

ERIA Research Project Report 2018, No. 2

**2018 Progress Survey Report of
Infrastructure Projects in the Comprehensive
Asian Development Plan 2.0**

Edited by

Takafumi Fujisawa

Junichi Wada

Matthew LoCastro



Economic Research Institute for ASEAN and East Asia

2018 Progress Survey Report of Infrastructure Projects in the Comprehensive Asian Development Plan 2.0

Published by

Economic Research Institute for ASEAN and East Asia (ERIA)

Sentral Senayan 2, 6th floor,

Jalan Asia Afrika no.8,

Central Jakarta 10270

Indonesia

© Economic Research Institute for ASEAN and East Asia, 2019

ERIA Research Project FY2018 No. 2

Published June 2019

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form by any means electronic or mechanical without prior written notice to and permission from ERIA.

The findings, interpretations, conclusions, and views expressed in their respective chapters are entirely those of the author/s and do not reflect the views and policies of the Economic Research Institute for ASEAN and East Asia, its Governing Board, Academic Advisory Council, or the institutions and governments they represent. Any error in content or citation in the respective chapters is the sole responsibility of the author/s.

Material in this publication may be freely quoted or reprinted with proper acknowledgement.

Preface

The Economic Research Institute for ASEAN and East Asia (ERIA) submitted the Comprehensive Asia Development Plan (CADP) 2.0 to the East Asia Summit in 2015.

In the CADP 2.0, we update the infrastructure projects from the first CADP submitted to the 2010 East Asia Summit-Economic Ministers Meeting, reformulate the conceptual framework for connectivity and innovation, and discuss the quality of the infrastructure projects.

The CADP 2.0 lists 761 East Asian infrastructure projects in a wide range of sectors (e.g. roads and bridges, railroads, ports, and electric power) on which we conducted a survey in 2017–2018. Although the progress status of these projects may not be noticeable due to the short period over which the survey was conducted, the results reflect to some extent the political and economic situation in each country, as well as the influence of its policies.

Several important infrastructure projects were completed in 2018, and more projects will be completed in the coming years. We will continue to monitor the progress of these infrastructure projects and summarise trends and prospects obtained from the survey.

We received tremendous on-the-ground research and preparatory support within in each country highlighted in this report. The CADP team would like to thank and acknowledge the following groups and individuals:

Cambodia	Suzuki Hiroshi	Business Research Institute for Cambodia
Indonesia	Lutfah Ariana	Research Center for Science and Technology Development, Indonesian Institute of Sciences
Lao People's Democratic Republic	Leeber Leebouapao Sthabandith Insisienmay	National Institute of Economic Research
Malaysia	Firdaos Rosli	Institute of Strategic and International Studies Malaysia
Myanmar	Kan Zaw Nanda Hmun	Myanmar Academy of Social Sciences
Philippines	Gilberto M. Llanto	Philippine Institute for Development Studies
Thailand	Narong Pomlaktong	Neighbouring Countries Economic Development Cooperation Agency

Viet Nam	Nguyen Dac Phuong	Consultant and Inspection Joint Stock Company of Construction Technology and Equipment
----------	-------------------	--

East Asia Industrial Corridor Team

Project Members

Takafumi Fujisawa: Senior Policy Advisor, Research Department, East Asia Industrial Corridor team, Economic Research Institute for ASEAN and East Asia (ERIA)

Junichi Wada: Senior Policy Advisor, Research Department, Energy Unit, ERIA

Matthew LoCastro: Luce Scholar, Henry Luce Foundation, ERIA

Contents

	List of Figures	vii
	List of Tables	viii
Chapter 1	Overview	1
Chapter 2	Progress in Fiscal Years 2015–2018	3
Chapter 3	Highlighted Projects and Their Progress by Country	15
Bibliography		67
Appendices		
	Appendix 1: Regional Map—Greater Mekong Subregion	70
	Appendix 2: Regional Map—Indonesia-Malaysia- Thailand+ Subregion	71
	Appendix 3: Regional Map—Brunei Darussalam- Indonesia-Malaysia-Philippines+ Subregion	72

List of Figures

Figure 1.1:	Comprehensive Asian Development Plan 2.0 Digital Map	2
Figure 2.1:	Comprehensive Asia Development Plan Progress 2015–2018	5
Figure 2.2:	Progress by Subregion	11
Figure 3.1:	Sisophon Railway Station and the National Road No. 5 Improvement Project	19
Figure 3.2:	Map of the Southern Economic Corridor (Construction of the Stung Bot Border Crossing Facilities and Access Road to National Road No. 5 Project) and the Master Plan of Poipet PP Special Economic Zone	21
Figure 3.3:	Lower Se San 2 Hydropower Plant and Map of the Transmission Line from the Lower Se San 2 Hydropower Plant to Phnom Penh	23
Figure 3.4:	Lao People’s Democratic Republic–China Railway Financing Breakdown	34
Figure 3.5:	Nam Ngeip 1 Hydropower Dam Site	36
Figure 3.6:	China Railway High-Speed Railway Exhibition in Kuala Lumpur Station	39
Figure 3.7:	East Coast Development (East Coast Rail Link: Row 1, Kuantan Port: Row 2, Malaysia-China Kuantan Industrial Park: Row 3)	40
Figure 3.8:	Thaketa Bridge	44
Figure 3.9:	Myingyan Power Plant	46
Figure 3.10:	Bonifacio Global City–Ortigas Center Link	53
Figure 3.11:	The Eastern Economic Corridor Project	55
Figure 3.12:	Thailand’s Special Economic Zones	60
Figure 3.13:	Lach Huyen International Port	65

List of Tables

Table 2.1:	Progress by Tier	12
Table 3.1:	National Road No. 5	18
Table 3.2:	National Strategic Program Based on the National Medium-Term Plan 2015–2019	24
Table 3.3:	Transport Infrastructure Funding Gap	26
Table 3.4:	Overview of the National Socio-Economic Development Infrastructure of the Lao People’s Democratic Republic	31
Table 3.5:	Targeted Infrastructure Spending	49
Table 3.6:	Mode of Financing of Investment Requirements	50
Table 3.7:	Thailand Eastern Economic Corridor Project Overview	57
Table 3.8:	Thailand Special Economic Zone Project Overview	61

Chapter 1

Overview

The economic development of the Association of Southeast Asian Nations (ASEAN) and East Asia occurs in three stages: participation in production networks, the formation of industrial clusters, and the realisation of urban comfort. The Comprehensive Asian Development Plan (CADP) 2.0 highlights the importance of infrastructure quality according to the stage of economic development. To realise this plan, we presented 761 concrete projects as hard and soft infrastructure improvements. The CADP 2.0 was submitted to the East Asia Summit in 2015, along with the Master Plan on ASEAN Connectivity 2025, to continue efforts to improve the East–West Corridor and Southern Economic Corridor, and strengthen regional connectivity.¹

In this report, we review the progress² of these 761 projects in 11 sectors (roads and bridges, railways, ports and maritime, airports, other transportation, industrial estates and special economic zones (SEZs), energy and power, water supply and sanitation, telecommunications, urban development, and ‘other’ [containing the remaining projects]) in 12 countries (ASEAN, China, and India) in financial year (FY) 2018.³

We first summarise the progress of the CADP 2.0 projects in FY2018, and then show the progress of all 761 projects from 2015, both in total and by tier.⁴ We examine this progress based on the status of policy initiatives in each country. In addition, we detail the contents of and views on the projects, with a focus on each country. Within each country analysis, we indicate the tier of the projects highlighted due to their strategic importance with respect to domestic and regional development.

Infrastructure development takes many years from the conceptual stage through the construction stage to the operation stage. Although some of the projects listed in FY2015 have

¹ Vientiane Declaration on Promoting Infrastructure Development Cooperation in East Asia (Vientiane, 8 September 2016): ‘Continue efforts to make regional connectivity vibrant and effective through the early completion of projects listed in the Master Plan on ASEAN Connectivity 2025 and the Comprehensive Asia Development Plan 2.0 to improve the East–West Economic Corridor and Southern Economic Corridor.’

² This progress is evaluated in four stages: (i) conceptual, (ii) feasibility study, (iii) construction, and (iv) operation.

