a trailer with (a) front wheel(s), and the tractor or truck has its own bed, such as the vehicle in the last row below. *Wheel base* is the length between the centre of the front wheel and that of the rear wheel. The *rear overhang* is the length between the centre of the rear wheel and the rear edge of the truck or the trailer.

As far as the weight is concerned, the burden on roads can be reduced when there is an increase in the number of axles and wheels. The longer the length between two axles, the smaller the burden on the road. The single axle load is a load per axle. The maximum rear axle load might be expressed in the length between the wheel base and the rear overhang. The way to regulate the axle loads is different by country. For example, in Viet Nam, the maximum axle load is regulated by the number of axles, the length between the twin or triple axles, and the dimension (Chapter 6). In Cambodia, the number of wheels is considered regardless of the length between the axles (Chapter 3).

Figure 1.5. Rigid Motor Vehicle and Articulated Motor Vehicle



Source: Created by the author.

The fundamental rules on the technical requirements are stipulated in the annexes of AFAFGIT's Protocol 4. Table 1.5 shows the mandatedmaximum values such as weight, height, and width. Maximum lengths and widths for rigid vehicles are the same between CLMV's standards and those stipulated in the AFAFGIT.

Meanwhile, the underscored maximum lengths and heights for articulated vehicles in Table 1.5 have values higher than the AFAFGIT standards. This means that articulated vehicles registered under these countries (i.e., Cambodia and Lao PDR) are not guaranteed to be allowed to ply in other ASEAN countries.

Table 1.5. Technical Standards Stipulated in CLMV and in the AFAFGIT (metre)

	Cambodia	**Lao PDR**	**Myanmar**	**Viet Nam**	**AFAFGIT**
Maximum Length					
(Rigid Motor Vehicle)	12.2	12.2	12.2	20	12.2
(Articulated Vehicle)	18.0	19.0	15.2		16.0
Maximum Width	2.5	2.5	2.5	2.5	2.5
Maximum Height	4.2	4.5	4.6	4.2	4.2
Maximum Number of Axles	5	6	6	No Restriction	
Maximum Axle Load	10.0	No Restriction		10.0	
Maximum Rear Axle Road	19.0	ROH < 60% of WB	ROH < 60% of WB	18.0	ROH < 60% of WB

AFAFGIT= ASEAN Framework Agreement for Facilitation Goods in Transit; ROH = rear overhang; WB = wheel base

Notes: 1) the maximum width of vehicles equipped with tools shall not be more than three metres, the maximum length of the automobiles towing semi-trailers shall not exceed 16 metres in Cambodia.

2) The maximum height on the expressway or Class I –III highways is 4.75 metre in Viet Nam.

Source: Based on chapters 3–6 of this publication.

Table 1.6 shows the technical standards on weight stipulated in CLMV and in the AFAFGIT. In many cases, the maximum weights permitted in CLMV are higher than the standard of the AFAFGIT. In particular, the maximum weight in Lao PDR seems to be higher than that of the other countries.

Table 1.6. Technical Standards on Weights in CLMV and in the AFAFGIT

	Cambodia	Lao PDR	Myanmar	Viet Nam	AFAFGIT
3-axle Rigid Vehicle	25.0	25.0	21.0	24.0	21.0
4-axle Rigid Vehicle	30.0	29.5	25.0	30.0	25.0
4-axle Articulated Vehicle	35.0	36.0	31.0	34.0	32.0
5-axle Articulated Vehicle	40.0	45.0	45.0	38.0–42.0	36.0
6-axle Articulated Vehicle	Permission	49.6	48.0	40.0–48.0	38.0

AFAFGIT= ASEAN Framework Agreement for Facilitation Goods in Transit.
Notes: In Cambodia, use of vehicles with more than five axles requires a permission letter from the Ministry of Public Works and Transport.
Source: Based on Chapters 3–6.

Figure 1.6 shows road signs with the required weight limit before approaching a small bridge. Vietnamese border officials recently set the weight limit to prevent damage to the road's surface. Thus, at Lao Bao, a border city of Viet Nam with Lao PDR along the East–West Economic Corridor, cargoes coming from a Lao truck have to be unloaded and then reloaded onto two trucks before entering Viet Nam. However, it is highly possible that overloading do occur in some cases despite the presence of these road signs along the borders if the government of Lao PDR does not check vehicles' weight rigidly.

Figure 1.6. Road Signs on the Maximum Weight in Lao PDR and Cambodia

Lao PDR

Source: Taken by the author on 8 November 2015.

Cambodia

Source: Taken by the author on 6 November 2015.

3. Comparing Road Signs

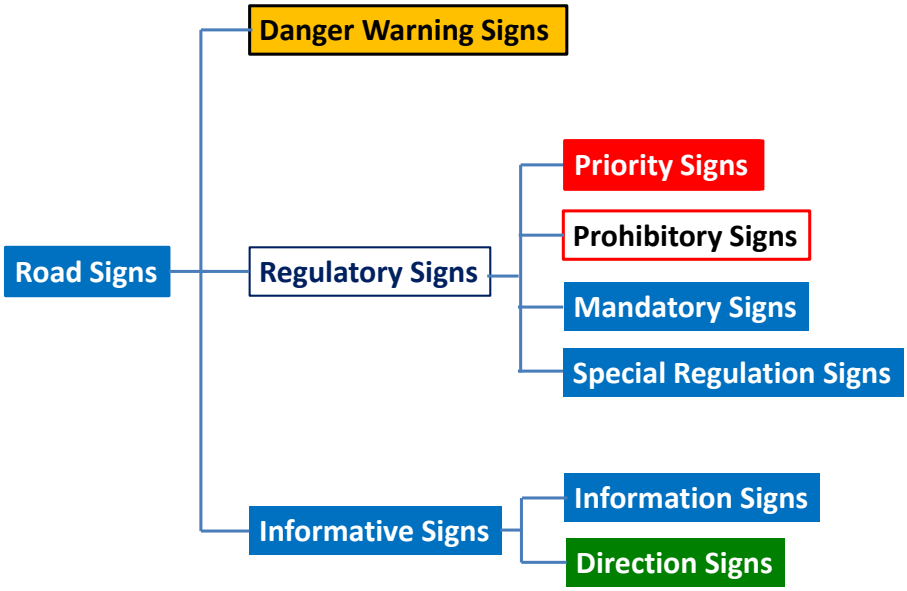
As mentioned at the start of this chapter, all annexes and protocols of the CBTA have been ratified by all member countries in 2015. Article 15 of the CBTA's main agreement stipulates that 'the member countries undertake to gradually adopt their road traffic regulations and signage to the rules and standards set out in Annex 7.' Article 2 of Annex 7 further stipulates that 'road signs, signals, symbols, and road markings on the routes and corridors designated in Protocol 1 of the Agreement shall be as prescribed in Attachment 2 to the Annex,' based on the Vienna Convention on Road Signs and Signals, and signed in 1968. The article provides a transition period of four years in case the characteristics of the road signs, signals, symbols are used with a different meaning from that prescribed by the agreement's attachment; and a 15-year transition period in cases where there are signs and markings that do not conform in principle to the system prescribed by the attachment.

Article 3 of the annex prescribes that (i) the use of language in road markings and signals can be limited to a minimum by the use of symbols; and (ii) the prescribed use of English/Latin

characters and Arabic numeral by no means prohibits the parallel use of the local language.

Road signs are categorised as either danger warning signs, regulatory signs, and information signs (Figure 1.7). Danger warning signs are intended to inform drivers of possible dangers or unusual conditions ahead. Regulatory signs are intended to inform drivers of special obligations, restrictions, or prohibitions with which they must comply.

Figure 1.7. Types of Road Signs



Source: Created by the author with reference to the classification of the Vienna Convention.

The regulatory signs are divided into priority signs, prohibitory signs, mandatory signs, and special regulation signs.

Priority signs indicate to drivers the order in which vehicles should pass intersection points (e.g., 'give way' and 'stop'). The prohibitory or restrictive signs are intended to prohibit certain types of manoeuvres or some types of traffic (e.g., 'no parking,' 'no entry,' and 'do not take over'). Most of the prohibitory signs are surrounded by a red fringed circle. The inside of the 'no parking' and 'no stopping' signs are blue-coloured with a slash or *x*, respectively. There are some exceptions, however, such as 'do not enter.'

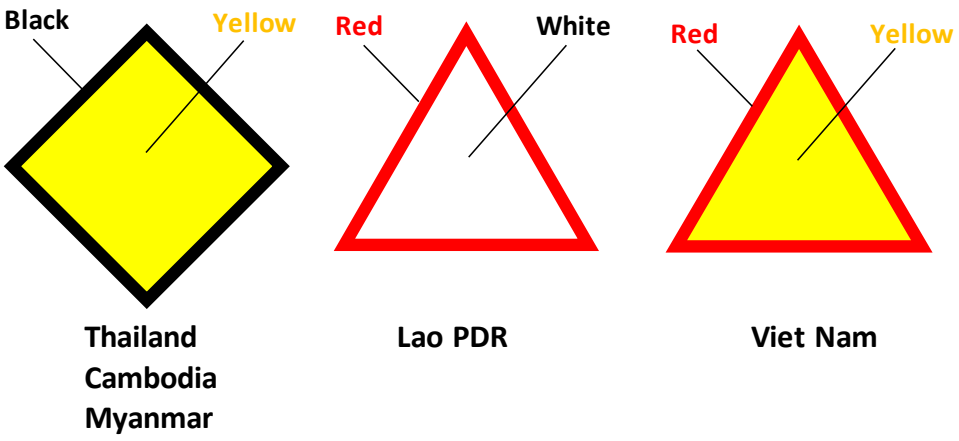
Mandatory signs are intended to set the obligations of all traffic that uses a specific area of the road. Unlike prohibitory ones, mandatory signs prescribe traffic what it must do. Most mandatory road signs are circular. In Inland ASEAN countries, these may use white symbols on a blue background with white border.

Special regulation signs indicate a regulation or danger warning applicable to one or more traffic lanes, lanes reserved for buses, the beginning or end of a built-up area, or signs having zonal validity.

Informative signs are intended to guide drivers or to provide other useful information. They are divided into information and direction signs, position or indication signs. The information signs inform drivers of the existence of an object such as a parking area, hospital, and gas station. They are rectangular with white symbols and backgrounds in either blue or green. The direction signs give information about the location of either the driver or possible destinations (e.g., '50 km to Phnom Penh').

Most signs in the five Inland ASEAN countries are universally recognised, with critical differences in special cases only. First, the appearances of danger warning signs differ (Figure 1.8). In Thailand, Cambodia, and Myanmar, the signs are diamond shaped with a yellow background and black borders. In Lao PDR and in Viet Nam, these have a triangular shape with red borders. The background is white in Lao PDR and yellow in Viet Nam.

Figure 1.8. Different Shapes and Colours of Danger Warning Signs



Source: Created by the author.

Second, Thailand uses a 'do not overtake' sign that differs from that used by the four other nations (Figure 1.9). The ones in Cambodia, Lao PDR, Myanmar, and Viet Nam are based on the Vienna Convention, which may come with or without a diagonal line such as the ones used in Viet Nam.

While the sign found in Thailand differs from the rest, it can be intuitively recognised and is used in Japan as well.

Figure 1.9. Signs for 'Do Not Overtake'

Cambodia
Lao PDR
Myanmar
Viet Nam

Thailand

Notes:
1) The picture on the upper left is a sign in Germany, while the basic designs are not different.
2) Both photos show actual signs used in Viet Nam.
Source: Created by the author and photos taken by the author.

Third, the sign for ‘stop’ is octagonal in shape (Figure 1.10), but expressed in the local language in Thailand. In Lao PDR, some signs are shown only in the local language while others are both in English and the local language. In Cambodia, these are shown in both languages. In Myanmar and Viet Nam, these are in English. In Viet Nam, however, seldom is the sign ‘stop’ seen even on the city streets.

Figure 1.10. Road Signs for ‘Stop’

Cambodia

Lao PDR

Myanmar

Thailand

Viet Nam

Note: In Viet Nam, the sign is designated, but is rarely seen.

Source: Photos are those by the authors as well as from websites.

Finally, the signs for hospitals are different in the four countries (Figure 1.11). The character H, which is based on the Vienna Convention, is not easily recognised intuitively; however, the white cross or crescent moon are also used according to the predominant religion. On the other hand, the sign in Thailand is not based on the Vienna Convention, but can be recognised intuitively.

Additionally, cultural differences can be identified from how road signs are used. In Lao PDR, the sign for ‘Do not overtake’ can be seen at curves. The sign for U-Turn is frequently used in Thailand, on the far-right lane with left-side driving country. For drivers to turn right, they

usually have to go straight, take a U-turn and turn left. In Viet Nam, signs for ‘Do not enter’ can be seen on the edge of median strips. In Myanmar, danger warning signs are expressed in English, using words such as ‘Slow down’ and ‘School,’ instead of symbols.

Other than the above-mentioned cases, drivers from these nations have a common understanding of the road signs, making them ready for an eventual increase in cross-border movements of vehicles. However, it would further help if the number of signs in local languages only is reduced.

Figure 1.11. Information Signs Indicating a Hospital

Cambodia

Lao PDR

Thailand

Viet Nam

Source: Photos taken by the author.

4. Laws on Road Transport

With the increase in cross-border traffic, any country-specific differences in transport or traffic rules have to be lessened to prevent confusion and road accidents. Thus, in this fiscal year project, the members of CLMV have been asked to review their domestic laws on road transport.

In Viet Nam, the Road Traffic Law stipulates broader issues. Such law was issued in 2001 and amended in 2008. In Cambodia and in Lao PDR, the laws are divided into the Road (Land) Law and Road (Land) Traffic Law. Lao PDR promulgated such laws in 2012. Cambodia, meanwhile, issued the Road Transport Law and the Road Traffic Law in 2014 and 2015, respectively.

Myanmar has its Land Transport Law, Motor Vehicle Law, and Highway Law. Historically, the fundamental laws like the civil law in Myanmar have been stipulated since the colonial era, while the current Land Transport Law, Motor Vehicle Law, and Highway Law were promulgated in 2016, 2015, and 2000, respectively.

The contents of the laws are diverse. In Cambodia, the Road Traffic Law prescribes rules such as on traffic signs, road use, pedestrians' walking, and traffic accidents. On the other hand, its Road Transport Law stipulates road classification, road development, and maintenance. In Lao PDR, traffic rules on technical standards, road safety, and prohibitions are stipulated in the Land Traffic Act, while matters such as business transport are covered by the Land Transport Law. In Myanmar, the Motor Vehicle Law stipulates matters on road safety, including the ceasing of importation of right-hand vehicles. Its Highway Law prescribes the construction and maintenance of roads in short-, medium-, and long-term plans. The Land Transport Law intends to reduce environmental pollution and improve efficiency of cross-border transport. In Viet Nam, these issues are under its Road Traffic Law. In countries such as Cambodia, transport-related laws have been recently legislated.

Note that this survey of the different transport rules of countries in Inland ASEAN is just the first step. Deeper analyses are needed henceforth.

5. Conclusions

This chapter reviews the history of the ASEAN Highway and MPAC. A comparison of the list of missing road links as well as roads identified for upgrade, with their current state reveals that there are sections where the need for an upgrade is not clear. This gap might be because the government staff assigned to monitor had failed to review the files in which road conditions are recorded regularly or failed to share the actual state of the roads with stakeholders. Thus, government officials should visit the fields themselves more frequently, and the information should be communicated to other government stakeholders, including the central government.

On the other hand, the new roads – especially expressways – that were improved recently have generated a positive economic impact such as increase in foreign direct investments and tourism, and expansion of distribution areas for agricultural products. In designing the highway and determining future locations, these positive experiences can be used as reference points.

Technical standards across Inland ASEAN nations do not differ much. One aspect where the difference does matter, however, is in the maximum weight limit. Countries whose maximum weight limit is higher than the standard of the AFAFGIT need to consider a reduction in their set weight. Also, road signs that have graphical differences across the Inland ASEAN nations should be harmonised. That is, nations could either harmonise their symbols or retain their own symbols but highlight the differences when training cross-border drivers.

Finally, it should be noted that transport-related laws are different amongst the Inland ASEAN countries; thus, a more extensive review of these laws need to be conducted.

In Chapter 2 of this publication, the transport facilitation programmes of transport-related ASEAN framework agreements, Greater Mekong Subregion's CBTA, and bilateral and trilateral arrangements for transport facilitation are examined. Chapters 3 to 6 show the current status of projects on national highways (i.e., expressways), including future plans, regulations of technical standards, road signs, and laws on transport or traffic in Cambodia, Lao PDR, Myanmar, and Viet Nam, respectively. Chapter 7 studies the impact of developments on corridor and sub-corridors using the Institute of Developing Economies Geographical Simulation Model. In particular, this model analyses the economic impact on the following areas:

- Northern sub-corridor of Cambodia
- National Highway No. 13N (North) of Lao PDR
- Lao PDR section of North–South Economic Corridor and Lao–Myanmar Friendship Bridge
- National Highway No. 3 in Myanmar
- Noi Bai–Lao Cai Expressway

It will be valuable to compare the actual situations of infrastructure development in the five nations with the simulation results in Chapter 7.

References

ASEAN Secretariat (1997), 'Joint Press Statement the 3rd ASEAN Transport Ministers Meeting Cebu, Philippines, 5 September 1997'. In the website of ASEAN Secretariat (accessed on 10 July 2015).

ASEAN Secretariat (1999), 'Ministerial Understanding on the Development of the ASEAN Highway Network Project'. In the website of ASEAN Secretariat (accessed on 10 July 2015).

Hayashi, K. (2014), 'Transport Infrastructure Development in Inland ASEAN and International Land Transport Service (in Japanese, 'Riku no ASEAN ni Okeru Yuso Infura Seibi to Kokusai Rikujo Yuso Saabisu'), *Logistics Research* (in Japanese, *Butsuryu Mondai Kenkyu*) No. 62. Pp. 66–81.

Ishida, M. (2015), 'Development for the Mekong-Basin Countries and ASEAN (in Japanese, Mekon Gawa Ryuiki Shokoku no Kaihatsu to ASEAN),' in Tran, V.T. ed. *The New Era of ASEAN Economies and Japan: Economies of Member Countries and New Developments of the Region* (in Japanese, *ASEAN Keizai Shinjidai to Nippon: Kakkoku Keizai to Chiiki no Shintenkai*). Tokyo: Bunshindo.

JETRO (2008), *ASEAN Logistics Network Map Study*. Tokyo: JETRO.

Chapter 2

Transport Facilitation in the Era of the ASEAN Economic Community[1]

So Umezaki

Transport facilitation is regarded as an integral step in deepening the Association of Southeast Asian Nations' (ASEAN) economic integration and achieving the goals outlined in the Asian Economic Community Blueprint. This chapter reviews the progress and challenges of transport facilitation initiatives in the ASEAN, which are governed by three framework agreements and their supplementary protocols. For example, despite delays, the ASEAN has made significant progress in establishing an institutional framework to facilitate cross-border movement of trucks and passenger vehicles. Other transport facilitation initiatives – the Cross Border Transport Agreement (CBTA) and bilateral and trilateral arrangements – are also discussed.

Introduction

The remarkable growth of many Association of Southeast Asian Nations (ASEAN) member states (AMS) is a success story on economic development. During this growth, AMS have successfully attracted foreign direct investments, upgraded their industrial structures, and integrated themselves fully into the world economy through participation in regional production and distribution networks. All of these developments have been supported by the continuous improvement of the region's transport network. Indeed, a more efficient, secure, and integrated ASEAN transport network is an indispensable element of the ASEAN Economic Community (AEC).

Transport cooperation in the ASEAN has been pursued since the 1980s based on consecutive 5-year plans. Key initiatives of the ASEAN Transport Action Plan such as the ASEAN Highway Network, the Singapore–Kunming Rail Link, the Roadmap for Integration of the Air Travel Sector, and three framework agreements on transport facilitation were incorporated in the

[1] This article was submitted to ERIA in March 2016.

AEC Blueprint. The Brunei Action Plan, which was adopted in November 2010, updated the implementation status and timelines of these transport initiatives, based on a comprehensive assessment of the ASEAN Transport Action Plan and other related issues (ASEAN, 2010b; ERIA Study Team, 2010).

These transport initiatives were incorporated also in the Master Plan on ASEAN Connectivity (MPAC), which was adopted in November 2010, as key strategies for enhancing the physical and institutional connectivity within the ASEAN, and between the ASEAN and other parts of the world (ASEAN, 2010a). In November 2015, the 21st ASEAN Transport Ministers Meeting adopted the Kuala Lumpur Transport Strategic Plan 2016–2025 as the successor to the Brunei Action Plan. Transport facilitation, a key agenda item in the ASEAN transport cooperation, is regarded as a requirement for the AEC to become a single market and production base. Against this backdrop, this chapter discusses the progress and the future of transport facilitation initiatives in ASEAN.

1. Launch of the ASEAN Economic Community (AEC)

Since the mid-1980s, the original members of the ASEAN have been proactively absorbing direct investment from Japan and elsewhere to achieve rapid industrialisation and economic development while forming regional production and distribution networks. In the early 1990s, however, factors such as the rise of China and the Asian Financial Crisis caused ASEAN leaders to become increasingly concerned about the future. To address their concerns, they developed the concept of an ASEAN community, positioning the AEC at its core.

The AEC Blueprint adopted in 2007 defined the AEC's four characteristics as (i) a single market and production base; (ii) a competitive economic region; (iii) one with equitable economic development; and (iv) integrated in the global economy. It then laid out a roadmap for the establishment of the AEC in 2015. In addition to liberalisation of trade in goods, which the ASEAN has been addressing since 1993 under the auspices of the ASEAN Free Trade Area, the AEC sought a deeper level of economic integration, including service liberalisation, investment liberalisation and facilitation, harmonisation of various economic

institutions, development of wide-area infrastructure, and regional economic and technical cooperation.

The ASEAN Community, inclusive of the AEC, was officially launched at the end of 2015. Although not all of the measures planned in the AEC Blueprint have been implemented, major progress has been achieved in certain areas such as the liberalisation of trade in goods. The trade liberalisation rate (measured as the ratio of zero-tariff items in the tariff line) of the original members of the ASEAN increased from 40.1% in 2000 to 99.1% in 2010.

In Cambodia, Lao PDR, Myanmar, and Viet Nam (CLMV), the same ratio rose from 9.6% in 2000 to 72.6% in 2010 and 90.9% in 2016. In January 2018, when the grace period granted to CLMV countries ends, the ratio will increase further to 97.8%.

In addition to trade liberalisation within the region, the ASEAN has concluded free trade agreements with neighbouring countries, including China (2005); Republic of Korea (2007); Japan (2008); and India, Australia, and New Zealand (2009). The ASEAN has emerged as the hub of a network of free trade agreements in Asia. At the same time, measures to realise deeper economic integration such as the development of the ASEAN Single Window for trade facilitation, elimination of non-tariff barriers, and facilitation and liberalisation of trade in services and investment, are proceeding – although at a slower pace than was agreed in the AEC Blueprint. The ASEAN's economic integration still has several steps to go, with wide reference being made to the 2015 version of the AEC.

As a result of direct investment in the ASEAN, the production and distribution networks built since the 1980s have served as the platform for the dramatic economic development and industrialisation of the ASEAN and neighbouring countries. Although *de facto* economic integration has preceded *de jure* economic integration in East Asia, the AEC has seen steady progress with the latter, and a virtuous cycle is emerging whereby *de jure* integration in turn deepens *de facto* integration.

In the six years between 2008 and 2014, intra-ASEAN trade increased by 24.9% while trade of the ASEAN+3 (i.e. ASEAN plus Japan, China, and the Republic of Korea) rose by 33.1%, compared to the 11.6% growth in world trade. Direct investment into the ASEAN has also

grown, from US$85 billion in 2007 (a world share of 5%) to US$136 billion in 2014 (11% share).

Moreover, 17.9% of the direct investment in ASEAN countries in 2014 came from within the ASEAN. This increase in trade and investment is indicative of the way in which production and distribution networks in the ASEAN and the surrounding region have expanded and deepened. 'Thailand Plus One' investment – a popular corporate strategy in recent years – is an example. In the Bangkok metropolitan area, major industrial agglomerations have formed, particularly in industries such as automobiles, electronics and electrical machinery, and textiles and apparel, turning the area into a hub of the production and distribution network in the ASEAN.

Recently, however, against the backdrop of rising wages and other production costs accompanying rapid economic development, and increasingly fierce competition in global markets, there has been a second unbundling, a concept claimed by Richard Baldwin in which labour-intensive production processes are transferred to less-developed neighbouring countries such as Cambodia, Lao PDR, and Myanmar.[2] One factor behind this trend is the reduced cost of linking geographically dispersed production processes (also called service-link costs) that have resulted from the *de jure* economic integration realised by the AEC.

The reduction not only in monetary costs such as freight charges and tariffs but also in time-related costs such as transport time, along with the predictability of those costs, has made cross-border production activities much easier to conduct. Take, for example, the process in apparel manufacturing. First, raw materials are procured at a main factory in Thailand. Then, these are sent to a factory in Lao PDR for labour-intensive processes such as cutting and sewing. Finally, these are returned to Thailand for the next stage in the production process.

In addition, after Myanmar's transition to civilian rule in March 2011, the Myawaddy–Kawkareik section of the ASEAN Highway Network (also the Asian Highway Network) that

[2] Factors behind the 'Thailand+1' strategies are investigated in Umezaki et al. (2015), and the mechanism of 'second unbundling,' or fragmentation of production processes, is fully demonstrated in ERIA (2010).

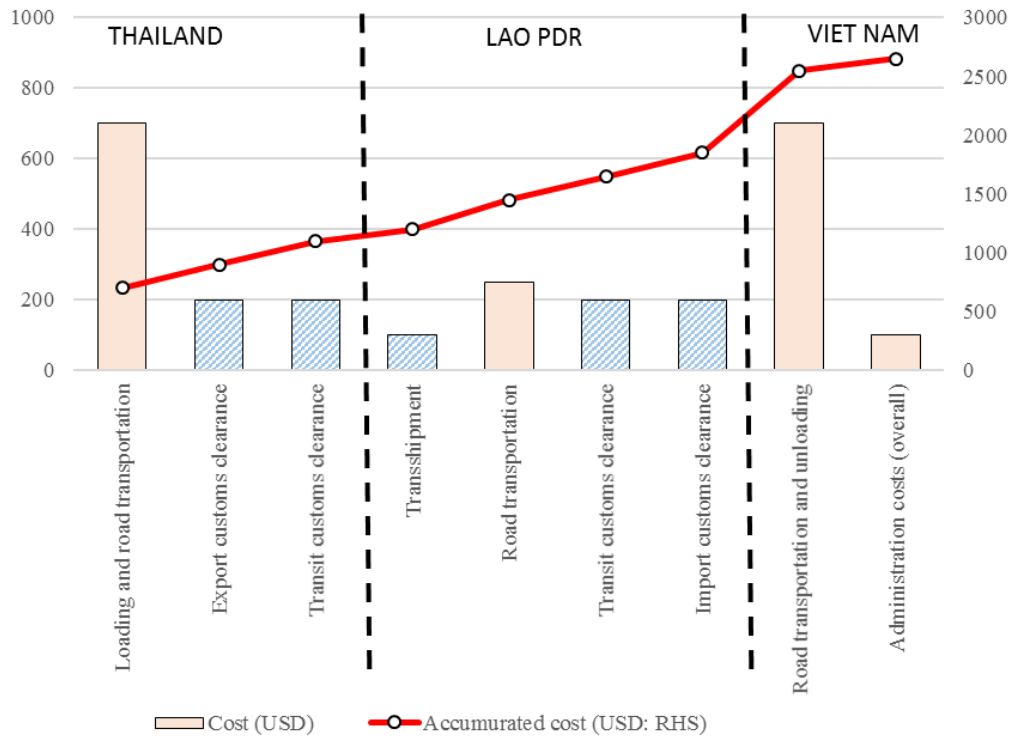
links Myanmar and Thailand was built with assistance from Thailand. This road is also part of the East–West Economic Corridor being constructed through the Greater Mekong Subregion (GMS) Economic Cooperation Programme.

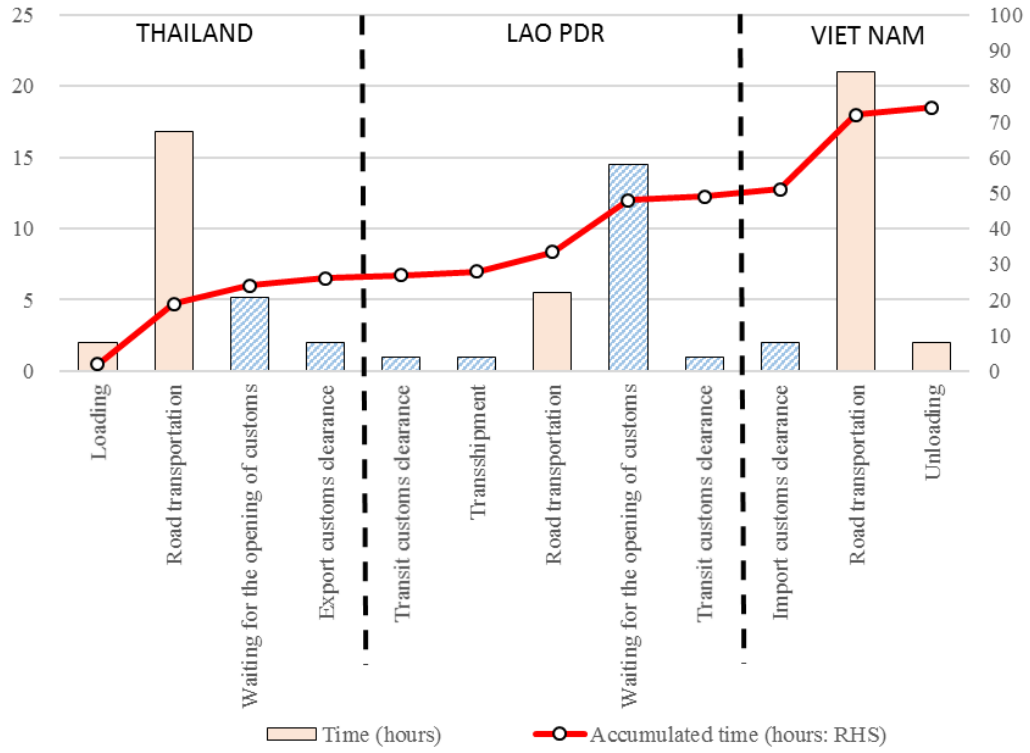
Such improvements in physical infrastructure are expected to trigger further expansion of production and distribution networks and continued economic development along economic corridors.

2. Framework Agreements on Transport Facilitation in the AEC

Although it is necessary to enhance physical connectivity by road or railway networks, this is not enough to achieve the goals of the AEC, which include creating an ASEAN single market and production base and narrowing the development gaps. For example, because cross-border transportation by trucks is usually not allowed, unloading and reloading are required at national borders. Land transportation sometimes requires passing through a third country, i.e. one between the country of origin and the country of destination.

Figure 2.1. Process-wise Cost and Time for Cross-border Transportation from Bangkok to Hanoi via Lao PDR by Truck





Note: Bar graphs with stripes indicate costs and time related to border crossing.
Source: Author's compilation based on JETRO (2008), p.112 and p.125.

In the absence of an agreement on transit transport, logistics service providers need to go through customs procedures twice: (i) when they enter the third country; and (ii) when they enter the country of destination from the third country. As illustrated in Figure 2.1, the costs and time for border crossing are significant, indicating that the expected effects from transport facilitation are significant as well.

In addition, international transportation services often involve multiple modes of transportation such as trucks, railways, ships, and aircraft. To facilitate international trade, it is important to have a common understanding of the legal liability of logistics companies that provide integrated logistics services across multiple modes of transportation.

2.1 Framework Agreements on Transport Facilitation

Based on these premises, AMS have signed three framework agreements on transport facilitation ever since they started to consider deeper economic integration in the late 1990s.

The ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT) was signed in Hanoi on 16 December 1998, with the objective of mutually allowing transit transport amongst AMS. As stipulated in Article 4 of the AFAFGIT, 'goods carried in sealed road vehicles, a combination of vehicles, or a container shall not be subjected to examination at customs offices en route' except for exceptional cases 'to prevent abuses such as smuggling and fraud' or 'when irregularity is suspected'. A significant reduction in time and costs is expected.

The AFAFGIT consists of the main text of the agreement and the following nine protocols: (i) designation of Transit Transport Routes and facilities; (ii) designation of frontier posts; (iii) types and quantity of road vehicles; (iv) technical requirements of vehicles; (v) ASEAN scheme of compulsory motor vehicle third-party liability insurance; (vi) railways border and interchange stations; (vii) customs transit system; (viii) sanitary and phytosanitary measures; and (ix) dangerous goods.

The ASEAN Framework Agreement on Multimodal Transport (AFAMT), meanwhile, was signed in Vientiane, Lao PDR on 17 November 2005 to specify the legal liability of multimodal transport operators and consigners and the standard format of their transport contracts. The AFAMT applies to international multimodal transport services provided by registered transport operators from and to AMS. As stipulated in the strategic schedule of the AEC Blueprint, AMS are required to enact domestic legislations regarding multimodal transport.

The ASEAN Framework Agreement on the Facilitation of Inter-State Transport (AFAFIST) was signed in Manila, Philippines on 10 December 2009, with the objective of allowing transport operators that are registered in an AMS to provide transportation services in other AMS when the goods are transported from or to the operator's country of registration.

Together with the AFAFGIT, the AFAFIST is expected to significantly increase the efficiency of transit transport by eliminating the need to unload and reload the goods at national borders.

The AFAFIST shares the nine protocols with the AFAFGIT. Although the number of vehicles allowed to operate in other AMS was limited to 60 in the original text of the AFAFGIT's Protocol 3, it was increased to 500 in Article 9 of the AFAFIST in anticipation of the growing intra-ASEAN trade.

The AEC Blueprint followed the ASEAN Transport Action Plan, the then-working five-year plan of transport cooperation in the region, in setting timelines for the implementation of these transport facilitation agreements. Majority of the AFAFGIT stipulations were to be implemented by 2009, contingent on the speedy conclusion of Protocol 2 (designation of frontier posts) and Protocol 7 (customs transit system). Protocol 6 (railways border and interchange stations) was to be concluded by 2011. The AMS agreed to enact the necessary domestic legislation by 2009 as a prerequisite to the implementation of the AFAMT. Per the plan, the AFAMT was to be implemented in at least two AMS by 2011 and across all of ASEAN by 2013. The main text of the AFAFIST was to be finalised and adopted by 2009 so that the implementation could begin by 2011 and complete its ASEAN-wide coverage by 2015.

2.2 Implementation Status

The AFAFGIT was enacted on 2 October 2000, a year after the schedule agreed upon in the AEC Blueprint, when Singapore deposited its instrument of ratification with the Secretary-General of the ASEAN (Table 2.1). Based on the latest official information in the ASEAN Secretariat Website, six out of the nine protocols shared by the AFAFGIT and the AFAFIST have been enacted as of May 2018. That is, by the middle of 2015, Protocols 3, 4, 5, and 8 had been ratified and enforced by all AMS (ASEAN, 2015b). Although not all AMS have ratified Protocol 1 (designation of Transit Transport Routes and facilities), such protocol was enacted on 21 August 2011 by those members that had backed it, due to the relaxed condition for enactment (i.e. the ASEAN Minus X formula). The remaining contention under Protocol 1 is between Malaysia and Singapore, who have not yet agreed on the designated transport routes (ARISE, 2015).

Table 2.1. Implementation Status of Transport Facilitation Agreements

			Signature	Entry into force	Conditions for entry into force
AFAFGIT: ASEAN Framework Agreement on the Facilitation of Goods in Transit			16/12/1998	02/10/2000	All
	Protocol 1.	designation of TTRs and facilities	08/02/2007	21/08/2011	60 days after the deposit of 6th instrument, only among ratified members.
	Protocol 2.	designation of frontier posts	Ongoing		
	Protocol 3.	types and quantity of vehicles	15/09/1999	19/04/2010	All
	Protocol 4.	technical requirements of vehicles	15/09/1999	19/04/2010	All
	Protocol 5.	ASEAN scheme of compulsory motor vehicle insurance	08/04/2001	16/10/2003	All
	Protocol 6.	railway border and interchange stations	16/12/2011	Not in force	All
	Protocol 7.	customes transit system	24/02/2015	Not in force	All
	Protocol 8.	sanitary and phytosanitary measures	27/10/2000	13/01/2011	All
	Protocol 9.	dangerous goods	20/09/2002	13/09/2017	All
AFAMT: ASEAN Framework Agreement on Multimodal Transport			17/11/2005	01/10/2008	30 days after the deposit of 2nd instrument, only among ratified members.
AFAFIST: ASEAN Framework Agreement on the Facilitation of Inter-State Transport			10/12/2009	30/12/2011	30 days after the deposit of 2nd instrument, only among ratified members.

TTR = Transit Transport Route.

Notes: ASEAN agreements enter into force only amongst AMS that ratify them, based on the number of instruments of ratification/acceptance that the AMS deposit with the Secretary-General of ASEAN. This is a version of the 'ASEAN Minus X' formula, which was designed to facilitate the enactment of ASEAN agreements even when some AMS take longer than others to complete the domestic processes for ratification.

Source: Compiled based on 'ASEAN Transport Instruments and Status of Ratification' (As of May 2018), (http://asean.org/storage/2017/05/Ratification-status-Transport-Agreement-as-of-Aug2018_T.pdf), last accessed on 22 August 2018.

Protocols 6 and 7 have been signed and are in the process of being ratified, while Protocol 2 (which pertains to the designation of frontier posts) is still under negotiation.

The remaining disagreement in Protocol 2 also involves Malaysia and Singapore. Because Protocol 2, together with Protocol 7, is a critical component of the ASEAN Customs Transit

System, this issue needs to be addressed from a wider point of view rather than as a bilateral problem. The ASEAN Customs Transit System is expected to facilitate cross-border movement of goods by providing 'full end-to-end computerisation of transit operations with a single electronic customs transit declaration' (ASEAN, 2015b).

With assistance from the European Union in the form of the ASEAN Regional Integration Support from the EU programme, an ASEAN Customs Transit System pilot project will be conducted in Malaysia, Singapore, and Thailand in 2016. Moreover, it is highly reasonable to assume that this disagreement between Singapore and Malaysia on the designation of frontier posts is one of the major reasons for the delay in the ratification process of Protocol 1 (designation of transit transport routes and facilities).

Under Protocol 3 (types and quantity of road vehicles), AMS have agreed to allow each member state to use a maximum of 500 trucks for transit transport. To make this work, each AMS must establish a system for allocating cross-border permits to transit transport vehicles (ARISE, 2015). In addition, a database for sharing domestic rules and regulations on road transportation has been developed under the purview of the Transport Facilitation Working Group of the Senior Transport Officials Meeting.

The Blue Card Scheme is one of the mechanisms for operationalising Protocol 5 (on compulsory motor vehicle insurance). The Blue Card can be issued by any national authority as an identification card to prove the existence of a compulsory motor vehicle insurance policy. Lao PDR, Thailand, and Viet Nam have been operating the Blue Card Scheme since 2009, while Cambodia is preparing for implementation. Singapore has its own arrangements that enable drivers of foreign-registered vehicles (except for those registered in Malaysia) to buy mandatory insurance coverage at the immigration checkpoint.

Protocol 7 (on customs transit system) has taken a long time to be finalised and signed. The delay has been caused by the cross-sectoral nature of this issue. Although the overall implementation of the transport facilitation initiatives is under the purview of the ASEAN Transport Ministers Meeting, this customs transit system must be designed mainly by each member state's customs authority and Ministry of Finance.

Protocol 8 was enacted on 10 August 2012 upon ratification by all AMS. The ASEAN has been trying to enhance its coordination with sectoral bodies such as the ASEAN Ministers on Agriculture and Forestry working group, and to maximise the role of the ASEAN Sanitary and Phytosanitary Contact Points as the central coordination body with regard supervision, inspection, and quarantine services.

Protocol 9 was finally ratified by all ASEAN nations on 13 September 2017 when Malaysia reported the ratification after completing the process of amending or developing their domestic regulations on the transportation of dangerous goods.

As shown in Table 1, the conditions for enactment are much more relaxed for the AFAMT and AFAFIST than the AFAFGIT or its protocols. The AFAMT and AFAFIST have been designed to enter into force 'upon the thirtieth day after the deposit of the second Instruments of Ratification or Acceptance, and shall be effective only amongst the Contracting Parties who have ratified or accepted it.'

Although the AFAMT and the AFAFIST have been enforced, not all AMS have ratified them. As of the end of 2015, the AFAMT had been ratified and entered into force amongst six AMS: Cambodia, Lao PDR, Myanmar, the Philippines, Thailand, and Viet Nam. The AFAFIST had been ratified and entered into force amongst five AMS: Cambodia, Lao PDR, the Philippines, Thailand, and Viet Nam.

2.3 Ways Forward

The full operationalisation of the AFAFGIT, the AFAMT, and the AFAFIST is an important element of the AEC. For this purpose, the ASEAN needs to finalise AFAFGIT's Protocol 2 and expedite the ratification of Protocols 6 and 7.

Albeit a major step, the enactment of these agreements and protocols is not sufficient to fully operationalise the transport facilitation agreements. As gleaned from the ASEAN's efforts to develop a database of road traffic rules and regulations, a number of technical issues, including the difference between right-hand driving and left-hand driving, are still being resolved by AMS.

Some of the protocols require closer cooperation and coordination amongst AMS' government authorities such as Ministries of Transport, Finance (including Customs), Foreign Affairs, and Agriculture. For example, the Philippines' ratification of the AFAFIST is now only awaiting the concurrence of its Department of Justice.

Inter-ministerial coordination is necessary in various stages of the agreement process: from drafting and finalising the agreement's content, ratifying the agreements and protocols, to preparing standard operating procedures for full implementation. Such coordination must take place within each AMS as well as at the ASEAN level. In this regard, the roles of the National Transit Transport Coordination Committee in each AMS and the Transit Transport Coordination Board at the ASEAN level are highly important. Concurrently, to realise its vision for the region, the ASEAN needs to design efficient mechanisms and facilities, such as the physical and institutional infrastructure for the customs transit system.

Moreover, some of the agreements or protocols may require AMS to enact new laws, rules, or regulations or to amend existing ones. The AFAMT, which requires each AMS to enact domestic laws governing multimodal transport operators, is a typical example.

These domestic reforms, however, tend to take a while to be implemented, probably due to insufficient prior consultation with relevant domestic authorities. These sometimes require technical assistance, particularly when new variables (such as new concepts and recommendation from other AMS) have to be introduced.

The exchange of information amongst AMS on such matters as best practices and lessons learned from unsuccessful cases is a practical and feasible way to address these challenges. For example, since some AMS have allowed transit transport based on bilateral/trilateral agreements or the CBTA under the GMS Economic Cooperation Programme, these nations have lessons learned that can be used as a reference point when implementing transport facilitation agreements in the whole ASEAN.

Even after a transport facilitation agreement has been fully operationalised, AMS may encounter additional problems caused by conflicting domestic laws, rules, or regulations. To explore the full potential of transport facilitation agreements, nations should continuously and collectively look at fine-tuning their processes and rules.

3. Transport Facilitation under the GMS-CBTA

This section provides an overview of other transport facilitation initiatives, including the Cross-border Transport Agreement (CBTA) under the GMS Economic Cooperation Programme led by the Asian Development Bank (ADB). Also reviewed are other bilateral and trilateral arrangements for transport facilitation, taking examples from the case of AMS in the Indochinese Peninsula (e.g. Thailand as well as the other nations it shares land national borders with: Myanmar, Lao PDR, Cambodia, and Malaysia) based on the findings from the previous round of this ERIA project conducted in 2014–2015.

3.1 Cross-border Transport Agreement

As earlier discussed, the ASEAN took the first step towards deeper economic integration by establishing the AEC in the late 1990s. At around that same time, the concept of economic corridors, including the idea of transport facilitation along the corridors, began to take form. At the 8th Ministerial Meeting of the GMS Economic Cooperation Programme in 1998, ADB proposed these corridors as catalysts for breaking free of the region's deepening financial crisis (Ishida, 2007). The aim was to stimulate economic activity by developing key transport infrastructure such as roads, railways, and ports so as to facilitate the cross-border movement of goods, services, capital, and people. The original ideas contained in the CBTA were first discussed in 1994 and then became key components of the strategy for the development of economic corridors (Ishida, 2013).

The official agreement on the CBTA dates back to the 'Agreement between and amongst the Governments of the Lao People's Democratic Republic, the Kingdom of Thailand, and the Socialist Republic of Viet Nam for Facilitation of Cross-border Transport of Goods and People', which was signed by the three above-mentioned countries on 26 November 1999. Cambodia later acceded to the agreement on 29 November 2001, followed by China on 3 November 2002, and Myanmar on 19 September 2003.

The main text was subsequently supplemented by 16 annexes, three protocols, and bilateral and trilateral memoranda of understanding (MoUs) to promote 'the elimination of intermediary stops or transshipment, as well as promot[e] the reduction in the amount of

time spent in crossing borders'.[3] The objectives of the CBTA are similar to that of transport facilitation agreements at the ASEAN level.

However, the conditions for the CBTA's enactment were more stringent than those in the ASEAN transport facilitation agreements. For the CBTA to be enacted, all contracting parties are required to ratify the main text and all of its annexes and protocols. This contrasts with the conditions for enactment of the AFAMT, the AFAFIST, and Protocol 1 of the AFAFGIT. Although the signing process was completed on 20 March 2007, the CBTA was not enacted until September 2015 – eight and a half years after the completion of the signing process, when Myanmar completed its ratification.[4] The institutional design of the CBTA had become outdated by the time it was enacted. It now requires reviews and updates to accommodate the progress in information and communications technologies, and other developments.[5]

3.2 Bilateral and Trilateral Arrangements for Transport Facilitation[6]

On 24 November 1979, even before transport facilitation initiatives in the ASEAN began, Thailand (which shares national borders with Myanmar, Lao PDR, Cambodia, and Malaysia) had already agreed with Malaysia to permit the transit transportation of perishable goods by road from Thailand (Sadao crossing) through Malaysia (Bukit Kayu Hitam crossing) and on to Singapore without duties, taxes, fees, or any other charges.[7] According to the agreement, vehicles, where needed, must be capable of being sealed to meet the security requirements of various customs regimes. Malaysian authorities were in charge of approving the vehicles.

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[3] This quote is taken from the Asian Development Bank's website. The CBTA is fully described in ADB (2011).

[4] The ratification process was completed by Lao PDR in 2007; Cambodia and China, in 2008; Viet Nam, in 2009; Thailand, in January 2015; and Myanmar, in September 2015.

[5] Based on his 5 October 2015 interview with James Lynch, the ADB's Director for Regional Cooperation and Operations Coordination in Southeast Asia, Sukegawa (2015) stated, 'Because the CBTA was designed based on paper-based customs procedures, several articles need to be reviewed although all the contracting parties have completed the ratification process.'

[6] This subsection is based on information from the previous round of this research project conducted last year, referring specifically to Sopadang, et al. (2015), Sisovanna (2015), Nolintha (2015), MMRD (2015), and Nguyen (2015).

[7] 'Memorandum of understanding between the government of the Kingdom of Thailand and the government of Malaysia on the Movement in Transit of Perishable Goods by Road from Thailand through Malaysia to Singapore' that was signed in Bangkok.

On 5 March 1999 – 8 months before the signing of the original CBTA agreement – Thailand and Lao PDR signed an agreement on road transport. On 17 August 2001, a subsidiary agreement was signed to specify the details on the transshipment of goods, which included the designation of border crossing points, routes, technical requirements for vehicles, and documents. The agreements covered transportation of goods and passengers between the two countries and through a third country. These excluded transportation of dangerous goods and domestic road transportation within the territory of each other, which was consistent with the rules and regulations of each country.

Of the bilateral and trilateral transport agreements signed by GMS countries, some were undertaken as Initial Implementation of the CBTA (II-CBTA), a modality agreed in August 2004 to open key border-crossing points on a pilot basis. The II-CBTA aims to accelerate 'the implementation by allowing the early identification of key issues and the early realisation of benefits from improved transport facilitation' (ADB, 2011). Others were undertaken even before the CBTA was formalised.

On 4 July 2005, Thailand signed two MoUs on II-CBTA – one with Lao PDR and the other with Cambodia – to exchange the traffic rights through specific border-crossing points: Mukdahan–Savannakhet with Lao PDR, and Aranyaprathet–Poipet with Cambodia.

On 30 March 2008, Thailand and Cambodia signed a bilateral MoU, under which the maximum number of transport permits through the Aranyaprathet–Poipet border-crossing points was limited to 40 for the 12 months after the enactment but would be renegotiated later for future revision (Article 9, [c]).

Although this MoU was originally based on a previous memorandum on II-CBTA, the linkage was dissolved by the subsequent addendum signed on 17 September 2009, so as to avoid expected delays in implementing the original MoU.[8] Recently, Thailand and Cambodia reached a draft agreement to increase the quota of the number of cars from 40 to 500 'alongside the opening of a second border crossing point at Hat Lek, Thailand and Cham Yeam, Cambodia' (ADB, 2015).

[8] Article 1 of the Addendum stipulates that all references in the MoU between Cambodia and Thailand on 30 March 2008 to the MoU on II-CBTA between Thailand and Cambodia shall be disregarded.

There has been no such MoU regarding transport facilitation between Thailand and Myanmar. Under the ongoing Transport and Trade Facilitation Action Programme, however, ADB has been supporting Myanmar to develop a draft MoU template for the negotiation of cross-border traffic rights exchanges with Lao PDR, Thailand, and China (ADB, 2015). It was also reported that Thailand, Myanmar, and India would sign a transport agreement sometime in 2016.[9]

Cambodia and Viet Nam signed an agreement on road transport on 1 June 1998 but took a long time to finalise the implementation protocol, and finally signing it on 10 October 2005. The initial quota of cross-border transport permits was set at 40, but was expanded gradually, reaching 500 vehicles by 15 September 2012.[10] The exchange of traffic rights between Cambodia and Viet Nam is being implemented at Bavet–Moc Bai and other border-crossing points.

For Cambodia and Lao PDR, the exchange of traffic rights is governed by an agreement signed on 21 October 1999, and the supplementary protocol signed on 14 December 2007. Consequently, cross-border transport between Lao PDR and Cambodia follows the terms and conditions of both agreements: the main agreement, on the basic principles for cross-border transportation; and the subsidiary agreement, on specific technical terms and requirements, including designated checkpoints and routes, technical requirements for vehicles, rules regarding passengers and drivers, and documents. A quota of 40 trucks per year is also set for each country.

Meanwhile, a trilateral MoU on the exchange of traffic rights was signed amongst Cambodia, Lao PDR, and Viet Nam on 17 January 2013. Although the MoU had been enacted, it has not yet been operationalised.

Lao PDR and Viet Nam's guidelines on cross-border transport are governed by a main agreement signed on 23 May 2009 and a subsidiary agreement signed in September 2010.

[9] See, for example, 'India to Sign Motor Transport Agreement with Myanmar, Thailand' in *The Economic Times*, 1 November 2015, and 'India–Myanmar–Thailand to Work on Cross-border Transport' in *The Myanmar Times*, 22 December 2015.

[10] Ishida (2017) summarised the development of bilateral transport agreements between Cambodia and Viet Nam, and between Thailand and Cambodia.

As early as 23 August 2007, however, Lao PDR and Viet Nam, along with Thailand, signed an MoU on the II-CBTA, which allows properly licensed transport operators to provide international transportation services through two border-crossing points: Dansavanh–Lao Bao and Savannakhet–Mukdahan. Currently, cross-border transportation amongst these three countries is governed by the MoU on II-CBTA and its addendum signed on 21 February 2013.

Cross-border transportation amongst Lao PDR, Cambodia, and Viet Nam was liberalised by an MoU on road transport amongst the three countries on 17 January 2013. This MoU applies to cross-border road transportation of goods and people by commercial, non-commercial, and licensed transport operators.

4. AEC Blueprint 2025 and the Kuala Lumpur Transport Strategic Plan Plan 2016–2025

The 27th ASEAN Summit in Kuala Lumpur, Malaysia in November 2015 adopted the AEC Blueprint 2025, a plan for the next decade.

Although it takes its cue from the previous blueprint, the AEC Blueprint 2025 includes several innovations in terms of the implementation method. First, it does not include a strategic plan with specific measures and dates, which was the feature of the previous AEC Blueprint. Instead, specific action plans will be drawn up per individual sector such as transport, tourism, information and communications technologies, and energy.

Second, it emphasises strengthening the functions of ASEAN institutions, including the ASEAN Secretariat, and enhancing cooperation amongst sectors. The aim appears to be for the relevant ministerial meetings to take responsibility for drafting and implementing detailed action plans for sectoral cooperation and for facilitating inter-sectoral coordination by enhancing the functions of the ASEAN Secretariat, the AEC Council, and other organisations.

Third, more emphasis has been placed on the role of the private sector as a source of funds for infrastructure development and of information for improving the investment environment.

Fourth, consideration has been given towards developing a certain discipline for evaluating how domestic institutions could hamper further economic integration. The ASEAN as a highly diverse community has always emphasised the principle of non-interference in government to maintain its cohesiveness. The AEC Blueprint 2025 appears to be taking a new step towards realising the economic integration envisioned by the AEC.

These four innovations could be viewed collectively as a practical approach for boosting the feasibility of the AEC Blueprint 2025 and sectoral action plans, which are expected to be completed in 2016.

The action plan for the transport sector in the next decade – called the Kuala Lumpur Transport Strategic Plan 2016–2025 – was adopted during the 21st ASEAN Transport Ministers Meeting in 2015. It maintains the previous strategic plan's goal for transit transport: to 'establish an integrated, efficient and globally competitive logistics and multimodal transportation system, for seamless movement of passengers by road vehicles and cargos within and beyond ASEAN.'

Given what they had achievements until 2015, AMS aim now to fully operationalise the three framework agreements on transport facilitation in the next three decades. In addition, further work will be made on the implementation of the ASEAN Framework Agreement on the Facilitation of Cross-border Transport of Passengers by Road Vehicles.

5. Conclusion

This chapter highlights two challenges in future transport facilitation in the ASEAN. The first challenge relates to the distribution of the gains from economic integration. Economic integration *per se* is expected to facilitate the allocation and reallocation of production processes based on comparative advantages. This enables better utilisation of production factors, which then increases the economic welfare of all participating countries.

However, the process also requires that participating countries undergo structural adjustments. In addition, there will be social demand for some form of income redistribution. With economic development also driving the democratisation of ASEAN countries, there will be a growing public call for protection of domestic companies and industries. The AMS will face a difficult challenge in the new economic environment created by the AEC: They will need to adopt appropriate income redistribution policies and steadily implement programmes that can satisfy their commitments to agreements with other countries while seeking to avoid becoming excessively protectionist.

Transport facilitation is no exception to this challenge, as shown by an example introduced in Umezaki, et al. (2015). 'The provincial government of Savannakhet introduced a regulation to prohibited Thai trucks with empty containers to enter the province on 26 August 2014. It was reported that the policy came out after a short period of notice, and the similar regulation was found neither in other provinces nor at the national level. Before the introduction of the regulation, several companies operating in Savannakhet province used to arrange Thai trucks with empty container when they export their products to Thailand, without using Lao trucks. Therefore, it is conjectured that the new regulation was introduced to promote the use of Lao trucks.'

The second challenge is the fundamental difficulty of implementing multilateral agreements for transport facilitation. As already discussed, despite long-drawn efforts, ASEAN-wide agreements for transport facilitation (e.g. the AFAFGIT, the AFAMT, and the AFAFIST) have not yet been implemented. Although the main agreements and more than half of the protocols have been enacted, their utilisation have been stalled by delays in the ratification of key protocols and in the enactment of necessary domestic laws and regulations.

As one would expect, the more parties to an agreement, the more difficult is the agreement's implementation. The fact that the high-demand Transit Transport Routes have been effectively opened by bilateral and trilateral agreements seems to undermine the expectations that AMS could expedite the ratification process for ASEAN-wide agreements. As observed in the CBTA, the original design could become outdated if member states spend too long in the ratification process.

References

ASEAN Regional Integration Support from the EU [ARISE] (2015), '5th Six Monthly Progress Report (1 November 2014 to 30 April 2015)'. Project No. DCI-ASIE/2010/021-657.

Association of Southeast Asian Nations [ASEAN] (2010a), *Brunei Action Plan 2011–2015: ASEAN Strategic Transport Plan*. Jakarta: ASEAN Secretariat.

Association of Southeast Asian Nations [ASEAN] (2010b), *Master Plan on ASEAN Connectivity*. Jakarta: ASEAN Secretariat.

Association of Southeast Asian Nations [ASEAN] (2015a), *ASEAN 2025: Forging Ahead Together*. Jakarta: ASEAN Secretariat.

Association of Southeast Asian Nations [ASEAN] (2015b), *ASEAN Integration Report 2015*. Jakarta: ASEAN Secretariat.

Asian Development Bank (ADB) (2011), *Greater Mekong Subregion Cross-Border Transport Facilitation Agreement: Instruments and Drafting History*. Manila: ADB.

Association of Southeast Asian Nations [ASEAN] (2015), *TTF Newsletter: Highlights of ADB's Transport and Trade Facilitation Activities in Southeast Asia*. Manila: ADB.

Economic Research Institute for ASEAN and East Asia (ERIA) (2010), 'The Comprehensive Asia Development Plan'. ERIA Research Project Report No. 2009 7–1. Jakarta.

ERIA Study Team (2010), *ASEAN Strategic Transport Plan 2011–2015: Final Report*. Jakarta: ERIA and ASEAN Secretariat.

Ishida, M. (2007), 'Greater Mekong Subregion Economic Cooperation and the Three Economic Corridors' in Masami Ishida and Toshihiro Kudo (eds), *Greater Mekong Subregion Economic Cooperation: Realizing Three Economic Corridors* [in Japanese: *Dai Mekon Ken Kaihatsu to Mittsu no Keizai Kairo*]. Chiba: Institute of Developing Economies.

Ishida, M. (2013), 'What is the Cross-Border Transport Agreement (CBTA)?' in Masami Ishida ed., *Border Economies in the Greater Mekong Subregion*. London: Palgrave Macmillan.

Ishida, M. (2017), 'The Past and Future of the Development of the Southern Economic Corridor: Expecting the Further Progress in Infrastructure Development' in Japan Center for Economic Research (JCER), *Report on International Economic Research for the Fiscal Year 2015* [in Japanese: *Nambu Keizai Kairo Kaihatsu no Keii・Tembo: Infura Seibi no Saranaru Shinten ni Kitai*]. Tokyo: JCER.

Japan External Trade Organization (JETRO) (2008), *ASEAN Logistic Network Map 2008* [in Japanese: *ASEAN Butsuryu Nettowāku Mappu 2008*]. Tokyo: JETRO.

Myanmar Marketing Research and Development (MMRD) (2015), 'Mekong–India Economic Corridor as Land Bridge: Myanmar Paper'. A mimeographed paper submitted to ERIA.

Nguyen, B.G. (2015), 'Mekong–India Economic Corridor as a Land Bridge: The Role Played by Vietnam'. A mimeographed paper submitted to ERIA.

Nolintha, V. (2015), 'Realizing the East West Economic Corridor in Lao PDR'. A mimeographed paper submitted to ERIA.

Sisovanna, S. (2015), 'Cambodia: Mekong–India Economic Corridor as a Land Bridge'. A mimeographed paper submitted to ERIA.

Sopadang, A., S. Wichaisri, S. Teerasoponpong, and R. Banomyong (2015), 'MIEC Land Bridge: A Thailand Perspective'. A mimeographed paper submitted to ERIA.

Sukegawa, S. (2015), 'On the Progress on the ASEAN Economic Community (AEC): A Reflection of the ASEAN Summit' [In Japanese; *ASEAN Keizai Kyodotai (AEC) no Shinchoku ni Tsuite: ASEAN Shuno Kaigi wo Fumaete*]. A presentation material distributed at a research seminar held at Japan–ASEAN Center, Tokyo, on 21 December 2015

Umezaki, S., C. Sotharith, V. Nolintha, A. Min, and T.D. Lam (2015), 'Investment Climates for Thai and Multi-national Companies in the CLMV Countries'. In Masami Ishida (ed.), *Prospects for Forming Mekong Business Area: Thai Plus One Corporate Strategy and Its Supporting Policies*.

Chapter 3

Improvements and Challenges Associated with the Facilitation of Road Transport in Cambodia

Sau Sisovanna

Cambodia has made remarkable progress in reforming and modernising its transit transport activities and in aligning its customs procedures, including customs transit, with international standards. Excluding some protocols, the nation has also signed key transport-related Association of Southeast Asian Nations framework agreements and entered into bilateral memoranda of understanding for the initial implementation of the Greater Mekong Subregion Cross-Border Transport Agreement with neighbouring countries.

Furthermore, Cambodia has designed most road traffic signs in accordance with the Convention on Road Traffic that was signed in Vienna on 8 November 1968, even before the nation had become a signatory.

Despite such improvements over the past 2 decades, the demands of development are unmet. There remain challenges. For one, while stipulations on vehicle management (such as those that set loading restrictions for passenger and commercial vehicles) are already covered by Cambodia's Road Law and Road Traffic Law, more transportation laws that facilitate future road transport are needed.

In terms of cross-border transport, Cambodia's challenges include inadequate physical infrastructure, insufficient maintenance of roads, poor traffic safety and overloading, underdeveloped and inefficient urban transport, and low climate resilience. Moreover, the nation must address institutional issues such as inadequate transport logistics, a lack of private sector participation, and funding.

To overcome these challenges and advance the facilitation of road transport in Cambodia, physical constraints such as the insufficient and disjointed transport infrastructure network need be strengthened and upgraded, and nonphysical constraints – including the cost, time, and paperwork associated with customs procedures – must be reduced or eliminated.

Introduction

To help ensure connectivity both within the country and with other countries in the region, the Royal Government of Cambodia of the Fifth Legislature is investing in transport infrastructure and improving trade facilitation as priority areas. It aims to eventually develop a dynamic multimodal transport and logistics network.

Connectivity is key to national and regional networks in such areas as transport, trade, and energy infrastructure. Such connected and more effective domestic and regional networks, in turn, can facilitate the efficient flow of its goods, services, and people, both within Cambodia and with other countries in the region. To develop such connectivity, however, the nation needs to take into account not only the physical aspects of individual networks, but also the policy and regulatory frameworks under which they operate. Cambodia currently faces a number of challenges in its transport infrastructure such as high transportation costs in comparison with that of neighbouring countries, road repair and maintenance, overloaded commercial vehicles, traffic congestion, accidents, weak coordination between border management agencies, and others associated with varied transportation modes. By developing and modernising its infrastructure, the country can bring about improved economic efficiency, competition, and economic diversification, and even reduce the incidence of poverty.

This review thus focuses on the facilitation of road transport in Cambodia, including physical infrastructure development and institutional arrangements, as well as looks at the challenges. Specifically, this chapter consists of this introduction and seven sections. Sections 1 and 2 investigate the physical infrastructure and institutional improvements in Cambodia. Section 3 looks at official road traffic signs, while Section 4 and 5 examine transport facilitation initiatives and the associated challenges, respectively. Section 6 identifies policy recommendations for achieving a successful facilitation of road transport in Cambodia. Section 7 presents the conclusions.

1. Improvements in Physical Road Infrastructure

1.1 Current Status of Roads

Table 3.1 shows how Cambodia has been working to improve its road network, which consists of national, provincial, and rural roads. Its nine one-digit national roads and 146 two-digit national

roads are under the control of the Ministry of Public Works and Transport (MPWT) and have a total length of 2,243 km and 8,864 km, respectively. In total, these national roads measure over 11,107 km, accounting for 20.10% of the country's total road network length and 43.7% of its total bridge length. Also under the control of the MWPT are 236 three- and four-digit provincial roads with a total length of 4,407 km, or 7.98% of the total road network length; and 904 bridges with a total length of 16,309 m, or 21.4% of the total bridge length.

On the other hand, under the purview of the Ministry of Rural Development are 13,355 rural roads totalling 39,728 km, or 71.92% of the total road network, along with 1,869 bridges equal to 46% of total number of bridges accounted for 26,599 m equal to 34.8% of total bridge length (MPWT, 2015).

All the road networks in Cambodia have a combined length of 55,242 km, of which 15,514 km (28.09%) are national and provincial roads, and 39,728 km (71.92%) are rural roads.

Table 3.1. Length of the Road Network in Cambodia

Road Classification	Road Length		Road Number	Bridge Number		Bridge length		Management Authority
	km	%		Number	%	m	%	
1-digit National Roads	2,243	4.06	9	589	14.5	17,643	23.1	MPWT*
2-digit National Roads	8,864	16.05	146	698	17.2	15,710	20.6	
3- and 4-digit Provincial Roads	4,407	7.98	236	904	22.3	16,309	21.4	
Rural Roads	39,728	71.92	13,355	1,869	46	26,559	34.8	MRD
Total Length	**55,242**	**100.00**	**13,746**	**4,060**	**100.00**	**76,221**	**100.00**	

MRD = Ministry of Rural Development; MPWT = Ministry of Public Works and Transport
Source: Ministry of Public Works and Transport (MPWT).

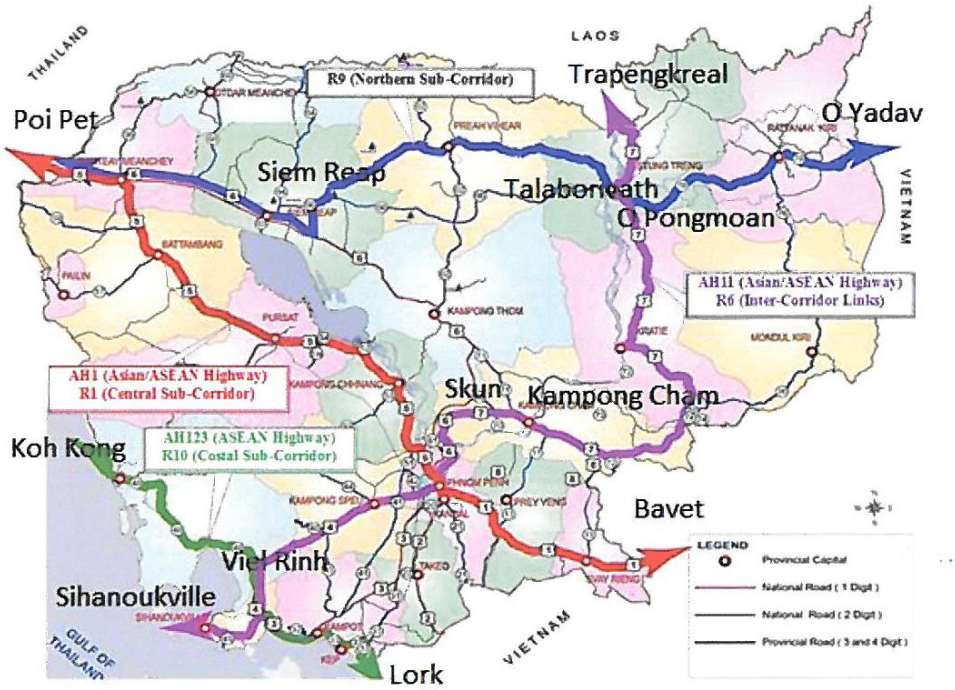
1.2 International Road Network

The following four international roads cross Cambodia: (i) Rattanakiri–Banteay Meanchey; (ii) Svay Rieng–Banteay Meanchey; (iii) Stung Treng–Sihanoukville; and (iv) Kampot–Koh Kong (Figure 3.1). These roads are classified as follows based on width and pavement type per MPWT regulations:

- **Primary: Roads used exclusively by automobiles/asphalt concrete (AC) or concrete pavement;**
- **Class I: Highways with four lanes or more /AC or concrete pavement;**

- **Class II: Roads with two lanes or more/AC or concrete pavement; and**
- **Class III: Narrow two-lane roads/double bituminous surface treatment (DBST) pavement.**

Figure 3.1. International Road Network in Cambodia



Source: Ministry of Public Works and Transport.

Cambodia's road network falls within Class II, Class III, and below Class III (which is considered as of low standard). To promote travel within the region primarily by reducing travel time and cost, Cambodia is currently focused on building Class I roads and upgrading existing ones.

1.3 ASEAN Highway

The ASEAN Highway Network Project signed in 1999 aims to upgrade all designated national routes to Class I standards by 2020, although Class II standards are acceptable for low-traffic, non-arterial routes.

The ASEAN Highway (AH) in Cambodia has a total length of 2,126.4 km. It consists of the following segments:

- AH1, Poipet (Cambodia–Thai Border)–Sisophon–Phnom Penh–Bavet (Cambodia–Viet Nam Border). Total length: 571.5 km. Current condition: paved with AC or DBST. Number of lanes: 2. A long bridge at Neak Loeung across the Mekong River was recently opened;
- AH11, Preah Sihanoukville–Phnom Penh–Kampong Cham–Stung Treng–Trapeang Kriel (Cambodia–Lao Border). Total length: 762.20 km. Current condition: paved with AC or DBST. Number of lanes: 2. Currently being widened to four lanes from Phnom Penh to Skun (75 km);
- AH123, Cham Yeam (Cambodia–Thai Border)–Koh Kong–Sre Ambel–Prek Chak (Cambodia–Viet Nam Border). Total length: 280.8 km. Current condition: under repair. Number of lanes: 2; and
- AH21-R9, Poipet (Cambodia–Thailand border)–Siem Reap–Preah Vihear–Stung Treng–Rattanakiri-O'Yadav (Cambodia–Viet Nam border). Total length: 511.9 km. Current condition: Construction and repair completed. Paved with DBST. Connected by the recently opened Stung Treng Mekong River Bridge. Number of lanes: 2.

The entire two-lane section along AH1 is paved with AC or DBST. The 4 km section from Phnom Penh is being widened to four lanes. There is also a plan to widen the road to four lanes from National Road (NR) No. 5. The bridge over the Mekong River at Neak Loeung, which was built with funding from the Japanese government, has been fully operational since 6 April 2015.

The entire two-lane section along AH11 is also paved with AC or DBST, while the section between Phnom Penh and Skun (75 km) is being widened to four lanes. The AH21 was completed in 2014. The Stung Treng Bridge over the Mekong River is now fully operational.

In total, the ASEAN Highway in Cambodia currently consists of nine roads measuring 2,126.4 km long (Class II: 581.1 km; Class III: 1,162.4 km; below Class III: 385.9 km) (Table 3.2).

1.4 National Road and Key Bridge Improvement Projects

A decade after the end of the civil war, Cambodia entered a phase of infrastructure rehabilitation and development. The key road infrastructure projects that have been built and repaired over the past five years are shown in Table 3.3. Most financial resources for these projects came from foreign donors.

Table 3.2. ASEAN Highway and Classifications

Name of International Road		Transit Cities	Length (km)	International Road Classification				
GMS roads	ASEAN Highway			Primary	Class I	Class II	Class III	Below Class III
Central Sub-corridor	AH 1	Poipet–Sisophon (NR 5)	47.5			47.5		
		Sisophon–Phnom Penh (NR 5)	360.0				360	
		Phnom Penh–Bavet (NR 1)	164.0			57	107	
Sub-total Length (km)			**571.5**			**104.45**	**467**	
Inter-Corridor	AH 11	Phnom Penh–Sihanoukville (NR4)	226.4			226.4		
		Phnom Penh–Skun (NR 6)	75.0			75		
		Skun–Kampong Cham (NR7)	49.0			49		
		Kampong Cham–Trapeang Kriel (NR 7)	411.8				411.83	
Sub-total Length (km)			**762.2**			**350.4**	**411.83**	
Southern Costal Sub-corridor (R1)	AH123	Cham Yeam–Koh Kong (NR 48)	13.0			13		
		Koh Kong–Sre Ambel (NR48)	138.0				138	
		Sre Ambel–Veal Rinh (NR4)	42.0			42		
		Veal Rinh–Kampot (NR33)	36.0				36	
		Kampot–Lork (NR33)	51.8				51.8	
Sub-total Length (km)			**280.8**			**55**	**225.8**	
Northern Sub-corridor (R2)	AH 21 R9	Siem Reap–Talaborivath (NR 66 +NR210+NR62+NR9)	305.2				38.8	266.38[1)]
		Talaborivath–O'Pongmoan (NR 7)	19.0				19	
		O' Pongmoan–O'Yadav (NR78)	187.7			68.2		119.5[1)]
Sub-total Length (km)			**511.9**			**68.2**	**57.8**	**385.9**
Grand Total Length (km)			**2,126.4**			**581.1**	**1,162.4**	**385.9**

Note: 1) AH21 or NR No. 9 was completed in 2014 and can be classified as higher than 'Below Class III', according to assessments by members of the author's team.

Source: Ministry of Public Works and Transport (2015).

Table 3.3. Key National and Provincial Road Infrastructure Construction and Improvement Projects as Shown in the Report of Ministry of Public Works and Transport

Road No.	Donor	Cost (million US$)	Length (km)	Section	Year		Funding	Pavement Status
					Start	End		
	Japan	11.17	9	PK: 4+000-PK:13+000 (3rd phase)	2010	2011	Grant	AC
1	Japan	15	4	Monivong Bridge–PK: 4+000 (4th phase)	2014	2016	Grant	AC (Detailed Design)
	WB	3	107	Neak Loeung–Bavet	2009	2013	Loan	Road Maintenance (Upgrading)
3	Korea	41.5	134.8	Phnom Penh–Kampot (phase 2)	2008	2011	Loan	DBST
3	ADB & AusAid	28.5		Southern Costal Corridor Project (NR3: Kampong Trach to Prek Chak, NR3: Kampot to Veal Rinh, Cross-Border Facilitation at Lork (Viet Nam border)	2011	2014	ADB=$7 AusAid=$8	DBST (Upgrading & Periodic Maintenance)
5	ADB	>1	85	PK:6+00–Kampong Chhnang	2010	2011	Loan	Maintenance
5	China	56.8	30	Phnom Penh–Prek Kdam	2013	-	Loan	AC (4 Lanes) 18.89% (As of 31 May 2014)
5	Japan	88	81.2	Battambang–Sisophon	2013	2017	Loan	AD (Detailed Design)
6	China	248.8	248.525	Thnal Kaeng–Skun (4 lanes)	2013	2016	Loan	AC (24.36% as of 31 May 2014)
	China	70.25	40	PK: 4+000 to Thnal Kaeng	2012	2015	Loan	AC (4 Lanes) 79.87% (as of 31 May 2014)
8	China	71.5	109.08	Prek Tameak–Anlong Chrey	2007	2012	Loan	AC
8-1	China	14.8	5.6	Krabao–Moeun Chey	2010	2012	Loan	AC
8-2	China		18.56	Anlong Chrey–Krek	2010	2012	Loan	
9	China	63.8	143.33	Tbeng Mean Chey-Talaborivath	2012	2016	Loan	DBST
11	China	63	90.4	NR1:Neak Loeung–NR7: Thnal Tortoeung	2015		Loan	AC
13	ADB	23.39	62.4	Svay Rieng–Anlong Chrey	2014	2016	Loan	DBST
21	VN		0.4	Chrey Thom			Loan	Bridge (50–50 with Cambodia)
23	China	33	53	Pea Reang Leu–Chambork (border)	2013	-	Loan	DBST
	ADB	13	17	Kampong Trach–Lork (Viet Nam border)	2007	2010	Loan	DBST
41	WB			NR4–Prek Thnout River	-	-	Loan	DBST
	China	95.28	46.25	Thnal Tortoeung– Chum Kiri–Kampot	2010	2013	Loan	DBST
43	China	42	77	NR4:Treng Troyeung–	2015	-	Loan	

				NR3: Lvea Thmey				DBST (Under Negotiation)
44	China	80.3	139.14	Chbarmorn–Oral–Amleang– Udong	2012	2015	Loan	DBST
55	China	140	189.7	Pursat–Thmar Da. Thai–Cambodia border	2013	-	Loan	DBST (Next 5-year Plan)
56	ADB+ Korea	29.9	84	29km from Sisophon to Samrong	2009	2015	Loan	Road Improvement
57	China	41.88	103.14	Battambang–Pailin–Thai border	2008	2012	Loan	DBST
57B	China	176.81	89.98	1) Thmar Kol–Bovel–Sampov Loun 2) Bovel–Sanseb–Phnom Prek 3) Sanseb–Kamrieng	2010	2014	Loan	DBST
58	China	77	132	Banteay Meanchey–Banteay Meabrith–Thmar Daun–Phaong	2014	-	Loan	DBST (Under Negotiation)
59	China	72.89	140.25	NR59 (Kaun Damrey–Malay– Sampov Loun–Phnom Prek–Kam Rieng–Pailin)	20010	2013	Loan	DBST
60B	China	130	140+1.67	Kg. Thmar–Kratie–Bridge	2015	-	Loan	DBST(+Bridge Cost)
61	China	9.76	15.63	Prek Kdam-–Thnal Kaeng (NR6)	2010	2012	Loan	AC
62	China	57.8	157	Koh Ker–Thnal Bek, Tbeng Meanchey–Preah Vihear temple	2008	2012	Loan	DBST
	China	52	128	Kampong Thom–Tbeng Meanchey–	2009	2013	Loan	DBST
64C	China	100	132	Tbeng Meanchey–Thalaborivath	2011	2014	Loan	DBST
66	WB	3.2	18	Rovieng–River Stung Sen			Loan	DBST (Not Started)
68	Cambodia	33	113.74 3.18	O' Smach- Kralanh + Bypass Samrong town	2009	2011	Nat. Budget	DBST Re-Pavement
70B	China	90	150	Tonle Bet–Srey Santhor–Prek Tameak–Lvear Em–Peam Ro	2015	-	-	DBST
71C	China	66	110	Tbong Khmum–Kroch Chhmar–Chamkar Leu	2015	-	-	DBST (+ Kroch Chmar Bridge)
71+7+72	China	112	145	Trapeang Phlong–Krek-Troeung– Kg. Thmar	2015	-	-	AC
76	China	51.9	127	Snuol–Sen Monorom	2008	2011	Loan	DBST
76	China	91.68	171.78	Sen Monorom–Koh Nhek–Lumphat–Taang	2012	2016	Loan	DBST
78	China	73.3	121.1	O' Porng Moan–Banlung	2009	2013	Loan	DBST
92	China	75	137	Sam An (NR9)–Kg. Sralao 2–Kg. Sralao 1–Mum Bey	2015	-	-	DBST
134B+135	China	24	43	Chumkiri–Chhuk–Dorng Tung–Kg. Trach	2015	-	-	DBST
258D	China	48.3	20	Kob (NR5, PK:383)–O' Bey Choan	2011	2013	Grant	DBST
314D	ADB	14.32	25.6	NR1–VN border: Prey Mlu	2014	2016	Loan	DBST
378	China	85	141	NR7: Dong Kralaor–NR78: Banlung	2015	-	-	DBST
1551	China	72	135	NR4: Smach Meanchey–NR55: Prmoy	2016	-	-	DBST
1554	China	41	70	Veal Veng (NR55)–Samlot (PR1577)	2015	-	-	DBST

1577	China	25	55.16	Sek Sork–Samlot–Border Pass400	2015	-	Loan	DBST
3762	China	14.89	26.38	Sen Monorom–Dakdam	2015	-	-	DBST
3787	China	98	180	Banlung–Kantuyneak	2015	-	-	DBST

AusAid = Australia Aid; AC = asphalt cement; ADB = Asian Development Bank; DBST = double bituminous surface treatment; WB = World Bank.
Notes: Prek Chak and Lork indicate the same place; 'Kg.' is an abbreviation of 'Kampong.'
Source: Ministry of Public Works and Transport (2015).

Most major bridges in Cambodia were built with financial support from donors Japan (in the form of grants), and China and the Republic of Korea (both via loans) as well as from private entities (Table 3.4). The most important bridge on NR1, which is currently being constructed at Neak Loeung, is funded by a grant from Japan. This bridge will enable the smooth flow of goods between Viet Nam and Thailand through Cambodia.

All national roads that also make up part of the international road network are being rehabilitated or improved. Some of the improvements are as follows:

- **NR5: Widened to four lanes with funding from China (from Phnom Penhto Prek Kdam), and Japan (Battambang–Sisophon);**
- **NR6: Widened to four lanes with funding from China (from Phnom Penh toThnal Keng);**

NR1: One of the most important routes in Cambodia, NR1 stretches from Phnom Penh to the southern part of Cambodia. It forms part of the Asian Highway Route AH1 that connects Ho Chi Minh City and Bangkok through Phnom Penh. The NR1 was funded by the Asian Development Bank (ADB) (for the section between Neak Loeung and the Viet Nam border) and grants-in-aid from Japan (for the section between Neak Loeung and Phnom Penh). To accelerate the transit of goods and passengers between Indochina and the GMS, the Japanese government provided funding (through grants-in-aid) and technical support for the construction of Cambodia's longest cable-stayed bridge at Neak Loeung, which was opened to public transport/traffic (except container transport) on 6 April 2015. This bridge was named Tsubasa ('Wing'), because the spans of the bridge resemble two yellow birds (representing Cambodia and Japan) spreading their wings (MPWT, 2015).

Table 3.4. Key Bridge Improvement Projects Carried Out Over the Past Five Years

Name of Bridge	Type of Bridge	Donor	Cost (US$ million)	Length (Km)	Location	Year		Funding	Status
						Start	End		
Tsubasa Bridge	Cable-Staved	Japan	$85.59	2.2	Kandal, Prey Veng, NR1	2011	2015	Grant	Completed
8 bridges	Concrete	Japan	$15.00	-	On NR 11 (Prey Veng)	2012	2015	Grant	Completed
Prek Tameak	Concrete	China	$43.50	1.066	Kandal, NR8 & NR6	2007	2010	Loan	Completed
Prek Kdam	Concrete	China	$28.90	0.975	Kandal, NR5 & NR61	2007	2011	Loan	Completed
New Second Chroy Changvar	Concrete	China	$30.00	0.719	Phnom Penh–NR6	2010	2013	Loan	Completed
Prek Phnov	Concrete	Private	$42.00	1.543	Phnom Penh – NR6	-	2010	B-O-T	Completed
Mekong River Bridge	Concrete	China	$52.72	1.731	Stung Treng (Junction NR7 &NR9)	2012	2015	Loan	Completed
Takmao Bridge	Concrete	China	$32.89	0.855	Takmao town	2012	2015	Loan	Completed
Chrey Thom Bridge	Concrete	Viet Nam	$35.84	0.48	Viet Nam border	2014	2015	Loan ($17.8)	In Progress
Koh Poh Bridge	Concrete	Private	$31	0.9	Sihanoukville–Morokot Island	2009	2011	B-O-T (99 Years)	Completed

B-O-T = build-operate-transfer
Source: Ministry of Public Works and Transport (2015).

2. Institutional Improvement

2.1 Transport Legislation

Cambodia has recently adopted several pieces of legislation related to road transport and traffic, namely, the Road Law and the Road Traffic Law.

2.1.1 The Road Law

The Road Law was adopted by the National Assembly on 3 April 2014, approved by the Senate on 11 April 2014, and promulgated by Preah Reach Kram NS/RKM/0514/008 on 4 May 2014. The Road Law is composed of 13 chapters and 81 articles:

Chapter 1: General Provisions (Articles 1-4): Describes the objective and scope of the law;

Chapter 2: All roads to be managed by the following governmental bodies:

- **Ministry of Public Works and Transport - In charge of expressways, national roads, and provincial roads;**
- **Ministry of Rural Development - In charge of rural roads and others as assigned by the Royal Government; and**
- **Sub-national Administration - The competent authority whose responsibilities include road planning, design, construction, repair and maintenance within capital, cities, and provincial towns.**

Chapter 3: Competent Authority for Road Management: One of the most notable revisions in this law is the expansion of the road classification scheme from three categories (national, provincial, and rural roads) to six categories (expressways, national roads, provincial roads, rural roads, urban roads, and special roads). This change indicates Cambodia's strong intention to build more expressways and improve its overall management of land infrastructure.