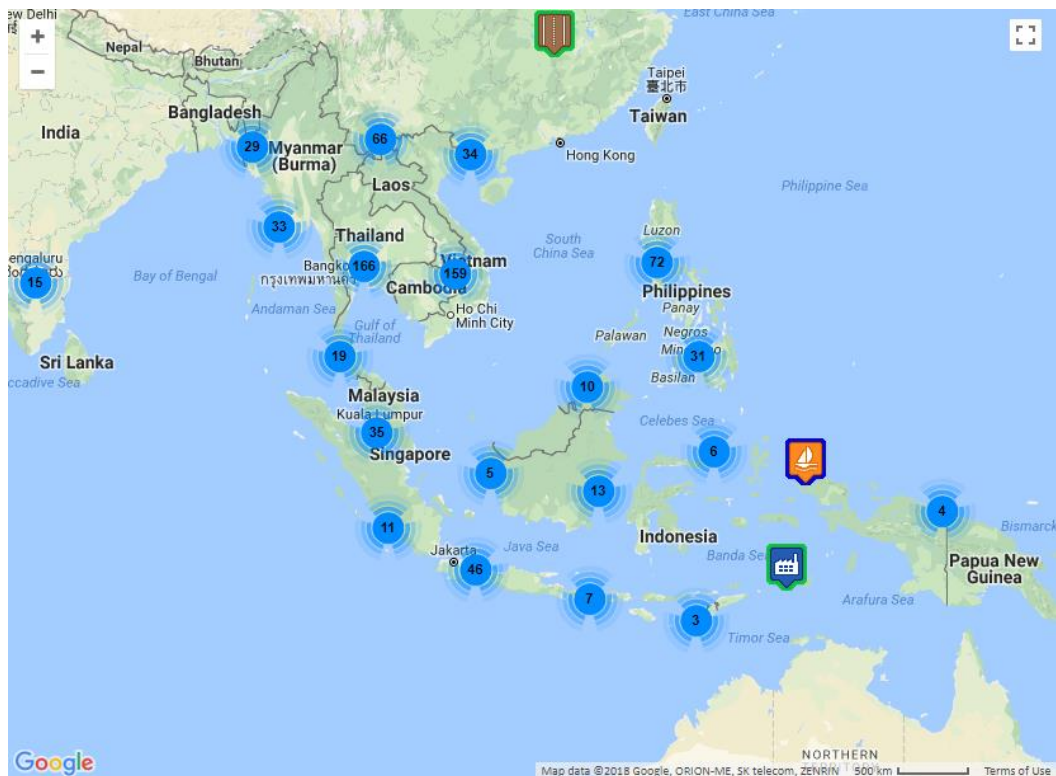
³ The survey period is from April 2018 to March 2019.

⁴ The CADP 2.0 classifies stages of development in terms of the degree of participation in production networks as follows: Tier 1—countries or regions already in production networks in which industrial agglomerations are beginning to form; Tier 2—countries or regions not yet fully integrated into rapid and high-frequency production networks; and Tier 3—countries or regions unlikely to come into rapid and high-frequency production networks in the short run, but that would like to provide a new framework for industrial development with the development of logistic infrastructure as a trigger.

been completed, there have also been some changes and discontinuations due to the policy changes taking place. We report on the current state of infrastructure development that will contribute to the improvement of ASEAN connectivity and development of innovation in FY2018.

The outline and progress of the 761 projects can be viewed on the CADP 2.0 digital map (<http://map.eria.org/>) launched on the website of the Economic Research Institute for ASEAN and East Asia in April 2019.

Figure 1.1: Comprehensive Asian Development Plan 2.0 Digital Map



Source: Economic Research Institute of ASEAN and East Asia. <http://map.eria.org/> (accessed 23 May 2019).

Chapter 2

Progress in FY2015–FY2018

Progress of All Comprehensive Asian Development Plan Infrastructure Projects

The Economic Research Institute for ASEAN and East Asia investigated 3 years of progress (2015–2018) of the 761 infrastructure projects chosen for the CADP 2.0 research initiative. In considering the status of these infrastructure projects, we discuss progress by region, country, tier, and sector.

1. Overall Progress

In 2015, the CADP 2.0 identified 761 infrastructure projects contributing to the development of connectivity and innovation. These projects focus on physical and economic infrastructure including roads, railways, ports, airports, power (generation and transmission), communication facilities, and industrial estates and SEZs. The report also includes the tracking of maintenance projects for water and sewage, medical, and educational infrastructure. These projects are vital for the development of both rural and urban development.

When selecting a project for evaluation, we considered the following points:

- (i) impact on the project area;
- (ii) the medium- and long-term plans of each country, priority projects, and projects related to neighboring countries; and
- (iii) the project's feasibility and ability to implement and/or construct the project.

Project progress has been classified into four stages: conceptual, feasibility study, construction, and operation. These classifications have been utilized each year since FY2015. The progress of each project was determined by interviews with government officials, researchers' reports, consultant analyses, and inspections of the project site in accordance with various media reports within each country. Figure 2.1 shows the progress of the 761 CADP 2.0 projects.

Although the CADP 2.0 covers projects in 11 sectors, progress can be tracked primarily within four major sectors: roads, SEZs, railways, and power. Compared with the road sector, which is steadily progressing to the construction and operation stages, progress in the railway sector requires more time for land acquisition and financing. Moreover, railway infrastructure takes longer to construct and often stagnates at the feasibility study stage. The progress of power-

generation projects and projects to develop SEZs has been focused on private enterprises. All seven projects in the SEZ sector are private enterprise projects, and all are at the operation stage. In addition, 43 projects in the power sector are at the operation stage, and 19 of the 30 power-generation projects are private or under public–private partnerships (projects that incorporate an element of private funding are considered private finance incentives).

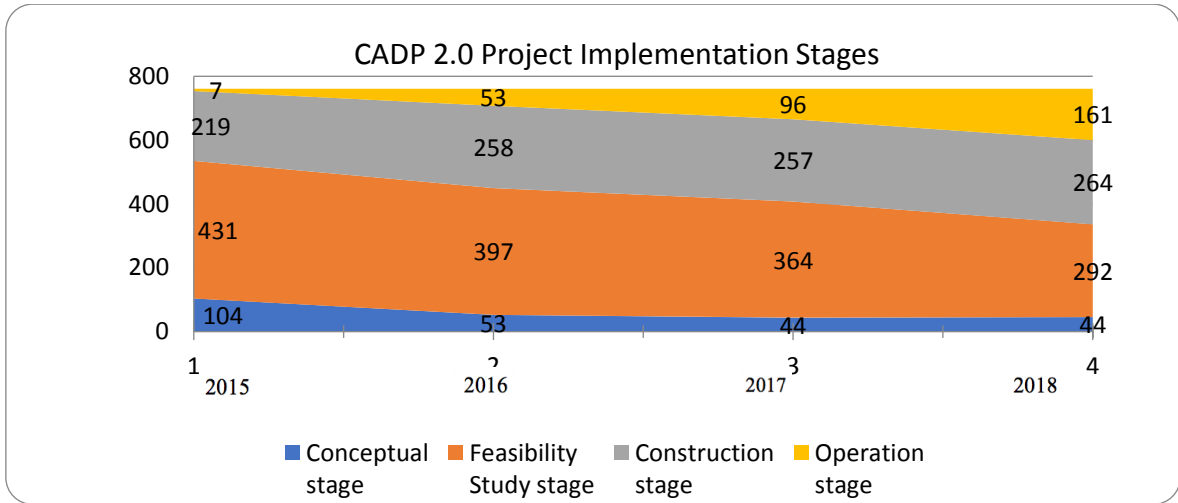
The number of operation-stage projects increased from 7 (1% of all projects) in 2015 to 161 (21%) in 2018, while that of projects in the construction stage increased from 219 (29%) in 2015 to 264 (35%) in 2018. Conversely, the total number of projects in the feasibility study stage decreased from 431 (57%) in 2015 to 292 (38%) in 2018, and that of projects in the conceptual stage decreased from 104 (14%) in 2015 to 44 (6%) in 2018 (this includes no change during FY2016–FY2018). Most conceptual-stage projects are unlikely to progress to the feasibility study stage.

In addition, as of 2018, 24 projects have been discontinued or postponed: seven in Indonesia, three in Malaysia, six in Myanmar, six in Thailand, and two in Viet Nam. By tier, these projects comprise 5 Tier 1 cases, 16 Tier 2 cases, and 3 Tier 3 cases. By sector, 3 of the projects concern roads, 4 ports, 2 airports, 13 power, 1 urban development, and 1 the water supply. The power sector, which accounts for the largest number of cancelled projects, included five thermal power projects in Myanmar; three hydropower projects, one transmission line project, and two nuclear power projects in Viet Nam; and two hydropower projects in Malaysia.