Chapter 4: Road Development and Maintenance;

Chapter 5: Technical Entities and Regulations for Road Infrastructure;

Chapter 6: Road Use;

Chapter 7: Protection of Road Infrastructure;

Chapter 8: Road Certification;

Chapter 9: Funding for Road Use, Maintenance, and Development;

Chapter 10: Inspection of Road Infrastructure;

Chapter 11: Penalties; and

Chapter 12: Final Provisions.

2.1.2 The Road Traffic Law

The Road Traffic Law was adopted by the National Assembly on 5 December 2014, approved by the Senate on 30 December 2014, and promulgated by Preah Reach Kram NS/RKAM/0115/001 on 9 January 2015. This law is composed of 12 chapters and 92 articles:

Chapter 1: General Provisions (Articles 1–4): Describes the objective, scope, and terminology of the law;

Chapter 2: Traffic Signs (Articles 5–6): Describes the traffic signs and priority signs;

Chapter 3: Drivers (Articles 7–26): Describes driving conditions, use of roads, and regulations regarding turning, lane crossing, and parking;

Chapter 4: Vehicle Lights and Horns (Articles 27-30): Describes the use of lights and horns;

Chapter 5: Pedestrians and Animal Riders/Herders (Articles 31–33): Describes regulations regarding pedestrians, animal riders, and crossing/walking;

Chapter 6: Traffic Accidents (Articles 34–38): Describes the competency of the traffic police, road accidents, and hit-and-run cases;

Chapter 7: Vehicle Management and Transportation (Articles 39–58): Describes driving licence issues, demerit points, vehicle inspections, overloading, and fines;

Chapter 8: Law Enforcement Agency of the Road Traffic Law (Article 59): Describes the roles and responsibilities of the National Road Safety Committee;

Chapter 9: Law Enforcement Personnel on Road Traffic Law (Articles 60–70): Describes detention rights, additional competencies of the traffic police, small fines, and right of complaint;

Chapter 10: Penalties (Articles 71–87): Describes the crimes punishable by small fines, civil and criminal responses by drivers, and other fines;

Chapter 11: Inter-provisions (Articles 88–90): Describes the validity and implementation of the law; and

Chapter 12: Final provisions (Articles 91–92): Describes the abolishment of Road Traffic Law of 2007.

Although Cambodia has yet to adopt any transportation laws, some transportation management stipulations related to the overloading of commercial and passenger vehicles have been mentioned in various articles and chapters of the Road Law and Road Traffic Law. For example, load weight limits were mentioned in Articles 25 and 26 of Chapter 6 in the Road Law dated April 2014 as follows:

Article 25:

Truck transportation companies must respect the load weight limits as hereunder specified in Article 26 of the Law, cooperate in the weighing procedures carried out at the weigh stations along each road, and conform to all technical standards and limits for road dimensions.

Article 26:

Regarding compliance with load weight limits on the road networks:

1) Drivers must comply with the following load weight limits on expressways, national roads, provincial roads, city streets, and rural roads:

a. The maximum permitted weight allowed on the load-sustaining axle of automobiles, trailers, or semitrailers is as follows:

- **6 tons for single-axle suspensions with two wheels under the steering wheel**
- **11 tons for twin-axle suspensions with four wheels under the steering wheel**
- **10 tons for single-axle suspensions with four wheels**
- **19 tons for twin-axle suspensions with eight wheels**
- **24 tons for triple-axle suspensions with adjacent axle spacing and 12 wheels**

b. The maximum permitted total weight of automobiles is as follows:

- **16 tons for twin-axle suspensions where one axle is located at the front of the automobile with two wheels, and the other one is located at the rear with four wheels**
- **25 tons for triple-axle suspensions where one axle is located at the front of the automobile with two wheels, and a twin axle is located at the rear of the automobile with eight wheels**
- **30 tons for four-axle suspensions with twin axles at the front of the automobile with four wheels, and twin axles at the rear of the automobile with eight wheels**

c. The maximum permitted total weight of automobiles with trailers is as follows:

- **35 tons for automobiles with trailers that have four axles total, in which a single axle is located at the front of the automobile with two wheels, and another single axle at the rear of the automobile with four wheels and two single axles of the trailers with eight wheels**
- **40 tons for automobile with trailers having five axles or more**

d. The maximum permitted total weight of automobiles with semi-trailers is as follows:

- **35 tons for automobiles with semi-trailers that have four axles total, wherein a single axle is located at the front of the automobile with two wheels and another single axle at the rear of the vehicle with four wheels, and twin semi-trailer axles with eight wheels**
- **40 tons for automobiles with semi-trailers that have five axles or more total. For automobiles and trailers or semi-trailers whose total weight is not described in the points above, a special permission letter is required from relevant road management authorities.**

2) All vehicle axle loads as specified in Point 1 above shall bear a pressure on the road of no more than 5 kg/sq. cm.

In addition to the articles and chapters in the Road Law mentioned above, Article 57 of the Road Traffic Law dated 6 January 2015 states:

Article 57:

Loads of goods in motor vehicles, trailers, or semi-trailers shall not exceed the maximum vehicle weight as indicated by the manufacturers, the weight concentrated on the vehicle axis, or the maximum weight permitted by the Road Law. When crossing a bridge, drivers of vehicles and of vehicles with trailers or semi-trailers must observe the maximum weight limit displayed on the sign located in front of the bridge. The maximum permitted size of vehicles and vehicles with trailers or semi-trailers shall be defined as follows:

- **The maximum vehicle width shall not exceed 2.5 m, except for vehicles equipped with tools, in which case vehicle width shall not exceed 3 m**
- **The maximum length of each vehicle shall not exceed 12.2 m**
- **The maximum length of each vehicle with a semi-trailer shall not exceed 16 m**

- **The maximum length of each vehicle with a trailer shall not exceed 18 m. Sizes of vehicles and vehicles with trailers or semi-trailers that are not stipulated above must obtain a special approval from the MPWT. Technical specifications on vehicles size and weight shall be defined by a Prakas ('proclamation') from the MPWT.**

Chapter 7 of the Road Traffic Law on vehicle transport management also stipulates the roles and responsibilities of the MPWT in the issuance of technical inspection certificates, licenses to national and international drivers who wish to use Cambodia's roads, and commercial licenses for domestic or international road transportation of goods and passengers. It also defines the MPWT's role in ensuring that loading procedures for goods on a vehicle are properly organised and that transport passengers are secure and comfortable (Article 45 to 56).

2.2 Regulations on Technical Requirements

According to the Road Law and Road Traffic Law, all transportation operators must comply with the technical standards on road weight limits as defined in the Prakas from the MPWT, the body that controls all national and provincial roads in Cambodia. These technical requirements are found to be consistent with those stipulated in the ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT).

Accordingly, Table 3.5 compares the standards in the AFAFGIT with the nation's technical requirements for vehicles traveling in Cambodia via NR1 (Phnom Penh–Bavet), NR4 (Phnom Penh–Sihanoukville), NR5 (Phnom Penh–Poipet), NR6 (Phnom Penh–Sisophon), NR7 (Phnom Penh–Trapeang Kriel), NR48 (Koh Kong–Sre Ambel), NR33 (Kampot–Prek Chak) and NR64 (Siem Reap–Stung Treng).

Table 3.5. Technical Requirements for Vehicles Traveling on National and Provincial Roads in Cambodia

Technical Requirements	AFAFGIT	Cambodia
Maximum Length (Rigid Motor Vehicle)	12.2 m	12.2 m
(Articulated Vehicle)	16.0 m	16.0 m
Maximum Width	2.5 m	2.5 m
Maximum Height	4.2 m	4.2 m
Maximum Number of Axles		
Maximum Axle Load		
Maximum Rear Axle Load	ROH<60% of WB	ROH<60% of WB

Maximum Permissible Gross Vehicle Weight	AFAFGIT	Cambodia
3-Axle Rigid Vehicle	21.0 ton	21.0 ton
4-Axle Rigid Vehicle	25.0 ton	25.0 ton
5-Axle Articulated Vehicle	32.0 ton	32.0 ton
6-Axle Articulated Vehicle	36.0 ton	36.0 ton
7-Axle Articulated Vehicle	38.0 ton	38.0 ton

AFAFGIT = ASEAN Framework Agreement on the Facilitation of Goods in Transit; ROH = Rear Overhang; WB = World Bank.
Source: Ministry of Public Works and Transport (2015).

3. Road Traffic Signs in Cambodia

3.1 Background

The Cambodian Civil War in 1970–1979 resulted in a loss of nearly all documents on the standards for traffic control devices. This, in turn, led to drivers' lack of awareness of and low compliance with traffic laws and regulations, frequent traffic accidents, and a social crisis.

In 1995, the MPWT's General Department of Public Works prepared annexes on Land Traffic Signs and circulated these for official use under Regulation No. 599 PRK.SK.DCH dated 22 August 1995. Since then, road infrastructure in Cambodia has undergone numerous changes. In 2002, the MPWT set up a working group that would study how to improve the existing annexes on Land Traffic Signs, and subsequently announced new Annex No. 130 PR.SK.DD dated 15 October 2002 (MPWT, 2005).

To lessen traffic accidents and allow expert officials to easily conduct studies on the compliance with new road requirements, the MPWT developed Land Traffic Signs Standards to replace the existing Land Traffic Sign annexes.

3.2 The Basic Foundation of Road Traffic Signs

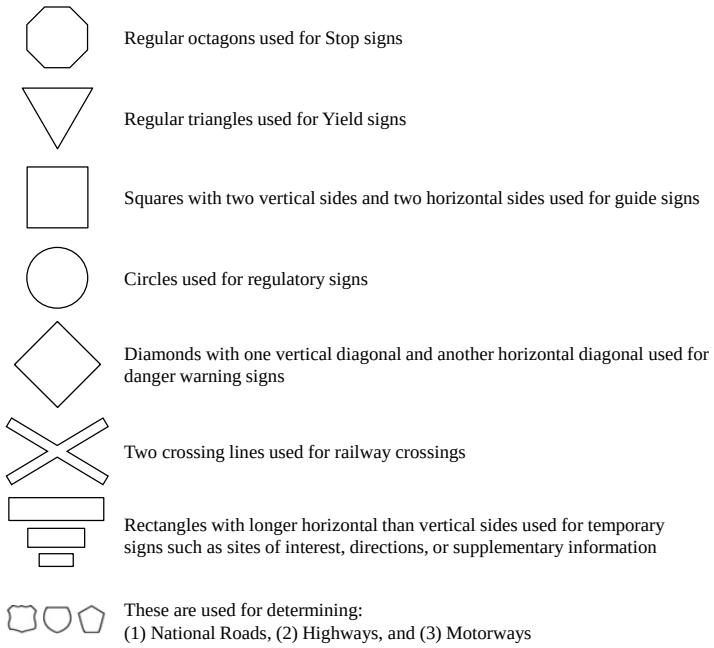
Road traffic signs are divided into different types, such as those that provide instructions that must be followed by road users, those that warn road users of potential dangers, and those that inform road users of or provide directions to locations of interest and major sites. All signs have predetermined shapes and colours.

Traffic signs, as an integral part of traffic systems, must be easily seen and understood, and thus their shapes and colours must be standardised, and their deployment must be based on geographical research.

3.3 The Shapes

Figure 3.2 indicates the meanings of the various shapes used for road signs in Cambodia.

Figure 3.2. Shapes and Meanings of Road Traffic Signs



Source: Ministry of Public Works and Transport, Cambodia.

3.4 Classification of Traffic Signs

There are four classifications of road signs: traffic signs, road marker signs, traffic signals, and traffic police signals.

3.4.1. Traffic Signs

a) Regulatory signs

Regulatory traffic signs convey traffic rules and regulations for intersections, weight limits, speed limits, one-way streets, and parking, amongst others. These signs are generally rectangular in shape and use white, black, and red as their main colours. Regulatory signs are divided into three basic groups: prohibitory, mandatory, and priority signs.

- **Prohibitory Signs**

  Prohibitory traffic signs prohibit certain types of manoeuvres or traffic. As shown in Figure 3.3, there are 45 types of prohibitory signs (Code Nos. PW03-R1-01 to PW03-R1-45).

Figure 3.3. Index of Prohibitory Signs

Source: Ministry of Public Works and Transport.

- **Mandatory Signs**

Mandatory traffic signs display rules that need to be followed when using a specific stretch of road. Unlike prohibitory signs, which tell drivers what they cannot do, mandatory signs tell drivers what they must do. Most mandatory road signs are circular in shape and tend to use white symbols on a blue background and a white border, or black symbols on a white background with a red border. As shown in Figure 3.4, there are 24 types of mandatory signs (Code Nos. PW03-R2-01 to PW03-R2-24).

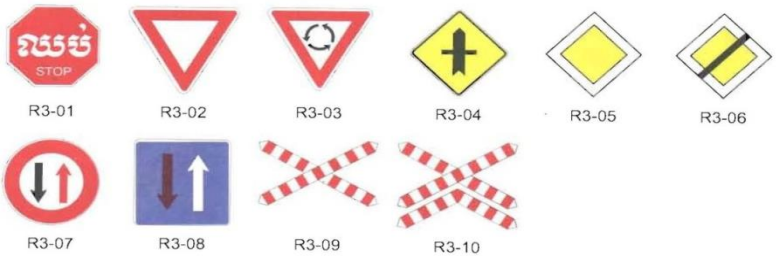
Figure 3.4. Index of Mandatory Signs

Source: Ministry of Public Works and Transport.

- **Priority Signs**

Priority traffic signs indicate the order in which vehicles should pass intersection points. A common example is the 'Yield' sign. As shown in Figure 3.5, there are 10 types of priority signs (Code Nos. PW03-R3-01 to PW03-R3-10).

Figure 3.5. Index of Priority Signs



Source: Ministry of Public Works and Transport.

b) Warning signs

Warning signs caution road users about potential dangers and are divided into two groups: danger warning signs and temporary warning signs.

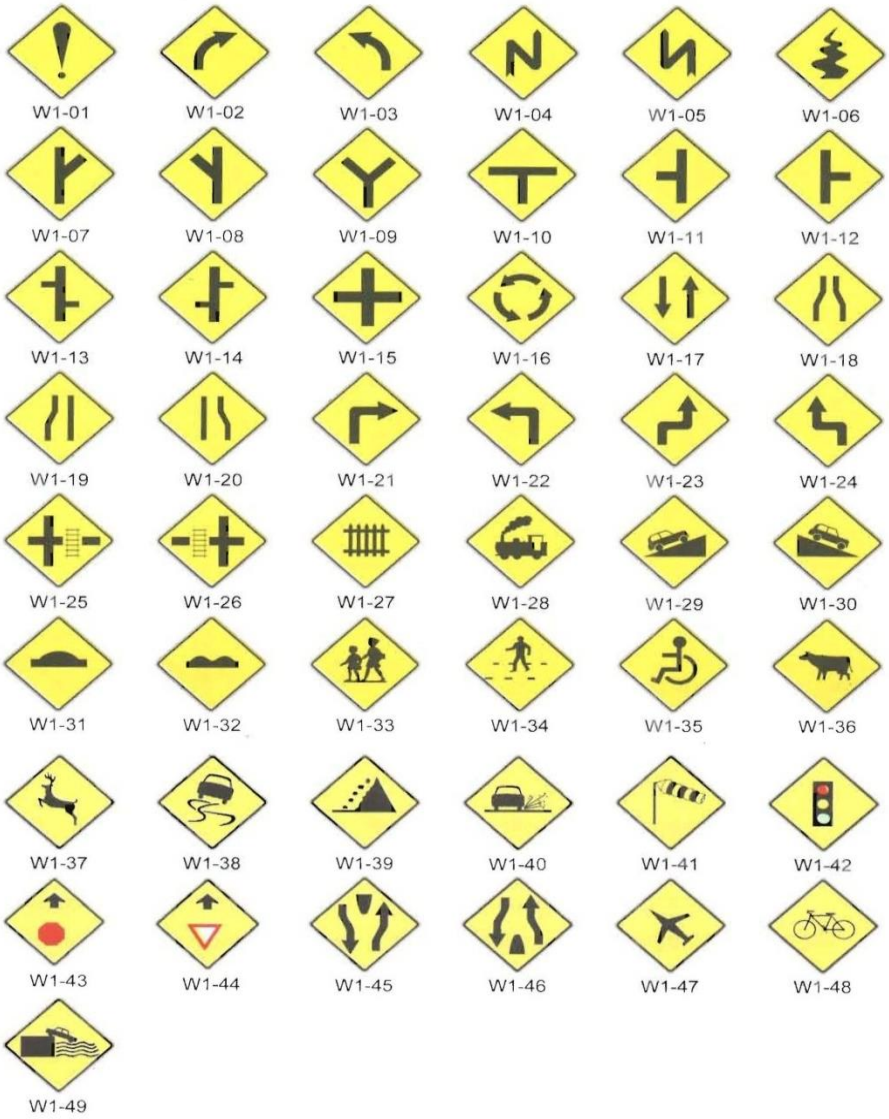
- **Danger Warning Signs**

A traffic warning sign indicates an upcoming road hazard that may not be readily apparent to the driver. These signs are diamond-shaped with a black border and a yellow background. Warning signs usually contain a symbol. As shown in Figure 3.6, there are 49 types of danger warning signs (Code Nos. PW03-W1-01 to PW03-W1-49).

- **Temporary Warning Signs**

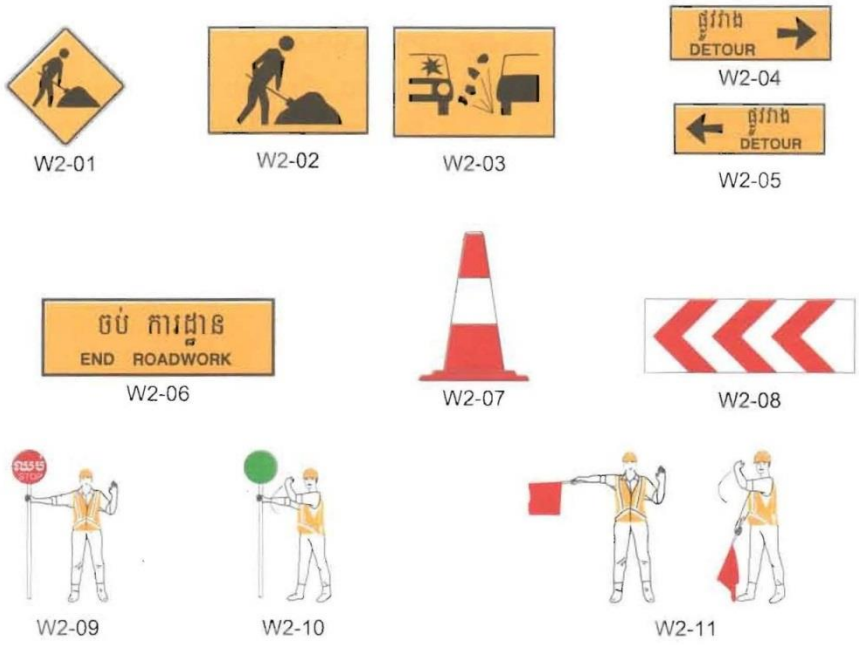
As the name suggests, these signs are often temporary in nature and used to indicate road maintenance or construction, poor conditions, or temporary conditions ahead, including flaggers, survey or utility crew, zipper merges, detours, bridge-outs, blasting areas, bumps, dips, frost heaves, flooding (with signs labelled 'High water'), soft shoulders, uneven pavement, freshly paved roads, loose gravel, smoke, and trucks entering. When a warning sign provides temporary guidance through a work zone, it will have an orange background with a black legend and border. As shown in Figure 3.7, there are 11 types of temporary warning signs (Code Nos. PW03-W2-01 to PW03-W2-11).

Figure 3.6. Index of Warning Signs



Source: Ministry of Public Works and Transport.

Figure 3.7. Index of Temporary Warning Signs



Source: Ministry of Public Works and Transport.

c) Guide signs

Guide signs help road users navigate to their destination. These signs are generally rectangular and have white text on green backgrounds. Guide signs are divided into four groups: directions, place identification, street names, and services or information.

- **Direction Signs**

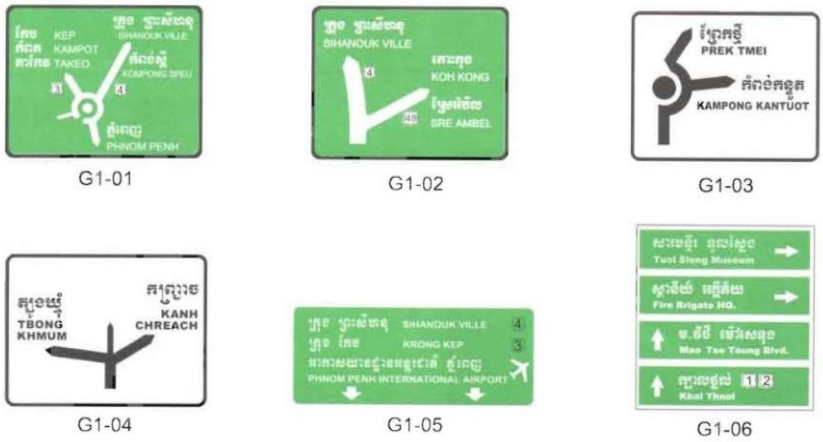
  Direction signs inform drivers about places, businesses, routes, lane choices, road choices, and distances to destinations. Direction signs with a yellow background (blue on motorways) show geographical destinations. Those with a white background (or white fields on yellow and blue signs) show local destinations. Meanwhile, direction signs with a brown background show destinations of special interest for tourists, while those with an orange background denote temporary detours.

  As shown in Figure 3.8, there are six types of direction signs (Code Nos. PW03-G1-01 to PW03-G1-06).

- **Place Identification Signs**

Direction signs are far more varied internationally than other classes of signs that

Figure 3.8. Index of Direction Signs



G1-01 G1-02 G1-03

G1-04 G1-05 G1-06

Source: Ministry of Public Works and Transport.

Repeat the name or number of the road, such as place identification signs. Place Agglomeration Indication signs shall be usually shaped as rectangular, with the longer side horizontal. Surrounded white external frame and red internal frame, white background on which shall be black inscriptions of agglomeration names. These signs inform drivers of beginning point of agglomeration or end point of agglomeration in the case of place indication signs with red line crossing from left bottom to right top. Boundary Indication Signs shall be shaped as rectangular, with the longer side horizontal, surrounded white external frame and blue background on which shall be white internal inscriptions of village, commune, district or provincial boundary names. These signs have been informing drivers about place of arrival or departure in case of place indication signs with red line crossing from left bottom to right top. As shown in Figure 3.9, there are four types of place identification signs (Code Nos. PW03-G2-01 to PW03-G2-04).

Figure 3.9. Index of Place Indication Signs

Source: Ministry of Public Works and Transport.

- **Street Name Signs**

Street name signs identify named roads, generally those that do not qualify as expressways or highways. Street name signs are most often found posted at intersections and usually in perpendicularly oriented pairs identifying each of the crossing streets. As shown in Figure 3.10, there are five types of street name signs (Code Nos. PW03-G3-01 to PW03-G3-05).

Figure 3.10. Index of Street Name Signs

Source: Ministry of Public Works and Transport.

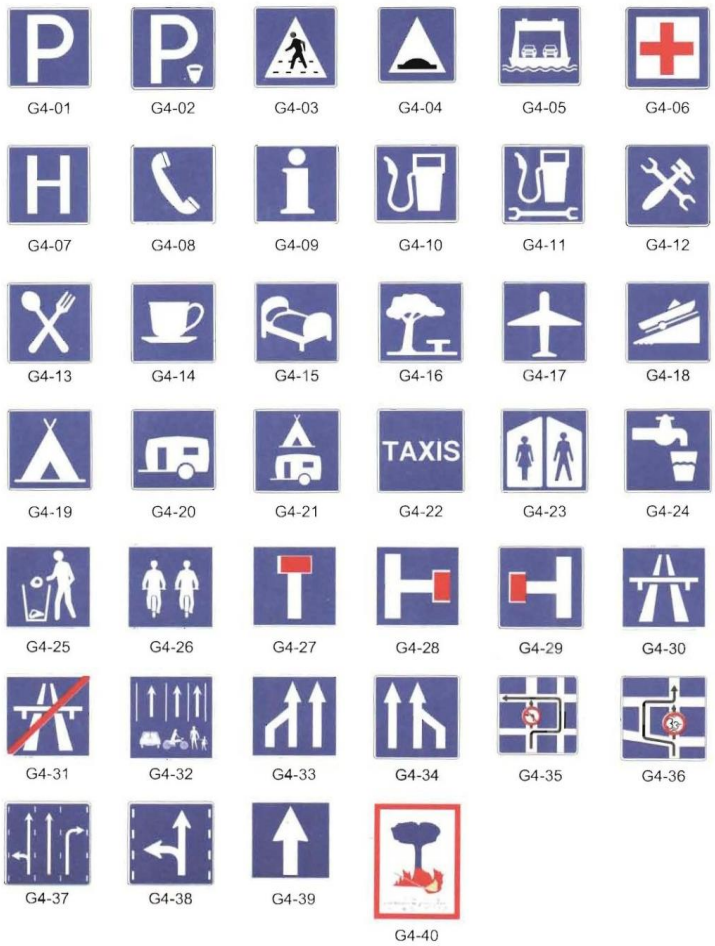
- **Service or Information Signs**

An information sign is an extremely legibly printed and noticeable placard that informs drivers of the purpose of an object, or provides instructions on the use of something. As shown in Figure 3.11, there are 40 types of service or information signs (Code Nos. PW03-G4-01 to PW03-G4-40).

Supplementary Signs

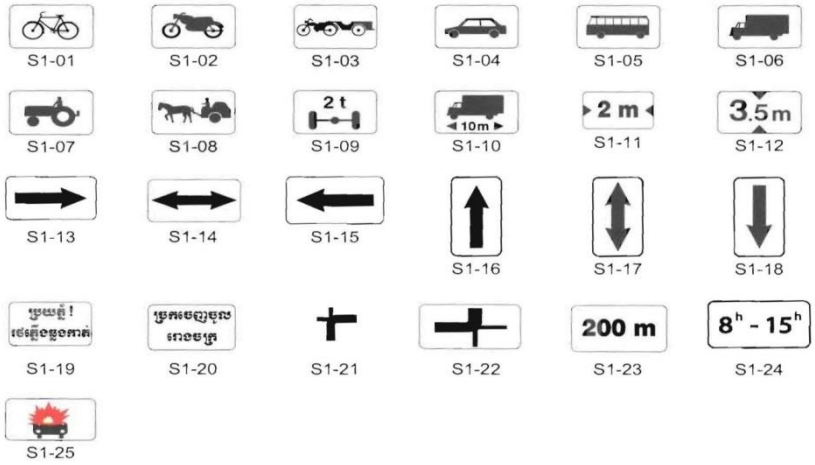
Supplementary Signs shall be shaped as rectangular with black frame and white background on which shall be black colour of image and any signs inside, except semi red- yellow colour signs of vehicle transported inflammable products (PW03-S1-25). This supplementary signs use to additionally help placing under traffic signs to confirm more clearly the meaning of things such as types of vehicles, distance, direction, time, images or words as required. There are 25 different types of supplementary signs which are being shaped and coloured as briefed above to confirm more clearly the meaning of words, of type of vehicles, its size, width, height, direction, and inflammable products transported (Figure 3.12).

Figure 3.11. Index of Service or Information Signs



Source: Ministry of Public Works and Transport.

Figure 3.12. Index of Supplementary Signs



Source: Ministry of Public Works and Transport.

- **Guide Posts**

There are ten different guide posts with different name and function such as

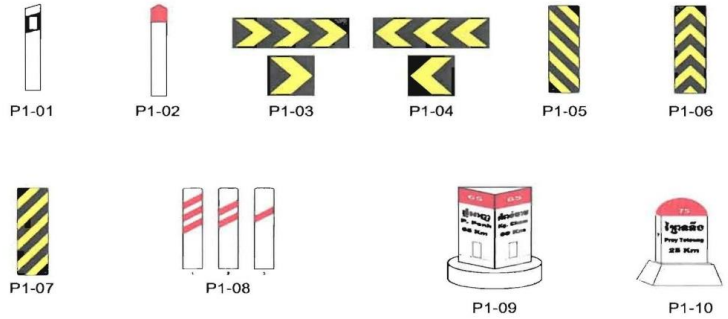
1) Delineator post use for showing the drivers to aware the road curve or use to straight line driving do not deviate from middle of the road;
2) Guide Post at Dangerous Curve uses to show the drivers to aware the dangerous curve with down or up inclination or bank of crevasse;
3) Lateral shift marker (to right): this sign use to show the drivers to be attention on curve to right;
4) Lateral shift marker to left: this sign use to show the drivers to be attention on curve road to left;
5) Object marker (on the right): use to show the drivers to be attention on obstacle on the right such as poles of bridge or other poles;
6) Object marker (at centre): this sign use to show the drivers to be attention on obstacle on middle road such as terrace or gardens;
7) Object marker (on the left): this sign uses to show the drivers to be attention on obstacle to the left such as poles of bridge or other poles;
8) Railway Crossing Post: this sign is used to inform the drivers to be attention on train crossing 150 m in front (figure 3.1), 100m in front (figure 3.2) and 50m in front (figure 3);

9) Kilometre Post (for 10 km INTERVAL): this guide post is used to inform the road users about a road distance to further significant regions;

This guide posts have an interval of 10km per each;

10) Kilometre Post (for 1 km INTERVAL): Kilometre Post (for 10 km INTERVAL): this guide post is used to inform the road users about a road distance to further significant regions. This guide posts have an interval of 1km per each;

Figure 3.13. Index of Guide Posts



Source: Ministry of Public Works and Transport.

3.4.2. Road marker signs

Road marker signs provide information regarding a road's onward course, or warn drivers about upcoming obstacles. Temporary road marker signs such as those indicating road maintenance must have a red background and be less than 6 mm off the ground, with cat's eye reflectors no more than 15 mm above the road surface.

Road markers must be white or yellow. The length and width of the markings vary according to their purpose; no specific sizes are indicated. Roads in developed areas should use a broken line for lane division. The use of continuous lines is reserved for special cases such as narrow undivided highways or roads with reduced visibility.

All words painted on the road surface should be either place names or words recognisable in most languages, such as ‘Stop’ or ‘Taxi.’

a. Transverse markings

Transverse Markings are single or double white lines that indicate a centre line or a no-passing zone. Transverse markings are placed near intersections or roundabouts with traffic signs such

as ‘Stop’ or ‘Yield’ to inform drivers that they must stop or yield to higher priority traffic before entering a road or roundabout (Code Nos. PW03-M1-01 to PW03-M1-04) (Figure 3.14).

Figure 3.14. Index of Traverse Markings

Source: Ministry of Public Works and Transport.

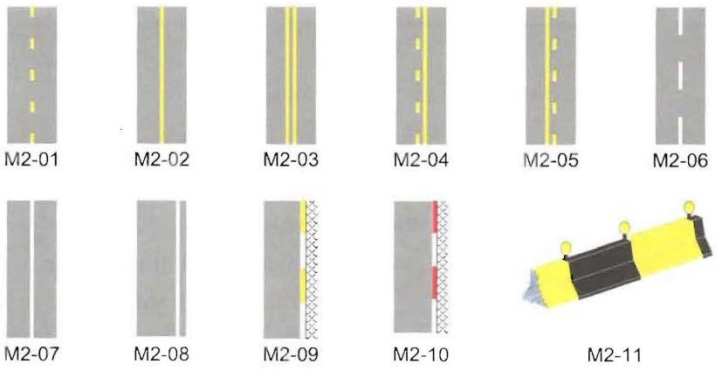
b) Longitudinal markings

Longitudinal markings are single or double white, yellow, or red lines, depending on whether a driver must stop or yield. Driving across longitudinal markings is prohibited (Code No.: PW03-M2-01 to PW03-M2-11) (Figure 3.15).

c) Arrow markings

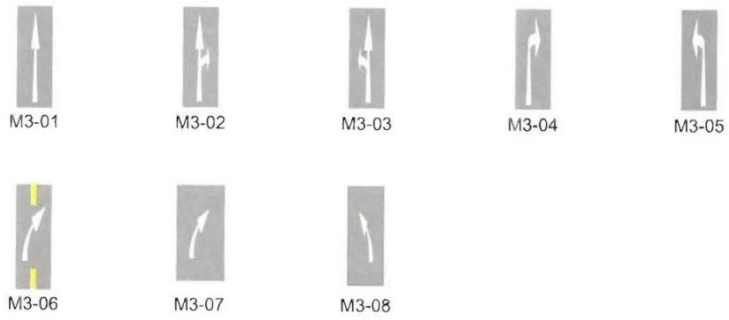
Arrow markings are typically used on undivided highways. They are white and indicate a direction that drivers must follow. Arrow markings inform the driver that they are approaching an intersection or a turning lane in advance so that they can easily alter their position according to their intended destination (Code Nos. PW03-M3-01 to PW03-M3-08) (Figure 3.16).

Figure 3.15. Index of Longitudinal Markings



Source: Ministry of Public Works and Transport.

Figure 3.16. Index of Arrow Markings



Source: Ministry of Public Works and Transport.

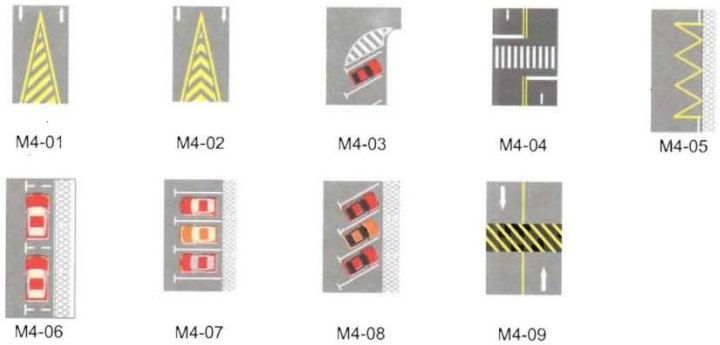
d) Other road markings

Road markings other than those stipulated above include diagonal hatched markings (two-way road), chevron markings (one-way road), diagonal hatched markings (road edges), crosswalk markings, bus stop markings, parking bay markings (parallel or vertical parking), and road hump markings (Code Nos. PW03-M4-01 to PW03-M4-09).

3.4.3. Traffic signals

Traffic signals are used to manage and facilitate traffic flow, reduce traffic congestion, and prevent traffic accidents amongst both drivers and pedestrians. These are typically installed at intersections and roads with crosswalk signs and markings.

Figure 3.17. Index of Other Road Markings

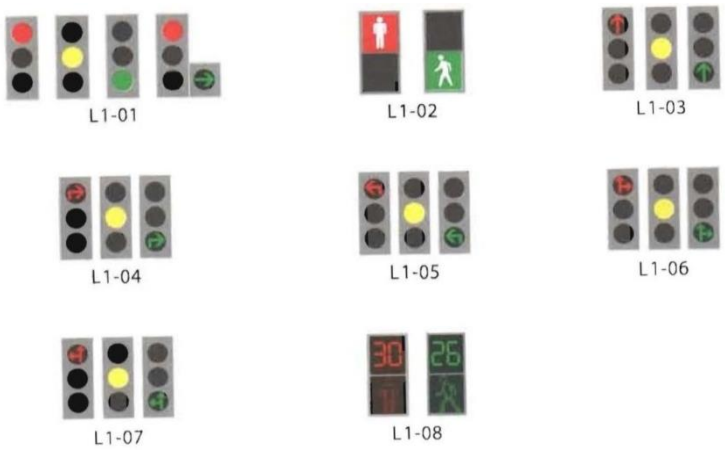


Source: Ministry of Public Works and Transport.

a) Three-colour traffic signals

There are three types of traffic signals: three-colour traffic signals, two-colour traffic signals, and one-colour flashing traffic signals (Code Nos. PW03-L1-01 to PW03-L1-08) (Figure 3.18).

Figure 3.18. Index of Three-colour Traffic Signals



Source: Ministry of Public Works and Transport.

b) Two-colour traffic signals

Two-colour-traffic signals intend to show pedestrians whether to stop or to walk. Code Nos. PW03-L2-01 to PW03-L2-01.

c) One-colour flashing traffic signals

One-colour flashing traffic signals intend to show pedestrians remaining time for crossing. Code No. PW03-L3-02.

3.4.4. Traffic police signals

Traffic police signals are used to help improve traffic flow under the following circumstances:

- **During traffic congestion;**
- **When there are no traffic lights;**
- **When ordering motor vehicles to slow down or stop; and**
- **When managing traffic ahead of convoys.**

Not counting the Traffic Police Signals, Cambodia already has a total of 272 road traffic signs, most of which were designed in accordance with the Convention on Road Traffic signed in Vienna

on 8 November 1968 although the country has not yet become a signatory (UN Treaty Collection, 2016).

4. Facilitation of Transport

4.1 ASEAN Framework Agreements

According to the MPWT, Cambodia is an active signatory member of key ASEAN framework agreements. Cambodia signed the ASEAN Framework Agreement on Multimodal Transport on 17 November 2005, the ASEAN Framework Agreement on the Facilitation of the Inter-state Transport on 10 December 2009, and AFAFGIT on 16 December 1998; however, two AFAFGIT protocols (Protocols 2 and 7) have not been signed yet.

4.2 Cambodia's Implementation of GMS CBTA

After the six GMS countries signed all 17 annexes and three protocols of the CBTA in March 2007,all the countries ratified in 2015.

As of January 2009, Cambodia had signed and ratified (via the Parliament, Senate, and Royal Palace) 20 protocols and annexes, but only 12 could be implemented (by the Ministry of Foreign Affairs) (MPWT, 2015).

Thereafter, Cambodia entered into bilateral MoUs for the initial implementation of the GMS CBTA with Thailand and Viet Nam.

4.2.1 Cambodia-Thailand traffic rights exchange

The legal documents mainly referred to are as follows:

- **Memorandum of understanding signed at Kunming on 4 July 2005 on the initial implementation at Aranyaprathet (Thailand) and Poipet (Cambodia) of the agreement to facilitate cross-border transport of goods and people between and amongst Cambodia, China, Lao PDR, Myanmar, Thailand, and Viet Nam;**

- **Memorandum of understanding between the Cambodia and Thailand on the exchange of traffic rights for cross-border transport through the Aranyaprathet-Poipet border crossing points signed on 30 March 2008 in Vientiane;**
- **Addendum to the memorandum of understanding between Cambodia and Thailand on the exchange of traffic rights for cross-border transport through the Aranyaprathet–Poipet border crossing points signed in Phnom Penh on 17 September 2009.**

The MPWT has requested a quota of 500 vehicles including buses, vans and trucks for approval from Cambodia and is prepared to negotiate a future bilateral CBTA between Cambodia and Thailand. At present, only a few transport companies that are in operation offer tourist packages from Cambodia to Thailand using hired buses and vans; Nattakan, a Cambodian bus operator, and Thai Transport Companies have operated scheduled passenger bus tours using four Cambodian buses and four Thai buses with daily departures in the Siem Reap–Bangkok and Phnom Penh–Bangkok routes.

4.2.2 Cambodia–Viet Nam traffic rights exchange

The exchange of traffic rights between Cambodia and Viet Nam is being implemented at Bavet–Moc Bai and other border crossing points between the two countries.

The legal bases for the implementation of the exchange of traffic rights between Cambodia and Viet Nam include: (i) the Agreement on Road Transportation signed in 1998; (ii) a protocol signed in Hanoi on 10 October 2005 that stipulated an initial quota of 40 vehicles; (iii) an MoU signed in Phnom Penh on 17 March 2009 that increased the quota to 150 vehicles; (iv) an amendment to the MoU signed in Phnom Penh on 15 September 2010 that brought up the quota to 300; (v) and an amendment to the MoU in Bali on 30 November 2012 that stipulated another increase in the quota to 500.

One can observe that the quotas in these bilateral CBTA have been rising from the initial quota of 40 trucks, to 150 in 2009, 300 in 2010, and finally, 500 plus a planned increase of 100 vehicles annually thereafter.

4.2.3 Cambodia–Lao PDR traffic rights exchange

The legal bases for the implementation of the exchange of traffic rights between Cambodia and Lao PDR include:

- **Agreement on Road Transportation between Cambodia and Lao PDR, signed in Vientiane, Lao PDR, on 21 October 1999;**
- **Protocol for the implementation of a road transport agreement between Cambodia and Lao PDR, signed in Siem Reap, Cambodia on 14 December 2007.**

The transport cooperation between Cambodia and Lao PDR started in 2009 (i.e., the Trapeang Kriel–Nong Nokkhien border crossing points). However, the implementation of contractual cross-border passenger transport operations between the two nations remains limited.

The Agreement on the Facilitation of Goods in Transit. (AFFAGIT) (discussed since 1990s) have yet to be finalized. The GMS Cross-Border Transport Agreement (discussed since 1994) have been ratified including annexes and protocols since 2015 but single stop inspections have been implemented only at Lao – Vietnamese border along the East-West Economic Corridor. The content of the agreements has been translated into Khmer language (MPWT, 2015).

An MoU on land transport amongst Cambodia, Lao PDR, and Viet Nam was signed on 17 January 2013 in Pakse, Champasak Province, Lao PDR. This MoU allows 150 commercial vehicles of each of these nations to transport goods and/or passengers into these three countries. Although the MoU went into effect in April 2013, it has not been implemented.

4.3 Condition of Cross-Border Transport

In May 2014 – a year ahead of the ASEAN Economic Community's 2015 deadline – the Cambodian National Assembly approved a draft law aimed at simplifying, modernising and aligning customs procedures with those of neighbouring nations. On September 9, the Ministry of Commerce announced that it would implement a simplified and automated Certificate of Origin service by March 2015.

Particularly within ASEAN countries, the single window initiative would help benefit Cambodia's exports and improve its business climate and trade, which currently stands at less than the trade

with outside the bloc and would also encourage foreign direct investment which might enable Cambodia to achieve the development goal of increasing foreign investment (MPWT, 2015).

4.4 National Transit Transport Coordinating Committee

The National Transit Transport Coordinating Committee was established in Cambodia by Sub-decree No. 115 A.N.KR. BK. dated 21 November 2001 to comply with the requirements of the ASEAN Transit Transport Agreement. Some countries in the GMS have used the National Transit Transport Coordinating Committee as a mechanism to either coordinate the GMS CBTA or to transform into the National Transport Facilitation Committee, as required by the GMS CBTA.

The National Transport Facilitation Committee is the body that will issue the agreed-upon number of permits annually.

4.5 Customs Procedures

4.5.1 Modernization of customs procedures

Cambodia has made significantly reformed and modernised its external transport activities by streamlining and harmonising customs procedures with international standards.

Major reforms include

- **development and implementation of the Automated System for Customs Data (ASYCUDA) World System and the extensive application of information technology;**
- **simplification of customs procedures to bring them within the standards of the Revised Kyoto Convention, such as the creation of special procedures for special economic zones and highest-compliant traders and investors;**
- **implementation of customs valuation procedures consistent with the World Trade Organization Valuation Agreement;**
- **implementation of risk management concepts and an automated risk management system at major customs posts to identify high-risk cargo and provide guidance to officers in addressing the risks;**
- **implementation of post-clearance audit, an important mechanism in fostering and promoting voluntary compliance, at company premises;**

- **provision of a mechanism to support the effective implementation of trade facilitation principles and valuation agreements;**
- **establishment of a strong foundation for the implementation of international trade facilitation standards and initiatives such as the Authorized Economic Operators Programme (to date, eight companies have been certified as Best Trader Group Members);**
- **introduction of the Advance Ruling System on Tariff Classifications, Rules of Origin and Custom Valuation; and**
- **development of the Cambodia National Single Window that will eventually connect with the ASEAN Single Window.**

Based on report of Strategy and Work Programs on Reform and Modernization of the General Department of Customs and Exercise of Cambodia (2014-2018), with financial and technical support from development partners, the ASYCUDA World System has been implemented in 22 major customs offices, including the Port of Sihanoukville and various border posts around the countries that cover almost 95% of the Single Administrative Declaration and approximately 85% of trade volume (JICA, 2015).

The ASYCUDA World Programme contributed to better logistics, making it easier for exporters to integrate into regional production networks. Customs clearance times with physical inspection fell from 5.9 days in 2010 to 1.4 days in 2014, while the share of consignments selected for physical inspection fell from 29% to 17% in the same period, confirming that the capabilities of customs risk management have improved (World Bank, 2012).

More than 120 laws, royal decrees, sub-decrees, and regulations containing formal non-tariff measures have been identified in the World Bank Group (2014), including various import- or export-related permits, licenses, and approvals required for trade.

Through the financial support of the World Bank, the government is automating the application and issuance of certificates of origin and improving transparency through a trade information website where all rules, regulations, fees, and procedures will be made available. Other initiatives include the development of a guide on the implementation of a national single window where traders can conduct all of their regulatory requirements; expansion of the use of electronic transactions such as e-payment of duties and taxes; and the acceptance of electronic copies of attached documents such as invoices and transportation documents (GDCE–MOEF,

2015). These will allow data to be submitted only once, and coordinate the processing, risk assessment, and inspection steps.

4.5.2 Customs transit procedures

The Ministry of Economy and Finance's issuance of Instruction No. 508 MEF.BRK on Customs Transit Procedures on 1 July 2008 played a crucial role in Cambodia's cross-border transport facilitation. For one, it allowed transit cargo to be exempted from regular physical inspections, bond deposits, and custom escorts. It is expected to reduce the time spent in cross-border formalities for land transport between international border crossing points, as well as to facilitate regional interaction and help create new logistics routes.

If no irregularities are suspected after checking the authenticity of documents, means of transportation, and containers, the competent customs officers shall stamp and certify that the goods/passengers have undergone customs transit procedures (which define a number of conditions, especially the legal routes and time limits for the transit) and affix customs stamps or seals to the transit vehicle or containers.

According to *Business* 2010, 2011, 2012, 2013 and 2015, the numbers of required documents on were reduced from 11 in 2010 to eight in 2015 for exports, and from 11 to nine in 2015 for imports (Table 3.6). The required documents for trading across borders in Cambodia according to World Bank, Doing Business, Cambodia Profile is shown in Table 3.7. Therefore, trade is facilitated by the number of formalities and procedures reduced.

Table 3.6. Trading Across Cambodian Borders in the period between 2010 and 2015

	Doing Business in Cambodia			
	2010	2012	2014	2015
Documents to export (number)	11	9	8	8
Time to export (days)	22	22	22	22
Cost to export (USD per container)	732	732	795	795
Documents to import (number)	11	10	9	9
Time to import (days)	30	26	24	24
Cost to import (USD per container)	872	872	930	930

Source: *Doing Business* 2015, 2014, 2012, and 2010 Reports & Cambodia Profile.

5. Challenges Associated with the Facilitation of Road Transport

Despite the substantial progress in its road infrastructure and assigned institutions, Cambodia still faces a number of challenges in cross-border transport.

5.1 Infrastructure Challenges

5.1.1 Inadequate Physical Infrastructure

On the overall, Cambodia's transport network cannot yet meet the rapidly growing demand for transport facilities and services. This includes the lack of paved provincial roads, and the low durability of unpaved roads, especially in rural networks. In addition, there is still a lack of cargo terminals (for trans-shipments).

Table 3.7. The Required Documents for Trading across Borders in Cambodia according to World Bank, Doing Business, Cambodia Profile

	The required documents to Import	2010	2012	2014	2015
1	Bill of Lading	-	yes	Yes	yes
2	Certificate of Origin	-	yes	No	No
3	Commercial Invoice	-	yes	Yes	yes
4	Cargo Release Order	-	yes	Yes	yes
5	Company Registration	-	No	No	No
6	Customs Import Declaration	-	yes	yes	yes
7	Import Permit	-	yes	yes	yes
8	Insurance Certificate	-	yes	yes	Yes
9	Packing List	-	yes	yes	Yes
10	Road Transport Document	-	No	No	No
11	Tax Certificate	-	yes	yes	Yes
12	Terminal Handling Receipt	-	yes	yes	Yes
Total Documents to Import		11	10	9	9

Source: World Bank, Doing Business 2010; and Doing Business, Cambodia Economic Profile for 2012, 2014 and 2015 while for 2010 was not Cambodia Econ.Profile Publication by WB.

5.1.2 Insufficient maintenance of rehabilitated roads

Cambodia's road network has significantly improved since the mid-1990s and is generally in fair and good condition. However, the road quality is not always optimal, with some new roads not meeting international standards and therefore deteriorating quickly (MOC, 2014). Most of the national road networks have been rehabilitated and are now in good condition. However, the provincial and rural road networks are in disrepair due to years of limited investment and neglect.

5.1.3 Traffic safety and overloaded transport

Road traffic safety is getting problematic, with crashes, casualties, and fatalities all rising at a faster rate than the population and volume of road traffic. Inadequate and improper implementation of traffic safety devices, hardware, and measures; poor enforcement of traffic laws and regulations; increasing number of road vehicles; poor transport infrastructure; lack of awareness amongst road users; poor driving licensing and vehicle inspection processes; poor driver and pedestrian behaviour; limited education; and the proliferation of alcohol advertising all contribute to Cambodia's high rate of road fatalities.

Overloaded transport is also a primary cause of damage to roads. The MPWT has made great efforts to improve its monitoring and control of axle loads, constructing nine new weighing stations at major national roads and acquiring 36 portable weighing scales, 34 of which were funded by the ADB, to be distributed to several provinces (MPWT, 2015); however, overloading remains prevalent.

5.1.4 Underdeveloped urban transport

In the past decade, urban traffic has steadily worsened in major cities. Urban transport relies overwhelmingly on motorcycles that, due to lax enforcement of traffic rules, are the cause of most accidents in urban areas.

Traffic congestion and accidents have risen because public mass transport system has not yet been introduced. Due to a lack of government subsidies and public interest, the first trial of bus services in 2001 failed. The second trial of bus services, which was supported by the Japan International Cooperation Agency, launched 10 buses between February and March 2014. The bus services started during this round of trial gained a degree of public trust and support, and are still running today (MPWT, 2015).

5.1.5 Vulnerability to climate change

Sustainable infrastructure development is now being challenged by the effects of climate change, including heavy rains, floods, and typhoons. A single catastrophic event that results from and/or worsened by climate change can undermine decades of growth and development. Therefore, it is necessary to assess the vulnerability of the transport network to climate change and to create guidelines on how to adapt to these issues.

5.2 Institutional Challenges

5.2.1 Inadequate transport logistics

Cambodia is a small international freight market with a relatively small flow of bulk commodities. However, if the growth in container transport continues at its current rate, the transfer of containers to and from Sihanoukville will likely put a strain on the capacity of NR4, the national highway that links the port city to Phnom Penh. This outlook is one of the justifications for investing in the rehabilitation of the railway system.

The main constraints to efficient and competitive trade logistics emanate from operational, procedural, and organisational causes. Despite the significant leap in its ranking in the World Bank's Logistics Performance Index from the years 2010 to 2014, Cambodia still placed poorly when compared with other ASEAN countries.

5.2.2 Legislation

The ASEAN Agreement on Transit Transport was signed in 1998, but its protocols have not been fully finalised until recently. Most importantly, as these agreements often require reforms and adjustment in domestic legislations, many were signed but never fully ratified and/or implemented by signatory countries.

In addition to actual bilateral agreements, the GMS CBTA was set up as a multiple agreement on the cross-border transport of people and goods. In March 2007, all six member countries signed the annexes and protocols. These annexes and protocols have been ratified only recently.

The implementation of trade facilitation in Cambodia has not been fully effective due to the ongoing operation of existing laws and regulations that allow a duplication of other agency (Camcontrol of ministry of Commerce) activities at the border gates with the duty and responsibility also officially supported by Sub Decree to control and inspect imports and exports jointly with Customs. This would be expressed some degree of concerns relating to Cambodia's customs legislation that allows overlapping controls of agency operations at the border posts that could be also reflected a challenge in legislation sector to achieve successfully the implementation of border management. That is why this issue is fit to this legislation sub- title (Seng, 2014).

However, the disadvantage of sub-regional transport agreements is that it often takes years to conclude negotiations and complete the domestic legal processes required before they can go

into effect.

5.2.3 Lack of private sector participation

The key driver of socioeconomic development is the private sector. However, the challenges that impede the private sector's involvement need to be addressed.

Currently, the transport investment required cannot be met by funding coming from the government and development partners. The participation of development partners in rural road development needs to be reinforced by private sector involvement. However, private sector organisations have little or no awareness of the CBTA itself and are therefore not attracted to infrastructure development. To secure their long-term commitment and participation, there is a need to create a favourable environment that will attract the private sector towards public transport investment.

5.2.4 Finance

Financing requirements for the transport infrastructure are exceeding the capacity of the state budget. For the Public Investment Projects for 2015–2017, a total of US$4.9 billion (of which the total transport infrastructure investment is US$588 million) – or around US$1.6 billion per year – is required.

In addition to the government's budget allocations of KHR4,883.4 billion (US$1.191 billion) for public sector investment, the balance (total amount minus the government allocation) over the three-year period 2015–2017 amounts to KHR14,985.3 billion (US$3.709 billion) – or KHR4,995.1 billion (US$1.236.3 billion) per year. Such will need to be financed through:

- **Grants-in-aid from traditional external development partners (bilateral, multilateral, and nongovernmental organisations);**
- **Concessional term loans from external development cooperation partners (mainly, multilateral financial institutions and bilateral development partners);**
- **Resources from nontraditional sources, including nontraditional partners (both grants and semi-concessional loans);**
- **Potential new income from the development of extractive industries (oil, gas, and minerals) when commercial production in these sectors commences. In particular, Cambodia is in the process of increasing rice exports and production through agricultural diversification to garner higher budget revenues (MOP, 2016).**

From 2005 to 2013, 14 multilateral or bilateral development partners provided funds totalling about US$1.619 billion. Nine of these have funded transport infrastructure development or/and maintenance since 1992.

At present, the rural roads subsector's active development partners are the ADB, German Development Cooperation through the Kreditanstalt für Wiederaufbau, the government of the Republic of Korea through KEXIM Bank, the government of Australia, and the World Bank (ADB, 2014). A marked slowdown in the participation of development partners in national and provincial networks has been noted.

5.2.5 Customs procedures

Cambodia has made great strides recently in reforming and modernising its import, export, and transit operations, including streamlining and harmonising customs procedures with international standards. However, there remains a need (i) to implement further reforms in border management, particularly on physical inspection; and (ii) to disseminate information on customs' procedures. The time required to clear goods through customs is a relatively small fraction of the total import time, but that time increases significantly whenever goods are subjected to physical inspection.

The customs department is not the only agency involved in border management; the other agencies are those that handle quality/standards inspections, health/sanitary and phytosanitary measures, and immigration.

Cambodia requires a higher number of import and export documents, has higher import and export costs, and experiences longer export times than all ASEAN member countries except Lao PDR, which is a landlocked country similar to Myanmar (Table 3.8). Furthermore, Cambodia requires longer import times than all ASEAN member countries except Lao PDR and Indonesia.

In addition, Cambodia has some remarkably unsupportive institutional arrangements: Some barriers exist at the cross-border points, while others are found along transport routes, or spread randomly throughout the country. The impacts of these barriers are also varied (JICA, 2009). Institutional bottlenecks remain prevalent in the form of border-crossing formalities, which are rife with all forms of problems.

Table 3.8. Trading Across Borders of ASEAN Member Countries

Items	Brunei	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
Documents to export (number)	5	8	4	10	4	8	6	3	5	5
Time to export (days)	19	22	17	23	11	20	15	6	14	21
Cost to export (US$ per container)	705	795	572	1,950	525	620	755	460	595	610
Documents to import (number)	5	9	8	10	4	8	7	3	5	8
Time to import (days)	15	24	26	26	8	22	15	4	13	21
Cost to import (US$ per container)	770	930	647	1,910	560	610	915	440	760	600

Source: *Doing Business 2015*.

At present, cross-border formalities exist at both sides of the border, and customs, quarantine, and immigration formalities are handled through separate avenues. The simplification of formalities could shorten the time required at physical border-crossing facilities (JICA, 2007).

Cambodia also faces other challenges. It currently has difficulties in establishing a representative office/branch office in Viet Nam. Other operational constraints include a lack of parking areas, unavailability of issuing a third-party insurance; a ineffective guarantor system for international cargo[1]; either congestion in common control areas or a lack of common control areas at border-crossing points; and a lack of mutual agreements between Cambodia and Viet Nam regarding cross-border transportation by Cambodian trucks.

6. Recommendations

To overcome the existing challenges in infrastructure development for cross-border transport facilitation, well-planned and well-coordinated policy measures and actions are urgently needed. The following recommendations must be considered:

- **The transport infrastructure network for internal and sub-regional connectivity should be strengthened;**

[1] A guarantor of a country of a consigner is needed to guarantee the import tariff for transit country, for instance, when a truck loaded with transit cargoes is hijacked in the transit country and goods in the truck are imported to the country unintentionally.

- **Roads should be upgraded to a level that can guarantee a seamless transport infrastructure network;**
- **The physical road infrastructure should be improved. This includes the installation of road safety devices, increased education for road users, improved driving behaviour, stricter and stronger law enforcement, and more accurate vehicle inspections to reduce traffic accidents;**
- **Non-physical constraints, including the cost, time, and paperwork associated with customs procedures, should be reduced or eliminated;**
- **Current policies, laws, regulations, procedures, and guidelines related to transport and trade facilitation should be comprehensively reviewed and amended, and border management should ensure that they are simplified and harmonised in line with international standards. The aim is to reduce unnecessary duplication and overlapping of agencies' responsibilities;**
- **A new bilateral agreement should be negotiated and signed to ensure conformity with CBTA initiatives and protocols;**
- **Capacity building of human resources working in the field of transport and trade facilitation and at border crossings should be strengthened;**
- **Technical issues such as common control areas for joint inspection or transshipment of goods should be negotiated;**
- **Transport facilitation should be enhanced by eliminating provincial checkpoints and institutional cross-border barriers; and**
- **The role of private sector participation through approaches such as public-private partnership mechanisms should be increased to mobilise sufficient capital resources for public infrastructure.**

Before entering into any bilateral or multilateral regional transport agreements, signatory countries should consider the required reforms and adjustments to domestic legislation that need to be enforced.

7. Conclusion

Although there is a marked progress in physical infrastructure, reforms and modernisation of cross-border transport facilities, and customs procedures, the facilitation of transport and trade has not been completely successful.

To further improve the facilitation of road transport and trade, institutional cross-border barriers will need to be eliminated or reduced through close collaboration and coordination between customs institutions and other relevant border management agencies. Such barriers include documentations and other formal requirements that are excessive or do not serve any specific purpose.

Once implemented, such reform could lead to lower costs, shorter time required for customs clearance and export/import procedures, stronger international competitiveness, and better economic diversification. These are key factors for growing the economy and reducing poverty.

To address current shortfalls in infrastructure and meet new financing requirements, Cambodia will need to seek funding and loans from international institutions and development partners, in addition to approaches such as public-private partnerships.

Furthermore, campaigns on improving road users' awareness and education on road traffic laws, road laws, and road safety devices are urgently needed to help reduce the number of traffic accidents.

References

ADB (2014), 'Sector Assessment (Summary): Transport, Country Partnership Strategy: Cambodia, 2014–2018'.

Bhattacharyay, B.N. (2009), 'Infrastructure Development for ASEAN Economic Integration'. ADBI Working Paper Series, No. 138.

General Department of Customs and Excise, Ministry of Economy and Finance [GDCE-MOEF] (2015), *Customs Clearance Handbook*. Phnom Penh: Ministry of Economy and Finance.

Japan International Cooperation Agency [JICA] (2007), *The Research on the Cross-Border Transportation Infrastructure-Phase II, Final Report*. Tokyo: Japan International Cooperation Agency.

Japan International Cooperation Agency [JICA] (2009), *The Research on the Cross-Border Transportation Infrastructure-Phase III, Final Report*. Tokyo: Japan International Cooperation Agency.

Japan International Cooperation Agency [JICA] (2015), *Strategy and World Programs on Reform and Modernization of the General Department of Customs and Excise of Cambodia (2014–2018) 1st Edition*. Phnom Penh: JICA Phnom Penh Office.

Ministry of Commerce [MOC] (2014), *Cambodia Trade Integration Strategy 2014–2018, Full Report*. Phnom Penh: Ministry of Commerce.

Ministry of Commerce [MOC] (2016), 'Public Investment Programme, 3-year Rolling, 2015–2017', Phnom Penh: Ministry of Planning (http://www.twgaw.org/wp-content/uploads/2016/08/PIP-2017-2019-English-08-July-2016.pdf).

Ministry of Public Work and Transport [MPWT] (2005), Standards Traffic Control Devices.

MPWT (2015), *Overview of the Transport Infrastructure Sector in the Kingdom of Cambodia (5th Edition)*.

Seng, S. (2014), 'The Facilitation of Trade in Cambodia: Challenges and Possible Solutions,' *World Customs Journal,* 8(1).

World Bank (2012), *Connecting to Compete 2012, Trade Logistic in the Global Economy*. Washington DC: World Bank.

World Bank Group (2014), *Connecting to Compete 2014, the Logistic performance Index and Its Indicators*. Washington DC: World Bank.

Websites

United Nations Treaty Collection on Transport and Communications (Chapter XI): https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XI-B-19&chapter=11&Temp=mtdsg3&clang=_en

Chapter 4

Improvements and Challenges Associated with the Facilitation of Road Transport in Lao PDR

Vanthana Nolintha

The government of Lao PDR has made significant improvements in its hard transport infrastructure in support of its road connectivity-related policies. Investments focus on enhancing sections of the Association of Southeast Asian Nations Highway and strategic roads that can improve domestic and regional connectivity. There has also been a gradual improvement in the soft transport infrastructure, particularly the implementation of the Greater Mekong Subregion Cross-Border Transport Agreement. However, major challenges persist in terms of the financing of infrastructure projects and mechanisms for road maintenance. In addition, domestic transport regulations need further revisions to be in accordance with international and regional transport agreements.

Introduction

To take advantage of its strategic geographical location and to transition from being a land-locked country to one that is 'land linked', Lao PDR has been prioritising and strengthening its efforts in road transport facilitation. Improving its connectivity within the country and throughout the region is crucial for this transformation. Therefore, the Lao government is cooperating closely with neighbouring countries and development partners under the Association of Southeast Asian Nations (ASEAN) and Greater Mekong Subregion (GMS) Framework Agreements to facilitate road transport as well as regional cross-border transport.

Amongst Lao PDR's investments in hard infrastructure, the transport infrastructure has always been the top priority. Investments in the transport infrastructure account for between 35% and

50% of total government investment (MPWT, 2010). Considering the large number of competing development objectives in the country, this level of investment is substantial. The total length of the road network increased from 39,585 km in 2010 to 51,597 km in 2014.

Road transport is the most important mode of transportation in the country, accounting for almost 80% of the total transport. This is followed by river transport (18%) and air transport (2%). The volume of road transport increased from 4.43 million tons in 2010 to 4.78 million tons in 2014.

In addition to hard infrastructure, the government has invested in improving its soft infrastructure, including the revision of existing legislations and the enhancement of institutional and technical capabilities.

Despite these outstanding achievements, the facilitation of road transport in the country still faces several challenges, including limited financial and human resources, deficiencies in the existing regulatory framework, inconsistencies between domestic transport regulations and regional and bilateral agreements, and the difficulty in enforcing rules and regulations.

Against this backdrop, this chapter aims to examine recent developments in the facilitation of road transport in Lao PDR. In Section 2, recent updates as well as improvement plans for sections of the ASEAN Highway in the country are discussed. Major improvements in the soft infrastructure of road transport in Lao PDR are then summarised in Section 3. Finally, the conclusion and policy recommendations are provided.

1. Improvements in Hard Transport Infrastructure in Light of Increasing Regional Integration

1.1 Progress and Challenges in Projects on Sections of the ASEAN Highway in Lao PDR[1]

Amongst the major aims of Lao PDR's Ministry of Public Works and Transport (MPWT) is to improve national roads that serve as regional highways. From 2011 to 2015, almost 2,200 km of national roads and sections of the ASEAN Highway have been repaired or improved (Table

[1] In addition to the official report from the MPWT, recent updates regarding sections of the ASEAN Highway in Lao PDR are based on interviews with relevant government officials from the MPWT and selected provincial planning and investment departments from December 2015 to February 2016.

Table 4.1. Current Situation of the ASEAN Highway Network in Lao PDR

AH No.	National Road	Section	Distance	Road Class (2012)	Road Class (2015 update)
AH11	NR13S	Vientiane–Nong	861 km	III (100%)	III (100%)
AH12	NR13N	Thanaleng–Nateuy	682 km	III (100%)	III (100%)
AH15	NR8	Banlao–Nam Phao	132 km	III (65%	III (100%)
AH3	NR3	Houayxay–Boten	251 km	III (65%	II (98.7%), below III
AH16	NR9	Lao–Thai border in Kaysone Phomvihane–Dansavanh	241 km	III (completed)	III (97.2%), II (2.8%)
AH13	NR2E, NR2W	Ngeun District (Sayaboury, border with Thailand)–Tay Trang (border with Viet Nam)	363 km	Need funding	III (47.2%, Tai Chang–Xai District), III and below (52,8%, Xai District–Nguen District)

AH = ASEAN Highway; NR = national road.
Source: MPWT (2015a).

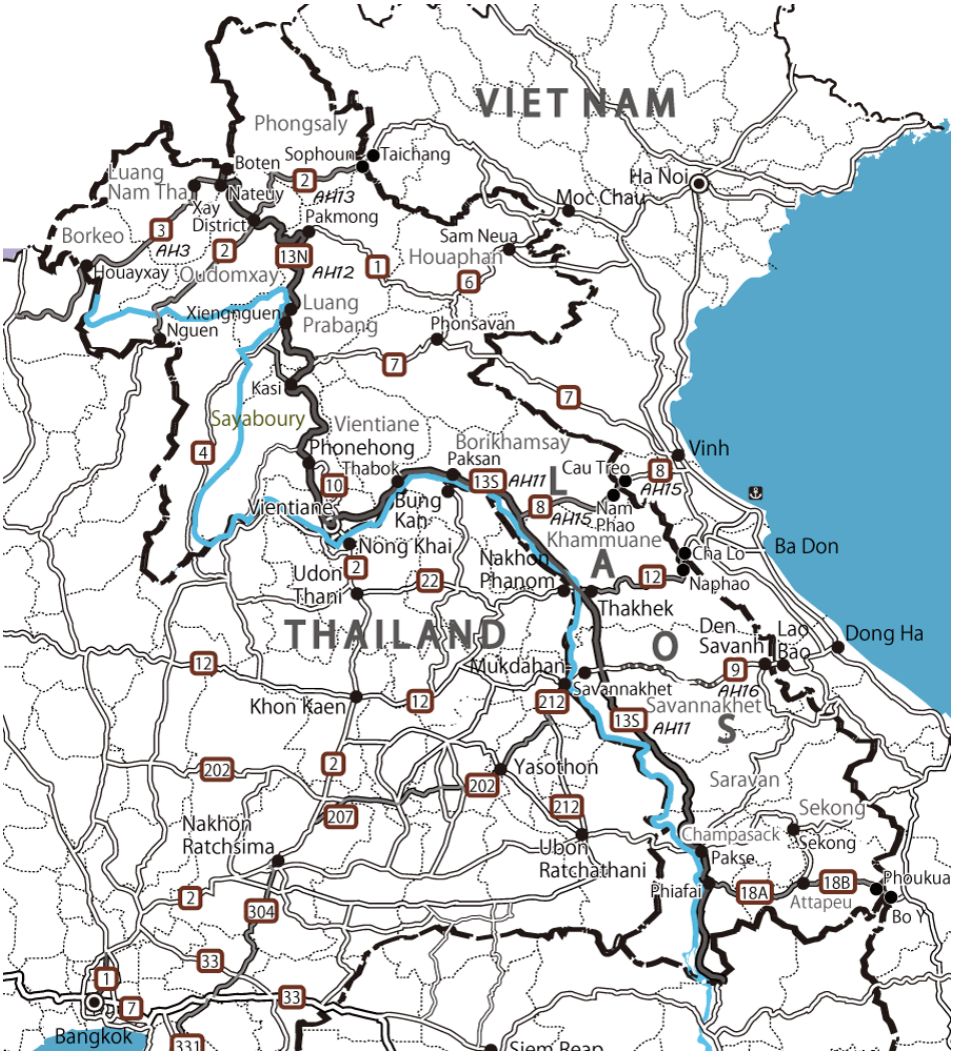
There are six sections of the ASEAN Highway in Lao PDR: AH11, AH12, AH15, AH3, and AH16. The total length of its ASEAN Highway is 2,530 km. In 2015, 82.4% of Lao PDR roads in the ASEAN Highway Network were designated as Class III, 10.2% as Class II, and the remaining 7.6% as Class III and below, based on the ASEAN standards. These are a marked improvement over the 2012 status, when 70% of the roads in its ASEAN Highway Network were classified as Class III or below (of which 30% were below Class III). More details on the improvements made to each section of the ASEAN Highway are provided in the following section.

1.1.1 AH11 (NR13S)

The national road NR13S, which also serves as an ASEAN Highway (AH11), runs from the Vientiane Capital all the way to the Lao–Cambodian border in the far south (Figure 4.1). The NR13S is the longest ASEAN Highway in Lao PDR at 861 km long and passes through the following six provinces: Vientiane Capital, Bolikhamxay, Khammouane, Savannakhet, Salavan, and Champasak. It serves as the only north–south transport route for goods and passengers amongst Vientiane Capital, the central region, and the southern region. Because the central and southern regions (especially in the western part of the country) are mostly flat, NR13S is a popular route, not only of motor carriers of goods, but also of tourists and local travellers.

Although NR13S is one of the most important highways in Lao PDR, the condition of the road has remained poor (i.e., classified as Class III) and in need of upgrades. Some parts of the road are at risk of flooding during the rainy season. Many small sections also have to be repaired or maintained several times a year. Therefore, the maintenance of NR13S alone represents a substantial financial burden to the government.

Figure 4.1. Map of Major Highways in Lao PDR



Note: numbers in the red box indicate the national road number used in each country, the dark connecting line is Lao PDR's main national road, the dark dash line is Lao PDR's national border.
Source: Created by the author and the project leader.

To upgrade the state of this important road, the government has begun to explore the possibility of using public–private partnership (PPP) mechanisms as a means to mobilise financial resources. The MPWT has been working with the World Bank Group to implement a pilot PPP project that aims to select a private concessionaire that will operate, improve, and maintain parts of NR13S from Vientiane Capital to Thabok Village in Bolikhamxay Province (Figure 4.1).

The World Bank Group consists of the World Bank, the Public–Private Infrastructure Advisory Facility, and the International Finance Corporation. These three agencies are responsible for providing comprehensive and sufficient support to the pilot PPP project. The World Bank and the Public–Private Infrastructure Advisory Facility support the development of a PPP regulatory framework, capacity building, and strengthening of the MPWT's institutional capabilities. In addition, the World Bank provides technical assistance in the supervision and management of concession projects and funds a detailed feasibility study for the project. The International Finance Corporation, meanwhile, is responsible for providing technical support to the MPWT on the commercial, environmental, social and legal aspects of the project.

An earlier feasibility study by the World Bank Group recommended decreasing the scale of the PPP project mainly because Lao PDR lacks the needed experience (PPIAF, 2013). The original idea was to upgrade NR13S from Vientiane to the Paksane District in Bolikhamxay and NR13N from Vientiane to the Vang Vieng District. Another feasibility study is currently being conducted.

There is also some interest from a Chinese investor to build a toll expressway on NR13S and NR13N (Southern and Northern section of NR13, respectively). The MPWT, however, had proposed that the investor conduct a survey and feasibility study on the construction of a new toll expressway as opposed to an expansion or upgrade of the existing road.

1.1.2 AH12 (NR13N)

The AH12, locally known as NR13N, is another major highway in Lao PDR. This national highway has a total length of 682 km, running from Vientiane Capital to the Lao–Chinese border in the northern region of the country. It crosses five provinces: Vientiane Capital, Vientiane Province, Luang Prabang, Oudomxay, and Luang Namtha. Similar to NR13S, NR13N is

a north–south transport corridor connecting the capital with the northern region of Lao PDR. The northern region of Lao PDR is mostly mountainous; thus, a large part of the NR13N has a high incline grade, subjecting it to numerous challenges such as landslides and road collapse due to a washout. Such difficult terrain makes NR13N hard and costly to maintain.

Some improvements were made to NR13N between 2011 and 2015, especially between Luang Prabang, Oudomxay, and Luang Namtha (Figure 4.1). In particular:

- The section between Xay district of Oudomxay and Pakmong of Luang Prabang (80 km) was due to upgrade its surface from one with bituminous surface treatment to asphalt concrete via a loan of more than US$80 million from China. The improvement was expected to be completed in early 2016.
- The section between Xay district and Nateuy has been improved since 2011 through a grant from China.
- Routine maintenance and repair of the remaining section of NR13N is being carried out from Luang Prabang to Pakmong.

Prior to these improvements, these sections of NR13N had amongst the worst road conditions. Today, these improvements will provide numerous benefits to Luang Prabang, Oudomxay, and Luang Namtha, especially in reducing transport time and cost between these important provinces and in promoting business opportunities along the road. Road signs have also been installed along NR13N through a funding assistance from the World Bank. More road signs are planned to be installed in other sections of the ASEAN Highway.

Finally, there is an ongoing feasibility study on the upgrade of the section of NR13N that runs from Vientiane Capital to Phone Hong (Figure 4.1) under the same pilot PPP project as NR13S. This section has one of the heaviest traffic congestion in the country, and an upgrade will therefore provide significant benefits, especially in reducing transport time and costs as well as in driving more tourists to Thalat and Vang Vieng, the major tourist destinations in Vientiane Province.

1.1.3 AH15 (NR8)

The AH15 (or NR8) in Bolikhamxay Province, is the shortest ASEAN Highway in Lao PDR. With a total length of 132 km, NR8 begins in Banlao (connecting with NR13S) and ends at the Namphao–Cau Treo border. The NR8 is a paved road in good condition and meets the criteria of a Class III road. However, most of the terrains through which NR8 runs are either hilly or mountainous, with an average slope of 10 to 12 degrees. Such challenging terrain limits the speed of heavy trucks.

The NR8 is one of the alternative shortcuts for road transport from the central region of Lao PDR to Viet Nam, as well as between Thailand and Viet Nam. The distance from Vientiane Capital to Cua Lo, a seaport in Viet Nam, via NR8 is 326 km, and the estimated travel time is about six and a half hours (Nolintha, 2012). Similarly, for the same destination, the distance from the Third Lao–Thai Friendship Bridge in Khammouane to Cua Lo is only 350 km, with an estimated travel time of slightly over three hours.

Some minor improvements have been made to the NR8 in recent years. Four concrete bridges were constructed along NR8 in 2014 using government funds. The total construction cost was nearly ₭N25 billion – or more than US$3 million. These concrete bridges can support heavier traffic. In addition, the South Korean government has provided financial and technical support to the conduct of a detailed feasibility study on the upgrade of the NR8. Finally, the government of Thailand, through the Neighbouring Countries Economic Development Cooperation Agency, has expressed continued support in the upgrade of NR8 because of this road's potential to improve the connectivity between Northeastern Thailand and Viet Nam via Lao PDR. The role of NR8 will increase significantly once the newly constructed Thai–Lao Bridge connecting Paksane (Bolikhamxay) and Bungkan Province of Thailand is constructed as planned (Figure 4.1). The bridge will make AH15 a complete East–West transport corridor similar to how NR12 is to Khammouane and NR9, to Savannakhet.

1.1.4 AH3 (NR3)

The AH3 is one of the most important regional economic corridors in Lao PDR. It measures 251 km long, extending from the Lao–Chinese border to Nateuy along NR13 and then from Nateuy to Luang Namtha and the Thai–Lao border in Houayxay, Bokeo, along NR3 (Figure 4.1).

The AH3 serves as the North–South Economic Corridor connecting Thailand and China via Lao PDR. The completion of the Fourth Thai–Lao Friendship Bridge in late 2013 helped AH3 achieve its full potential in boosting trade, investment, and tourism in Lao PDR, and in promoting more cross-border transport of goods and passengers. Therefore, this route has been used heavily for cross-border traffic. After the completion of the Fourth Thai–Lao Friendship Bridge, more investors, especially those from China, began showing some interest in investing in transport, tourism, trade, and manufacturing in Luang Namtha, while locals who live along AH3 became more active in producing handicrafts and agricultural goods, as well as in opening small shops to gain from the increase in traffic.[2]

In terms of road condition, 98.7% of AH3 is classified as a Class II road. Overall, the condition of AH3 is fair; however, as the terrain is mostly mountainous, the road condition deteriorates during the rainy season. As the road can become slippery, trucks have to reduce their speed. During heavy downpour, mudslide and landslides can block traffic for hours, causing a problem to both domestic and cross-border transport. In addition, some large sections of the road can collapse due to washout.

According to the MPWT, no major improvements are planned for this route; only regular maintenance will be done to sustain the current quality. Two Chinese investors have expressed their interest in constructing a toll highway in the area and are now conducting a preliminary survey. Note that if this pushes through, the toll highway would have to be newly constructed, and AH3 would still need to be maintained to service the transport of public goods in the region.

1.1.5 AH 16 (NR9)

The NR9 (or AH16) starts at the Lao–Thai border in Kaysone Phomvihane District (Savannakhet in Figure 4.1) and ends at the Lao–Viet Nam border in Den Savanh Village Figure 4.1), Sepone District, in Savannakhet. It has a total length of 241 km, with 97% classified as Class III. Its remaining section that lies between the centre of Savannakhet and the Lao–Thai border is classified as Class II. The terrain is mostly flat (80%) with some hilly sections (20%) between Phin District and the Lao–Vietnamese border.

[2] Interview with Luang Namtha's Department of Planning and Investment on 25 January 2016.

This section of the ASEAN Highway aims to function as an East–West economic corridor connecting Thailand and Viet Nam through Lao PDR. The NR9 has helped increase the inflow of foreign direct investment to Lao PDR and promote more cross-border trade and transport in the region.

To maximise the benefits from the ASEAN Highway, the Savan–Seno Special Economic Zone was developed along this route. The highway has been heavily used, especially between Sepone and Savannakhet, due to the heavy volume of copper transport from the mine located in Sepone.

Some major improvements have been made to AH16. Japan is the primary donor that supports the rehabilitation of this road. From 2012 to 2015, Japan financed the repair of a severely damaged 58-km stretch of AH16 via a grant worth ¥3.3 billion (about US$28 million). This improvement has helped the economic development of Savannakhet Province and enhanced connectivity between Lao PDR and the GMS.

Recently, there has been a foreign direct investment boom in the manufacturing sector in the Savan–Seno Special Economic Zone associated with the regional production network (Umezaki et al., 2014). Such boom takes advantage of the strategic location of Savannakhet, which has ease of access to the regional market via AH16. Improvement of this road will reduce the required time and cost for cross-border transport along the route, and promote more trade, investment, and tourism to the area. Finally, an increase in such business activity will generate more income and job opportunities for the poorer eastern part of Savannakhet Province.

The Japanese government also supported further improvements of NR9 by replacing two bridges built in the 1980s: the Xe Kumkam Bridge and Xe Thamouak Bridge. These bridges have severe structural problems and do not meet ASEAN Highway standards. Detailed planning for the repair of these bridges commenced in late 2015.

Finally, an investor from the Republic of Korea expressed an interest in constructing a new highway to connect the Lao–Vietnamese border in Dansavanh and the Lao–Thai border in Savannakhet using the build-operate-transfer model. Details about this road, including the directions of the route and road specifications, are currently unavailable.

1.1.6 AH13 (NR2)

The NR2 (or AH13) is the most recently developed ASEAN Highway in Lao PDR. It begins at the Lao–Vietnamese border (Sophoun–Tay Trang checkpoint) and passes through the Khua District of Phongsaly and then Oudomxay Province before ending at the Lao–Thai border in the Nguen District of Sayaboury Province. It could serve as an East–West transport corridor for the northern region to link Viet Nam and Thailand via Lao PDR. Measuring 363 km long, AH13 has nearly half of its road classified as Class III and the remaining as below Class III. It runs through hilly (68%) and mountainous (32%) terrains.

The most recent improvement on this ASEAN Highway was on the section between the Lao–Viet Nam border and Khua District in Phongsaly (67 km). Construction began in 2009 and was completed in 2012. The construction cost ₭N370 billion (almost US$46 million), 93% of which was financed by a loan from Viet Nam. Other improvements have been made to the section between Xay District and Pakbeng (145 km) since 2003 with support from the World Bank; and to the section between Pakbeng and Nguen District (46 km) from 2006 to 2009, with funding from the government of Thailand.

1.2 Improvements of Other Important Roads for Regional Connectivity

In addition to the ASEAN Highways, the government has also invested in several roads to improve domestic and regional connectivity. Some of the major improvements are detailed below.

1.2.1 The development of NR12 as a new regional transport route

The NR12 (or AH131) runs from Thakhek in Khammouane to Naphao (at the border with Viet Nam). It is counted as a new ASEAN Highway although not yet included in the official list. It has a total length of 138 km and is currently classified as a Class III road.

Also, NR12 is Khammouane's most strategic road: It allows access to Viet Nam and could serve as another competitive corridor to facilitate regional trade from east to west, much like NR9 is in Savannakhet.

The route was developed under a bilateral agreement between Lao PDR and Viet Nam in 1996. The Thai government decided to participate by constructing the Third Lao–Thai Friendship Bridge. Via NR12, the distance from Thakhek (Khammouane) and the Vung Ang Port in Viet

Nam is just over 300 km – much shorter than the route to Danang via R9 (Nolintha, 2012). This could be an important transport corridor for access from the northeastern region of Thailand to Viet Nam and the Vietnamese Sea. The Neighbouring Countries Economic Development Cooperation Agency of Thailand has been approached to support a detailed study on the upgrade of NR12 to ASEAN standards.

The NR12, therefore, has the potential to be another important transport corridor for ASEAN countries.

1.2.2 The upgrade of NR18

National road NR18 (or AH132) begins at the intersection of NR18 and NR13S in Phiafai (Champasak) and travels through the centre of Attapeu Province before ending at the Lao–Viet Nam border (Phoukeau–Bo Y checkpoint). This route connects with Ubon Ratchathani in Thailand via NR13S and NR16 and is 231 km long.

Recently, NR18's quality has been improved. The section between Attapeu and the Lao–Viet Nam border (NR18B) was upgraded through the assistance of the Asian Development Bank, while the section between Attapeu and NR13S (NR18A) was improved by a foreign concessionaire of a mining project in Attapeu. These improvements help connect several important tourist destinations in the southern region of Lao PDR.

The NR18 is designated as one of the three East–West economic corridors for the Development Triangle Area, the sub-regional cooperation framework between Lao PDR, Viet Nam, and Cambodia. It could serve as an alternative transport route connecting the lower northeastern region of Thailand with Viet Nam. The distance between Ubon Ratchathani and Danang Port is slightly more than 600 km via NR18 (Nolintha, 2012).