Currently, 70 projects (9% of the total, including 46 projects in the conceptual stage that have not been advanced) have no prospect of execution. Land acquisition and finance composition are the most important factors in determining when construction can begin on a project. Land acquisition often poses the most trouble due to higher land prices than initially anticipated, budget shortages due to price increases (including wages), and local regulatory barriers. In addition, events such as construction interruption due to payment delays from the order side have also occurred. However, although some projects have stagnated or been discontinued or postponed, development has begun for many of the projects (161) that conducted a feasibility study during 2015–2018. Currently, 425 projects (56%) have been completed or are moving toward realisation, and some are under construction.

Countries across the region have determined the need for infrastructure development as the foundation for other policies. To this end, the CADP captures that countries in Asia are actively implementing development frameworks in line with infrastructure-driven economic growth goals.

Figure 2.1: Comprehensive Asian Development Plan Progress 2015–2018



CADP = Comprehensive Asian Development Plan.
Source: Authors.

2. Progress by Subregion

The CADP 2.0 infrastructure projects have been classified into three subregions: Mekong, Brunei Darussalam-Indonesia-Malaysia-Philippines+ (BIMP+), and Indonesia-Malaysia-Thailand+ (IMT+).

2.1 Greater Mekong Subregion

There are 517 infrastructure projects in the Greater Mekong Subregion (GMS), accounting for about 68% of all projects. During 2015–2018, the number of projects in the operation stage increased from 1 (0% of all projects) to 107 (21%), while that of projects in the construction stage also increased from 149 (29%) to 172 (33%). Conversely, the number of projects in the feasibility study stage decreased from 297 (57%) to 214 (41%), and that of projects in the conceptual stage decreased from 70 (14%) to 24 (5%). To strengthen physical and economic connectivity in the GMS, infrastructure development must continue to focus on the South Economic Corridor connecting Ho Chi Minh City to Phnom Penh, Bangkok, and Dawei. Development of the South Economic Corridor road in Cambodia has been progressing smoothly, but that of Dawei, the gateway to the Indian Ocean in Myanmar, has not progressed. In addition to the number of projects planned for the South Economic Corridor, several developments have been planned for the East–West Economic Corridor connecting Yangon in Myanmar to Da Nang in central Viet Nam through the Lao People’s Democratic Republic (PDR) and Thailand.

The East–West Economic Corridor includes the development of a port and other facilities in Da Nang, which will act as the gateway to the Viet Nam side of the border. This project will be advanced in conjunction with the development of National Road No. 9 crossing the Lao PDR, and the Friendship Bridge across the Mekong River to Thailand. Single-stop and single-window operations have begun across several of these border crossings to reduce non-tariff barriers. On the Myanmar side, the Second Thai–Myanmar Friendship Bridge with Thailand was completed in 2018, and the road from Thailand to Yangon has also been improved. Construction of the Thilawa Industrial Park and other areas near Yangon have also been completed, indicating that preparations for industrial development centred on the East–West Economic Corridor are in place. In 2017, the Long Binh (Long An)–Chory Thom Bridge over the Mekong River between Viet Nam and Cambodia opened with the cooperation of both countries. The construction of the Fifth Friendship Bridge between Thailand and the Lao PDR will also be completed soon as it is currently in the final stages of construction.

There are still several unfinished plans for infrastructure development in the GMS to continue to promote economic revitalisation in the future. These plans include evaluating high-standard roads from Vientiane in the Lao PDR to Hanoi in Viet Nam, and the consistent development of the international power grid to make it possible to share power generated in the Lao PDR across the region economically. Thus far, these developments have been primarily supported by neighbouring countries based on bilateral contracts, to further encourage Thailand, Viet Nam, and Cambodia to import energy from the Lao PDR.

2.1.1 Cambodia

As of 2018, of the 68 projects in Cambodia, 26 (38%) are in the operation stage and 19 (28%) are in the construction stage. These projects focus on the Thailand-Plus-One Strategy for economic development, involving economic cooperation between Thailand and the other Mekong nations. This has included the improvement of National Roads No. 5 and No. 6 of the Southern Economic Corridor, as well as the development of border cities outside Thailand but near the border, such as the installation of industrial parks in Poipet, and the resurgence of railway networks. This allows Thailand to take advantage of cheaper labour, and neighbouring nations to take advantage of regional development opportunities by increasing the flow of business and capital.

The Cambodia Industrial Development Policy 2015–2025 (enacted in May 2015) prioritises logistical improvements for the South Economic Corridor. In addition, construction is underway on a hydroelectric power plant in Strung Treng (northern Cambodia) and thermal power plant in southern Sihanoukville, as is the development of a transmission line project connecting various parts of the country.

Preparations are being undertaken to solve the issues of power shortages and high power costs, which have bottlenecked Cambodia's economic development. Steady progress in the development of infrastructure, such as roads and electricity, will create a foundation for

industrial development while promoting Cambodia's overall economic growth, primarily centred on the South Economic Corridor.

2.1.2 Lao People's Democratic Republic

As of 2018, of the 61 projects in the Lao PDR, 11 (18%) are in the operation stage and 22 (36%) are in the construction stage. Six projects focusing on road improvement were completed in 2018; however, many projects remain unfinished due to the lengthy wait times to arrange funds, which has resulted in many projects struggling to advance from the feasibility study stage to the construction stage.

The hydroelectric capacity of the Lao PDR, known as the battery of the Indochina peninsula, has reached a total of 20,000 megawatts, and the construction of hydroelectric power plants in the Mekong basin is proceeding steadily. In the 8th National Socioeconomic Development Plan (2015–2020), the Government of the Lao PDR outlined its goal to improve the public works, transport, and power sectors. The development of the power sector focuses on ensuring the stability of the power supply. Of the 25 power projects, 14 involve the construction of hydropower plants; 1 plant has been built, 10 are under construction, and 3 are at the feasibility study stage.

The Tier 2 Lao PDR–China Railway project aims to connect Kunming, China with Vientiane through the border city of Boten in the Lao PDR. This project, which is supported by funds and technology from China, began in FY2016 and is also proceeding quickly; it is scheduled to be completed in December 2021. This will result in an increasingly intertwined economic dynamic between the Lao PDR and China that will require further study.

2.1.3 Myanmar

As of 2018, of the 87 projects in Myanmar, 18 (21%) are in the operation stage and 28 (32%) are in the construction stage. Under the new administration inaugurated in March 2016, the 30-20 National Comprehensive Development Plan 2010–2030 was updated to the Myanmar Sustainable Development Plan in July 2016.

One of the 12 economic policies set out in this plan focuses on advancing the development of roads, ports, and power infrastructure to provide a foundation for economic industrialisation. The new administration introduced five projects for thermal power plants and one for a hydropower plant. Other plans (all of which are classified as Tier 2) include the development of flyovers to mitigate traffic congestion in Yangon City, the introduction of a bus rapid transit system, the improvement of equipment at Myanmar's international airport, the modernisation of equipment for the circle line of the Myanmar National Railway, and the commencement of railway rehabilitation work.

One example of the development of industrial parks and SEZs is the infrastructure development at the Thilawa Industrial Park in the suburbs of Yangon. Efforts to attract foreign companies have

been undertaken through the revision of SEZ laws, and there have been efforts to increase economic cooperation along the East–West Economic Corridor on the border with Thailand. The development of the Friendship Bridge is also underway. In the city of Mandalay, a pipeline connecting the Kyaukpyu Industrial Park (which faces the Indian Ocean) with China has also been completed, and a feasibility study of the railway linking Mandalay with the city of Muse at the Chinese border was completed at the end of 2018.

2.1.4 Thailand

As of 2018, of the 115 projects in Thailand, 13 (11%) are in the operation stage and 51 (44%) are in the construction stage. The reason why so few projects have been completed is that many of the projects are large, and involve lengthy construction periods.

Of these 115 projects, 39 are railway projects, including high-speed railways (Tier 1), mass rapid transit (MRT) systems based on those in Bangkok, and single to double track projects (Tier 2) connecting local cities. The purple line (Tier 1) was completed in 2016, and the dark green line extension (Tier 1) was completed in 2018. These MRT projects are contributing to Bangkok's growing ability to innovate. It is also important to note that 9 of the 21 rail projects contributing to the MRT construction in Bangkok will utilise private–public partnership agreements.

The Government of Thailand is planning to connect the two international airports in Bangkok with the U-Tapao Airport in Rayong by the Bangkok–Rayong high-speed railway. The bidding stage of this project was completed in 2018. The goal of this expansion is to realise the development strategy of the Eastern Economic Corridor within the Thailand 4.0 strategy.