1.2.3 Developing a new shortcut for the Vientiane Capital–Luang Prabang Route

The mountainous route between Vientiane Capital and Luang Prabang is the most heavily used section of NR13N. Land transport for passenger cars between Vientiane Capital and Luang Prabang, which is only about 360 km, takes around eight to nine hours. In addition, the section between Vientiane Capital and Phone Hong (70 km) has been congested in the last few years because of the increasing number of vehicles and traffic between the outskirts of the capital

and the inner-city area. The government has developed a few major pieces of road infrastructure to reduce congestion along NR13N and provide more options for road users:

- A new two-lane road was developed in Vientiane Province as a shortcut for NR13N (marked '1' in Figure 4.1) using government funds. This new road has a length of 70 km. It runs from the intersection of NR13N in Kasi District (Vientiane Province) to the intersection with NR4. It then continues on NR4 in Nan District and meets with NR13N again in Xiengnguen District in Luang Prabang. It has a small section (about 9 km) of steep terrain, but the rest of the route is much less mountainous than the old route. Although this shortcut only saves 40 km between Vientiane Capital and Luang Prabang, it saves about 1.5 to two hours of travel time because of the difference in terrain conditions. After the completion of this shortcut route, traffic – as did the amount of business activity – along the old route declined.[3]

  In addition, the new route helps connect Vang Vieng, a popular tourist destination, with Nan Province in Thailand. Tourists from Thailand can visit Vang Vieng directly without having to pass through Luang Prabang. The distance from the Lao–Thai border (Muang Nguen–Huay Kon international checkpoint) to Vang Vieng is 291 km via this new shortcut.

- A new bridge was constructed across Nam Ngum that connects Meung Kao and Pakkayung in Vientiane Province (marked '2' in Figure 4.1). The completion of this bridge represents a new alternative route for the section between Vientiane Capital and Phone Hong along NR13N. As mentioned previously, this section of NR13N is extremely congested, and the road quality is quite severe. With the new bridge, road users, especially passenger cars, can travel to Phone Hong via NR10.

- Two major sections of NR10 have also been improved. Funded by the government's budget, the section between the intersection of NR10 and NR13S and Tha Ngon has been upgraded from two lanes to four lanes of concrete road. The second section between the new bridge and Phone Hong has also been upgraded to two and four lanes of asphalt concrete as part of the relocation of the municipality of Vientiane province from Phonehong District along NR13N to Viengkham District near the new bridge. Although the distance between Vientiane to Phone Hong via the new bridge is slightly longer than the

[3] Interviews with local businesses along the old route during a field expedition in December 2015.

old route along NR13N and the travel time is almost the same, road users can now enjoy a road that is wider and of better quality.

1.3 Major Plans for the Development of Hard Infrastructure for the Facilitation of Road Transport over the Next Five Years

The Lao government will continue to improve the hard and soft infrastructure to strengthen competitiveness and enhance connectivity within the regional economy (MPWT, 2015b and 2015c). Details on selected hard infrastructure projects are shown in Appendix 1.

The planned infrastructure development projects can be summarised as follows:

First, the top priority is to improve the quality of existing ASEAN Highway sections in Lao PDR. Roads considered as part of regional corridors such as NR2, NR3, NR8, NR9, NR12, NR13, and NR18 will be upgraded to meet regionally acceptable standards. These are part of the existing regional highways AH3, AH11, AH12, AH13, AH15, AH16, AH131, and AH132.

Second, other national roads that have the potential to be important routes for regional connectivity will also be in the pipeline for upgrade. These include NR4, an important road between Sayaboury and Luang Prabang connecting Sayaboury with the Thai border that recently served as an important shortcut between Vientiane Capital and Luang Prabang. Other routes planned for upgrade are NR6 (Luang Prabang–Houaphan–Viet Nam), NR15 (Salavan–Viet Nam), NR16 (Sekong–Viet Nam), and NR17 (connecting Luang Namtha with Myanmar through the new Lao–Myanmar Friendship Bridge).

Third, a few major connecting bridges are planned for construction. These include two Lao–Thai bridges over the Mekong River: namely, the Bolikhamxay–Bungkan Bridge in the Paksane District of Bolikhamxay Province, and the Salavan–Ubon Ratchathani Bridge near the Paktaphan checkpoint in Salavan Province. Two domestic bridges crossing the Mekong River, Luang Prabang–Chomphet Bridge in Luang Prabang Province, and another bridge in the Paktha District of Bokeo Province, will also be constructed.

Apart from roads and bridges, other important infrastructure development projects include the construction of the Boten–Vientiane Railway and the Savannakhet–Lao Bao Railway. The government will conduct a feasibility study as well as design the new Nongkhai–Vientiane Bridge specifically for railways – namely, the section between Vientiane Capital, Thakhek

District (Khammouane Province), and Naphao (border checkpoint with Viet Nam), and between Pakse District (Champasak Province) and Vang Tao (border checkpoint with Thailand).

Finally, to better utilise these improvements, logistics parks and/or dry ports for international and regional logistics services are also planned in Thanaleng (Vientiane Capital), Nateuy (Luang Namtha), Seno (Savannakhet), and Vang Tao (Champasak).

Given such ambitious plans to develop hard and soft infrastructure, the main challenge remains to be in financing. Lao PDR's MPWT estimates that the total investment in hard and soft infrastructure in this sector will be as high as ₭N73,000 billion – or almost US$10 billion – for the years between 2016 and 2020, of which 18% of the required investment is allocated to the improvement and maintenance of existing infrastructure; 6.5% is to continue uncompleted projects under the previous 5-year plan; and almost 70% is for new infrastructure. The required investment is almost four times higher than the amount that could be realistically mobilised. Therefore, it is important to prioritise infrastructure projects and promote private investment and PPP mechanisms.

2. Improvements in Soft Infrastructure for Road Transportation

Along with developing hard infrastructure, the Lao government has also directed its efforts into improving the soft infrastructure. Between 2011 and 2015, several important pieces of legislation were revised and made consistent with regional and international agreements. These include the revision of road transport laws, road traffic laws, and multimodal transport laws, and the setting of maximum permissible gross weight limits for trucks. In addition, two long-term transport-related strategies – a logistics strategy and an environmentally sustainable transport strategy – have been drafted for the government's consideration.

The Department of Legislation was recently established under the MPWT. This type of institutional change reflects how legislation in the area of transport and public works is being prioritised.

In addition, Lao PDR and Viet Nam have been operating a pilot single-stop inspection programme in the Lao Bao–Dansavanh international checkpoint in Savannakhet Province in Lao PDR and Quang Tri Province in Viet Nam since December 2015. This initiative, together with

the e-customs system, helps simplify cross-border administrative procedures by reducing the amount of documents, time, and personnel involved. It is carried out under the GMS Cross-Border Transport Agreement (CBTA). A similar model will soon be applied at the Savannakhet–Mukdahan international checkpoint at the Second Lao–Thai Friendship Bridge at the other end of AH16[4] and, subsequently, to other important international border checkpoints.

2.1 Regulations and Technical Requirements

Technical requirements for vehicles in Lao PDR have been gradually revised to facilitate cross-border transportation with neighbouring countries. The latest technical requirements for trucks are governed by the 2013 regulation on the maximum permissible gross weight for trucks (No. 13848/MPWT, dated 26 September 2013). This regulation replaces previous rules (No. 849/MPWT and No. 2205/MPWT).

Compared with its predecessors, the current regulation in Lao PDR permits higher maximum gross weights for all types and sizes of trucks. Another difference pertains to the regulation on maximum axle loads. In contrast to the previous regulations, which placed specific restrictions on the maximum front and rear axle loads for all types and sizes of vehicles, the current regulation does not have any restrictions on maximum axle loads; it only has a regulation on the gross weight of the vehicle. To better facilitate cross-border transport in the ASEAN region, member countries' regulations on weight limits need to be harmonised.

In addition, trucks have been known to travel with overloaded goods to gain more profit.[5] This is one of the major causes of road damage in Lao PDR. Therefore, weight stations, which have been closed since 2011, are reopening to enforce regulations on weight limits.

A comparison of technical requirements for vehicles between Lao PDR's regulations and those of the ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT) is provided in Table 4.2. Note that the maximum length and width set for rigid motor vehicles are consistent between the domestic regulations and those of the AFAFGIT. However, local requirements permit higher maximum lengths and heights for articulated vehicles.

[4] Article published in *Bangkok Post* on 26 January 2016 and *Vientiane Times* on 28 January 2016.
[5] Interview with officials from the Ministry of Public Works and Transport on 26 January 2016.

Meanwhile, there are some variations between ASEAN and domestic regulations' maximum permissible gross vehicle weight. The maximum permissible weights for three- and four-axle rigid vehicles in Lao PDR are generally within the range of ASEAN requirements. For instance, AFAFGIT allows a three-axle rigid vehicle to have a maximum weight of 21 tons, while domestic regulations allow from 13.5 tons (for three-axle, six-wheel rigid vehicles) to 25 tons (three-axle, 10-wheel rigid vehicles).

Local technical requirements provide more details on regulations for specific types of vehicles in that they take into consideration the number of both axles and wheels. The maximum permissible weights for articulated vehicles are slightly higher in the local regulations.

It is also important to note that the maximum gross weights of vehicles are set differently between national roads that serve as regional corridors (such as NR9, NR3, and NR4) and other roads. Vehicles traveling on NR9, NR3, and NR4 have higher maximum permissible weights than vehicles traveling on other roads. Again, the purpose of such policy is to facilitate cross-border transportation.

Table 4.2. Technical Requirements for Vehicles in AFAFGIT and Local Regulations

	AFAFGIT	**Types of Vehicles Specified in Domestic Regulations**	**Lao PDR (NR3, NR4, NR9)**	**Lao PDR (Other Roads)**
Maximum Length (Rigid Motor Vehicle)	12.2 m		12.2 m	12.2 m
(Articulated Vehicle)	16.0 m		19.0 m	19.0 m
Maximum Width	2.5 m		2.5 m	2.5 m
Maximum Height	4.2 m		4.5 m	4.5 m
Maximum Number of Axels			6 axle	6 axle
Maximum Axle Load			No restrictions	No restrictions
Maximum Rear Axle Load	ROH < 60% of WB		No restrictions	No restrictions
Maximum Permissible Gross Vehicle Weight for:				
3-Axle Rigid Vehicle	21.0 ton	3-axle 6-wheel	13.5 ton	13.5 ton

		(2 front, 2 middle and 2 back)		
		3-axle 6- wheel (2 front and 4 back)	17.0 ton	16.0 ton
		3-axle 8-wheel	17.5 ton	17.5 ton
		3-axle 10-wheel (2 front and 8 back)	25.0 ton	23.2 ton
4-Axle Rigid Vehicle	25.0 ton	4-axle 8-wheel	22.5 ton	20.0 ton
		4-axle 12-wheel	29.5 ton	27.2 ton
4-Axle Articulated Vehicle	32.0 ton	4-axle 14-wheel (2 front, 4 middle and 8 back)	36.0 ton	32.3 ton
		4-axle 14-wheel (2 front, 8 middle and 4 back)	35.0 ton	
5-Axle Articulated Vehicle	36.0 ton	5-axle 18-wheel	45.0 ton	41.4 ton
6-Axle Articulated Vehicle	38.0 ton	6-axle 22-wheel	49.6 ton	49.6 ton

Source: ASEAN standards are from Protocol 4 of the ASEAN Framework Agreement on the Facilitation of Goods in Transit, and domestic regulations are from Ministry of Public Works and Transport (2013).

Finally, during the rainy season (from 1 June to 30 November), the maximum gross weight for all types and sizes of trucks traveling on earth roads or natural roads must be 20% lower than the normal limit.

2.2 Road Traffic Signs in Lao PDR

Road traffic signs in Lao PDR are governed by the Law on Land Traffic (No. 23/NA, dated 12 December 2012). There are seven types of road signs in Lao PDR: warning signs; priority signs; prohibitory or restrictive signs; mandatory signs; special regulation signs; direction, position, or indication signs; information, facilities, or services sign; and signs with additional panels.

The shapes of different types of road signs are shown in Table 4.3. Road traffic signs in Lao PDR are consistent with those standardised by the Vienna Convention, even though Lao PDR is not a signatory. A comparison of selected road signs in Lao PDR with the Vienna Convention-compliant signs is provided in Appendix 2.

Table 4.3. Common Road Signage in Lao PDR

Shape of Road Sign	Meaning	Shape of Road Sign	Meaning
(Triangle)	Warning	(Circle)	Restrictive, end of restriction or mandatory
(Diamond)	Priority sign	(Horizontal rectangle)	Warning, special regulation, direction, position, or additional panels
(Octagon)	Stop	(Vertical rectangle)	Warning, special regulation, direction, position, or additional panels
(Inverted triangle)	Yield	Square)	Priority, special regulation, mandatory, direction, or additional panels

Source: Department of Transport (2015).

In Lao PDR, some road signs are still in the local language, posing some problems to foreign drivers (Table 4.4). For instance, some important signs (such as indication signs for police stations and vehicle checkpoints), and temporary signs for road blocks or temporary bypass roads, are shown in the local language. Lao PDR, however, has begun to install ASEAN Highway road signs along the main highways, starting with AH11 in 2015. This work will expand to other ASEAN Highways in the near future.

Table 4.4. Road Signage in or with Lao Language

Meaning	Road Sign
Stop	
Direction of bypass road for temporary roadblock	
Traffic policy station	
Vehicle checkpoint	

Source: Department of Transport (2015).

2.3 Outline of the Road Transportation Law

Road transportation in Lao PDR is governed by two main laws; namely, the Land Traffic Law and the Land Transport Law. The Land Traffic Law (No. 23/NA, dated 12 December 2012) aims to define principles, regulations, and measures on the establishment, activities, and management of land traffic to facilitate and control the movement of human beings and the use of various vehicles on the roads.

The Land Traffic Law focuses on the safety and control of land traffic, including regulations on driving licenses, road signs, traffic lights, and technical standards for vehicles. The Land Traffic Law is composed of the following 11 chapters:

- General provisions
- Land traffic
- Technical standards and vehicle management
- Business activities related to land traffic
- Associations and foundations related to land traffic
- Prohibitions
- Conflict resolution
- Committee on Road Safety
- Land traffic management and inspection
- National Road Safety Week, uniforms, and signs
- Policies towards persons with outstanding achievements and measures against violators

On the other hand, the Land Transport Law (No. 24/NA, dated 12 November 2012)[6] deals with the administration, management, and monitoring of the domestic and cross-border transport of goods and passengers. Interestingly, because logistics services are important to the Lao economy, the Land Transport Law broadly defines the role and responsibility of the logistics park/zone (Chapter 4, Articles 51 and 52).

On cross-border transport (Chapter 12), the Land Transport Law allows the implementation of country-specific bilateral, regional, or international transport agreements; does not decide upon the place of trans-shipment, but stipulates that this must be agreed upon by governments; allows vehicles to have right-side steering wheels when engaging in cross-border transport activities in countries that utilise left-side traffic systems (Article 15); and stipulates that foreign vehicles must follow local traffic and other related regulations.

[6] Interview with officials from MPWT on 26 January 2016.

The Land Transport Law is composed of the following 11 chapters.

- General provisions
- Transport operations
- Land transport enterprises
- Land transport business operations
- Vehicle transporter unions
- Prohibitions
- Conflict resolution
- Transportation committee
- Work management and inspection
- Policies towards persons with outstanding achievements and measures against violators
- Final provisions

A full outline of the Land Transport Law is provided in Appendix 3.

2.4 Further Planned Improvements for Soft Road Transport Infrastructure in Lao PDR

Soft infrastructure should be given the same importance as hard infrastructure. For one, there is a need to align domestic transport regulatory frameworks with existing international, regional, and bilateral transport agreements. Thus, Lao PDR plans to see that the GMS CBTA is implemented more effectively, and its stipulations further integrated in domestic transport regulations.

In addition, the information system behind vehicle registration and drivers' licenses will also be modernised, and public works as well as transport institutes and training centres will be strengthened. Other areas of soft infrastructure that future initiatives aim to improve are in road safety management and promotion; road traffic legislation; and translation of international, regional, and bilateral transport agreements.

3. Conclusion

The facilitation of road transport in Lao PDR has been significantly improved to support the road connectivity-related policies of the government. Lao PDR has strengthened its cooperation with other countries in the region as well as with development partners to

promote investment in hard transport infrastructure, particularly improvements of regional and national highways.

Aside from the hard infrastructure initiatives, the soft infrastructure has been strengthened through revisions of several legislative and regulatory frameworks, institutional changes, and progress in implementing the GMS CBTA.

However, there remain challenges in improving hard transport infrastructure. A significant part of the funds for hard infrastructure projects comes from bilateral assistance and development partners. Because the government's budget is limited, its fund has been used primarily to maintain the quality of existing roads or to construct a few strategic roads or road sections.

Still, road maintenance remains a major concern in terms of sustaining the quality of both regional and national highways. Currently, the road maintenance budget covers only about one-third of the need.[7] Difficult terrains and the associated problems (landslides, washouts, etc.) and overloaded trucks adversely affect the quality and durability of roads.

In addition, several projects in the past have relied on advance investments by the private sector – funds that often have high implied interest rates for repayment. Therefore, PPP mechanisms, especially those under the build-operate-transfer model, could play an increasingly important role in financing large infrastructure projects, especially those with a high rate of traffic.

The PPP mechanisms require a good regulatory framework and a rigorous system of checks and balances to monitor the terms of the agreement and the implementation of the project. Although Lao PDR has constantly amended domestic laws and regulations on transportation to keep them more consistent with regional and international frameworks, more revisions are needed in terms of the permissible weight limits of vehicles and trucks.

Road signs in Lao PDR are already consistent with international regulations, but more road signs need to be installed, with their visibility enhanced. Old or broken road signs must be replaced, and English translations ought to be provided for those road signs that are currently written in the local language only.

[7] Interview with Mr. Chanthaphone Phanvisouk, Department of Planning and Cooperation, Ministry of Public Works and Transport in January 2016.

References

Bangkok Post (2016), 'Thailand, Lao PDR Ready One-Stop Service at Mukdahan Bridge', *Bangkok Post Newspaper* (Online), 26 January 2016. In http://www.bangkokpost.com/business/news/840224/thailand-laos-ready-one-stop-service-at-mukdahan-bridge (accessed on 8 February 2016).

Department of Transport (2015), *Guidebook on Road Signs in Laos.* Vientiane: Ministry of Public Works and Transport.

Ministry of Public Works and Transport [MPWT] (2010), *Development Strategy of the Public Works and Transport Sector for 2011 to 2020*. Vientiane: Ministry of Public Works and Transport.

Ministry of Public Works and Transport [MPWT] (2013), *The Regulation on Maximum Permissible Gross Weight for Vehicles*. No. 13848/MPWT dated 26 September 2013. Vientiane: Ministry of Public Works and Transport.

Ministry of Public Works and Transport [MPWT] (2014), 'Lao PDR's Country Report On Transport Sector'. Proceedings at the 18th meeting of the GMS Sub-regional Transport Forum, 23–24 July 2014, Vietnam.

Ministry of Public Works and Transport [MPWT] (2015a), *2015 Updated ASEAN Road Inventory of Lao PDR*. Vientiane: Ministry of Public Works and Transport.

Ministry of Public Works and Transport [MPWT] (2015b), *2030 Vision and the 2016–2025 Development Strategy of the Public Works and Transport Sector*. Draft. Vientiane: Ministry of Public Works and Transport.

Ministry of Public Works and Transport [MPWT] (2015c), *Five Year Development Plan of the Public Works and Transport Sector for 2016–2025*. Draft. Vientiane: Ministry of Public Works and Transport.

National Assembly (2012a), 'The Law on Land Traffic'. No. 23/NA, dated 12 December 2012. Vientiane: National Assembly.

National Assembly ((2012b), 'The Law on Land Transport'. No. 24/NA, dated 12 November. Vientiane: National Assembly.

Nolintha, V. (2012), 'Economic Sub-Corridors and Potentials for Regional Development in Lao PDR' in *Emerging Economic Corridors in the Mekong Region.* Edited by Masami Ishida, BRC Research Report No. 8. Bangkok Research Centre, IDE–JETRO, Bangkok, Thailand.

Public–Private Infrastructure Advisory Facility [PPIAF] (2013), *Moving Forward: Developing Highway PPPs in Lao PDR.* In http://www.ppiaf.org/sites/ppiaf.org/files/documents/Lao_transport_Final_Report.pdf (Accessed 12 December 2015).

Umezaki, S., C. Sotharith, V. Nolintha, A. Min, and T.D. Lam (2014), 'Investment Climates for Thai and Multi-National Companies in the CLMV Countries', a study under Prospects for Forming Mekong Business Area: Thai plus One Corporate Strategy and Its Supporting Policies project supported by ERIA.

Vientiane Times (2016), **'**New Customs Checks Planned for Savan–Mukdahan Border Crossing'. Published in *Vientiane Times* (On Line), dated 28 January 2016. http://www.vientianetimes.org.la/FreeContent/FreeConten_New_customs.htm **(**accessed 8 February 2016).

Appendix 1. Proposed Hard Infrastructure Projects 2016–2025

No	Name, Location	Distance (Km)	Present Status	Estimated Project Value (₭N Million)	Source of Financing	Priority of Project for GMS Framework ('1' being the highest)
A	**Construction or Upgrade of Road**					
1.1	**Section of Highway**					
1	Upgrading of NR8 (AH15, Ban Lao–Nam Phao)	132	KOICA support in feasibility study study	640,000	Financing is needed	
2	NR17 (Lao–Myanmar bridge to Luang Namtha District)	180	Pre-feasibility study is complete	2,160,000	Financing is needed	**6**
3	NR13S (AH11,Vientiane–Veunkham)	861	Plan	13,776,000	Financing is needed	
4	NR13N (AH12, Vientiane–Nateuy)	650	Plan	10,400,000	Financing is needed	
5	NR2 (AH13, Nguen District–Panghok Border)	362	Plan	5,792,000	Financing is needed	
6	NR8, (AH15, Ban Nalao–Namphao Border)	131	Plan	2,096,000	Financing is needed	**4**
7	NR18, (AH 132, Thakhek District–Namphao	126	Plan	2,016,000	Financing is needed	
8	Rehabilitation of NR9	180.5	Plan	182,000	Financing is needed	
1.2	**Construction of Bridges Across the Mekong River**					
1	Paksane (Bolikhamxay, Lao PDR)–Bungkan (Thailand) Bridge	1.6	Feasibility study is ongoing	400,000	Request for assistance from NEDA	**2**
2	Salavan–Ubon Ratchathani Bridge	2	Plan	400,000	Request for assistance from NEDA	
3	Koneteun Bokeo Province Mekong Bridge			400,000	Financing support is needed	

Appendix 1. Selected Proposed Hard Infrastructure Projects 2016–2025 (Continuation)

No	Name, Location	Present Status	Estimated Project Value (₭N Million)	Sources Of Financing	Priority of project for GMS framework ('1' being the highest)
1.3	**Construction of Domestic Connecting Roads**		6,166,000		
1	Nguen District (Sayaboury)–Chomphet district (Luang Prabang)	Detailed design is complete	720,000	Request for assistance from NEDA	**3**
1.4	**Expressway Construction**		**2,240,000**		
1	Upgrading NR13N (Vientiane–Phone Hong) and NR13S (Vientiane–Thabok) Section of AH11	Feasibility study ongoing	2,240,000	Possible PPP investment, with World Bank support	**2**
B	**Facilitation of Transport Infrastructure**				
1	Construction of the logistics park in Thanaleng, Vientiane	Discussion with PPP partner	520,000	Financing support is needed	
2	Construction of the logistics park in Seno, Savanhnakhet	Pre-feasibility study	240,000	Financing support is needed	
3	Construction of the logistics park in Nateuy, Leuangnamtha	Feasibility study	240,000	Financing support is needed	
4	Construction of the logistics park in Vang Tao, Champasak	Feasibility study	120,000	Financing support is needed	
5	Thanaleng border-crossing infrastructure improvement		200,000	Financing support is needed	**3**
6	Xiengkok River Port		120,000	Financing support is needed	**4**
7	Ban Mom River Port		96,000	Financing support is needed	**5**
8	Building transport facilities along R3	Plan	TBD		
9	Building transport facilities along NR13N and 13 S	Plan	TBD		

Appendix 1. Selected Proposed Hard Infrastructure Projects 2016–2025 (Continuation)

No	Name, Location	Present Status	Estimated Project Value (₭N Million)	Sources of Financing	Priority of project for GMS framework ('1' being the highest)
10	Building transport facilities along NR 9	Pre-implementation	18,400		
11	Upgrading Vang Tao border-crossing point	Plan	120,000	Private sector financing being sought	**1**
12	Upgrade of the international checkpoint and facilities in Namphao checkpoint (R8)	Plan	40,000	Financing support is needed	**6**
13	Upgrade of the international checkpoint and facilities in Naphao checkpoint (R12)	Plan	40,000	Financing support is needed	**6**
14	Upgrade of the international checkpoint and facilities in Lalai checkpoint (R15)	Feasibility study completed in 2013	40,000	Private sector financing being sought	**5**
15	Upgrade of the international checkpoint and facilities in Dak Chung checkpoint (R16)		24,000	Private sector financing being sought	**7**

NEDA = Neighbouring Countries Economic Development Cooperation Agency; PPP = public–private partnership; KOICA =Korea International Cooperation Agency.
Source: Details of investment projects from Ministry of Public Works and Transport (2015c) and priority ranking is derived from Ministry of Public Works and Transport (2014).

Appendix 2. Comparison of Select Road Signs in Lao PDR and of the Vienna Convention

Meaning	Vienna Convention	Lao PDR	Examples
Warning Signs			
Road narrows right			
Road narrows left			
Slippery			
Falling rocks			
Pedestrian crossing			 Child crossing in school area, 30 km/h speed limit
Bicycle crossing			

Appendix 2. Select Road Signs in Lao PDR and of the Vienna Convention (Continuation)

Meaning	Vienna Convention	Lao PDR	Examples
Warning Signs			
Road work			
Railway crossing		 (Railway crossing ahead with no barrier)	
		 (Railway crossing ahead with a barrier)	
Railway crossing approx. 240 m ahead	 	 Railway crossing approx. 300 m ahead	
Railway crossing approx. 160 m ahead	 	 Railway crossing approx. 200 m ahead	

Appendix 2. Select Road Signs in Lao PDR and of the Vienna Convention (Continuation)

Meaning	Vienna Convention	Lao PDR	Examples
Warning Signs			
Railway crossing approx. 80 m ahead	 	 Railway crossing approx. 100 m ahead	
Sharp curve ahead			
Steep climb			
Steep descent			 

Appendix 2. Select Road Signs in Lao PDR and of the Vienna Convention (Continuation)

Meaning	Vienna Convention	Lao PDR	Examples
Priority Signs			
Stop			
Yield			 Yield in the roundabout
Prohibitory or Restrictive Signs			
No entry			
No automobiles			
No motorcycles			
No bicycles			

Appendix 2. Select Road Signs in Lao PDR and of the Vienna Convention (Continuation)

Meaning	Vienna Convention	Lao PDR	Examples
Prohibitory or Restrictive Signs			
No large trucks			
		No trucks larger than the stated weight limit (e.g. 8 tons)	
Horizontal clearance			
Vertical clearance			
Weight limit			
No U-turn			
No overtaking			

Appendix 2. Select Road Signs in Lao PDR and of the Vienna Convention (Continuation)

Meaning	Vienna Convention	Lao PDR	Examples
Prohibitory or Restrictive Signs			
No overtaking (Japan)			
No passing for heavy trucks			
End of speed limit			
Mandatory Signs			
Mandatory direction of travel (Go straight or turn right)			
Roundabout			
Minimum speed limit			

Appendix 2. Select Road Signs in Lao PDR and of the Vienna Convention (Continuation)

Meaning	Vienna Convention	Lao PDR	Examples
Direction, Position or Indication Signs			
Directions to major destinations ahead			
Major destinations ahead			
Direction and distance to major landmarks		 	
Indicating dangerous road areas ahead			   

Appendix 2. Select Road Signs in Lao PDR and of the Vienna Convention (Continuation)

Meaning	Vienna Convention	Lao PDR	Examples
Information, Facilities or Service Signs			
Clinic		 Hospital, clinic, or other smaller type of health centres	
Gas station		 Distance to nearest gas station ahead	
Restaurant			

Source: Road signs in Lao PDR are derived from Department of Transport (2015). All photographs taken by the author during field research.

Appendix 3. Outline of the Land Transport Law (No. 24/NA, dated 12 November 2012)

1) General Provision
    - Objectives
    - Meaning of Land Transport
    - Definitions
    - State Policy on Land Transport Performance
    - Land Transport Principles
    - Obligations of Land Transport Operators
    - Scope of Application of the Law
    - International Cooperation
2) Land Transport Operation
    - ❖ Type and Scope of Land Transport
        - Types of Land Transport
        - Scope of Land Transport
        - Domestic Transport
        - International or Cross-Border Transport
    - ❖ Transport Vehicles
        - Size of Transport Vehicles
        - Requirements for Land Transport Drivers
        - Requirements for Vehicles Used in Transport Enterprises and Specialised Transport
        - Conditions for Private Cars
        - Used Vehicle Permits
        - Technical and Health Inspections for Drivers
        - Insurance for Transport Vehicles
3) Land Transportation Enterprises
    - Business Activities of Land Transport Enterprises
    - Application for Establishment of Land Transport Enterprises
    - Application for Establishment of Branches of Land Transport Enterprises
4) Land Transport Business Operations
    - ❖ Passenger Transport
        - Passenger Transport
        - Scheduled Passenger Transport
        - (Transport with predetermined route including beginning station, final destination, ticket sale)
        - Non-Scheduled Passenger Transport
        - (Transport without predetermined route, but based on specific transport contract/agreement. Two types: private charter transport and specialised transport)
        - Rights, Obligations, and Responsibilities of Transport Operators
        - Rights, Obligations, and Responsibilities of Passengers
    - ❖ Section 2. Transport of Goods
        - Contracts for the Transport of Goods
        - Primary Content of Contracts for the Transport of Goods
        - Bill of Lading
        - Rights, Obligations, and Responsibilities of Goods Transport Operators

- Rights and Obligations of Goods Transporters
- Rights and Obligations of Goods Receivers
- Compensation for Damaged Goods
- Transport of Perishable Goods
- Transport of Food and Plants
- Transport of Animals
- Transport of Dangerous Materials
- Special Transportation

❖ Freight Forwarding
- Article 40: Freight Forwarding
- Rights and Obligations of Freight Forwarders
- Responsibilities of Freight Forwarders

❖ Stations for Transport Vehicles
- Types of Transport Vehicles
- Size of Stations for Transport Vehicles
- Stations for Goods or Animals Transport Vehicles

❖ Vehicle Rentals
- Vehicle Rental Operators
- Rights, Obligations, and Responsibilities of Vehicle Rental Operators
- Rights, Obligations, and Responsibilities of Vehicle Renters

❖ Goods Distribution Centre
- Goods Distribution Centre
- Rights, Obligations, and Responsibilities of Goods Distribution Centres

❖ Logistics Zones
- Logistics Zones
- Rights, Obligations, and Responsibilities in Logistics Zones

❖ Rest Areas or Parking Areas
- Rest Areas or Parking Areas
- Rights, Obligations, and Responsibilities in Rest Areas or Parking Areas

❖ Bus Ticket Counters
- Bus Ticket Counters
- Rights, Obligations, and Responsibilities of Bus Ticket Counters

5) Transporters Association
- Transporters Association
- Role of Transporters Association
- Rights, Obligations, and Responsibilities of Transporters Association

6) Prohibitions
- General Prohibitions
- Prohibitions for Drivers of Transport Vehicles
- Prohibitions for Authorities and Related State Officials
- Prohibitions for Transport Enterprise Operators

7) Conflict Resolution
- Function of Conflict Resolution
- Compromise
- Administrative Resolution
- Resolution by Economic Dispute Resolution Agency
- Court Decisions
- International Resolution

8) National Transport Committee
    - Establishment of the National Transport Committee
    - Structure of the National Transport Committee
    - Rights and Duties of the National Transport Committee
9) Administration and Inspection of Land Transport Performance
    - ❖ Administration of Land Transport
        - Rights and Duties of the Ministry of Communication, Transportation, Post and Construction
        - Rights and Duties of the Ministry of Communication, Transportation, Post and Construction Division in Each Province, Vientiane
        - Rights and Duties of the Communication, Transportation, Post and Construction Office in Each District
        - Rights and Duties of Prefecture Zones
    - ❖ Inspection of Land Transport Performance
        - Inspected Organisation of Land Transport Performance
        - Right and Duties of the Inspected Organisation of Land Transport Performance
        - Contents of Land Transport Performance Inspection
        - Function of Land Transport Inspection
10) Policies on Persons with Exemplary Records and Measures against Violators
    - Policies on Persons with Exemplary Records
    - Measures against Violators
    - Re-Education Measures
    - Disciplinary Measures
    - Fines
    - Civil Measures
    - Criminal Measures
11) Final Provisions
    - Implementation
    - Effectiveness

Chapter 5

Improvements and Challenges Associated with the Facilitation of Road Transport in Myanmar

Ahkar Soe

Myanmar is located between China and India and acts as a land route between South Asia and Southeast Asia. If Myanmar is able to take advantage of its location, it could become a major regional hub. The transportation sector is key in providing the necessary connectivity within Myanmar but the condition of its roads, the majority of which are Class III and below, does not yet meet international standards. For this study, the road conditions and road signs of the Association of Southeast Asian Nations Highways 1, 2, and 3 in Myanmar are examined. Road traffic signs in Myanmar generally follow international conventions and are similar to those in Thailand and Germany. Furthermore, transport laws have been established since the early 1900s. However, only recently have the laws been updated with the Auto Vehicle Law and Road Transport Law. Myanmar has also successfully ratified the remaining protocols and annexes of the Greater Mekong Subregion Cross-Border Transport Agreement. To take advantage of Myanmar's location and effectively establish itself as the next major regional hub, extensive planning, sufficient funding, and active participation by all stakeholders are required.

Introduction

Located in Southeast Asia, Myanmar is the second largest country in the region, with a land area covering over 676,000 sq. km. The country shares its borders with Bangladesh, China, India, Lao PDR, and Thailand, and is therefore strategically located at the crossroads of China, South Asia, and Southeast Asia. It has a good economic relationship with its neighbours, including India, China, and Thailand, and engages in a thriving border trade with these countries. Given that it has opened up to the global economy starting 2011 – along with other factors such as its size, population, resources, market, and relatively undeveloped economy – the opportunities for Myanmar are aplenty.

With its strategic location, Myanmar can act as a land bridge for China, South Asia, and Southeast Asia. It can also act as a regional hub to neighbouring countries across the region. Myanmar is part of the Association of Southeast Asian Nations (ASEAN), which established the ASEAN Economic Community in 2015.

To achieve regional connectivity with strong economic and industrial corridors, Myanmar will first need to develop a solid transport corridor within the region. In fact, the country has been participating in highway networks in the region: namely, the ASEAN Highway, the Greater Mekong Subregion (GMS) Economic Corridor, the GMS Highway, and the Thai–Myanmar–India Tripartite Highways. Myanmar, thus, plays a crucial role in integrating the emerging economies of China and India with the rest of Asia. It can bring great benefits to ASEAN countries by improving the physical infrastructure – particularly road infrastructure – that links the Myanmar–China border (Muse), the Myanmar–Thailand border (Myawaddy), and the Myanmar–India border (Tamu).

Myanmar also complies with regional transportation and trade agreements to enhance international trade and investment. As a full ASEAN member, Myanmar is not only involved in ASEAN-level agreements on trade in goods (i.e. ASEAN Trade in Goods), services (i.e. ASEAN Framework Agreement on Services), investment (i.e. ASEAN Investment Area), and other ASEAN Economic Community-related integration and cooperation areas. It is also involved in all ASEAN + 1 agreements (five are currently in force: these are with Australia–New Zealand, China, India, Japan, and the Republic of Korea).

Since 1988, Myanmar has been taking steps to improve its physical and social infrastructure in compliance with its market-oriented economic policy. One of its economic objectives is to ensure ease of transportation within the country. Myanmar, thus, has taken measures to increase investments in infrastructure, which include encouraging the private sector's participation, joint ventures between public and private agencies, and build–operate–transfer (B-O-T) systems.

Domestically, many different modes of transport exist in Myanmar, including roads, railways, inland waterways, ports, and civil aviation. Road transport is the nation's dominant mode of transportation (ADB, 2015a), helping connect rural areas and support regional and international trade.

With the participation of the private sector, the development of road infrastructure has gained significant momentum and has been further accelerated with new and existing road construction projects across the country. However, since Myanmar's national transport policy has focused on the construction of major highways and new railways, little funding is left for the operation and maintenance of existing networks, particularly for low-level road networks.

Therefore, there remain significant gaps in Myanmar's infrastructure development. According to the Logistics Performance Index published by the World Bank, Myanmar was ranked 145 out of 160 nations in terms of logistics in 2014 – the lowest in the ASEAN region. According to available data published by the Department of Public Works, the total road length in Myanmar reached over 148,000 km in 2015 (Ministry of Construction, 2015), with paved roads only accounting for over 21% of its road network (World Bank, 2015). Although the total length of the road has increased dramatically in recent years, the quality remains relatively poor. This evident gap in the road networks of Myanmar compared to that of its neighbouring countries presents opportunities for private sector investment across several sectors.

1. Sections of the ASEAN Highway Planned for Upgrade in Myanmar

The ASEAN Highway (AH) Network is a regional transport initiative aimed at enhancing the efficiency and development of the road infrastructure in Asia, which then supports the development of Euro–Asia transport linkages; and improving connectivity for landlocked countries. Myanmar participated in the development of the ASEAN Highway and signed an agreement in April 2004 (Myint, 2013). It also ratified the agreement, which focuses on conformity with the classifications and design standards stipulated in the agreement's annex.

Amongst the ASEAN Highways passing through Myanmar, AH1, AH2, and AH3 need to be upgraded, while AH112 and AH123 are still considered as missing road links (Table 5.1; Figure 5.1). The AH1 starts from Tamu (a border town near India) and ends in Myawaddy (a border town near Thailand), while AH2 starts from Tachileik (a border town near Thailand), overlaps with AH1 at Meiktila, and ends at Tamu. Meanwhile, AH3 starts from Kyaing Tong, a town along AH2, and ends at Mong La (a border town near China).

Table 5.1. Data on Selected Sections of the ASEAN Highway in Myanmar

Route No.	Itinerary	Total Length (km)	Road Classification					Missing Link
			Primary	Class I	Class II	Class III	Below Class III	
AH1	Tamu–Mandalay–Meiktila–Yangon–Bago–Phayagyi–Thaton–Myawaddy	1,650	0	80	144	984	448	0
AH2	Meiktila–Loilem–Kyaing Tong–Tachileik	807	0	0	6	344	457	0
AH3	Mong La–Kyaing Tong	93	0	0	0	93	0	0
AH112	Thaton–Mawlamyine–Thanbyuzayat–Ye–Dawei–Lahnya–Khamaukgyi, Lahnya–Khlong Loy	1,145	0		20	84	981	60
AH123	Dawei–Maesamepass (Phu Nam Ron)	141	0	0	0	0	0	141

AH = ASEAN Highway
Source: Japan International Cooperation Agency (2014).

Figure 5.1. ASEAN Highway Network in Myanmar and Missing Road Links

Source: Myanmar Marketing Research and Development Co. Ltd.

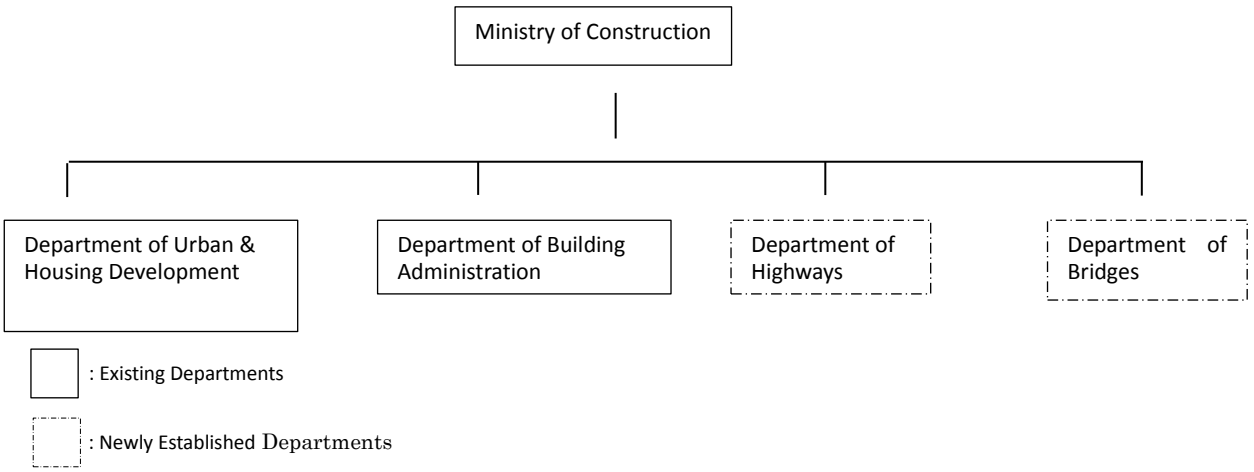
Both AH112 and AH123 are located in the southern part of Myanmar. The AH112 connects Lahnya to Khlong Loy (border town in Thailand), while AH123 connects Dawei to Phu Nam Ron (a border town in Thailand). The Department of Public Works under the Ministry of Construction is mainly responsible for the implementation and management of the highway network in Myanmar, including the ASEAN Highways.

- *Lahnya–Khlong Loy (This road connects the small seaside town in Southern Myanmar with the border town in Thailand)*
- *Dawei–Maesamepass (Phu Nam Ron) (This road connects Dawei, Capital of Southern Myanmar Region, with the border town in Thailand.)*
- *Tamu–Mandalay–Bago–Myawaddy (This road links from Tamu, a town at India–Myanmar border, with Myawaddy, a town in Myanmar–Thai border. It passes through major business cities such as Mandalay and Bago.)*
- *Meiktila–Loilem–Kyaing Tong–Tachileik (This road connects Central Myanmar with Eastern parts, which are linked to Thailand and China.)*
- *Kyaing Tong–Mong La (This road links Kyaing Tong, a town in Eastern Myanmar, with Mong La, a border down in Myanmar–China border.)*

There are four sections of the ASEAN Highway in Myanmar: AH1 through AH3, and AH14 (Muse–Mandalay) – covering a total length of over 3,000 km. Most sections are managed under B-O-T schemes by local companies under the authorisation of Myanmar's Department of Public Works. Construction of main roads and bridges in Myanmar is financed by the central government based on the national annual budgetary plan, with funds generated from tax levies on fuel and vehicles.