Construction of the high-speed railway (Tier 1) from Bangkok to Nakhon Ratchasima in the northeast of Thailand and Vientiane in the Lao PDR began in 2018 near Nakhon Rachasima, but little progress has been made. With regard to the section stretching from Nakhon Rachasima to the Lao PDR border town of Nong Khai, negotiations with the Chinese side have been prolonged, and the specific completion date is unclear. No progress has been made on the high-speed railway line connecting Bangkok and Chiang Mai given the lack of coordination with the Government of Japan in terms of funding.

2.1.5 Viet Nam

As of 2018, there are 152 projects in Viet Nam, the largest portfolio of projects in the GMS. Of these projects, 28 (18%) are in the operation stage and 45 (30%) are in the construction stage. The Social and Economic Development Ten-Year Strategy adopted in 2011 identifies ‘maintenance of transportation and urban infrastructure’ as one of the breakthroughs in economic development that the Government of Viet Nam is striving to achieve. Infrastructure development at a consistent pace has been concentrated on Tier 1 investments in Hanoi and Ho Chi Minh.

Notable progress is taking place in the Hai Phong area, a suburb of Hanoi. The port city of Hai Phong acts as a gateway to northern Viet Nam and is a strategic hub in Viet Nam’s economic development. The opening of the Lach Huyen Port (Tier 1) in 2018 further supported this development, as did the completion of an expressway network (Tier 1) connecting Hai Phong with Hanoi and the construction of an industrial agglomeration near Hanoi.

The city of Da Nang will also continue to abide by the Asia-Pacific Economic Cooperation Summit’s vision from November 2017 by expanding and modernising Da Nang International Airport. With regard to Tier 1 projects, high-technology parks have also been completed, and port repair work has begun.

Da Nang, which is located at the eastern end of the East–West Economic Corridor, is promoting the installation of roads, ports, and industrial parks aimed at distribution bases. Da Nang will increase the number of enterprises in the city from approximately 21,000 companies (98% of which are small and medium-sized enterprises) to 30,000 companies by 2020, focusing on tourism, trade, high-technology, and information and communications technology companies. Viet Nam is aiming to achieve its own development and establish Da Nang as an economic halfway point between north and south Viet Nam, with the aim of equipping the city to act as the central location along the east end of the East–West Economic Corridor.

2.2 Brunei Darussalam-Indonesia-Myanmar-Philippines+

There are 172 infrastructure projects in the BIMP+ region: 82 in Indonesia and 77 in the Philippines. From 2015 to 2018 these projects advanced as follows: the number of projects in the operation stage increased from 6 (3% of the total) to 34 (20%); that of projects in the construction stage increased from 47 (27%) to 64 (37%); that of projects in the feasibility study stage decreased from 97 (56%) to 65 (38%); and that of projects in the conceptual stage decreased from 22 (13%) to 9 (5%). Among the BIMP+ countries, Indonesia’s achievements are remarkable, and as of 2018 the country had a total of 60 projects (73%) in either the operation or construction stage: 23 (28%) in the operation stage, and 37 (45%) in the construction stage.

2.2.1 Indonesia

In view of the April 2019 presidential election, the current administration under President Joko Widodo (Jokowi) developed Java's highway network (a Tier 2 project) to gain public support by implementing domestic infrastructure development. The Jakarta MRT was opened in March, building on a successful history of railway infrastructure advancements starting with the airport railway (a Tier 1 project), which was completed in 2017. In addition, seven SEZs (Kawasan Ekonomi Khusus) and 17 industrial estate (Kawasan Industri) measures have been launched to attract foreign capital actively.

2.2.2 Philippines

The Philippines has a total of 77 projects but has struggled to progress these projects. Of these, 30 (39%) are currently in either the operation or construction stage: 9 (12%) are in the operation stage and 21 (27%) are in the construction stage. Of the 30 road projects in and around Manila, where traffic congestion is a major social issue, only 3 have been completed and 11 are incomplete. Of the 11 incomplete projects, 4 are under construction, 6 are in the feasibility study stage, and 1 is in the conceptual stage. The Government of the Philippines regards the 75 infrastructure flagship projects approved by the National Economic Development Agency as fundamental to the nation's future economic growth. The total value of these projects is \$31.6 billion, and they have a set completion date of 2022, while President Rodrigo Duterte is still completing his term in office.

The railway sector accounts for most of the project costs, including the extension and establishment of existing MRT and light rail transit lines crossing the city centre of Manila as measures to reduce traffic congestion in Metro Manila (Tier 1 projects). Japan will also support a commuter railway (Tier 2) project linking the city of Manila with the suburbs, as well as the maintenance of the Philippine National Railways from Legazpi in Albay Province to Manila (a distance of approximately 650 kilometres [km]). The new railway will extend another 100 km from Davao on Mindanao Island to Tagum via Digos, and will be implemented with support from China.

2.3 Indonesia-Malaysia-Thailand+

There are a total of 72 infrastructure projects in the IMT+ region. From 2015 to 2018, the number of projects in the operation stage increased from 0 (0%) to 18 (25%), while that of projects in the construction stage increased from 23 (32%) to 30 (42%). Meanwhile, the number of projects in the feasibility study stage decreased from 37 (51%) to 21 (29%); and that of projects in the conceptual stage decreased from 12 (17%) to 3 (4%). In the IMT+ region, 33 projects (67%) are in either the construction or operation stage, more than in all the other subregions under consideration.

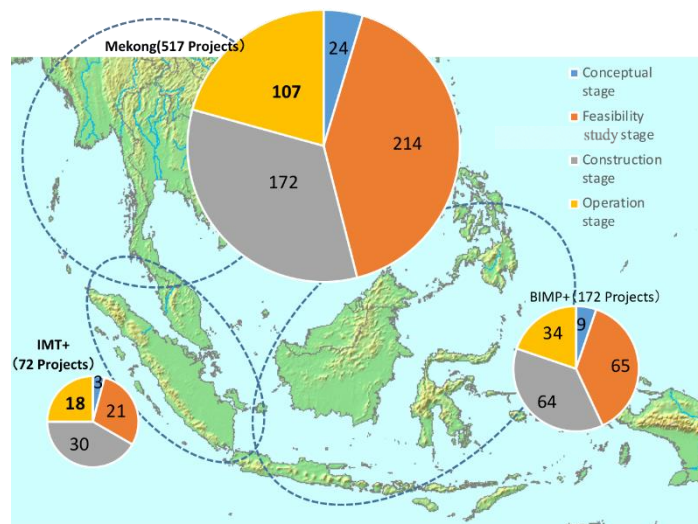
2.3.1 Indonesia

In both the IMT+ and BIMP+ regions, Indonesia (specifically Sumatra Island) has made remarkable progress; as of 2018, 12 projects (35%) were in the operation stage and 13 (38%) in the construction stage, a total of 25 cases (73%). The Jokowi administration advocates a Marine State Initiative based on the development of marine infrastructure, and of the 24 major port expansion plans of the Tol Laut Strategy in the National Medium Term Development Plan 2015–2019, which was announced in 2015, four are in the IMT+ area. Three of these expansion projects have been completed. Moreover, maintenance of the expressway network near Medan, which is part of the Sumatra toll road, the backbone of Sumatra Island, is underway. The main focus of this project is to support the development of marine infrastructure, such as improved access to Belawan Port and Kuala Tanjung international hub port, that will soon be implemented.

2.3.2 Malaysia

Due to financial problems arising from the fiscal changes that occurred in 2018, Malaysia has postponed plans for the high-speed railway between Kuala Lumpur and Singapore until 2021, as well as the multi-pipeline plan supported by China. During April 2019, East Coast Railway stakeholders successfully negotiated with the project’s Chinese stakeholders to reach a new agreement. The contract contents, which were considered extremely disadvantageous to the Malaysian side, were to be substantially changed, and construction is set to resume.

Figure 2.2: Progress by Subregion



Source: Authors.

3. Progress by Tier

The CADP 2.0 infrastructure projects are classified into three tiers, as outlined in Table 2.1 below.

Table 2.1: Progress by Tier

	Tier 1 (222)			
	Conceptual	Feasibility Study	Construction	Operation
2015	29	137	55	1
2016	8	129	67	18
2017	7	114	74	27
2018	7	95	81	39
2015–2018	Δ22	Δ42	Δ26	Δ38
	Tier 2 (432)			
	Conceptual	Feasibility Study	Construction	Operation
2015	58	247	126	1
2016	35	223	153	21
2017	29	203	146	54
2018	26	166	143	97
2015–2018	Δ32	Δ81	Δ17	Δ96
	Tier 3 (107)			
	Conceptual	Feasibility Study	Construction	Operation
2015	17	47	38	5
2016	10	45	38	14
2017	8	47	37	15
2018	8	34	40	25
2015–2018	Δ9	Δ13	Δ2	Δ20

Source: Authors.

3.1 Tier 1

There are 222 Tier 1 infrastructure projects. From 2015 to 2018, the number of projects in the operation stage increased from 1 (0%) to 39 (18%), and that of projects in the construction phase increased from 55 (25%) to 81 (36%). Meanwhile, the number of projects in the feasibility study stage decreased from 137 (62%) to 95 (41%), and that of projects in the conceptual stage decreased from 29 (13%) to 7 (3%).

In Tier 1 urban areas, demand for infrastructure, especially in the transport sector, is increasing in step with economic and population growth, and this is also accelerating the start of construction. Although urban railway projects are an economically effective measure, huge costs of construction, procurement, and land acquisition in urban areas present the largest bottlenecks. With respect to Tier 1, new infrastructure projects are emerging one after another as a result of the relationship between politics and the rapidly changing social situation. Viet Nam is making noticeable progress, with 81 projects (36% of the total) underway, the largest number of ongoing Tier 1 projects in a single country.

In Viet Nam, the construction of ring roads and urban railways in Hanoi and Ho Chi Minh, and of ports, airports, and high-technology parks in Da Nang has reached completion. In Jakarta, terminal expansion works are scheduled to be completed in 2019. These projects include the Tanjung Priok Port, the largest port being constructed among these projects. Under this project, which is currently underway, the port's capacity will be expanded to about 11.5 million 20-foot equivalent units, approximately twice its current capacity. After construction is completed, large container vessels will be able to enter the port, greatly increasing the cargo retention time and reducing logistics costs.

In FY2017, the Tanjung Priok Port Access Expressway led to a reduction in travel time to the Tanjung Priok Port and the industrial parks east of Jakarta. The expressway also alleviated traffic congestion. Another development that has alleviated traffic congestion is the Jakarta MRT, which stretches 15.7 km north–south and can be travelled in 30 minutes. The MRT, which opened on 24 March 2019, has also been framed as an urban amenity that is expected to help innovation blossom, as opposed to a mere transportation method to reduce congestion.

3.2 Tier 2

There are 432 Tier 2 infrastructure projects, accounting for about 57% of all projects. Most projects in Cambodia and Myanmar are classified as Tier 2. From 2015 to 2018, the number of Tier 2 projects in the operation stage increased from 1 (0% of the total) to 97 (22%), and that of projects in the construction stage increased from 126 (29%) to 143 (34%). Meanwhile, the number of projects in the feasibility study stage decreased from 247 (57%) to 166 (38%), and that of projects in the conceptual stage decreased from 58 (13%) to 26 (6%). With respect to Tier 2 projects, Cambodia has made remarkable progress; as of 2018, there were 25 projects (38%) in the operation stage and 19 (29%) in the construction stage. In Myanmar as of 2018, there were 17 projects (20%) in the operation stage and 27 (32%) in the construction stage.

3.3 Tier 3

There are 107 Tier 3 infrastructure projects, including 44 in Indonesia and 32 in the Lao PDR (70% of projects in these countries). From 2015 to 2018, the number of Tier 3 projects in the operation stage increased from 5 (5% of the total) to 25 (23%), and that of projects in the construction phase increased from 38 (36%) to 40 (37%). Meanwhile, the number of projects in the feasibility study stage decreased from 47 (44%) to 34 (32%), while that of projects in the conceptual stage decreased from 17 (16%) to 8 (7%). With respect to Tier 3 projects, similar to the BIMP+ and IMT+ regions, Indonesia has made remarkable progress, with 13 projects (27%) in the operation stage and 20 (45%) in the construction stage. On the other hand, the Lao PDR has seven projects (22%) in the operation stage and 10 (31%) in the construction stage.

Chapter 3:

Highlighted Projects and Their Progress by Country

The following eight sections will provide a high-level overview of development progress in selected Association of Southeast Asian Nations (ASEAN) member states since 2017. Each country will be evaluated based on the consideration of individual projects as well as each country's master plan(s), if extant. The following country overview highlights projects according to their tier classification, when applicable.

1. Cambodia

1.1 Policy Trend(s): Industrial, Transportation, and Economic Master Plans

The Government of Cambodia has established a plan to maintain sustainable, inclusive, and high economic growth through economic diversification, strengthened competitiveness, and the promotion of productivity. The government's vision consists of three goals:

- (i) Increase the gross domestic product (GDP) share of the industrial sector from 24.1% in 2013 to 30.0% by 2025, and that of the manufacturing sector from 15.5% in 2013 to 20% in 2025.
- (ii) Diversify goods exports by increasing the export of non-textile goods to 15% of all exports and that of processed agricultural products to 12% of all exports by 2025.
- (iii) Encourage the formal registration of 80% of small enterprises and 95% of medium-sized enterprises, and ensure that 50% of small enterprises and 70% of medium-sized enterprises have proper accounts and balance sheets.

To realise these targets, the government has embraced four strategies:

- (i) Mobilise and attract foreign investment as well as private domestic investment by focusing on large industries, expanding markets, and enhanced technology transfer.
- (ii) Develop and modernise small and medium-sized enterprises by expanding and strengthening the manufacturing base, modernising the registration of enterprises, and ensuring technology transfer and industrial linkages.
- (iii) Revisit the regulatory framework to strengthen country competitiveness through investment and trade facilitation, dissemination of market information, and reduction of informal fees.

- (iv) Coordinate supporting policies, such as the development of human resources; technical training; improvement of industrial relations; development of support infrastructure such as transportation and logistics and an information and communications technology (ICT) system; the supply of electricity and clean water; and public, social, and financial services.

A cornerstone of these development initiatives is the Industrial Development Policy (IDP), which was originally created and adopted in March 2015 as a guide to promote the country's industrial development. As its core strategy to implement the IDP and thus enhance Cambodia's competitiveness and attractiveness, the government has adopted the following four key concrete measures to be accomplished by 2018:

- (i) reduce the price of electricity for targeted industrial zones, expand transmission coverage, and improve supply reliability;
- (ii) prepare and implement a plan to develop a multimodal transport and logistics system;
- (iii) develop and strengthen a mechanism to manage the labour market; and
- (iv) develop and transform Sihanoukville province into a multi-purpose special economic zone (SEZ).

The IDP also forms the basis for the National Transport and Logistics Master Plan. This master plan, which is being constructed primarily with the assistance of the Japan International Cooperation Agency (JICA), aims to develop sufficient capacity to meet future demand on volume; sufficient diversity of services to meet future demand with regard to quality; and speedy, stable, and cost-effective transportation to support industry growth and development. The strategies of this plan are to develop economic corridors and international gateways, develop logistics hubs for multi-modal transport, fully realise seamless border management, enhance the capacity of logistics service providers, and strengthen national legal and institutional frameworks.

Cambodia's plan to achieve an affordable electricity tariff is based on the National Strategic Development Plan. In particular, the government aims to ensure supply capacity, improve electrification, and reduce tariffs.

During 2010–2016, electricity demand increased by 18% and power generation increased by 19% year on year. Previously, Cambodia depended entirely on oil power generation and imports from neighbouring countries; however, with the rapid growth of coal and hydropower, imports of electricity have largely decreased since 2010. The Cambodia energy outlook also reports that the electricity demand will increase by a factor of 7.5 from 2015 to 2040. Based on this situation, the Economic Research Institute of ASEAN and East Asia and the Ministry of Mines and Energy

prepared a Basic Energy Plan for Cambodia that is appropriate, comprehensive, feasible, and effective. This plan recommends the following countermeasures for electricity:

- (i) The power generation mix in 2030 will consist of coal (35%), hydropower (55%), and renewable energy consisting of biomass and solar photovoltaics (10%). This mix will maintain affordability and security.
- (ii) Resilience improvements to the transmission and distribution networks will reduce transmission and distribution losses from 13% in 2016 to 8% in 2030, decrease the System Average Interruption Duration Index to less than 620 minutes per year, and decrease the System Average Interruption Frequency Index to less than 7.3 times per year. Connection to the national grid will increase the household electrification ratio from the current 70% to 95% by 2030, which will contribute to accessibility, security, and safety.
- (iii) Reforms of electricity tariffs, such as time-of-use and cross-subsidy systems, must contribute to the levelisation of the electricity demand and elimination of the price gap between urban and rural areas while maintaining affordability and transparency.

These development plans share an emphasis on connecting the major economic poles and three economic corridors in Cambodia: Phnom Penh–Sihanoukville, Phnom Penh–Bavet, and Phnom Penh–Poipet.