The Department of Public Works under the Ministry of Construction is the main implementing body for road and bridge construction in Myanmar (Figure 5.2). The department has drawn up a highway development strategy that consists of six consecutive 5-year plans. These plans further explain the strategy and implementation activities for the highway network in the next 30 years. On 1 April 2015, the Department of Highways and Department of Bridges were founded to construct new roads and bridges as well as maintain the existing ones.

Figure 5.2. New Organisational Chart of the Ministry of Construction

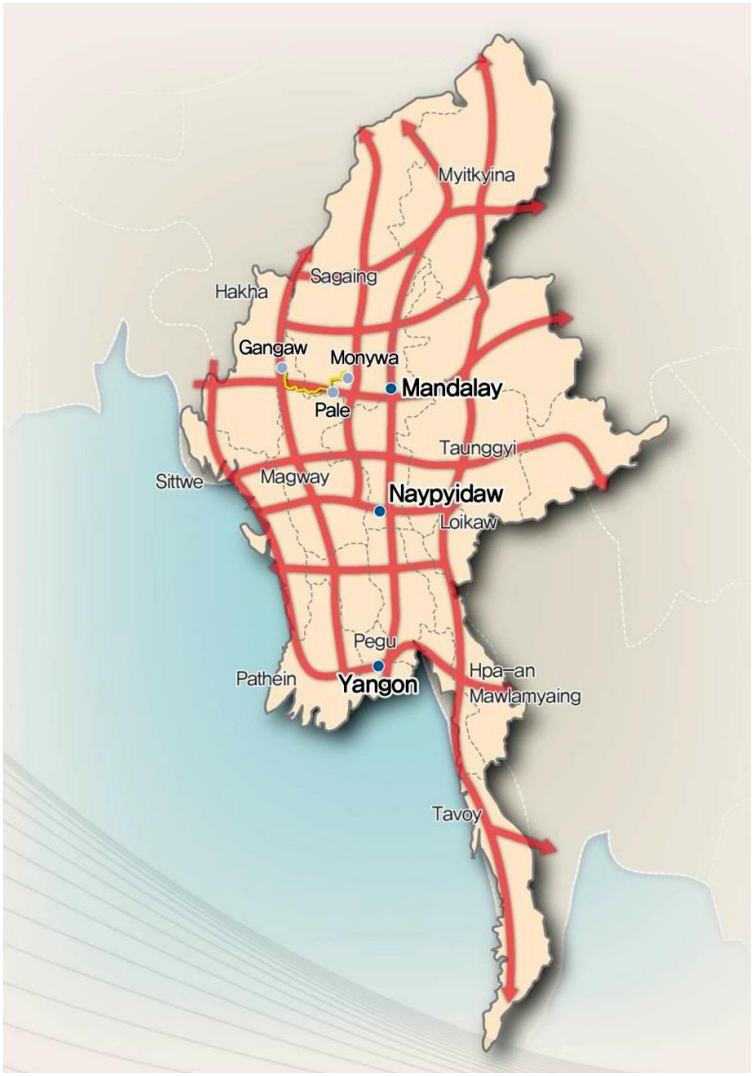


Source: Ministry of Construction (2015).

To connect with Myanmar's neighbouring countries, the Department of Public Works places a high priority on segments of the highway network that link to the regional networks: namely, the ASEAN Highway, the GMS Economic Corridor, the GMS Highway, and the Thai–Myanmar–India Tripartite Highways. By developing these segments, economic growth will be accelerated, improving international trade with neighbours.

To properly plan the road improvement and development, the Ministry of Construction has developed a master plan for the construction of an expressway network and sub-arterial roads nationwide (Figure 5.3). This plan was created through the cooperation of the Korea International Cooperation Agency and the Ministry of Construction.

Figure 5.3. Master Planning of the Highway Network in Myanmar



Note: In the text, 'Naypydaw,' 'Pegu,' 'Mawlamyaing', and 'Tavoy' are expressed as 'Nay Pyi Taw,' 'Bago,' 'Mawlamyaine', and 'Dawei,' respectively.
Source: Website of Yooshin Engineering Corporation.

The Yooshin Consortium, the project contractor of the Korea International Cooperation Agency, presented the plan, which included the arterial road network development project,[1] to the ministry in May 2015. The development project contains an extensive expressway network of 9,470 km, a main arterial road network (a union highway spanning 13,224 km), and a sub-arterial road network (national/region roads: 11,684 km). These have a total length of 34,378 km.

[1]In the *Global New Light of Myanmar*, 29 May 2015 (P. 9).

According to the master plan, about half (44.6%) of the total length will be developed in phases over the next 20 years.

The north–south routes include Pathein–Taungup–Sittwe; Ayeyarwady Region to Tamu through Magway Region and Chin State; Pyay–Magway–Monywa to Kalay; Yangon–Mandalay to Myitkyina; and Kawthaung to Myitkyina, passing through Mawlamyine, Thaton, Loikaw, Taunggyi, and Hsipaw. East–west expressways include Tamu–Bhamo, Mandalay–Pale, Sittwe–Tachileik, Loikaw–Nay Pyi Taw–Kyaukpyu, Taungup–Upper Bago, and Pyay–Hpa An. The 9,470 km expressway network will comprise a highway linking Yangon and Myitkyina in the northernmost state of Kachin.

To buttress the funds for road and infrastructure development, the Ministry of Construction borrowed US$208 million from the Japan International Cooperation Agency (JICA) under a 40-year term for the construction of bridges and roads; US$138 million from the Republic of Korea for the construction of the Yangon–Dala Bridge; and US$80 million from the Asian Development Bank (ADB) for upgrades on the Maubin–Kyaiklat Road in the Ayeyarwady Region (Soe, 2015).

2. Missing Road Links

2.1 Lahnya–Khlong Loy

The Lahnya–Khlong Loy link is part of the 60 km road that is not yet completed. The link is currently a gravel road, which might not be passable during the rainy season.

2.2 Dawei–Maesamepass (Phu Nam Ron)

The Dawei–Maesamepass link connects Dawei to Kanchanaburi in Thailand. It is part of the Mekong–India Economic Corridor, which connects Ho Chi Minh City, Phnom Penh, and Bangkok to Dawei. Through the Dawei deep sea port, the link will connect to Chennai in India by sea.

Given the potential of the Dawei deep sea port, Myanmar would connect not only South Asia, but also Africa and Europe, with East Asian countries.

The construction of the Dawei–Maesamepass (Phu Nam Ron) road link to the Dawei deep sea port will be implemented by the Italian–Thai Development Company from Thailand under a

B-O-T scheme. In the initial stage (2013 to 2017), a two-lane toll road will be built. From 2018 onwards, the 132 km link will be upgraded to a four-lane motorway (Apisitniran, 2015). The connection will feature a motorway of international standards and facilities for seamless border crossing. Pre-engineering work and access roads to the project site have already been completed.

At present, the link is a two-lane road with a total length of 141 km that connects Dawei and Kanchanaburi. It is considered an ASEAN Highway that can possibly connect to Mawlamyine in the north (the end of the East–West Economic Corridor). According to a discussion with government officials, the area's Dawei Special Economic Zone and deep sea port are progressing slowly. On 5 August 2015, the Myanmar government and private developers signed a concession agreement to start a smaller version of the Dawei Special Economic Zone that will include a paved two-lane road to Thailand (Hammond, 2015).

3. Links to Be Upgraded

3.1 Tamu–Mandalay–Bago–Myawaddy (AH1)

The AH1 is the longest section of the ASEAN Highway Network, running 20,557 km (12,774 mi) from Japan to Turkey. About 1,650 km of the primary Asian Highway route is within Myanmar's boundary, starting at Tamu at the India–Myanmar border, passing through the central part of Myanmar, and ending at the Thai–Myanmar border (Figure 5.4).

The Tamu–Mandalay section is an extension of the Mandalay–Monywa Road, while the Mandalay–Bago portion is part of the Yangon–Mandalay Highway. The route passes through Phayagyi (Bago Region) instead of Bago City, and ends in Myawaddy at the Thai–Myanmar border.

Apart from the upgrades to AH1 already completed by the Ministry of Construction, some additional upgrades and improvements will be financed by the Thai and Indian governments. For example, the 18 km-long roadway from Myawaddy to Thingan–Nyinaung has already been upgraded through the development assistance of the Thai government, while the 28 km stretch between Thingan–Nyinaung and Kawkareik is being built by the Thai government with

assistance from the ADB (ADB, 2015c) (Figure 5.5). This new road between Myawaddy–Kawkareik is meant to promote the East–West Economic Corridor.

Figure 5.4. Map of AH1 in Myanmar

Source: Myanmar Marketing Research and Development Co. Ltd.

Figure 5.5. Section of the New Thingan–Nyinaung–Kawkareik Road

Source: Photos taken by the author on 27 January 2016.

On the other side of Myanmar's border, the 144 km section between Tamu and Kalaymyo has already been upgraded through the development assistance of the Indian government (ADB, 2015b). Compared with other sections of the AH1 in Myanmar, the Tamu–Mandalay Road could be considered the worst part of the expressway. It can take up to 12 hours to travel from Mandalay to Tamu. The road is paved and in good condition from Mandalay to Monywa, but markedly inferior from Monywa to Kalaywa. Although the road has been paved by the government, it is currently a gravel road due to the soil condition. Commuters cannot even use

this road during the rainy season. The road from Kalaywa to Tamu, however, is in very good condition. Its development was made possible through the support of the Indian government.

The Mandalay–Bago section is a major part of the Yangon–Mandalay expressway, although it uses a smaller two-lane road to Phayagyi near the Yangon end of the highway.

The Yangon–Mandalay expressway opened in December 2010 (Figure 5.6). Although this 587 km expressway has reduced the travel time between Yangon and Mandalay, it does not have many of the safety features found in international highways such as roadside reflectors and rumble strips to alert drivers when their vehicles are leaving the road. Such oversight led to a number of accidents every year. Therefore, the Ministry of Construction has put up many signs and speed control systems along the expressway to remind drivers to drive safely.

Figure 5.6. Section of the Yangon–Mandalay Expressway

Source: Myanmar Marketing Research and Development Co. Ltd.

In December 2014, the Ministry of Construction called for expressions of interest for a project to double the width of the highway from four lanes to eight lanes and improve its support infrastructure under a B-O-T scheme (Kyaw Hsu Mon, 2014).

The Yangon–Mandalay expressway is only for passenger cars and buses. Cargo trucks still use the old Yangon–Bago–Mandalay highway, which is longer than the Yangon–Mandalay

expressway. Thus, the ministry also plans to upgrade the Yangon–Bago–Mandalay highway – which can be used by all types of vehicles – from two lanes to four lanes.

Phayagyi Junction is 60 km away from the first toll gate of the Yangon–Mandalay highway (Yangon Region). It is a two-lane paved concrete road that connects the highway to AH1 from Myawaddy (Figure 5.7). The Phayagyi–Myawaddy road passes through Thaton, HPa–An and Kawkareik before ending in Myawaddy at the Thai–Myanmar border (Figure 5.8). This two-lane asphalt road until Kawkareik is classified as a Class II road.

Figure 5.7. Yangon–Mandalay Highway at Phayagyi Junction

Source*:* Myanmar Marketing Research and Development Co. Ltd.

Figure 5.8. Road Conditions at the Phayagyi–Myawaddy Section of AH1

Source: Myanmar Marketing Research and Development Co. Ltd.

A 45.5 km stretch from Myawaddy to Kawkareik was officially opened on 30 August 2015, shortening the distance from Kawkareik to Thingan–Nyinaung from 45 km to 28 km. Its improved road condition has also eased the overall trade traffic (unlike in the past when transportation between Myawaddy and other parts of Myanmar used to be possible only on alternate days). This new road also bypasses the Kawkareik town and links straight to the Kawkareik–Eindu road.

The Ministry of Construction will also upgrade a 66.4 km section of the road connecting the towns of Eindu and Kawkareik in the state of Kayin via a US$100 million loan from the ADB (ADB, 2015c). This road is the missing link of the GMS East–West Economic Corridor. Once complete, the road will link Danang in Viet Nam with Mawlamyine and Yangon.

Aside from the ADB-initiated project, a rehabilitation project on the section between Eindu and the main Yangon–Mawlamyine Highway is under way through a government-managed B-O-T concession operated by a private company in Myanmar. The Eindu–Kawkareik upgrade will bring the existing two-lane road up to the GMS road network's standards, adding paved shoulders suitable for bicycles, motorcycles, and agricultural vehicles.

Meanwhile, apart from the improvement projects on the road that connects Myanmar to Thailand, there is also a need to build a new bridge between Myawaddy and Mae Sot, Thailand. The current bridge allows crossing trucks of up to 25 tons only. Thus, vehicles over 25 tons need to transfer their loads to smaller trucks before crossing the Thai–Myanmar Friendship Bridge at the Myawaddy–Mae Sot Border.

The Second Myawaddy Friendship Bridge has been designed and budgeted by the Thailand government, with construction aimed to start in 2016. This new bridge will be able to handle trucks carrying loads of up to 60 tons.

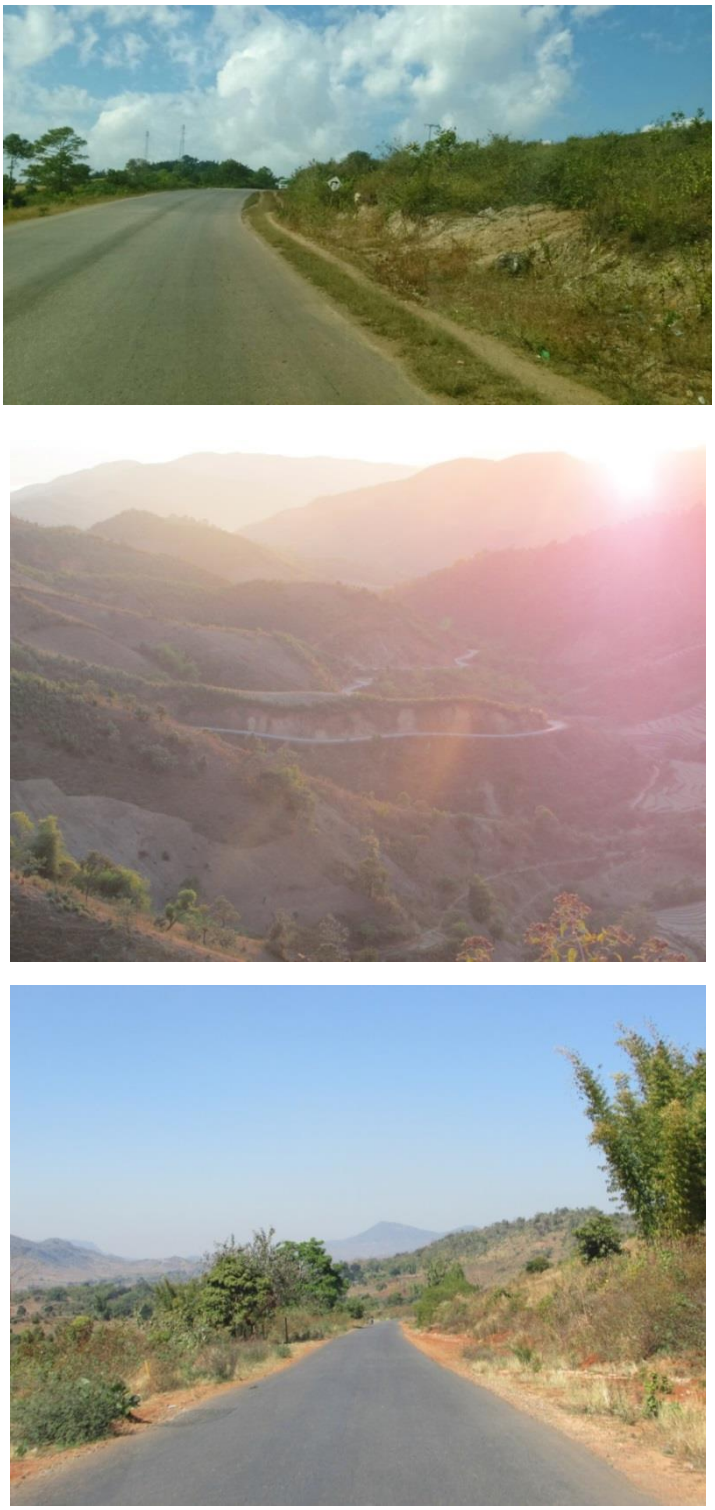
Other plans to ease cross-border trade include the possible relocation of the Myawaddy Industrial Zone to a site beside the Myanmar side of the bridge. The Thai side of the bridge is already situated next to the new Mae Sot Special Economic Zone.[2]

3.2 Meiktila–Loilem–Kyaing Tong–Tachileik (AH2)

The Meiktila–Loilem–Kyaing Tong–Tachileik route links the central part of Myanmar to the mountainous region of Shan State. It starts from Tachileik, the eastern town of the Thai–Myanmar border, and connects to the Yangon–Mandalay Expressway in Meiktila (Figures 9–10), which further links AH1 to Tamu, a town at the India–Myanmar border. Since this road passes through the Shan plateau, it is narrow. It is also hilly and remote in some parts. Clearly, the construction of better roads can help areas in their ongoing economic development.

[2] Interview with an official from the Ministry of Construction on 5 February 2016.

Figure 5.9. Sections of AH2 in Myanmar



Source: Myanmar Marketing Research and Development Co. Ltd.

Figure 5.10. Map of AH2 in Myanmar

Source: Myanmar Marketing Research and Development Co. Ltd.

The road between Meiktila and Taunggyi is a two-lane paved road that becomes winding when it begins to climb the Shan plateau. The road from Taunggyi to Kyaing Tong is over 400 km long and passes through Loilem. It is winding as well, and takes eight hours to reach Kyaing Tong from Taunggyi. Improvements on the section from Kyaing Tong to Tachileik are being undertaken by a national company under a B-O-T scheme.

Meanwhile, the Kyaing Tong to Tachileik section has been paved and upgraded to ASEAN Class III standards (Umezaki, 2012). The road from Tachileik to Kyaing Tong is in good condition and takes three hours only to traverse by car. Tachileik–Mae Sai is one of the major trade posts between Myanmar and Thailand, as well as a tourist attraction due to its location in the Golden Triangle Area.

3.3 Kyaing Tong–Mong La (AH3)

In Myanmar, AH3 links Tachileik, Kyaing Tong, and Mong La. The Mong La to Kyaing Tong section (Figures 11–12) has been upgraded to a two-lane bituminous road by the Department of Public Works.[3] The distance from Kyaing Tong to Mong La is 93 km only.

Figure 5.11. Sections of AH3 in Myanmar

[3] Interview with a local official of the Ministry of Construction on 14 December 2015.

Source: Myanmar Marketing Research and Development Co. Ltd.

Figure 5.12. Map of AH3 in Myanmar

Source: Myanmar Marketing Research and Development Co. Ltd.

4. Regulations for Technical Requirements

The Road Transport Administration Department (RTAD) under the Ministry of Rail Transportation is responsible for vehicle requirements and inspections for road worthiness. Apart from inspections, the department also provides testing and issuing services for driving licences, issues traffic regulations, levies taxes, and collects revenues.

Highways in Myanmar, meanwhile, are built according to the basic principles of Highway Design that the Department of Public Works under the Ministry of Construction had developed. Union Highways and main roads, including ASEAN Highways, are under the control of the Ministry of Construction, although roads are constructed in collaboration with several other ministries.

Myanmar has set length, width, and height requirements similar to those outlined by the ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT) (Table 5.2). However, for bigger vehicles such as five- and six-axle articulated vehicles, Myanmar does not follow the weight limits set by the AFAFGIT. Myanmar has set 45 tons for the five-axle vehicle and 48 tons for the six-axle counterpart instead of the AFAFGIT-prescribed 36 tons and 38 tons, respectively.

Table 5.2. Comparison of Vehicle Requirements; Maximum Permissible Gross Vehicle Weights

Vehicle Requirements	Myanmar	AFAFGIT
Maximum Length (Rigid Motor Vehicle)	12.2 m	12.2 m
Maximum Length (Articulated Vehicle)	15.2 m	16.0 m
Maximum Width	2.5 m	2.5 m
Maximum Height	3.66 m (Normal)	4.2 m
Maximum Number of Axles	6	
Maximum Axle Load	48.0 tons	
Maximum Rear Axle Load	ROH < 60% of WB	ROH < 60% of WB

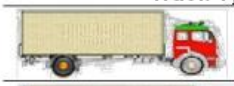
Maximum Permissible Gross Vehicle Weight	Myanmar	AFAFGIT
3-Axle Rigid Vehicle	21.0 ton	21.0 ton
4-Axle Rigid Vehicle	25.0 ton	25.0 ton
4-Axle Articulated Vehicle	31.0 ton	32.0 ton
5-Axle Articulated Vehicle	45.0 ton	36.0 ton
6-Axle Articulated Vehicle	48.0 ton	38.0 ton

AFAFGIT = ASEAN Framework Agreement on the Facilitation of Goods in Transit; ROH = rear overhang; WB = wheel base.
Source: Road Transport Administration Department (2015).

Myanmar needs a large road works programme that covers maintenance of road networks over time. Due to the poor quality of the materials used, repair and rehabilitation are generally needed as frequently as every few years to maintain or improve road quality. A lack of funding also contributes to the poor state of the road network.

The setting of weight limit on vehicles helps extend the quality of roads. As shown in Figure 5.13, Myanmar has been reducing its total permissible vehicle weights after 2015. However, these larger vehicles have not yet followed the criteria set by AFAFGIT.

Figure 5.13. Allowable Loads by Truck Type

Truck Type	Axle and Wheel Configuration	Total Allowable (Tons) (Before 2015/ After 2015)	Post 2015 Damage Factor if Legally Loaded (ESAL)	Damage Factor if 15% overloaded (ESAL)
	2 axles, 6 tires	16/15	1.88	3.3
	3 axles, 10 tires	23/21	2.25	3.9
	4 axles, 12 tires	30/25	3.2	5.5
	4 axles, 14 tires	33/31	3.9	6.8
	5 axles, 18 tires	46/45	6.9	12.0
	6 axles, 22 tires	51.5/48	5.8	10.1

ESAL = equivalent single-axle load
Source: Department of Public Works.

5. Road Signages Specific to Myanmar

As the department that sets rules and regulations related to driving and road safety, the RTAD also issues traffic and road signs to educate the public.[4]

Figure 5.14 shows the highway road signs used in Myanmar. The first two signs warn of sharp curves in the road ahead. The third and fourth signs warn of left and right turns. The fifth sign alerts drivers that the divider is about to end, while the sixth alerts them that they are approaching a divider. Figure 5.15 shows photos of these road signs.

Figure 5.14. Highway Road Signs in Myanmar

Source*:* Road Transport Administration Department.

[4] See Road Transport Administration Department website.

Figure 5.15. Examples of Highway Road Signs in Myanmar

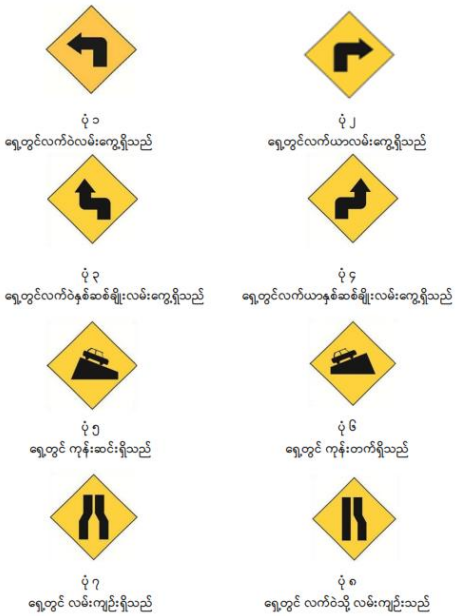
Source*:* Myanmar Marketing Research and Development Co. Ltd .

Warning signs in Myanmar are common symbols such as those adopted by other countries, including Thailand, Malaysia, Japan, and the United States. Figure 5.16 shows some of the most common warning signs in Myanmar. The first two signs indicate turn left/turn right, while the third and fourth signs indicate double turns. The fifth and sixth symbols indicate steep climb and steep decline. The seventh indicate that the road will narrow ahead, while the eighth indicates that the road will narrow to the left. Photos of highway road signs in Myanmar are shown in Figure 5.17.

Signs are normally put up along accident-prone areas. Apart from international signs, huge signboards with large white letters on red backgrounds are installed to alert drivers (Figure 5.18). Myanmar also uses red and white pillars to indicate turns, as well as white strips to indicate that vehicles should slow down ahead, as shown in the last photo in Figure 5.18. The Yangon–Mandalay Highway has many signs to alert drivers and passengers. However, roads

along the Phayagyi Junction towards Myawaddy have little or no signage, which suggests that there are fewer accidents occurring on these roads than on highways.

Figure 5.16. Highway Road Signs in the International Community and in Myanmar



Source: Ishida (2015) and Road Transport Administration Department.

Figure 5.17. Examples of Highway Road Signs in Myanmar

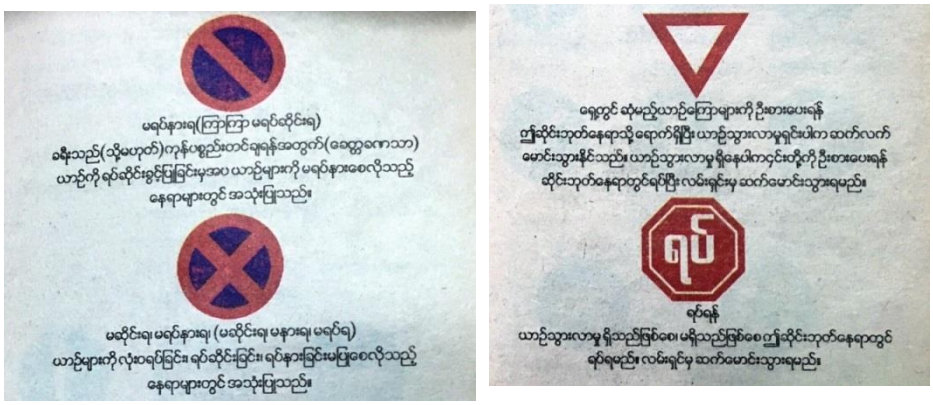
Source: Myanmar Marketing Research and Development Co. Ltd.

Figure 5.18. More Examples of Highway Road Signs in Myanmar

Source: Myanmar Marketing Research and Development Co. Ltd

Regulatory signs are shown in Figure 5.19, and a photo of a sign used in Myanmar is shown in Figure 5.20.

Figure 5.19. Regulatory Signs in International Communities and in Myanmar



Source: Ishida (2015) and Road Transport Administration Department.

Figure 5.20. An Example of a Regulatory Sign in Myanmar

Source: Myanmar Marketing Research and Development Co. Ltd.

Prohibitory or restrictive signs are generally used to prohibit certain types of vehicles or specific actions by drivers. Figure 5.21 shows a comparison of international signs and those used in Myanmar. Figure 5.22 are photos of prohibitory/restrictive signs used in Myanmar.

Figure 5.21. Prohibitory/Restrictive Signs in International Communities and in Myanmar

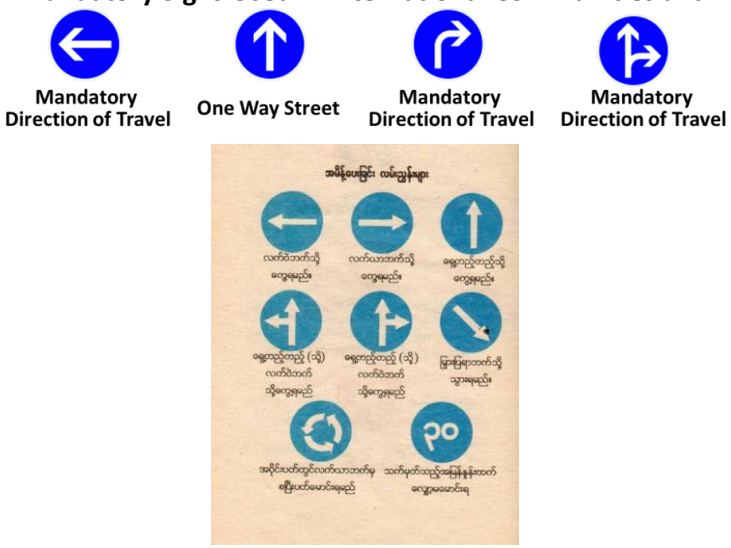
Source: Ishida (2015) and Road Transport Administration Department.

Figure 5.22. Examples of Prohibitory/Restrictive Signs in Myanmar

Source: Myanmar Marketing Research and Development Co. Ltd.

Mandatory signs are used when drivers must follow strict instructions. Figure 5.23 shows a comparison of international signs and those used in Myanmar, while Figure 5.24 is a photo of a mandatory sign used in Myanmar.

Figure 5.23. Mandatory Signs Used in International Communities and in Myanmar



Note: The first four signs are used internationally, while the next eight signs are those found in Myanmar with text in the local language.

Source: Ishida (2015) and Road Transport Administration Department.

Figure 5.24. An Example of a Mandatory Sign in Myanmar

Source: Myanmar Marketing Research and Development Co. Ltd.

Information signs are typically used to show directions towards upcoming cities or towards, sometimes accompanied by details on distance. Figure 5.25 shows actual examples of information signs used in Myanmar.

Figure 5.25. Examples of Information Signs in Myanmar

Source: Myanmar Marketing Research and Development Co. Ltd.

6. Road Transport Laws in Myanmar

Road and motor vehicle laws in Myanmar have existed since 1914 under the British colonial period. Laws, rules, and regulations enacted from 1914 to 2015 were:[5]

India Motor Vehicle Act (1914)

Myanmar Motor Vehicle Act (1915)[6]

- *Myanmar Hired Vehicle Rules (1935)*
- *Road and Inland Water Transport Law (1963)*
- *1964 Motor Vehicle Law (enacted by the Chairman of the Revolutionary Council into Law No. 17 in 1964)*
- *1989 Motor Vehicle Rules (issued by the Ministry of Transport and Communications via Notification No. 1/89)*
- *Procedures for Vehicle Registration and Issuing of Driving Licenses (1994)*
- *Highway Law (2000)*
- *Motor Vehicle Law (2015)*
- *Road Transport Law (2016)*[7]

The Myanmar Motor Vehicle Act (1915)[8] enacted in April 1915 was the first automobile law in Myanmar. This act was based on the India Motor Vehicle Act, which focused on the prohibition of underage driving, the usage of licences, and driving penalties.

The 1964 Motor Vehicles Law (Kato et. al, 2010) covers the registration of motor vehicles, licences for owning motor vehicles, motor vehicle insurance, driving licences, control of traffic speed, and offences and penalties for violations. The 1989 Motor Vehicle Rules were enacted under Section 33 of the 1964 Motor Vehicles Law. These rules include the registration of motor vehicles, vehicle maintenance, driving licences, driver training schools, terms and conditions of hired motor vehicles, and traffic rules for vehicles, pedestrians, and cyclists.

[5] Road Transport Administration Department website.
[6] Refer to the World Legal Information Institute website.
[7] The website of 'The Mirror'.
[8] The website of 'The Public's Library and Digital Archive'.

The Highway Law (2000)[9] was enacted in November 2000 by the State Peace and Development Council to foster improved communication and transportation between states and regions, and to support the construction of highways that connect neighbouring countries. The law explicitly defines the duties and authorities of the Ministry of Construction as well as the Department of Public Works. According to Article 4 of the law, the duties of the Ministry of Construction include the following:

- *Constructing highways that connect to neighbouring countries, with the approval of the Myanmar government;*
- *Laying out work programmes to construct and extend highways, and if necessary, coordinating with the relevant governments' departments or organisations;*
- *Exchanging technical know-how and cooperating with international organisations, regional organisations, and foreign countries in relation to highway construction;*
- *Carrying out research on the construction, maintenance and repair of highways.*

The duties and powers of the Department of Public Works are explicitly stated in Article 5. These include the following:

- *Implementing the policies set by the Ministry of Construction for modernisation and development of communication within the State;*
- *Drawing up and submitting short-term, long-term, and special plans and work programmes for the Ministry of Construction in relation to the construction and extension of highways.*

The article also provides that the department stipulates the type and weight of vehicles allowed on highways:

> *Prescribing types of vehicles, including wheels, laden weight, and type of rims permitted on highways, and inspecting, supervising, and taking action as to whether such stipulations are abided by.*

It also details penalties, which include fines, jail terms of up to three years, or both, for offences related to building or damaging property within highway boundaries.

[9] Website on the Highway Law.

The new Motor Vehicle Law[10] was enacted in September 2015 to promote safety through a stricter driving process, to resolve existing traffic problems, and to tackle air pollution caused by automobiles. It introduced a number of changes. Under the new law and its by-laws, the Ministry of Commerce plans to cease importation of right-hand drive vehicles in 2018, as Myanmar is currently a right-hand driving country. In Article 76, the minister:

> *To use only left-hand drive vehicles suitable for the right-hand driving system in order to prevent danger.*

The law prescribes the duties of the RTAD, which include the import and registration of vehicles. It also details the powers of the RTAD registration officer to suspend or revoke licences and provides a list of prohibitions (such as disallowing individuals to establish an automobile training school without a licence).

Meanwhile, the Ministry of Rail Transportation is tasked to provide the associated rules and regulations on cross-border transportation amongst neighbouring countries. Article 40 states:

> *The ministry is to perform the following in agreement with the Union Government:*
>
> *Classify the type, year, and number of exported vehicles;*
>
> *Organise the places allowed based on the type of vehicles;*
>
> *Establish the rules related to the national and cross-border transport of goods and people.*

Penalties for offences, including jail terms and fines of up to MK5 million are described. To promote road safety, this law also supports the authority of the traffic police to check vehicles and drivers.

The Land Transport Law was enacted on 5 January 2016 to improve the overall systematic development of land transport, set rules and regulations, reduce environmental degradation related to land transport, and facilitate efficient cross-border transportation. The National Committee, headed by the Minister of Rail Transportation, was formed to manage, develop and improve the efficiency of domestic and cross-border transport. The Land Transport Administration Committee and the Cross-Border Land Transport Administration Committee are to be formed to implement the rules, regulations, and policies of the National Committee.

[10] See the Website of the Public Library and Digital Archive.

Meanwhile, the Cross-Border Land Transport Administration Committee is mandated to set up border inspection offices for both goods and people.

Chapter 8 of the law explicitly mentions the criteria of persons who operate cross-border land transport companies in Myanmar. Article 26 (B) states that citizens of Myanmar must own more than half of the investment and take more management roles than foreign investors for any joint venture projects. In addition, they must have experiences in the cross-border transport of both goods and people and obey both domestic and international laws and regulations.

Chapter 9 clearly details the roles and responsibilities of persons who operate transport services, which include the documentation of goods, insurance policies, and compensation for any lost goods.

Article 27 also mentions that persons can apply for a cross-border land transport licence at the RTAD. Article 33 details the criteria needed for foreign vehicles to transport goods and people in Myanmar. Chapters 11 to 14 specify the restrictions, offences, penalties, and appeal processes for persons who operate domestic and cross-border land transport companies. Chapter 15 also briefly mentions cross-border legal rights in the case of lost goods. This law repealed the licences endorsed by the Road and Inland Water Transport Law (1963); therefore, existing licences must be renewed according to the new law.

7. Conclusion

The transport sector can help define Myanmar's economic development. For one, the country has the potential to grow into a main logistics hub of Asia, connecting China, India, and the rest of the Southeast Asia. The ongoing highway development and upgrading projects can promote the overall livelihood of both the people living around the highways and those in designated rural areas. An efficient transport sector will also improve trade and reduce the overall poverty in Myanmar.

Today, Myanmar has been following the international standards on road and traffic signs recognised by neighbouring countries. It uses road signs similar to those in Thailand and Germany, for instance.

However, the existing conditions of all sections of the ASEAN Highways in Myanmar currently fail to meet the ASEAN Highway standards. Myanmar's overall road condition needs to be improved. As part of the region's road network, Myanmar has to have a road transport system that is as efficient and reliable as those of neighbouring countries (such as India, China, and Thailand). Since Myanmar is growing faster than its existing infrastructure can support, long-term investment and extensive financial planning are required to support the ASEAN Economic Community and sustain the ongoing development.

Although the government has long-term plans and strategies in place for the transport sector, an effective financial plan is the key to getting more projects off the ground. To date, given the limited budget of the Union government, the support from the international community and participation of the private sector are crucial.

There, too, is the issue with capacity building. Although the Department of Public Works has been able to extend and rehabilitate the highway network in Myanmar despite limited financing, the department itself has not meet the capability requirements. Because Myanmar has to raise its highway standards, the department has to build its capacity accordingly through the support of both private and public organisations as well as learn to partner with parties that have strong technical expertise.

The RTAD continues to support all the institutional initiatives related to the road and transport sector. In 2011, it abolished the fuel subsidisation system (ADB, 2014). From 2012 to 2013, it gradually facilitated the importation of foreign vehicles and reduced their import costs. However, one persistent issue that it must address in coordination with the Department of Public Works is the excessive cargo loading by transport vehicles, as this is one of the causes of road deterioration.

Thus, the RTAD should focus on improving and establishing new regulations, along with signing cross-border transport agreements with neighbouring countries to facilitate trade and potential investments.

References

Apisitniran, L. (2015), '*ITD Wants Bigger Dawei Budget'.* In http://www.bangkokpost.com/news/asean/791381/itd-wants-bigger-dawei-budget (accessed 16 December 2015).

Asian Development Bank [ADB] (2014), 'Maubin-Phyapon Road Rehabilitation Project: Report and Recommendation of the President'. In http://www.adb.org/sites/default/files/linked-documents/47086-002-ssa.pdf (accessed 16 December 2015).

Asian Development Bank [ADB] (2015a), 'Greater Mekong Subregion East–West Economic Corridor Eindu to Kawkareik Road Improvement Project: Report and Recommendation of the President'. In http://www.adb.org/projects/documents/mya-gms-ewec-eindu-kawkareik-road-improvement-project-rrp and http://www.adb.org/sites/default/files/linked-documents/46422-003-ssa.pdf (accessed 20 November 2015).

Asian Development Bank [ADB] (2015b), 'Thailand's Economic Integration with Neighboring Countries and Possible Connectivity with South Asia'. In http://www.adb.org/sites/default/files/publication/159839/adbi-wp520.pdf (accessed 20 November 2015).

Asian Development Bank [ADB] (2015c), 'ADB Loan to Help Upgrade Road in Kayin State on GMS Corridor Route'. In http://www.adb.org/news/adb-loan-help-upgrade-road-kayin-state-gms-corridor-route (accessed 20 November 2015).

Hammond, C. (2015), 'Government Signs Dawei Agreement With ITD-Again', *The Myanmar Times.* In http://www.mmtimes.com/index.php/business/15872-government-signs-dawei-agreement-with-itd-again.html (accessed 4 December 2015).

Japan International Cooperation Agency [JICA] (2014), 'The Survey Program for the National Transport Development Plan in the Republic of the Union of Myanmar'. In http://open_jicareport.jica.go.jp/pdf/12230728_02.pdf (accessed 3 December 2015).

Kato, H., N. Saito, A. Inagi, and U.A. Myint (2010), 'Regulatory Framework and Operational System of Urban Bus Transportation in Yangon, Myanmar'. In http://www.trip.t.u-tokyo.ac.jp/kato/papers_e/2010TRB_Yangon.pdf (accessed 3 December 2015).

Myint, K.S. (2009), 'Today's Vehicles and Motorways in Myanmar', *The New Light of Myanmar*. Dated 9 November 2009 (accessed 16 November 2015).

Kyaw Hsu Mon (2014), 'Government Calls For Foreign Investment in 'Death Highway' Upgrade', *The Irrawaddy*. In http://www.irrawaddy.com/business/govt-calls-foreign-investment-death-highway-upgrade.html (accessed 16 November 2015).

Ministry of Construction (2015), *Business Matching Workshop: Construction Sector*. In http://www.smedevelopmentcenter.gov.mm/sites/default/files/MOC1.pdf (accessed 3 December 2015).

Soe, A.M. (2015), 'Building Better Roads', *The Global New Light of Myanmar*. Dated 21 November 2015 (accessed 24 November 2015).

The Global New Light of Myanmar (2015), 'KOICA-Funded Master Plan For Arterial Road Network Development in Myanmar Launched'. In

http://www.burmalibrary.org/docs21/GNLM2015-05-29.pdf (accessed 16 November 2015).

Umezaki, S. (2012), 'Building the ASEAN Economic Community: Challenges and Opportunities for Myanmar'. In http://www.ide.go.jp/English/Publish/Download/Brc/pdf/10_08.pdf, IDE–JETRO (accessed 17 November 2015).

World Bank (2015), 'Logistics Performance Index'. In http://lpi.worldbank.org/international/global.

Websites

The Highway Law. In http://displacementsolutions.org/wp-content/uploads/THE-HIGHWAYS-LAW-2000.pdf (accessed 16 December 2015).

The Mirror. In http://www.burmalibrary.org/docs21/km%209.1.16.pdf 09 (accessed January 2016)

The Public's Library and Digital Archive. In http://www.burmalibrary.org/docs16/Burma_Code-Vol-VII-text_under_image.pdf (Accessed 16–17 December 2015).

Road Transport Administration Department, In http://www.myanmarrtad.com/ (accessed November 16, 2015).

World Legal Information Institute. In http://www.worldlii.org/cgi-bin/sinosrch.cgi?meta=%2Fworldlii&query=motor%20vehicles&method=auto&mask_path=mm (accessed 14 December 2015)

Yooshin Engineering Corporation. In http://www.yooshin.co.kr.