1.2 Highlighted Projects

1.2.1 Southern Economic Corridor Projects

In recent years, significant steps have been taken to improve the economic relationship between Thailand and Cambodia. This has resulted in the comprehensive development of logistical infrastructure to support the mutually beneficial economic relationship envisioned by the two nations. These logistical investments to support economic advancement have taken shape around the northwest region of Cambodia and the southeast region of Thailand in Poipet, an area known as the South Economic Corridor. The National Road No. 5 from Phnom Penh to the Thai border is the most important route for improving logistics within the South Economic Corridor under the IDP. At Poipet, the construction of new entry and exit facilities and access roads is underway. The Phnom Penh Special Economic Zone (PPSEZ), which opened in fiscal year 2018, is located near National Road No. 5 with newly built entry and exit facilities near the Thai border. In the future, Thai companies are expected to expand into the 'Thailand Plus One' network, which aims to transfer labour-intensive processes concentrated in Thailand to Myanmar, Cambodia, and the Lao People's Democratic Republic (PDR) where labour costs are low and a labour force can be easily secured. This would strengthen the economic relationship between the two countries at the border. Meanwhile, a railway to Phnom Penh running parallel to National Road No. 5 has opened; it currently operates once a week and mainly transports passengers. Track network improvements continue to signal future success in the achievement of Cambodia's development goals.

National Road No. 5 Improvement Project (Tier 2)

Linking Phnom Penh and the Thai–Cambodia border, National Road No. 5 serves as a trunk road for Cambodia and composes a portion of the Asian Highway and the Southern Economic Corridor; it is expected to function as a major industrial artery for the Greater Mekong Subregion (GMS). The National Road No. 5 Improvement Project (Prek Kdam–Thlea Ma’am section) will repair and widen National Road No. 5 between Prek Kdam and Thlea Ma’am near Phnom Penh where traffic is heaviest, and construct two bypasses to detour around the urban areas of Kampong Chhnang and Odong, thus increasing transportation capacity and improving transportation efficiency in the target area. This project will support the construction of an extension of an existing road by approximately 118.7 kilometres (km), a new bypass road 11.8 km long in Kampong Chhnang, and a new four-lane bypass 4.9 km long in Odong. The Government of Japan provided Japanese official development assistance (ODA) loans for this project. The first loan (for Section I), amounting to ¥1.699 billion (\$15.4 million), was signed on 10 July 2014; and the second loan (for Section II), amounting to ¥17.298 billion (\$157.2 million), was signed on 31 March 2016.

Table 3.1: National Road No. 5

Chroy Chang Var Bridge– Prek Kdam Bridge	About 33 km	Construction was completed in 2017. Some additional work is ongoing.
Prek Kdam–Thlea Ma’am	135.4 km	Construction began in 2017 and is expected to last until 2021.
Thlea Ma’am– Battambang	About 100 km	The bidding process is ongoing. Construction work will be carried out from 2019 to 2021.
Battambang– Sri Sophorn (Sisophon)	81.2 km	The construction contracts were signed. Construction began in 2017 and will be completed in 2020.
SriSophorn (Sisophon)– Poipet	48 km	The bidding process is ongoing. Construction work will be carried out from 2019 to 2021.

km = kilometre.

Source: Authors.

Railway: Northern Line (Tier 2)

The northern line railway connects Phnom Penh and Poipet, which lies on the border with Thailand. Renovation of the rail line began in 2010 with assistance from the Asian Development Bank (ADB); however, progress was very limited because of funding shortages.

The section between Poipet and Sisophon was completed on 4 April 2018, the section between Sisophon and Battambang was completed on 29 April 2018, and the section between Battambang and Pursat was completed on 29 May 2018. Finally, the entire northern line between Poipet and Phnom Penh (a distance of about 390 km) become operational on 4 July 2018. Although the rails are connected, they are not equipped with safety equipment, such as signalling systems or crossing gates.

Most of the track is 60 years old or older. Of the 167 bridges on the line, 46 have suffered damage from landmines or other impacts of war and have received temporary repairs. Speed is restricted to 5–10 km per hour (km/h) at 30 bridge sites. The international train between Thailand and Cambodia is still being planned; negotiations for agreement between the two governments are ongoing and are expected to be completed in 2019.

Figure 3.1: Sisophon Railway Station and the National Road No. 5 Improvement Project



Source: Authors.

Border Checkpoint at Poipet for Cargo (Tier 2)

The Poipet PPSEZ (a privately operated zone) includes the development of a new border checkpoint, illustrating the high level of government cooperation within this project. The loan agreement for the construction of the Stung Bot Cross Border Facilities and Access Road to National Road No. 5 was signed on 19 February 2016 between Cambodia's Ministry of Economy and Finance and Thailand's Neighbouring Countries Economic Development Cooperation Agency. The loan amount is B928,110,681 (approximately \$26.34 million). The loan covers border control facilities, roads, dormitories, cross-dock warehousing, a container yard, the

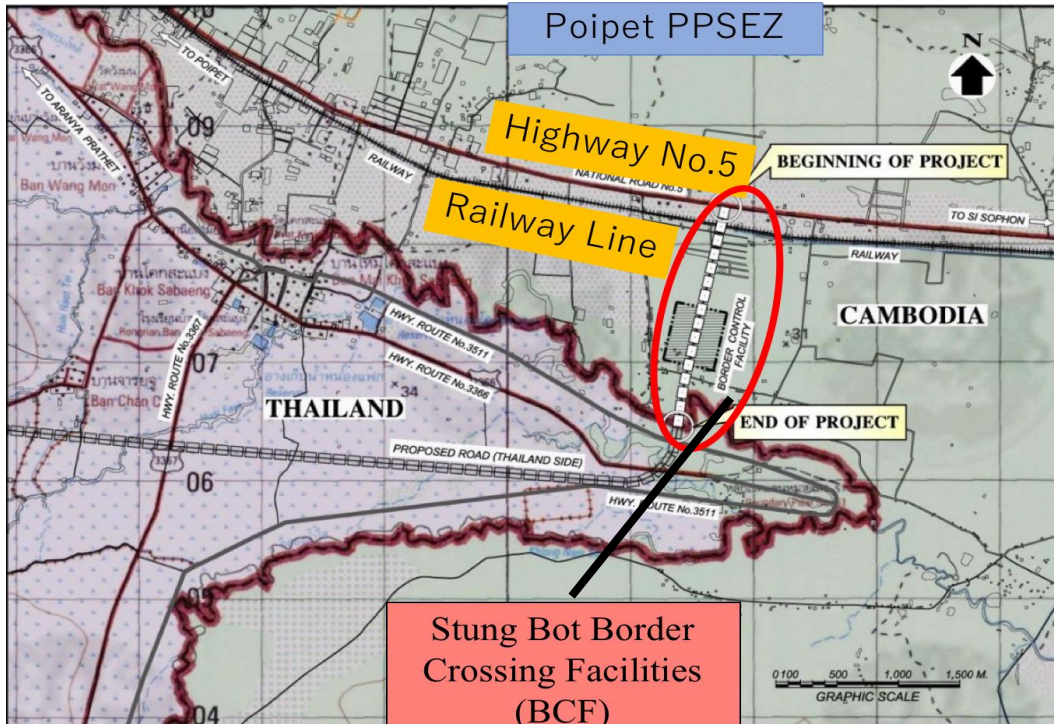
improvement of existing roads, flood mitigation, and consulting services. Construction of the new Cambodia–Thailand border checkpoint is expected to be completed by 2019.

In 2018, in a bid to ease traffic around the Stung Bot border checkpoint, H.E. Sun Chanthol, the Senior Minister and Minister of Public Works and Transport, asked Japan to support the construction of a flyover at the Stung Bot intersection.

Poipet Phnom Penh Special Economic Zone (Tier 2)

The Poipet PPSEZ is a new SEZ developed and operated under the Poipet PPSEZ Company, a wholly owned subsidiary of the PPSEZ Public Limited Company. The SEZ is located in Banteay Meanchey Province, in northwestern Cambodia, near the Cambodia–Thailand border. It is approximately 8 km east of the Poipet city centre, and gives access to one of the key border crossing points between Thailand and northwest Cambodia. This strategic location is attractive to prospective investors looking to establish new manufacturing, warehousing, or distribution centres. It is 250 km from the deep-sea port at Laem Chabang, Thailand. The SEZ is also an important commerce hub along the Hoh Chi Minh–Phnom Penh–Siem Reap–Bangkok route. In 2017, the Poipet PPSEZ completed major infrastructure and facilities works under Phase 1 of this project. On 10 April 2018, the Poipet PPSEZ opened to welcome its first tenant: Sumitronics Manufacturing (Cambodia) Company.