Chapter 6

Improvements and Challenges Associated with the Facilitation of Road Transport in Viet Nam

Nguyen Binh Giang

While the recent road improvement in Viet Nam has facilitated transport and promoted local investment, it has created additional challenges to drivers engaged in cross-border transport. These challenges, in particular, are in terms of the toll charges and local governance. Meanwhile, soft road infrastructure initiatives in Viet Nam such as road signs and road traffic laws are generally similar to that of neighbouring countries. The downside, though, is that Viet Nam still has a large number of these road traffic signs in Vietnamese than in English, the language commonly found on road signs in other sections of the ASEAN Highway Network. Signs written in the local language cannot help transit drivers from neighbouring countries in terms of guidance on road regulations that may be new to them.

Introduction

Recently, Viet Nam has made sustained efforts to develop its transport infrastructure, constructing expressways and upgrading and expanding important highways. In addition, road signs have been aligned with the stipulations of the Vienna Convention on Road Traffic Signs. Viet Nam is gradually replacing obsolete and unsuitable signs (particularly those limiting the maximum speed to 50 km/h, as current road conditions and vehicles can now ensure safety at higher speeds). Its provisions on technical standards for road transport vehicles in Viet Nam are similar (and even less restrictive in certain cases) to those stipulated in the Association of Southeast Asian Nations' (ASEAN) Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT).

Meanwhile, in terms of traffic signs, Viet Nam's Road Traffic Law is generally in line with the stipulations of the Vienna Convention on Road Traffic.

As part of the Greater Mekong Subregion, Viet Nam's Road Traffic Law and road sign system are comparable to those in other nations in this region. Similarities in their rules and regulations have greatly facilitated cross-border road transport between Viet Nam, China, and other ASEAN member states.

This chapter reviews recent developments in the road transport system in Viet Nam and discusses the regulations on technical standards for road vehicles, the road sign system, road traffic laws and their related legal documents, and the impact of such developments on the country and the ASEAN region.

1. Recently Upgraded Sections of the Road Network in Viet Nam

In recent years, heavy investment has been made in the Vietnamese road network to ensure both domestic and cross-border connectivity. However, the development of expressway networks and upgrade of some crucial national highways (NH) remain sluggish. Viet Nam is currently in the first phase of establishing expressway networks. New highway construction projects on the Hanoi–Lao Cai, Hanoi–Hai Phong, Hanoi–Thai Nguyen, Nhat Tan–Noi Bai, Ho Chi Minh–Long Thanh, and Ho Chi Minh–Ben Luc links have been completed, as has the upgrade and widening of the Hanoi–Can Tho segment of National Highway No. 1 (NH1A, also AH1). At the same time, segments of the North–South Expressway such as Hanoi–Ninh Binh, Long Thanh–Dau Giay, and Ben Luc–Trung Luong have been constructed (Table 6.1). The upgrade and widening of NH51 as well as the upgrade of the Ho Chi Minh Highway (NH14) have also recently been completed.

Table 6.1. Status of North–South Expressway Development

Section	Length	Status
Phap Van (Hanoi)–Cau Gie (Ha Nam)	29	In use as a four-lane expressway since 2011 and a six-lane since the mid of 2018. Connects to Hanoi–Hai Phong Expressway, Hanoi–Lao Cai Expressway, and NH1A via the Hanoi's Ring Road No. 3.
Cau Gie–Ninh Binh	54	In use since June 2012.
Ninh Bình–Danang	628.4	Awaiting further investment or start of

		construction.
Danang–Quang Ngai	139	Under construction since May 2015
Quang Ngai–Dau Giay (Dong Nai)	807.5	Awaiting further investment or start of construction
Dau Giay–Long Thanh (Dong Nai)	43	In use since February 2015. Connects to HCMC (in Dist. 2)– Long Thanh Expressway.
Long Thanh–Ben Luc (Long An)	58	Under construction since July 2014.
Ben Luc–Trung Luong (Tien Giang)	39.8	In use since February 2010. Connects to HCMC (in Binh Chanh District)–Ben Luc Expressway (in use since February 2010).
Trung Luong–My Thuan Bridge–Can Tho	92	Under construction since February 2015.

HCMC = Ho Chi Minh City

Source: Decision No. 140/QĐ-TTg of 21 October 2010 by the prime minister on the detailed plan on the North–South Expressway.
Survey done by the author.

1.1 AH14 (Kunming–Hanoi–Hai Phong Corridor)

On 21 September 2014, the 244 km Noi Bai–Lao Cai Expressway, which is part of the Kunming–Hanoi–Hai Phong Corridor (or ASEAN Highway AH14), was opened for use. The first stage of construction was funded by ordinary capital resources and the Asian Development Fund, both from the Asian Development Bank, as well as counterpart capital from the government of Viet Nam.

In the past, vehicles traveling between Hanoi and Lao Cai had to use NH2 and NH70, resulting in a journey close to 300 km. One month after the opening of Viet Nam's longest expressway, the traffic flow on the new route averaged 8,000 vehicles a day. One year after the opening, traffic flow reached 14,000 vehicles a day. Meanwhile, the traffic flow on NH70 decreased by 75%. Up to 96% of trucks and 79%

of cars changed their route from the highways to the expressway. Out of 24 transport service providers on the expressway who were interviewed, 23 confirmed the benefit of the expressway to their businesses. Most drivers interviewed reported that while they used to take at least seven hours driving from Hanoi to Lao Cai along the highways, they now can reach their destination via the new expressway in four hours. The expressway, thus, offers them a time savings of three to four hours.

They also save 10%–20% in fuel. A 12-ton truck requires a total cost of D3.49 million when driven on the highways, but only D3.1 million when it uses the expressway. Meanwhile, buses require a total cost of D3.47 million on the highways, but only D2.8 million on the expressway (Tri, 2014). Thanks to the cost savings from the Hanoi–Lao Cai route, bus service providers lowered the average bus fare from D370,000 to D220,000, which was a considerable benefit to passengers.[1] Ever since the opening of the expressway, the number of traffic accidents and travellers on NH70 in Lao Cai Province has decreased by 80%.

Around the same period that the expressway was being constructed, Yen Bai Province constructed the 10 km long and 50 m wide road connecting Yen Bai City with the expressway at Interchange (IC) No. 12.

Previously, driving on the highway from Yen Bai City to Hanoi took 200 minutes; from Yen Bai City to Hai Phong, 300 minutes; and from Yen Bai City to Lao Cai International Border, 200 minutes. Since the opening of the expressway, it now takes only 75 minutes from Yen Bai City to Hanoi (a two-thirds decrease), 90 minutes to the Lao Cai Border, 150 minutes to Hai Phong (along NH5, not the Hanoi–Hai Phong Expressway), 90 minutes to Bac Ninh City, and less than 120 minutes to Thai Nguyen City (Thanh Phuc, 2015).

The tourism industry in Lao Cai Province also grew rapidly since the opening of the expressway. In 2015, 2.1 million tourists visited Lao Cai – a 39% increase compared with the 2014 figure and a 235% jump from the 2010 numbers. Revenues from tourism in 2015 increased by 40% and 567% when compared with the 2014 and 2010 figures, respectively.[2] A month after the expressway's opening, tourism in Sa Pa[3] increased by 40%, reaching 2,000 to 3,000 people a day. During weekends, the number of tourists reached 12,000 to 15,000 a day. Before the expressway was opened, only about 23,000 people a week visited Sa Pa (Tri, 2014).

Similarly, a marked increase was seen in the number of visitors to Tay Thien (in Vinh Phuc)[4], Hung Kings Temple, Au Co Shrine (in Phu Tho)[5], and Dong Cuong and Nhuoc Son Shrines (in Yen

[1] Per the document prepared by Lao Cai Province People's Committee for the meetings with Institute of Developing Economies-Japan External Trade Organization and Institute of World Economics and Politics.
[2] Document prepared by Lao Cai Province People's Committee for the meetings with Institute of Developing Economies-Japan External Trade Organization, and Institute of World Economics and Politics.
[3] Sa Pa is a well-known ethnic and eco-tourism site in Lao Cai Province.
[4] Tay Thien is a well-known religious and eco-tourism site in Vinh Phuc Province.
[5] Hung Kings Temple is a place where the ancient founders of Vietnam can be worshipped.

Bai).[6] Phu Tho, Yen Bai, and Lao Cai jointly promoted the expressway to increase tourism in the region.[7]

Since the opening of the expressway, sharp increases in investment in Phu Tho, Yen Bai, and Lao Cai have been observed as well.[8] In 2015, Phu Tho had 38 investment projects, including 10 foreign direct investment injections. Some of the largest amongst the 38 new investment projects in Phu Tho included an electronic parts and components production project of Korea's Joint National Training Capability (capital: US$50 million); a garment project by Japan's Matsuoka (capital: US$75 million), and a chicken egg farm and factory project by DTK Corporation (capital: D784 billion).[9]

Yen Bai attracted 29 projects. Some of largest of these projects in 2015 included a rabbit breeding initiative by Nippon Zoki with a first-stage capital of US$78 million, a shopping mall and real estate project by Vingroup with a capital of D685.3 billion, a 27-hole golf course and resort development project by Chi Linh Star Golf with a capital of D630 billion, and an ox breeding project by the Hoa Phat Group.[10]

However, the Noi Bai–Lao Cai Expressway also brought some negative impact to the surrounding provinces. During a field survey on NH2 and NH70, the Institute of Developing Economies–Japan External Trade Organization and the Institute of World Economics and Politics team found that the people who live in towns and popular sites along the highway were totally or partly dependent on income from the services they provided to vehicles and passengers. Local communities along NH70 could have suffered a loss of income in such services when vehicles switched to the expressway.[11] The expressway disenfranchised local communities in areas that it runs through.

The expressway itself was not spared from complaints. Many residents found the tunnels under the expressway that serves communities to be small in size and insufficient in number,

[6] Document prepared by Yen Bai Province Department of Planning and Investment for the meeting with Institute of Developing Economies-Japan External Trade Organization, and Institute of World Economics and Politics on 21 January 2016.
[7] Yen Bai Province Department of Planning and Investment (2016).
[8] Documents prepared by the Phu Tho and Yen Bai Provinces' Departments of Planning and Investment and the Lao Cai Province People's Committee for the meetings with Institute of Developing Economies-Japan External Trade Organization, and Institute of World Economics and Politics.
[9] Phu Tho Province People's Committee (2015), Evaluation of Socio-economic Development Tasks in the Year 2015.
[10] Yen Bai Province Department of Planning and Investment (2016).
[11] Lao Cai Province People's Committee (2016).

thereby limiting the movement of local people and goods.[12] In addition, when the weight of vehicles that transport materials to expressway construction sites had damaged local roads, no rehabilitation projects have been carried out.[13] During the field visit to sites, this study's team found many traffic signs to be either too old or fail to meet either the national technical standards or the stipulations of the Vienna Convention on Road Traffic Signs.

The Hanoi–Hai Phong Expressway, which is 105.8 km long, connects Hanoi's Third Ring Road to Dinh Vu Harbour in Hai Phong, and is the widest expressway in Viet Nam. It consists of six lanes and two additional lanes for emergencies. It opened on 5 December 2015 after 6.5 years of construction that was funded by the Vietnam Development Bank. Its traffic flow of 9,000 vehicles a day helps reduce the overcapacity in NH5. It also reduces the travel time from Hanoi to Hai Phong to between one and 1.5 hours compared with the 2.5 hours along NH5 (Loan, 2014).

Figure 6.1. Example of Road Signs on the Hanoi–Hai Phong Expressway

Source: Photo taken by the author.

[12] Yen Bai Province Department of Planning and Investment (2016).
[13] Ibid.

1.2 AH1

The AH1 in Viet Nam includes the national highways NH1A, which runs from North to South Viet Nam, the North–South expressway, and NH22 in Southeastern Viet Nam.

The NH1A is the backbone route of the North–South transportation in Viet Nam, with the Hanoi–Can Tho segment having the largest traffic flow. Before it was upgraded and widened, almost all of the highway had only two lanes without a hard median strip. The road surface was also heavily damaged. For these reasons, the travel speed on NH1A was very slow, and there was a high rate of traffic accidents.

The upgrade and widening of NH1A started in 2011. The first 133 km segment between Hanoi and Thanh Hoa was finished in 2013. The segment between Thanh Hoa and Can Tho was completed at the end of December 2015, while the 45.8 km Hanoi–Bac Giang segment was finished at the beginning of January 2016.

The NH1A project was primarily funded by the government of Viet Nam from government bonds and partially funded through 17 build-operate-transfer (B-O-T) and build-transfer (B-T) contracts.

The upgraded highway is classified as a Class III road, but features four automobile lanes and two mixed lanes with a hard median strip. The 20.5 m wide road requires a speed limit of 80 km/h (or 60 km/h in heavy traffic areas). Therefore, it has characteristics of a Class II road, based on Viet Nam's national technical road standards. The segment between Hanoi and Bac Giang has six lanes and a speed limit of 100 km/h, similar to an expressway.

The NH1A upgrade project also includes the construction of several tunnels such as the Co Ma and Cu Mong Tunnels between Phu Yen and Khanh Hoa, and the Phu Gia and Phuoc Tuong Tunnels in Thua Thien–Hue, as well as the construction of dozens of new bridges.

The upgraded NH1A reduces the travel time between Hanoi and Ho Chi Minh City to 25–30 hours, representing a savings of 10 to 15 hours. In addition, the number of traffic accidents has decreased considerably. However, some complaints have been received regarding the fee applied to B-O-T segments (Hung, 2016). Some heavy trucks utilise local roads along NH1A to avoid toll gates, which results in damages on these local roads (Giang, 2016).

The North–South Expressway runs parallel to the east of (and close to) NH1A. According to the local (Ninh Binh) government, ever since the Hanoi–Ninh Binh segment of the North–South

Expressway was opened in 2012, both the provincial gross domestic product and the tourism industry have grown quickly. Thanks to improved transport, the number of tourists at sites such as Trang An, Bai Dinh, and Tam Coc Bich Dong has increased considerably (Ministry of Transport, 2015). The expressway has also enhanced trade connectivity between Ninh Binh and Hanoi as well as the surrounding provinces; facilitated travel and transport of humans and goods; and reduced travel time, traffic accidents, and traffic congestions on NH1A.

Before the North–South expressway opened, it took more than two hours to travel by car between Hanoi and Ninh Binh on NH1A. Today, however, the same trip takes just over an hour via the expressway. Traveling on the expressway also reduces costs by 12% to 15% (when compared to trips via NH1A).

Similarly, after the 35 km Thanh–Dau Giay opened in February 2015 and was linked to the 20 km Ho Chi Minh–Long Thanh Expressway, travel time between the Second Ring Road in District 2 of Ho Chi Minh City and Dau Giay has gone down to less than an hour. The old route, which is via the 70 km-long Bien Hoa, takes about three hours to traverse due to frequent traffic jams.

1.3 AH131

In the second half of the 2000s, the government of Viet Nam improved some provincial roads leading to NH12C to facilitate the flow of commercial traffic between the Vung Ang and Cha Lo Border Economic Zones. From Vung Ang Port, the NH12C runs through Ky Anh, and the Tuyen Hoa District to a Y-junction with the Ho Chi Minh Highway, where it also meets the NH12A, which then runs to the Cha Lo Border Gate. The NH12C's two-lane road imposes a speed limit of 60 km/h for about half of its length, 40 km/h for a 24 km segment near the border, and 80 km/h on a segment that overlaps with NH1A near Vung Anh Port. The NH12C greatly reduces the distance between Cha Lo and Vung Ang by about 37 km to 56.2 km.

1.4 AH17

The AH17 in Viet Nam includes NH14 and NH14B in Central Viet Nam, and NH13 and NH51 in Southeastern Viet Nam.

The first 24 m segment of NH14B runs through Danang City and has four lanes, while the next 36 km segment has two lanes. The upgrade of 663 km of NH14 in Tay Nguyen (Central

Highlands), financed by government bonds and B-O-T contracts, began in 2007, accelerated in 2014 and 2015, and was finished in June 2015. The entire route (outside of urban areas) has two lanes for motor vehicles and two additional lanes for all kinds of vehicles and sets a speed limit of 80 km/h. Some sections that run through urban areas expand to four lanes with a speed limit of 60 km/h.

This upgraded highway allows vehicles to reduce fuel usage by 30% to 40% and real costs by 10% to 20%, in comparison to the pre-upgraded highway. It also helps reduce travel time (Vietnam News Agency, 2015).

As another segment of AH17, the NH51 is a crucial route connecting Ho Chi Minh City, Binh Duong, and Dong Nai with international sea ports. This highway was widened to four lanes in 1997. However, due to the development of new industrial parks, urban towns, and sea ports, NH51 quickly became overpopulated. The highway had to be upgraded and widened into eight lanes (six vehicle lanes and two mixed lanes) in 2009. It was completed in 2012 through funds secured from B-O-T contracts.

The Ho Chi Minh–Long Thanh Expressway and the newly upgraded NH51 have reduced the travel time from Ho Chi Minh City to Vung Tau from 150 minutes to 80 minutes, and the travel distance from 120 km to 95 km. Travel costs also decreased by around 20% to 30%. An easing in traffic congestion and reduction in accidents has also been observed (Cau Duong Viet Nam, 2015).

2. Technical Requirements for Vehicle Dimension

2.1 Driving Side

In Viet Nam, traffic keeps to the right. According to Viet Nam's Road Traffic Law of 2001:

> *Automobiles of proper types allowed to join in traffic must satisfy the following quality, technical safety and environmental protection criteria:…Their steering wheels are on the left side of the automobiles.*

The Road Traffic Law of 2008 also states:

The steering wheel is on the left side of the automobile; for a foreigner's overseas-registered automobile with a right-handed steering wheel to join the road traffic in Viet Nam, it must comply with the Government's regulations.

According to Government Decree No. 80/2009/ND-CP of 1 October 2009, the operation of foreigners' overseas-registered right-hand drive cars in Viet Nam should be governed by the follow rules:

- To observe Viet Nam's law on road traffic;
- To travel in groups with an escort vehicle only along designated routes and with the Ministry of Transport's prior written approval. Organisations and individuals introducing right-hand drive cars in Viet Nam shall arrange for escort vehicles and ensure traffic safety when these vehicles run within the Vietnamese territory.

Because China, Lao PDR, Cambodia, and Myanmar follow the same left-hand rule, their vehicles will cause no issues on Viet Nam's roads. However, drivers from Thailand will find disparities in driving practices and rules and difficulties in obtaining an approval from Vietnamese authorities.

2.2 Weight and Load of Vehicles

Until recently, the limit in the sizes of vehicles was regulated by the Ministry of Transport's Circular Nos. 07/2010/TT-BGTVT, 03/2011/TT-BGTVT, and 65/2013/TT-BGTVT. Amongst their stipulated limits are:

1) Axle loads:

a) Single axle: Axle load ≤ 10 tons/axle.

b) Dual-axle cluster (2 axles), depending on the distance (d) between the two axle centres:

- If $d < 1.0$ m, then load of axle unit ≤ 11 tons;
- If $1.0 \text{ m} \leq d < 1.3$ m, then load of axle unit ≤ 16 tons;
- If $d \geq 1.3$ m, then load of axle unit ≤ 18 tons.

c) Triple-axle units (3 axles), depends on the distance (*d*) between the two adjacent axle centres:

- If $d \leq 1.3$ m, then load of axle unit ≤ 21 tons;
- If $d > 1.3$ m, then load of axle unit ≤ 24 tons.

2) Total weight of vehicles:

a) For unibody vehicles

- When the total axles equal two, the total vehicle weight ≤ 16 tons;
- When the total axles equal three, the total vehicle weight ≤ 24 tons;
- When the total axles equal four, the total vehicle weight ≤ 30 tons;
- When the total axles equal five or more, the total vehicle weight ≤ 34 tons;

b) For combination tractors with trailers or semi-trailers

- When the total axles equal three, the total vehicle weight ≤ 26 tons;
- With the total axles equal four, the total vehicle weight ≤ 34 tons;
- With the total axles equal five, the total vehicle weight ≤ 44 tons;
- With the total axles equal six or more, the total vehicle weight ≤ 48 tons.

c) For the combination of unibody vehicles pulling trailers or semi-trailers

- The total weight of combination vehicles includes the total weight of the unibody vehicle and the total axle load of pulled trailers and semi-trailers. The total weight should not exceed 45 tons.

Today, however, the axle load limits are defined by the new Circular 46/2015/TT-BGTVT (in effect since 1 December 2015). Its stipulations regarding axle load are the same as that in the superseded circulars, to wit:

(1) Axle load:

a) Single axle: Axle load ≤ 10 tons/axle.

b) Dual-axle cluster (2 axles), depends on the distance (*d*) between the two centres of axles:

- If $d < 1.0$ m, then load of axle unit ≤ 11 tons;
- If $1.0 \text{ m} \leq d < 1.3$ m, then load of axle unit ≤ 16 tons;
- If $d \leq 1.3$ m, then load of axle unit ≤ 18 tons.

c) Triple-axle units (three axles), depends on the distance (*d*) between the two adjacent centres of axles:

- If $d \leq 1.3$ m, then load of axle unit ≤ 21 tons;
- If $d > 1.3$ m, then load of axle unit ≤ 24 tons.

However, the new circular now stipulates that the total weight limit of a unibody vehicle that has five or more axles should depend on the distance between its first axle and the last axle (Item 2a below).

For combination tractors with trailers or semi-trailers with either five or six axles, the revised total weight limit now depends on the distances between the centre of the coupling pin and the centre of the first axle of each semi-trailer (Item 3b).

For combination unibody vehicles pulling trailers and semi-trailers, the load limit requirements differ under the criteria 'trailer' and 'semi-trailer'. The revised stipulations are underscored below.

(2) The total weight of the vehicle:

a) For unibody vehicles

- When the total axles equal two, the total vehicle weight ≤ 16 tons;
- When the total axles equal three the total vehicle weight ≤ 24 tons;
- When the total axles equal four, the total vehicle weight ≤ 30 tons;
- When the total axles equal five or more at the same time, the distance from the centre of the first axle to the centre of last axle:

+ Less than or equal to 7 m, the total vehicle weight ≤ 32 tons;

+ Longer than 7 m, the total vehicle weight ≤ 34 tons.

b) For combination tractors with trailers or semi-trailers

- When the total axles equal three, the total vehicle weight ≤ 26 tons;
- When the total axles equal four, the total vehicle weight ≤ 34 tons;
- When the total axles equal five and the distance between the centre of coupling pin and the centre of the first axle of semi-trailers:

+ From 3.2 m to 4.5 m, the total weight of combination vehicles ≤ 38 tons;

+ Longer than 4.5 m, the total weight of combination vehicles ≤ 42 tons.

- With the total axles equal six or more and the distance between the centre of coupling pin and the centre of the first axle of semi-trailers:

  + From 3.2 m to 4.5 m, the total weight of combination vehicles ≤ 40 tons; when carrying only one container, the total weight of combination vehicles ≤ 42 tons;

  + Longer than 4.5 m, but not longer than 6.5 m, the total weight of combination vehicles ≤ 44 tons;

+ Longer than 6.5 m, the total weight of combination vehicles ≤ 48 tons.

c) For the combination of unibody vehicles pulling trailers: The total weight of combination vehicles includes the total weight of the unibody vehicle and total axle load of pulled trailers. The total weight allowed should not exceed 45 tons.

d) The total weight has to be reduced by 2 tons for each metre of length shortened for the following combination vehicles: (i) ***For unibody vehicles pulling semi-trailers****: If the distance between the centre of coupling pin and the centre of the first axle of semi-trailers is shorter than 3.2 m;* (ii) ***For unibody vehicles pulling a one-axle trailer****: If the distance between the centre of the coupling pin and the centre of the axle of trailers is shorter than 3.7 m;* or (iii) ***For unibody vehicles pulling a multi-axle trailer****: If the distance between the centre of coupling pin and the centre of the first axle or the centre of first axle cluster of the trailer is shorter than 3.0 m.*

At Viet Nam's weigh stations, the method of checking the axle loads can be applied only if there is no capacity to check the total weight of vehicles and cargo. When the vehicle includes multi-axle clusters, the weigh station can choose the axle with largest load to check. The total weight is the total of axle loads. If the total weight of the vehicle and its cargo is larger than the allowed weight based on the above regulations, or if the axle load is 1.15 times larger than the allowed axle load based on the same regulations, then the vehicle is not allowed to enter a particular road.

2.3 Size Limit of Vehicles

According to the new Circular 46/2015/TT-BGTVT (Table 6.2), the size limit for vehicles should be no longer than 20 m, no wider than 2.5 m, and no higher than 4.2 m, except for the container trailer. (It is worth noting that the height limit on first- to third-class expressways or

highways is 4.75 m, while that on fourth- or lower class highways is only 4.5 m).

Oversized cargo is defined as unbundled cargo where the total dimensions of both vehicles and cargo are more than 20 m in length, 2.5 m in width, or 4.2 m in height (4.35 m in the case of container trailers).

Table 6.2. Comparison of Technical Requirements on the Size Limit of Vehicles Between Viet Nam and AFAFGIT

	Viet Nam	AFAFGIT
Maximum Length		
(Rigid Motor Vehicle)		12.2 m
(Articulated Vehicle)	20 m	16.0 m
Maximum Width	2.5 m	2.5 m
Maximum Height	4.2 m	4.2 m
Maximum Number of Axles		
Maximum Axle Load		
(Single axle)	10 tons	
(Dual axle cluster)	11–18 tons	
(Three-axle cluster)	21–24 ton	
Maximum Rear Axle Load		ROH < 60% of WB

AFAFGIT = Association of Southeast Asian Nations Framework Agreement on the Facilitation of Goods in Transit; ROH = rear overhang; WB = wheel base.
Source: Circular 46/2015/TT-BGTVT and AFAFGIT.

Overweight cargo is unbundled cargo where the total weight of the combination of vehicles and cargo is more than 32 tons. Vehicles are permitted to carry oversized or overweight cargo only with special permits from authorised agencies.

Table 6.3. Comparison of Regulations on the Weight and Load of Vehicles Between Viet Nam and AFAFGIT

Maximum Permissible Gross Vehicle Weight	Viet Nam	AFAFGIT
3-Axle Rigid Vehicle	24.0 tons	21.0 tons
4-Axle Rigid Vehicle	30.0 tons	25.0 tons
4-Axle Articulated Vehicle	34.0 tons	32.0 tons
5-Axle Articulated Vehicle	44.0 tons	36.0 tons
6-Axle Articulated Vehicle	48.0 tons	38.0 tons

AFAFGIT = Association of Southeast Asian Nations Framework Agreement on the Facilitation of Goods in Transit.
Source: Circular 46/2015/TT-BGTVT and AFAFGIT.

3. Road Signs in Viet Nam

The first regulations for road signs were issued in 1984. These regulations were adopted from that of the Soviet Union and China, which were generally based on the Vienna Convention. Viet Nam revised its regulations in 1998, 2001, and 2006 (after the signing of the Greater Mekong Subregion agreements). In May 2012, Viet Nam issued the National Technical Regulation on Traffic Signs and Signals (QCVN 41:2012). This national standard was based on the Vienna Convention, even though Viet Nam was not yet a member of the convention at that time.

In addition, Viet Nam issued its first regulations regarding expressway guide signs in July 2005, and the National Technical Regulation on Expressway Guidance Signs (QCVN 83:2015/BGTVT) in June 2015 (Figure 6.2). The nation is currently discussing plans to design new national technical standards on both highway and expressway signs.

Figure 6.2. Example of a Road Sign at the Entrance of the Hanoi–Hai Phong Expressway

Source: Photo taken by the author.

On 20 August 2014, Viet Nam officially became a member of the Vienna Convention on Road Traffic as well as the Vienna Convention on Road Traffic Signs and Signals. It became the fourth member of ASEAN to sign the conventions, after Indonesia, Thailand, and the Philippines; and the second ASEAN member state to ratify the conventions, after the Philippines.

Road signs in Viet Nam are categorised into six types:

- **Prohibitory signs**. These have a circular shape, a wide red border, a white background, and black symbols and inscriptions. Many prohibitory signs have red oblique downward bars;
- **Warning signs.** These have a triangular shape, a wide red border, a yellow background, and black symbols and inscriptions;
- **Mandatory signs.** These have a circular shape, no border, a blue background, and white

symbols and inscriptions (except for signs indicating the direction in which vehicles carrying dangerous goods should proceed, similar to sign D, 10 in the Vienna Convention);

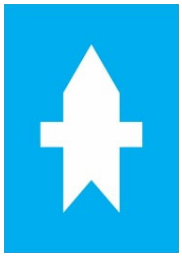
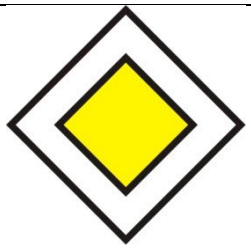
- **Information signs.** These have a rectangular or square shape, or a rectangular shape with a blue background;
- **Additional signs.** These have a rectangular or square shape and are a combination of the sign types above to provide additional information; and
- **Signs for cross-border routes.** These are similar to signs placed on domestic routes, but the text is in English instead of Vietnamese. Most road signs are placed on red and white poles on the right side of the road. Some are hung above the road or placed on a median strip.

In addition, the 2012 regulations also set rules for kilometre markers. These markers are upright cement poles with a white background and black text, except that their rounded tips have white text on a red background. The white text indicates the name of the highway and the distance to the other end of the highway. The black text indicates the name and distance (in kilometres) of a destination ahead.

Viet Nam's signs for distance and speed are indicated in kilometres rather than miles. This practice is similar to that in Lao PDR, Cambodia, Thailand, and China; thus, cross-border drivers will not have problems navigating around these neighbouring nations. On the other hand, drivers going inside Viet Nam from Myanmar might encounter some difficulty because Myanmar residents are more familiar with miles as a unit for measuring distance.

Ever since the 2012 national standard was issued, Viet Nam has not been able to replace all of its unsuitable traffic signs yet (Figure 6.3). While it managed to replace the signs along the Asian Highway and almost all national highways, a number of unsuitable signs along other routes have yet to be removed. Also, although the 2012 standards require signs to be set up on cross-border routes along the Asian Highway, there is still a lack of road signs written in English. In this chapter’s field study of the Noi Bai–Lao Cai Expressway (AH14), for example, many signs warning of overhead electric cables featured text stipulating the safe height for vehicles, but were written in Vietnamese only.

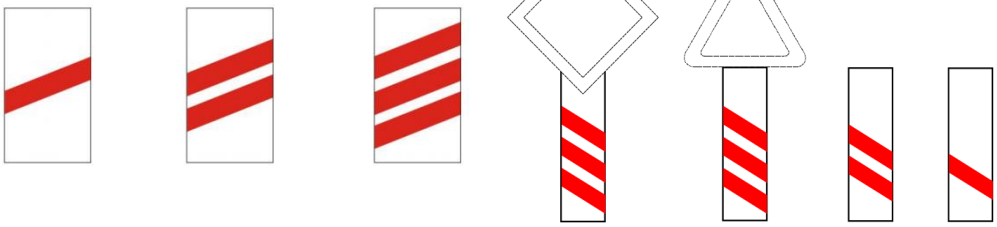
Figure 6.3. Differences in Traffic Signs between Viet Nam's 2001 and 2012 Regulations

Viet Nam's Sign Number	22 TCN 237-01 (of 2001)	QCVN 41:2012 (of 2012)
401		
402		
202		

Source: Ministerial Technical Regulation on Traffic Signs and Signals 22 TCN 237-01 and National Technical Regulation on Traffic Signs and Signals QCVN 41:2012.

Another significant difference pertains to warning signs for level crossings. In Viet Nam, one red bar indicates 50 metres, two bars mean 100 m, and three bars signify 150 m (See Sign No. 243 in Figure 6.4 as an example). In contrast, under the Vienna Convention, three bars indicate 300 m; two bars, 200 m; and one bar, 100 m. Regulations in Viet Nam also differ from those in Lao PDR, where each bar indicates an incremental increase in distance of 80 m.

Figure 6.4. Differences in Traffic Signs In Viet Nam's 2012 Regulations and the Vienna Convention

Viet Nam's sign number	QCVN 41:2012	Vienna Convention
247		
214		
211b		
243		

Source: National Technical Regulation on Traffic Signs and Signals QCVN 41:2012 and the Vienna Convention on Road Signs.

4. Road Traffic Laws

4.1 Outline of the Road Traffic Law

Viet Nam issued the first Road Traffic Law in 2001 (Law No. 26/2001/QH10) and the current Road Traffic Law in 2008 (Law No. 23/2008/QH12). In drafting the 2008 version, the Ministry of Transport reviewed and evaluated the implementation of the 2001 law and its accompanying documents, as well as translated international laws and conventions on road transport.

The 2008 Road Traffic Law includes the following eight chapters and 89 articles:

- **Chapter 1: General provisions.** This chapter provides the scope of regulations, application objects, interpretation of terms, operating principles.
- **Chapter 2: Road traffic rules**. This chapter covers aspects of road traffic rules such as the road signalling system; observance of road signs, vehicle speed, and distance between vehicles; use of lanes, passing, vehicle navigation; reversing; avoidance of oncoming vehicles; parking on roads or streets; loading of cargoes on vehicles; carriage of persons in cargo vehicles; priority rights of some vehicles; utilising ferries and pontoon bridges; yielding at intersections; traveling on level crossings between roads and railway tracks or bridges with railroad tracks; traffic on highways and in road tunnels; load-bearing capacity and size limits of roads; truck and tractor trailers; drivers and riders on motorcycles, bicycles, and other rudimentary vehicles; pedestrians, disabled persons and elderly road users; persons guiding animals on roads; street use and other activities on streets; organising traffic and direction of traffic; and responsibilities of agencies, organisations and individuals when traffic accidents occur.
- **Chapter 3: Road infrastructure facilities.** This chapter details the classification of roads and other regulations related to road construction and maintenance.
- **Chapter 4: Vehicles joining road traffic.** This chapter provides the conditions for motor vehicles, rudimentary vehicles, special-use vehicles to join road traffic; grant and withdrawal of registration and licence plates of motor vehicles; regulations on quality, technical safety, and environmental protection of motor vehicles that join road traffic.

- **Chapter 5: Operators of vehicles joining road traffic.** This chapter provides the conditions for drivers of vehicles to join traffic lanes, and to rules on driving licences.
- **Chapter 6: Road transportation.** This chapter details road transportation activities and road transportation support services.
- **Chapter 7: State management of road traffic.** This chapter describes the state management of road traffic; responsibilities of the authorities.
- **Chapter 8: Implementation provisions.**

4.2 Differences Between Viet Nam's Laws and the Vienna Convention on Road Traffic Regulations

There are differences between Viet Nam's traffic law and the Vienna Convention on Road Traffic. The first difference pertains to regulations on mobile phone use. Recent laws on composing and sending of text messages while driving have been introduced in many countries, but not in Viet Nam yet. Only motorcycle or moped operators are prohibited from using mobile phones while driving. According to Vietnamese law: 'Operators of motorcycles, three-wheeled motor vehicles, or mopeds are prohibited from using umbrellas, mobile phones, and audio devices, except hearing aids'.

Meanwhile, according to the Vienna Convention on Road Traffic (consolidated version), 'A driver of a vehicle shall at all times minimise any activity other than driving. Domestic legislation should lay down rules on the use of phones by drivers of vehicles. In any case, legislation shall prohibit the use by a driver of a motor vehicle or moped of a hand-held phone while the vehicle is in motion.' Motor vehicles, according to the Vienna Convention, include automobiles and motorcycles.

The second difference pertains to regulations on the use of safety belts. According to Viet Nam's Law on Road Traffic (2008): 'The driver and persons sitting on the front seat of a car equipped with safety belts shall wear the safety belts'. Passengers in the rear seats or drivers and passengers in a car that is not equipped with safety belts do not have to wear safety belts.'

On the other hand, according to the Vienna Convention on Road Traffic (consolidated version): 'The wearing of safety belts is compulsory for drivers and passengers of motor vehicles occupying seats equipped with such belts, save where exceptions are granted by domestic legislation.'

The third difference is in regard to tunnel regulations. Viet Nam does not prohibit vehicles from reversing or making U-turns in tunnels. According to the Viet Nam's Law on Road Transport (2008), 'Operators of vehicles travelling in road tunnels, apart from complying with traffic rules provided in this Law, shall also observe the following provisions: (i) Motor vehicles and special-use vehicles must switch on their lamps, and rudimentary vehicles must switch on their lamps or carry luminous signal devices; and (ii) They may only stand and park their vehicles at prescribed places.'

Meanwhile, according to the Vienna Convention on Road Traffic (consolidated version), Article 25: '(i) All drivers are forbidden to reverse and to make a U-turn; (ii) Even if the tunnel is lit, all drivers must switch on the driving or passing lamps; (iii) Drivers are permitted to stop or park a vehicle only in case of emergency or danger. In doing so, they must, where possible, use the places specially indicated; (iv) In case of a prolonged standstill, the driver must switch off the engine.'

In addition, there are several regulations included in the Vienna Convention but not mentioned in Viet Nam's 2008 Law:

- (Article 7 paragraph 3) Drivers shall show extra care in relation to the most vulnerable road users such as pedestrians and cyclists and, in particular, children, elderly persons, and the disabled.
- (Article 11 paragraph 9) 'A vehicle shall not overtake another vehicle that is approaching a pedestrian crossing marked on the carriageway or signposted as such, or which is stopped immediately before the crossing.' It should proceed at a speed low enough to enable it to stop immediately if a pedestrian is on the crossing. Nothing in this paragraph shall be construed as preventing Contracting Parties or subdivisions thereof from prohibiting overtaking within a prescribed distance from a pedestrian crossing, or from imposing stricter requirements on a driver of a vehicle proposing to overtake another vehicle stopped immediately before such a crossing.
- (Article 15) Domestic legislation should provide that where there are built-up areas, the drivers of other vehicles shall (subject to the provisions of Article 17, paragraph 1 of this Convention) slow down and if necessary, stop to allow public transport vehicles to manoeuvre out of such build-up areas. The provisions thus

laid down by Contracting Parties or subdivisions thereof shall in no way affect the duty incumbent on drivers of public transport vehicles to take, after having indicated their intention to move off, the precautions necessary to avoid any risk of accident.

- (Article 20 paragraph 5) Domestic legislation should provide that pedestrians walking on the carriageway shall keep to the side opposite to that appropriate to the direction of traffic, except where to do so places them in danger. However, persons pushing a cycle, a moped, or a motorcycle, and groups of pedestrians led by a person in charge of forming a procession shall in all cases keep to the side of the carriageway appropriate to the direction of traffic. Unless they form a procession, pedestrians walking on the carriageway shall, by night or when visibility is poor and, by day, if the density of vehicular traffic so requires, walk in single file, wherever possible.
- (Article 26 paragraph 1) Road users are prohibited from cutting across troop columns, files of schoolchildren accompanied by a person in charge, and other processions.

4.3 Specific Regulations

Circular No. 01/2007/TT-BCA-C11 by the Minister of Public Security also requires trucks and automobiles with more than nine seats to display the number (from the number plate) at the rear as well as on two sides of the vehicle; the maximum axle loads and vehicle weight on the two doors; and the name of the organisation that owns the vehicles on the two doors. Resolution 171/2013/ND-CP stipulates that the driver will be punished if the company's telephone number is not displayed on the vehicle’s door (Figure 6.5).

Figure 6.5. An Example of Vehicle Markings

Note: These characters show the name of the company that owns the truck, the number of drivers and passengers allowed (maximum of three persons), the permitted loads for each axle, and the total weight of the vehicle.
Source: Photo taken by the author.

In addition, Circular No. 57/2015/TT-BCA of the Minister of Public Security provides instructions on the installation of fire prevention and firefighting equipment in road vehicles. The owner of a vehicle that does not have a suitable fire extinguisher will be punished.

There are no other government issuances that require foreign vehicles to observe these regulations. However, a foreign vehicle may be stopped for inspection by Viet Nam's highway police due to the lack of the markings mentioned above or of fire extinguishers. Foreign drivers may find this process stressful.

5. Conclusion

The newly constructed and upgraded routes along sections of the ASEAN Highway Network in Viet Nam have significantly facilitated transportation by reducing the cost and time of travel, lessening the occurrence of traffic accidents, and promoting investments and tourism in nearby provinces. Some of the negative effects found, however, pertain to road tolls along road sections developed under B-O-T contracts and to the division of existing communities that are right in the path of the new expressways.

In the review of the technical regulations, Viet Nam's rules were found to be similar to the provisions under the AFAFGIT (and even somewhat less restrictive in terms of length and weight limits). Meanwhile, there are small differences in the stipulations between the 2008 Traffic Law and the Vienna Convention, but these can be overcome by supplemental regulations while amendments to the law itself are pending.

Although Viet Nam only recently signed the 1968 Vienna Conventions, the country has long been applying the conventions' provisions. One area where it is slow to make changes, however, is with the road signs along lengthy sections of the ASEAN Highway Network as well as highways used to transport cargo to and from Lao PDR, Cambodia, and China. That is, most signs here are still in the local language.

The replacement of road signs that are no longer appropriate is ongoing. What is needed now is to finish the installation of English road signs in all sections of the ASEAN Highway Network in Viet Nam. Such areas include the national highways and the Ho Chi Minh Highway, as well as other highways used by transit vehicles such as the Hanoi–Thai Nguyen Expressway and NH3 (Hanoi, Thai Nguyen, Bac Can, Cao Bang, which connects the Ta Lung Border–Suikou), NH10 and NH18 (Hai Phong, Quang Ninh Province Mong Cai–Tongxing, which connects to the border), NH217 (Tsinghua, which connects to the Na Meo–Namsoi Border), NH46 and NH7 (Nghe An, which connects to Nam Can–Namcan border), NH19 (Binh Dinh, Gia Lai, which connects to the Le Thanh–Oyadav Border), and NH91 and NH91C (An Giang, Long Binh–Chray Thom Border). In the future, Viet Nam is expected to develop and upgrade more sections of the ASEAN Highways Network.[14] It is also necessary to upgrade and increase the number of service stations to improve traffic safety and further develop local tourism and commerce.

References

Cau Duong Viet Nam (2015), 'Thong Xe Toan Tuyen Cao Toc Hien Dai Nhat Viet Nam' (Opening the Most Modern Expressway in Vietnam'). Available at http://hkhktcd.vn/tap-chi-cau-duong/toan-canh-cau-duong/thong-xe-toan-tuyen-cao-toc-hien-dai-nhat-viet-nam-1908.aspx (accessed 27 August 2018).

[14] Decision no. 604/QĐ-TTg dated 08 May 2015 by Vietnam's Prime Minister on approval of the proposals on enhancing the connectivity the transport in ASEAN until 2020 with orientation to 2030.

Directorate for Roads of Vietnam (2012), 'National Technical Regulation on Road Signs and Signals', QCVN 41:201 2/BGTVT.

Giang, H. (2016), 'O-to Ne Tram Thu Phi, Quan Nat Duong Lang' ('Dodging the Toll Gates, Trucks Ruin Village Roads'), *Nhan Dan* Newspaper. Available at: http://www.nhandan.com.vn/xahoi/item/28444202-o-to-ne-tram-thu-phi-quan-nat-duong-lang.html (accessed 27 August 2018)

Hung, M. (2016), '*Nguoi dan, Doanh Nghiep Dau Xe o Tram Thu Phi Phan Doi Viec Tang Phi*' ('Citizens and Firms Park Their Vehicle To Block the Toll Gate To Oppose the Rise in Fees'), *Cong an Thanh Pho Ho Chi Minh* Newspaper. Available at: http://congan.com.vn/giao-thong-24h/nguoi-dan-doanh-nghiep-dau-xe-o-tram-thu-phi-phan-doi-viec-tang-phi_13270.html (accessed 27 August 2018)

Ishida, M. and I. Isono (2012), 'Old, New and Potential Economic Corridors', in Ishida, M. ed., *Emerging Economic Corridors in the Mekong Region*, Bangkok: Bangkok Research Center, IDE–JETRO.

Lao Cai Province People's Committee. Unpublished documents prepared for the meetings with Institute of Developing Economies–Japan External Trade Organization, and Institute of World Economics and Politics.

Loan, D. (2015), 'Nhung Cong Trinh Giao Thong an Tuong Nam 2015' ('The Impressive Traffic Projects of 2015'), *VnExpress*. Available at http://vnexpress.net/photo/giao-thong/nhung-cong-trinh-giao-thong-an-tuong-nam-2015-3334028.html (accessed 27 August 2018)

Ministerial Technical Regulation on Traffic Signs and Signals 22 TCN 237-01.

Ministry of Transport (2015), '*Tao Da Phat Trien Kinh Te Xa Hoi Tu Cac Du An Duong Cao Toc*' ('Expressways Facilitate the Socio-Economic Development'). Official website of Vietnam's Ministry of Transport. Available at http://www.mt.gov.vn/vn/Pages/chitiettin.aspx?IDNews=36943 (accessed 27 August 2018)

National Assembly of Vietnam (2008), Law No. 23/2008/QH12 on Road Traffic.

Phu Tho Province People's Committee (2015), Evaluation of Socio-economic Development tasks in the year 2015. An evaluation report prepared by Phu Tho Province People's Committee.

Prime Minister of Vietnam Government (2010), Decision No. 140/QĐ-TTg of 21 October 2010 on the detailed plan of the North–South Expressway.

Thanh Phuc (2015), '75 Phut Hanoi, 90 Phut Lao Cai' ('75 Minutes To Reach Hanoi and 90 Minutes To Reach Lao Cai City'), *Yen Bai Daily*. At http://www.baoyenbai.com.vn/247/131754/75_phut_Ha_Noi_90_phut_Lao_Cai.htm (accessed 27 August 2018)

Tri, D. (2014), 'Cao toc Noi Bai–Lao Cai: Rut ngan 4 Tieng, Tiet Kiem Nhieu Chi Phi' (Noi Bai–Lao Cai Expressway: Reduce the Travel Time by 4 Hours and Save a Considerable Cost'). Available at http://dantri.com.vn/xa-hoi/cao-toc-noi-bai-lao-cai-rut-ngan-4-tieng-tiet-kiem-nhieu-chi-phi-1415357647.htm (accessed 27 August 2018)

United Nations (2006), 'Vienna Convention on Road Signs and Signals, consolidated versions'. In http://live.unece.org/fileadmin/DAM/trans/conventn/Conv_road_signs_2006v_EN.pdf (accessed on 27 August 2018).

United Nations (2006), Vienna Convention on Road Traffic, consolidated versions.

Vietnam News Agency (2015), 'Mo Rong Canh Cua Thuc Day Phat Trien Tay Nguyen' ('Open in Order to Push the Development of Central Highlands'), *Tin Tuc* Newspaper. Available at: http://baotintuc.vn/dan-toc/mo-rong-canh-cua-thuc-day-phat-trien-vung-tay-nguyen-20150618202156973.htm (accessed 27 August 2018)

Yen Bai Province Department of Planning and Investment. Unpublished document prepared for the meetings with Institute of Developing Economies–Japan External Trade Organization, and Institute of World Economics and Politics.

Chapter 7

Economic Impact of New Sub-corridor Development in the Mekong Region

Ikumo Isono

The recent economic impact of the sub-corridor development (i.e., in Cambodia, Lao PDR, Myanmar, and Viet Nam) in the Mekong Region is examined by utilising the Geographical Simulation Model. There are three main findings. First, the sub-corridor development can contribute towards narrowing development gaps within a country as well as in the Mekong region. Second, road development mainly contributes to the service industry, unless the communities along the road originally have a manufacturing base. Third, road infrastructure, together with industrial estate development, will have a greater economic impact on both the manufacturing and service sectors. Results strongly suggest that road development should be accompanied by industrial development measures.

Introduction

The official establishment of the ASEAN Economic Community (AEC) was, undoubtedly, one of the major milestones of the Association of Southeast Asian Nations (ASEAN). Trade volumes and foreign direct investment in and between ASEAN countries as well as in the neighbouring countries significantly increased. The income level of each ASEAN member state also climbed steadily. Furthermore, the latecomers to the ASEAN – i.e., Cambodia, Lao PDR, Myanmar, and Viet Nam – enjoyed higher growth rates than the rest of the member states.

However, many ASEAN member states have to contend with development gaps domestically. Most foreign direct investments are made in the largest and often more economically advanced cities and their surrounding areas. People and households are moving from rural areas to large cities, and many farmers in rural areas continue to have relatively lower incomes. A simulation analysis done by the Institute of Developing Economies-Geographical Simulation Model (IDE-GSM) shows that a free trade agreement (FTA) or free trade area may further

widen development gaps because firms located near or in the largest economic cities benefit more from the development than do firms located in remote areas.

The development of new economic corridors can be one of the solutions to narrow the development gaps. Economic corridors can create opportunities for people in rural areas to start new businesses as well as to purchase goods from the central areas at cheaper prices.

This study examines the economic impacts of the new sub-corridor development in the Mekong Region by utilising the IDE-GSM. Specifically, five new economic sub-corridors have been selected for the analysis:

- Northern sub-corridor in Cambodia
- National Highway No. 13N (North) in Lao PDR
- Lao PDR section of North-South Economic Corridor and Lao–Myanmar Friendship Bridge
- National Highway No. 3 in Myanmar
- Noi Bai–Lao Cai Expressway

Amongst these corridors, the National Highway No. 13N (North) in Lao PDR and the National Highway No. 3 in Myanmar are designated as priority projects in the Master Plan on ASEAN Connectivity (ASEAN 2011), which aims to upgrade 'below Class III' roads within ASEAN's designated Transit Transport Routes.

These five sub-corridors have different road specifications and stages of development. The Noi Bai–Lao Cai Expressway is the only highway with four lanes (the others are two-lane highways). As of early 2016, National Highway No. 13N (North) in Lao PDR and the National Highway No. 3 in Myanmar have not been completely improved, while a part of the access road to the Lao–Myanmar Friendship Bridge has not been paved. Meanwhile, there are bridges with weight limits of 25 tons only in the northern sub-corridor in Cambodia. Other than the Noi Bai–Lao Cai Expressway, all these projects should be completed by 2020 and are included in the simulation analysis by ERIA (2015). However, in this latest simulation analysis, it is assumed that all these infrastructure improvements have been completed and are therefore included in the impact analysis on the region.

The main objective of the simulation analysis is two-fold: (i) to analyse the potential role of a new economic corridor and sub-corridor development in the more integrated ASEAN and Mekong region and to detail how the improvements contribute towards narrowing the development gaps; and (ii) to explain how policymakers should view development corridors when drafting regional development policies.

There are three main findings. First, road development and improved border crossings can help develop the areas traversed by the roads, but they do not significantly improve the whole country. Second, road development mainly contributes towards the service industry, unless the region already has an existing manufacturing base and linkages to existing industrial clusters. This implies that road development, in itself, is not enough to enable the regions to expand their manufacturing activities if they do not yet have at least a fledgling manufacturing sector to speak of. Third, road infrastructure, when combined with industrial estate development, will have greater economic impact on both the manufacturing and service sectors.

Section 2 of this chapter briefly introduces the setting of the IDE-GSM system. Section 3 summarises the scenarios and simulation results. Section 4 outlines the conclusions and policy recommendations.

1. The Setting of Simulations

Table 7.1 summarises the features of IDE-GSM 2015.[1] The model includes China, India, and other economies in East and South Asia such as Japan, the Republic of Korea, Sri Lanka, Bhutan, and Nepal. In addition, the model covers 65 other countries, which represent the rest of the world.

Subnational data are used for Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Japan, Korea, Lao PDR, Malaysia, Nepal, the Philippines, Sri Lanka, Taiwan, Thailand, and Viet Nam. Brunei Darussalam, Hong Kong, Macao, and Singapore are treated as one unit. Country data are used for the other 65 countries, where the capital city represents their respective countries. Border costs, and tariff and non-tariff barriers are collected and estimated separately and incorporated into the latest version of the model.

[1] See Kumagai et al. (2013) for the details of the model.

Table 7.1. IDE-GSM 2015

	IDE-GSM 2015
Version of IDE -GSM	9.0
Number of economies in East and South Asia	21
Number of regions	1,818
Number of nodes	5,833
Number of routes	10,906
Number of transport modes	Road, Sea, Air and Rail
Number of industries	7
Intermediate goods	Yes
Non-tariff barriers	Yes
Rest of the World	65 economies
Tariff data	Yes
SEZ/disaster analysis	Yes
Congestion	Yes

SEZ = Special Economic Zone
Source: Author.

The current version of the IDE-GSM also incorporates changes in its productivity parameters, which describe Special Economic Zone (SEZ), as well as congestion at the borders, ports, and airports that are endogenously calculated in the model.

2. Scenarios and Results

In the alternative development scenarios, impact is shown as *Impact Density.* That is, the impact (in US dollars) is divided by area and the percentages are compared with the gross domestic product (GDP) or regional GDP in the baseline scenario for 2030.

2.1 Baseline Scenario

In the baseline scenario, the following assumptions are made to describe the changes between 2010 and 2015:

- Expressway development between Yangon and Mandalay, road improvement between Mandalay and Tamu, and port expansion in Yangon by 2015
- Double track rails in Northern Malaysia by 2015
- The Tsubasa Bridge at Neak Loeung in Cambodia by 2015
- Population of each country increases according to the forecast of the United Nations Population Division
- Technological progress in each country is calibrated to replicate the average GDP growth rate during the 2010–2020 period, as forecast by the World Economic Outlook, International Monetary Fund
- Tariff rates decrease, as scheduled in the ASEAN Trade in Goods Agreement and the five ASEAN+1 FTAs.

Any improvement pertaining to the economic corridor development outlined in this study, such as a fourth Thai–Lao Friendship Bridge, are excluded.

2.2 Alternative Development Scenarios

This study has five alternative scenarios aside from the baseline scenario. Each scenario has a combination of different types of improvement. Road development and improvements provide a new road section or reduce the time at specific road sections. Border facilitation reduces the time and cost at a specific border crossing. Industrial estate development raises the productivity parameter of the selected industry in the specific regions of the model.

How do the GDPs/Gross Regional Domestic Products (GRDPs) change in the model when an economic corridor is developed? First, reduced times can lower the costs for firms shipping their products to customers, leading to lower transport costs. Specifically, the cheaper transport costs make it possible for firms either located in regions with better infrastructure or

near road corridors to sell their products or services at lower prices. Consumers in the regions will also benefit, as they will be able to buy goods and services at lower prices. At the same time, firms in the manufacturing sector will be able to purchase parts and components at lower prices, thus incurring lower cost of production. This may even increase the sales and revenues of firms by precipitating more sales in the market.

Increased sales and revenues can lead to higher profits, more employment, and higher salaries for employees. Together with lower prices for products, higher salaries allow workers to demand for more goods and services. This, in turn, will attract and encourage workers from other regions to move into the associated regions. Such influx of workers will further increase the sales and profits of firms and the salaries and consumption of workers, thereby generating a ripple effect that attracts even more workers. In the end, these direct and indirect effects could raise the regional GDPs.

On the other hand, there are benefits as well as drawbacks for the other regions situated far from the improved infrastructure. First, firms in remote areas can seize the opportunity to utilise the better infrastructure and sell more products and services, although most consumers are located far from the firms and the potential sales increases are small. Second, firms and consumers in remote regions may also benefit by being able to purchase products and services from the improved regions at lower prices. However, some firms may face fierce price competition with counterparts in the improved regions, which may then lead to fewer customers for the former. In addition, some workers may eventually migrate out of the remote regions. Therefore, an improvement in the infrastructure may lead to a negative impact on remote provinces.

2.3 Northern Sub-corridor in Cambodia

The northern sub-corridor in Cambodia runs between Siem Reap, Cambodia, and Quinhon, Viet Nam. Specifically, the following development scenarios are assumed in the analysis:

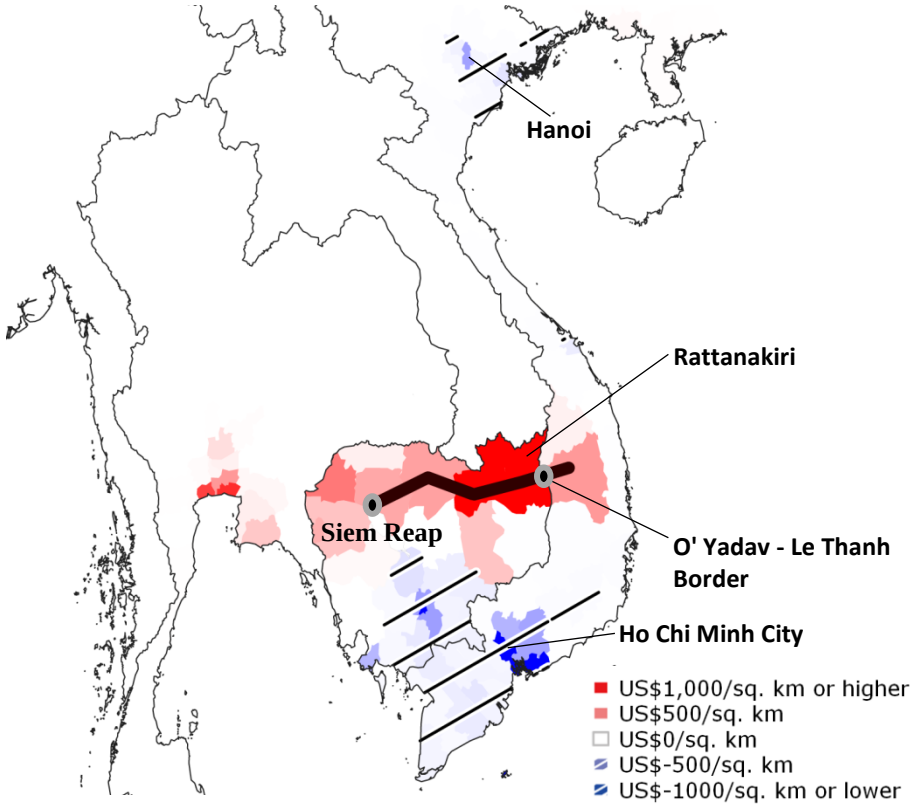
- A road between Siem Reap and Stung Treng is being improved so that trucks can travel this section at a speed of 38.5 km/h. This includes the construction of a bridge crossing the Mekong River near Stung Treng;

- A road between Stung Treng and Banlung is being improved so that trucks can travel this section at a speed of 38.5 km/h;
- Time and cost at the O' Yadav–Le Thanh border are halved.

Figure 7.1 shows the economic impact of the northern sub-corridor in Cambodia on the region in 2030. Regions marked in red will experience a positive impact compared with the baseline scenario, and areas in blue or with a hatched design will experience a negative impact.

Figure 7.1. Economic Impact of the Northern Sub-corridor in Cambodia

(Impact Density, 2030)



Source: Institute of Developing Economies-Geographical Simulation Model result.

Results show that improvements on roads and border crossings will benefit the provinces along the corridor. That is, Rattanakiri and Stung Treng will respectively experience a positive 10.07% and 8.45% economic impact. These results are consistent with the findings in the study of Ishida and Isono (2012). Preah Vihear will have a relatively smaller impact at 2.31%, while that

of Siem Reap will be even smaller at 0.23%. Meanwhile, Gia Lai will experience a positive impact of only 0.16%.

On the other hand, the central and southern parts of Cambodia, the southern part of Viet Nam, and the regions near Hanoi will experience negative impacts. These results imply that the development of this particular sub-corridor mainly benefits the provinces along the corridor and negatively affects the other areas. In the baseline scenario, more workers move from the provinces along the corridor to the big cities, such as Phnom Penh, Ho Chi Minh City, Hanoi, and their surrounding provinces. In the presence of better infrastructure in the sub-corridor, fewer workers will move from the provinces to the big cities, leading to a positive impact for the provinces along the corridor and negative impact for other regions.

Table 7.2 shows the components of the positive impact by industry for Rattanakiri and Stung Treng. These two provinces will experience a large positive effect, mostly on the service sector. Considering that these provinces have a small manufacturing base and that the corridor does not connect these provinces with any big cities, there will be a relatively smaller impact on the agriculture and manufacturing sectors.

Table 7.2. Economic Impact of the Northern Sub-corridor in Cambodia by Economic Sector (Selected Areas)

	Agriculture	Manufacturing	Services	All
Rattanakiri	5.2%	1.7%	93.2%	100.0%
Stung Treng	3.7%	3.6%	92.7%	100.0%

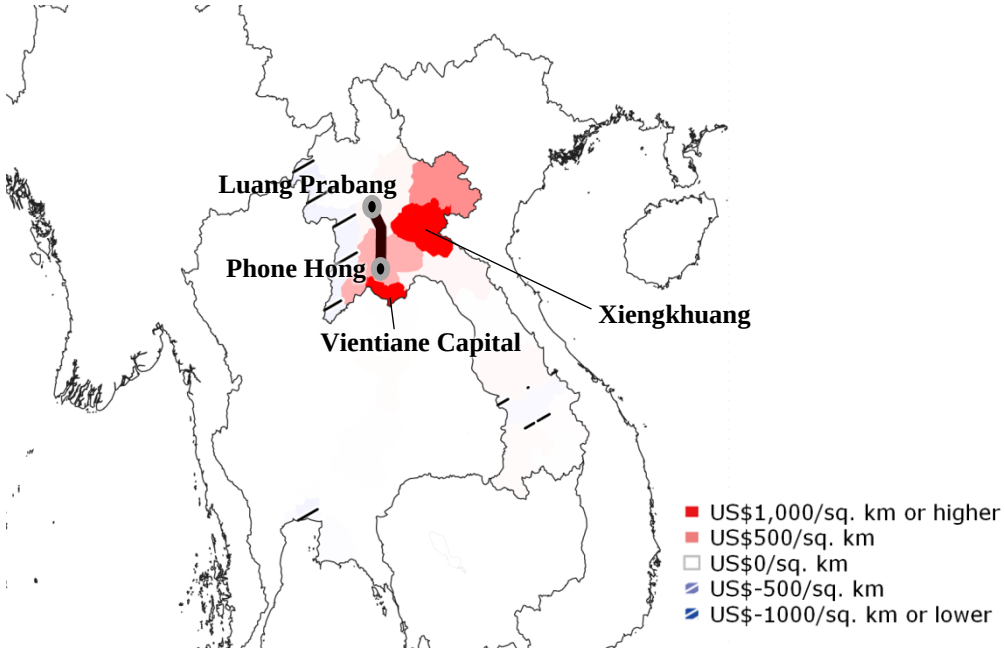
Source: Institute of Developing Economies-Geographical Simulation Model result.

2.4. National Highway No. 13N (North) in Lao PDR

The scenario for National Highway No. 13N (North) in Lao PDR covers the section between Phone Hong and Luang Prabang. In particular, the development scenario assumes an improvement on the road section between Phone Hong and Luang Prabang so that trucks can travel at a speed of 38.5 km/h.

Figure 7.2 shows the economic impact. Xiengkhuang, Houaphan, Vientiane, and Vientiane Capital will experience relatively large positive effects. Xiengkhuang, for example, will experience a positive impact of 7.12%. On the other hand, there will be a negative impact on Bokeo, Sayaboury, Salavan, and Luang Namtha. For example, Bokeo and Sayaboury will experience a negative impact of 0.06%. The economic impact on Luang Prabang is relatively positive but small.

Figure 7.2. Economic Impact of National Highway No. 13N (North) in Lao PDR
(Impact Density, 2030)



Source: Institute of Developing Economies-Geographical Simulation Model result.

Table 7.3 shows the impact by economic sector. The main findings indicate that Xiengkhuang will only experience a positive impact in its service sector. Likewise, both Vientiane and Vientiane Capital will also receive a positive impact on their service sector. Such results indicate that the improvement of the corridor cannot help Lao PDR develop its manufacturing sector if there are no industrial development measures or SEZs in the area.

Table 7.3. Economic Impact of National Highway No. 13N (North) by Economic Sector (Selected Areas)

	Agriculture	Manufacturing	Service	All
Xiengkhuang	2.6%	0.9%	96.5%	100.0%
Vientiane	-0.5%	0.2%	100.3%	100.0%
Vientiane Capital	-5.1%	-8.3%	113.5%	100.0%

Source: Institute of Developing Economies-Geographical Simulation Model result.

2.5. Lao PDR Section of the North–South Economic Corridor and the Lao–Myanmar Friendship Bridge

In the case of the Lao PDR section of the North-South Economic Corridor and the Lao–Myanmar Friendship Bridge, the scenario in the analysis assumes an improvement in the road section of the North-South Economic Corridor in Lao PDR, a new bridge across the Mekong River, and a new access road between Luang Namtha, Lao PDR and Mong Lin, Myanmar via the new bridge. In particular, the scenario involves:

- Improvement on the road between Houayxay and Boten so that trucks can travel this section at a speed of 38.5 km/h.
- Facilitation of cross-border transit between Boten, Lao PDR and Mohan, China; and between Houayxay, Lao PDR and Chiang Khong, Thailand.
- Construction of a new road that will allow an average travel speed of 38.5 km/h between Luang Namtha and Mong Lin. It includes the construction of a bridge across the Mekong River near Xiengkok.

The simulation reveals similar effects on the provinces along the corridor, even positively affecting Thailand and China. The economic impact (by province) is shown in Figure 7.3. Bokeo, Luang Namtha, Sayaboury, Oudomxay, and Phongsaly will experience a large and positive impact at 8.44%, 1.38%, and 0.81%, respectively.

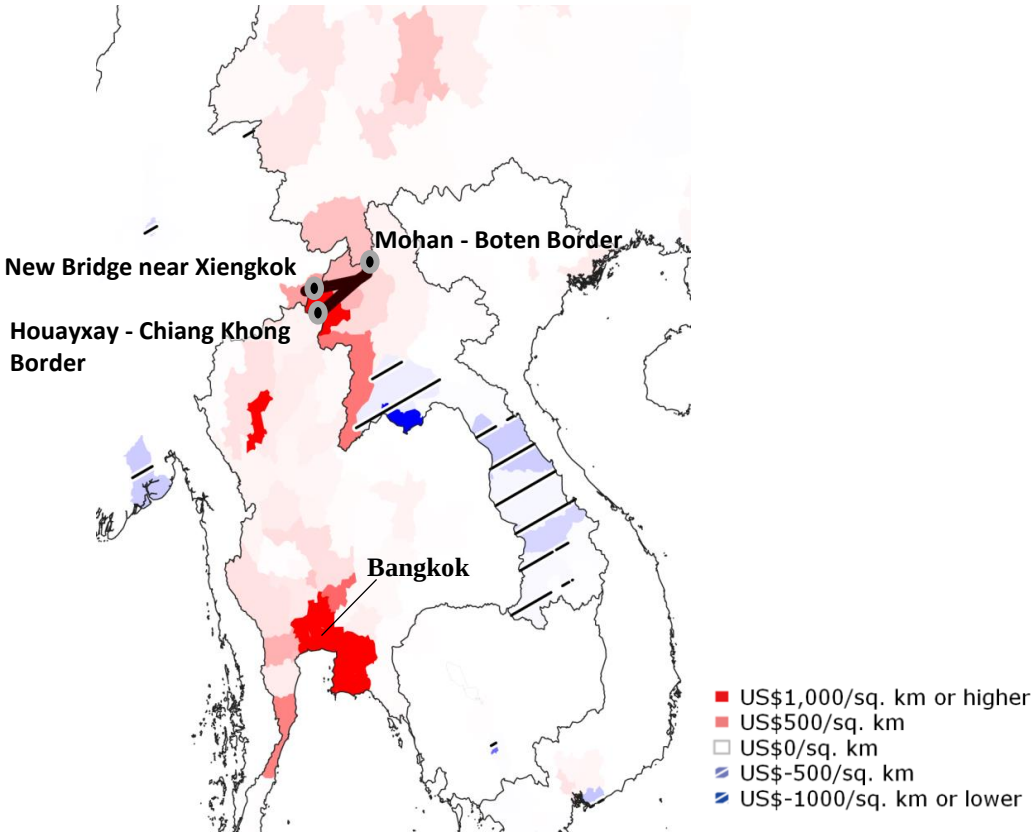
On the other hand, Vientiane Capital, Vientiane province, and the southern part of Lao PDR will be negatively affected, with Khammouane receiving the largest negative impact at 0.14%.

The positive economic impact on Tachileik, Myanmar will be 0.07%. However, the effect on the whole of Myanmar will be minimal because the negative effect on the Yangon area will offset the positive impact on Tachileik.

Figure 7.3 shows that Xishuangbanna and other regions in Yunnan Province, China, as well as Lamphun, Bangkok, and the surrounding regions of Bangkok will be positively affected by the scenario; that is, China and Thailand will benefit from the improvement of the North–South Economic Corridor in Lao PDR.

Figure 7.3. Economic Impact of the Lao PDR Section of the North–South Economic Corridor and the Lao–Myanmar Friendship Bridge

(Impact Density, 2030)

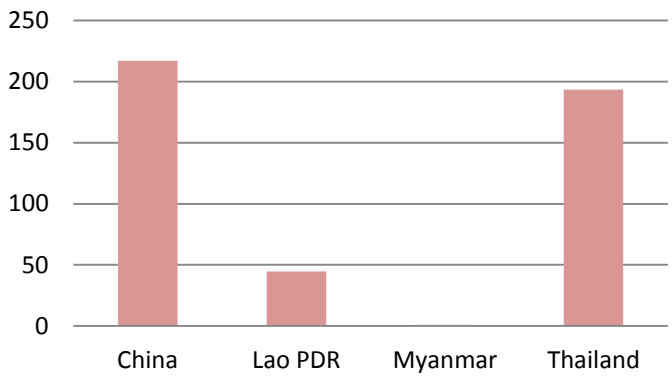


Source: Institute of Developing Economies-Geographical Simulation Model result.

The positive impact on China and Thailand will, in fact, be larger than that on Lao PDR or Myanmar in terms of absolute values (Figure 7.4). The main beneficiaries of the corridor development will be China and Thailand, although the economic impact they will receive in terms of percentages is small. This implies that the North–South Economic Corridor can stimulate the transit trade between China and Thailand via Lao PDR.

Figure 7.4. Economic Impact on Four Countries

(in US$ million: constant 2010 prices)



Source: Institute of Developing Economies-Geographical Simulation Model result.

2.6. National Highway No. 3 in Myanmar

The improvement of National Highway No. 3 in Myanmar has been a much-awaited project because it is an important connector between Thailand and the major cities in Myanmar, but has long been in poor condition. In mid-August 2015, a new bypass between Myawaddy and Kawkareik was opened, which is expected to facilitate land transport between Thailand and Myanmar.

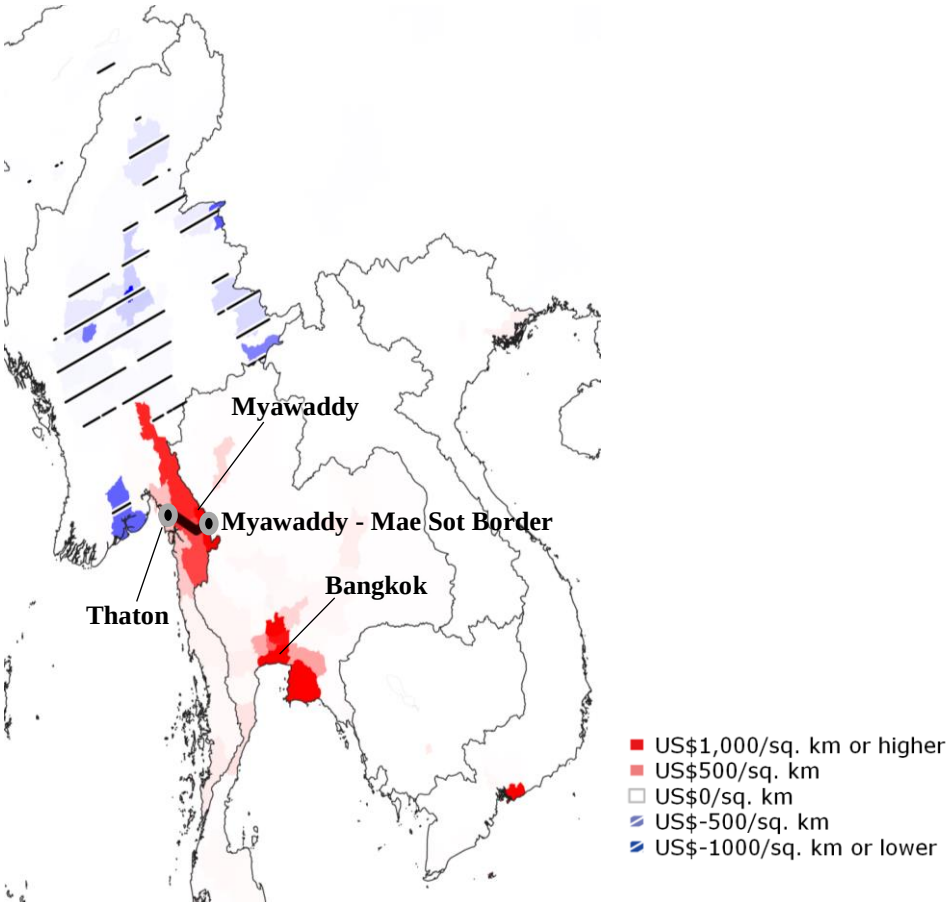
In this chapter's simulation analysis, the scenario also includes unfinished projects such as a new bridge between Myawaddy, Myanmar and Mae Sot, Thailand; and a road improvement between Kawkareik and Thaton, to assess the overall potential impact on the region. In particular, the scenario assumes:

- Improvement of a road between Myawaddy and Thaton so that trucks can travel this section at a speed of 38.5 km/h;
- Facilitation of cross-border transit between Myawaddy, Myanmar and Mae Sot, Thailand. This includes the construction of a new bridge between Myawaddy and Mae Sot.

The economic impact of National Highway No. 3 in Myanmar is shown in Figure 5. The national highway is estimated to positively impact Myawaddy by 25.03%. It will also have a positive effect on Kawkareik, Hpa-An, and Thaton.

Figure 7.5. Economic Impact of National Highway No. 3 in Myanmar

(Impact Density, 2030)



Source: Institute of Developing Economies-Geographical Simulation Model result.

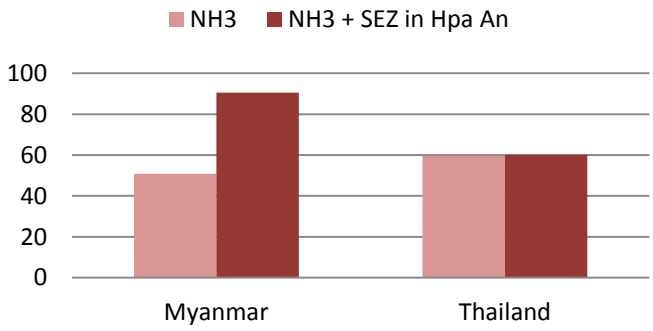
While the Tak province in Thailand, which shares a border with Myawaddy, is expected to receive a relatively small impact of 0.01%, the effect on Bangkok and its surrounding regions will be larger in terms of absolute value. The infrastructure improvements will also bring some positive effects on Ba Ria-Vung Tau, Viet Nam. This implies that an improvement of this section of the highway may benefit the economic activities along the southern economic corridor that connects Bangkok to southern Viet Nam.

Major cities in Myanmar such as Mandalay, Kyaing Tong, Tachileik, Pyin Oo Lwin, and Yangon will experience negative effects under this scenario because the economic activities are expected to move away from these cities and towards the regions traversed by National Highway No. 3. The positive impact on Myawaddy, Kawkareik, Hpa-An, and Thaton will be offset by the negative impact on the other regions of Myanmar.

In sum, the overall economic impact on Myanmar will be smaller than that on Thailand (Figure 7.6). Such results thus justify Thailand's support for this bypass project.

In addition, the positive impact on Hpa-An, Kawkareik, and Myawaddy are mainly on the service sector. In fact, 84.0% of the positive impact on Myawaddy is in the service sector. Recognising these issues, the simulation study set an additional scenario wherein Myanmar is assumed to establish a Hpa-An SEZ, which then increases the technological parameter of the manufacturing sector in Hpa-An by 10%, in addition to the improvement of National Highway No. 3 (the original scenario).

Figure 7.6. Economic Impact on Myanmar and Thailand
(in US$ million, constant 2010 prices)



SEZ = Special economic zone.
Source: Institute of Developing Economies-Geographical Simulation Model result.

As shown in Figure 7.6, the economic impact of this revised scenario on Myanmar is 1.7 times higher that of the original National Highway No. 3 scenario. Moreover, the contribution of the manufacturing sector to the overall economic impact on Hpa-An increases from 12.7% (under the original National Highway No. 3 scenario) to 73.1% (under the National Highway No. 3 + SEZ scenario). The result suggests that the development of an SEZ, in addition to road improvement, can enhance the industrial development of the region.

2.7 Noi Bai–Lao Cai Expressway

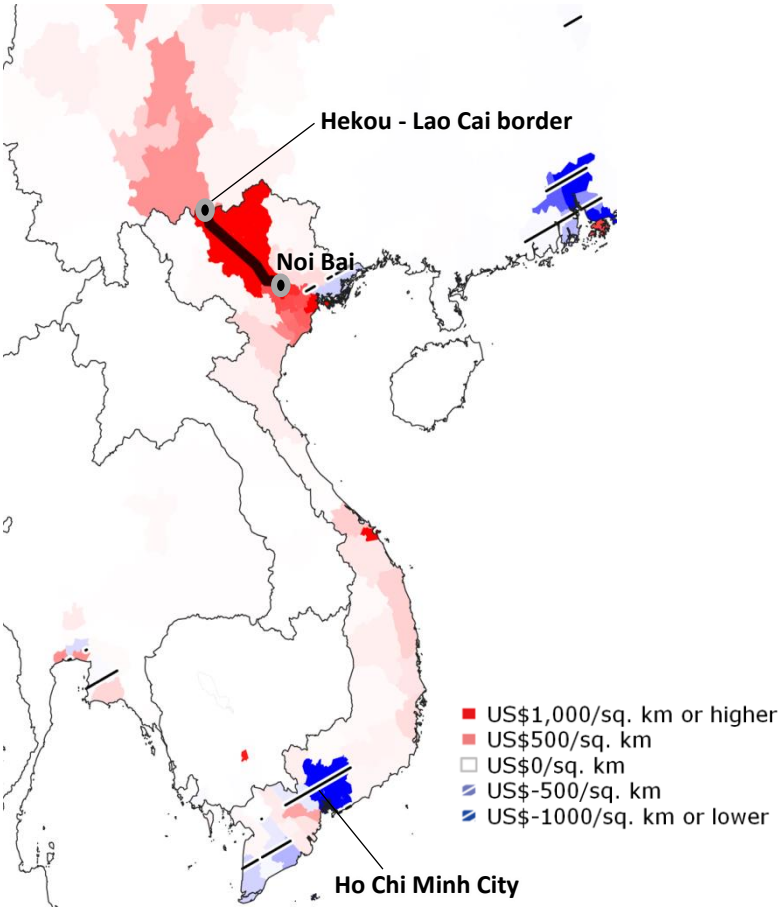
For the Noi Bai–Lao Cai Expressway, the scenario consists of the following:

- Improvement on the road between Noi Bai and Lao Cai (both in Viet Nam) so that trucks can travel this section at a speed of 60 km/h;
- Facilitation of border traffic between Lao Cai, Viet Nam; and Hekou, China.

Figure 7.7 shows the economic impact of the expressway's construction. In absolute value, Vinh Phuc, Phu Tho, and Lao Cai are the top three recipients of the positive impact from this scenario. Hanoi, Hai Duong, and the Hai Phong industrial belt area and the regions in Yunnan Province, China will also be positively affected by the developments. In contrast, the developments will negatively impact the southern part of Viet Nam – in particular, Ba Ria-Vung Tau, Dong Nai, and Ho Chi Minh City. In fact, the overall positive impact on China is 32.1% larger than that on Viet Nam because the negative effect on the southern part of Viet Nam reduces the overall positive impact on the nation.

Figure 7.7. Economic Impact of the Noi Bai–Lao Cai Expressway

(Impact Density, 2030)



Source: Institute of Developing Economies-Geographical Simulation Model result.

Table 7.4 lists the impact of the Noi Bai–Lao Cai Expressway on selected cities by economic sector. The importance of the manufacturing sector in Phu Tho (27.8%) is relatively higher than that in the other scenarios (Refer to Tables 2 and 3). This implies that Phu Tho has a manufacturing base, and the expressway can benefit Phu Tho province's industrial development. The significance of the manufacturing sector in the two Vietnamese areas Lao Cai and Yen Bai, are lower than that of Phu Tho, but still higher than that in the other scenarios in this study.

Table 7.4. Economic Impact of the Noi Bai–Lao Cai Expressway by Economic Sector (Selected Cities)

	Agriculture	Manufacturing	Service	All
Lao Cai	0.1%	13.2%	86.7%	100.0%
Phu Tho	0.4%	27.8%	71.9%	100.0%
Yen Bai	0.3%	17.2%	82.5%	100.0%

Source: Institute of Developing Economies-Geographical Simulation Model result.

3. Conclusions and Policy Implications

The simulation analyses on the five sub-corridor projects show different policy implications:

First, a sub-corridor development can help narrow the development gaps in a country as well as in the Mekong region. All scenarios indicate that the regions where there is an improved infrastructure will experience positive effect. These developments will also prevent the excessive influx of workers as well as mitigate traffic congestion in the largest economic cities. Based on simulation results, one cannot make a definitive conclusion that the road development in the Lao PDR section of the North–South Economic Corridor will not have any impact on Lao PDR (particularly the northern area of Lao PDR) at all just because its road will be used only for the transit trade between China and Thailand.

Second, any road improvement may not contribute much to the industrial development if the region does not have any existing industrial base. The scenario for the Noi Bai–Lao Cai Expressway shows that the expressway's construction can positively contribute to industrial development. On the other hand, results under the other scenarios in this study show that there is almost no positive impact on the manufacturing sector. An additional scenario regarding National Highway No. 3 suggests that the development of an SEZ, in addition to road development or improvement, can be a solution that will stimulate manufacturing activities in the region.

Third, a significantly positive impact on neighbouring countries is seen in the following projects: the Lao PDR section of the North–South Economic Corridor, the National Highway No. 3 in Myanmar, and the Noi Bai–Lao Cai Expressway. Such results justify the financial and technical support provided by higher-income neighbouring countries on these projects.

Improvements are not solely brought about by infrastructure development. Soft infrastructure initiatives such as the ASEAN Framework Agreement on the Facilitation of Goods in Transit (AFAFGIT) and bilateral memoranda of understanding, which facilitate the transit of trucks and drivers across borders, will also stimulate the economies on both sides of the border. Under bilateral agreements, a country that has a lower relative income and accepts traffic from a neighbouring country should consider the maintenance costs of their road and the appropriate ways to collect user fees because the benefits and costs should be shared between the two countries.

Lastly, these sub-corridor projects should be combined with the infrastructure projects in other regions. All five simulation results show that the positive economic impact cannot be spread all over a country, and that whatever positive effects there is could even be offset by the negative impact on other regions within the same country. Therefore, strategies on infrastructure projects should always have a regional perspective.

References

ASEAN (2011), *The Master Plan on ASEAN Connectivity.* Jakarta: ASEAN Secretariat.

ERIA (2015), *The Comprehensive Asia Development Plan 2.0*. Jakarta: ERIA.

Ishida, M., and I. Isono (2012), 'Old, New and Potential Economic Corridors in the Mekong Region'. In *Emerging Economic Corridors in the Mekong Region*, Masami Ishida (ed.), BRC Research Report No.8. Bangkok Research Center, IDE-JETRO.

Kumagai, S., K. Hayakawa, I. Isono, S. Keola, and K. Tsubota (2013), 'Geographical Simulation Analysis for Logistics Enhancement in Asia', *Economic Modelling*, 34. P. 145–153.