Figure 3.2: Map of the Southern Economic Corridor (Construction of the Stung Bot Border Crossing Facilities and Access Road to National Road No. 5 Project) and the Master Plan of the Poipet Phnom Penh Special Economic Zone



ha = hectares, Poipet PPSEZ = Poipet Phnom Penh Special Economic Zone

Source: Kingdom of Thailand, Neighbouring Countries Economic Development Cooperation Agency (2016), *The Construction of Stung Bot Border Crossing Facilities (BCF) and Access Road to National Road No. 5 Project*. <https://www.neda.or.th/home/en/uploads/download/YRrGxfe1dLCsLK14p2r.pdf> (accessed 27 May 2019).

Lower Se San 2 Hydropower Plant and Transmission (Tier 2)

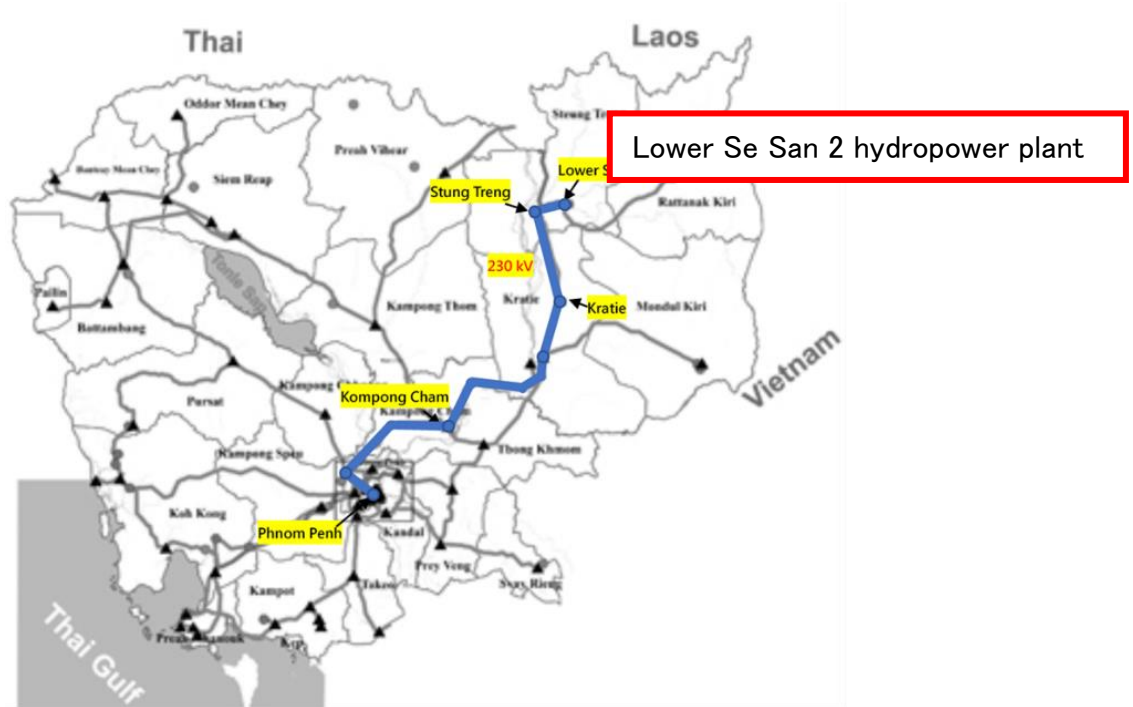
Based on the National Strategic Development Plan, Cambodia is seeking to increase domestic hydropower generation through projects such as the construction of the Lower Se San 2 Dam, a hydroelectric dam on the Se San River in Stung Treng Province, northeastern Cambodia. The dam is located about 70 km from the Cambodia–Lao PDR border in the north, and about 200 km from the Viet Nam–Cambodia border in the east. The river catchment area is 49,200 square km, the mean annual discharge at the dam site of the Lower Se San 2 hydropower plant is 1,310 cubic metres (m), and the reservoir is a daily adjustable reservoir with a normal water level at an elevation of 75 m and total storage of 2.715 billion cubic m. The main components of the project include an earth dam on both the left and right banks, a gravity concrete dam in the riverbed, a spillway, a powerhouse in the riverbed, a concrete wall, and other structures. The total length of the dam is 6,500 m. The management of the Lower Se San 2 reports that construction of this dam caused a boom in local industries that produced construction materials and provided logistics support, thus offering employment and technical training opportunities

to local labourers, and increasing the income of local residents. Consequently, this project strongly promoted the development of Cambodia's economy. The project was built by the Hydro Power Lower Sesan 2 Company, a joint company of the Royal Group of Cambodia (which holds a 39% stake in the project) and Hydrolancang International Energy (which holds a 51% stake); the remaining 10% is held by Vietnam Electricity. After 30 years of operation, the dam's ownership will be transferred to the government. The power plant will have a maximum capacity of 400 megawatts (MW) (50 MW x 8 units), with an expected average output of 1,998 gigawatt-hours per year. The project was expected to cost \$781 million, 30% of which was financed by Lower Sesan 2 and 70% by Chinese funders. Construction of the plant took 4 years, and the plant's first unit successfully began operating on 9 December 2017. The remaining seven units were put into operation by 21 October 2018.

During the site visit by the Economic Research Institute for ASEAN and East Asia, questions concerning the build-operate-transfer (BOT) model were posed to understand further the efforts being made to ensure proper knowledge transfer from the current Chinese management to Cambodian management. Currently, there are limited plans or frameworks in place to ensure sufficient transfer. This was further confirmed by the Ministry of Energy team, which currently does not have a plan for ensuring training and knowledge transfer. The other major takeaway from the site visit was that the dry season has an outstanding negative effect on the dam's ability to generate electricity. During the site visit only two of the eight available generators were utilised. It was also noted that, during the rainy season, only four of the generators are used, on average. Thus, despite the dam's capacity to generate 400 MW, it appears that this potential is rarely reached. Finally, it should be noted that the dam's construction was mindful of the environmental impacts on the regional community and aquatic life (the dam includes a passage for aquatic life). Furthermore, during the process of relocating the nearby communities, the Lower Se San 2 Company built new wells, schools, housing units, and a temple; and provided direct monetary compensation for the effects on fisheries.

The completion of the Lower Se San 2 dam is further complemented by the new operation status of the Kratie–Stung Treng 230-kilovolt (kV) transmission line and the Kratie–Kompong Cham 230 kV transmission line. These lines, which are connected to one another, complete the north–south transmission connection to the 230 kV Phnom Penh–Kompong Cham transmission line. The completion of the line provides a broader interconnection for the Cambodian energy market, with future plans to expand from Kompong Cham to Siem Reap. However, transmission issues persist due to competing capacity needs, resulting in blackouts in certain regions.

Figure 3.3: Lower Se San 2 Hydropower Plant and Map of the Transmission Line from the Lower Se San 2 Hydropower Plant to Phnom Penh



kV = kilovolt.

Source: Electricity Authority of Cambodia. <https://eac.gov.kh/site/index?lang=en> (accessed 30 May 2019) and authors.

2. Indonesia

2.1 The National Medium-Term Plan

According to statistics reported by the Ministry of National Development Planning (2018), the Indonesian economy was growing by 5.07% year-on-year as of 2017. This growth was driven by a rebound in government spending and increase in investment. To achieve higher economic growth, Indonesia has determined its infrastructure targets for 2015–2019; these were stipulated in the National Medium-Term Development Plan (see Table 3.2).

Table 3.2: National Strategic Program Based on the National Medium-Term Plan 2015–2019

Category	Goal	Projects
Logistics-related	Develop the sea-toll concept as a way to help Indonesia become the world maritime axis	Develop 24 new seaports. Increase the number of substantial vessels (i.e. pioneer cargo, transport vessels, and pioneer crossing vessels). Develop 60 crossing ports.
	Strengthen connectivity through air transport infrastructure development.	Develop 15 new airports. Develop air cargo facilities in six locations. Increase the number of pioneer airplanes.
	Develop urban transport.	Develop bus rapid transit in 29 cities. Develop mass rapid transit in six metropoleis and 17 large cities.
	Improve transport efficiency by developing and maintaining roads.	Develop 2,650 km of new roads. Develop 1,000 km of new toll roads. Rehabilitate 46,770 km of existing roads.
	Reduce logistics costs by improving railway infrastructure.	Develop new tracks in Java, Sumatra, Sulawesi, and Kalimantan. Develop 2,590 km of inter-urban railways. Develop 1,099 km of urban railways.
Energy-related	Achieve an electrification ratio of 99.9% by 2019 through generating capacity improvement.	Develop power plants with a total capacity of 35,000 megawatts.

km = kilometre.

Source: Indonesian Ministry of National Development Planning (BAPPENAS) (2018), *Government in the National Medium-Term Development Plan (RP JMN)*. Jakarta: Ministry of National Development Planning.

The Government of Indonesia through the Coordinating Ministry for Economic Affairs has initiated mechanisms to accelerate infrastructure delivery and the issuance of relevant regulations.

The Committee for Acceleration of Priority Infrastructure Delivery (KPPIP) has evaluated and listed projects that can benefit from the adoption of these mechanisms.

From mid-2016 to early 2017, the government evaluated and selected national strategic projects along with accelerated development mechanisms. The evaluation and selection process of national strategic projects (PSNs) by the KPPIP resulted in the selection of 245 PSNs as well as two programmes focusing on the electricity and aviation industries. These 245 projects and 2 programmes required around Rp4,769 trillion (\$332.8 billion) in total, with funding sourced from the state budget (Rp525 trillion), state-owned enterprises (SOEs) (Rp1,258 trillion), and the private sector (Rp2.414 trillion). The government allocated 13% of its total budget for this purpose, SOEs may contribute up to 30%, and private parties will contribute as much as 57%.

In the second amendment to Presidential Regulation No. 56 in 2018, the number of PSNs decreased to 223 projects and the number of sector-focused programmes increased to three (focusing on the electricity, aviation, and economic sectors). The PSNs include road, dam, energy, port, water and sanitation, aviation, irrigation, technology, housing, educational, and agricultural projects.

Many of the issues that infrastructure developers face are problems associated with financing, planning, preparation, land acquisition, construction, funding, and licensing. Therefore, the KPPIP continues to seek solutions to avoid delays of the PSNs. To achieve such targets, fiscal, institutional, and regulatory reforms have been made. These programmes and reforms include, but are not limited to, viability gap funding, Perseroan Terbatas (PT) Indonesia Infrastructure Finance, land acquisition assistance, risk-sharing guidelines, the expansion of public-private partnerships (PPPs), and the use of nongovernment budget equity financing.

In implementing the PSNs, President Jokowi appointed a number of SOEs as developers of key infrastructure projects. These SOEs oversee a much larger set of assets compared to private companies and are able to raise additional funds from state-owned banks. SOEs in the construction industry also benefit from capital injections from state budgets, which improve the feasibility of project development.

PPPs also play a vital role in encouraging private sector competition with public monopolies in the industry of infrastructure development and service provisions. Overall, PPPs encourage the merging of resources between the public and private sectors to serve public needs better. Successful infrastructure development through PPPs necessitates the adoption of a public-private win-win solution that adequately addresses the concerns of both sectors and guarantees the interests of all parties involved.

Another innovative financing tool for infrastructure development is Non-Government Budget Equity Financing (Pembiayaan Investasi Non Anggaran Pemerintah). This is a facilitation scheme

aimed at accelerating private investment in financing the PSNs. This financing comes from outside state budgets and is fully supported by government policies. The scheme categorises projects with an internal rate of return above 13% (in rupiah) as commercially viable.

The logistics sector pertains to developments in transportation and public works across Indonesia. The transportation sector covers the construction of railways, sea transportation (maritime ports), and air transportation (airports). This sector is facing a wide range of challenges to advancing economic growth, including old infrastructure, low connectivity in remote and/or rural areas, high distribution costs, and a low budget allocation. To realise project development, the government must provide \$190 billion, including \$6.6 billion during 2018–2019. However, gaps exist between investment need and the availability of funds at most levels of the transportation subsector, particularly the railway sector. This indicates that the role of the private sector as an alternative source of funding is necessary to realise the successful development of the transport sector.

As stated by President Jokowi, most transport development will prioritise the eastern parts of Indonesia. In response, the Ministry of Public Works and Public Housing through the Directorate General of Highways (Bina Marga) has allocated Rp42.14 trillion (\$2.9 billion), to support infrastructure advancement in Kalimantan, Bali, Nusa Tenggara, Sulawesi, Maluku, and Papua. In addition, as much as Rp6.12 trillion (\$427 million) is prioritised for the construction of the Indonesia–Malaysia border road in Kalimantan, the Trans-Papua road covering the Wamena–Hatem–Kenyam–Batas–Mamugu regions, and the Manokwari–Maruni road.

Table 3.3: Transport Infrastructure Funding Gap

(\$ billion)

Subsector	2018		2019	
	Budget	Requirement	Budget	Requirement
Land transport	4,058.65	13,814.46	3,855.72	13,802.29
Railway	23,082.62	33,436.26	29,776.58	71,529.62
Sea transport	10,764.93	16,714.25	8,396.64	19,439.57
Air transport	7,757.40	12,000.53	6,748.94	6,941.66
Total	45,663.60	75,965.50	48,777.88	111,713.14

Source: Republic of Indonesia, Ministry of Transportation (2018), *Transport Infrastructure Funding Gap*. Jakarta: Ministry of Transportation.

The Ministry of Public Works and Housing through planning and programming with the Regional Infrastructure Development Agency has also contributed to accelerating the implementation of the PSNs. This is mainly to support border areas, SEZs, national tourism strategic areas, industrial zones, urban and rural areas, and national food barns.

The development of a framework that integrates different stages in the delivery of public works and services and systematically addresses the key issues in each stage to achieve continuous efficiency improvements is essential for ensuring Indonesia's continued progress. The construction of 2,650 km of national roads in 2019 will improve connectivity and the mobility of goods, thus reducing logistics costs. The development of the drinking water supply, waste management, sanitation, and housing systems will improve both quality of life and Indonesia's environment. The magnitude of these accomplishments is also demonstrated by an increase in the country's Human Development Index ranking and the alleviation of poverty.

Energy deficits strongly constrain economic growth; however, when energy is abundant, its effect on economic growth declines. Technological progress has eliminated the barriers on economic growth stemming from the development of new methods of using coal and the discovery of new fossil fuel resources. However, despite increased energy independence through the use of fossil fuels, the Government of Indonesia aims to end its reliance on conventional energy (coal-fire) to support national development. To this end, the government has built various renewable energy sources, such as geothermal plants, across the country. As set out in the National General Plan of Energy, the country is targeting an increase in new-renewable energy from 11.9% of all energy generated to 23.0% by 2025. However, the realisation of this target is in doubt, as reported generation development accounted for only 6–7% of all energy in 2014–2016.

The national strategic energy sectors are outlined in the Presidential Regulation No. 4 Year 2016 on the acceleration of infrastructure development in the power sector. In implementing these objectives, the Ministry of Energy and Mineral Resources has declared the Electricity Supply Business Plan (RUPTL) for the period of 2018–2027. The RUPTL represents the projected plan of the state electricity company (Perusahaan Listrik Negara) to procure electricity from prospective power plant producers and private independent power producers over the next 10 years.

As expressed in the RUPTL, the administration expects to manufacture 56,024 MW in 2017–2026, less than the 78,000 MW targeted in the 2017–2026 10-year plan. Furthermore, the primary source of power will be coal-fired plants, which will account for 54.4% of the total supply by 2025. Renewable energy (23.0%), natural gas (22.2%), and fuel oil (0.4%) will meet the remaining energy demand. In terms of strategy, ensuring the accessibility of transmission networks (up to 65,855 km in length) is extremely urgent. To support this planned energy development, it is also necessary to construct substations with a volume of 151,424 megavolt-amperes, and develop a 526,390 km distribution network and distributive substation infrastructure with a volume of 50,216 megavolt-amperes.

As of 2018, the advancement of the energy sector had not been completely executed by the planned commercial operation date. Worldwide financial issues have affected the basic leadership process, making it difficult to complete planned projects in a timely manner. As indicated by the Ministry of Energy and Mineral Resources, the RUPTL for 2018–2027 contains updated projections for potential generation. The new plan projects that generation will decrease by around 5,000 MW for coal-fired plants, 10,000 MW for natural gas plants, 1,000 MW for hydropower plants, and 1,000 MW for geothermal power plants. This decline is due to

changes in projections of the expected energy demand, resulting in an updated goal for new generation from the previously set 78,000 MW to 56,024 MW. Conversely, the limit on sustainable power sources has been expanded to 2,000 MW, higher than the 1,200 MW limit set in the 2017 RUPTL.

The possibility of cancelling the project is still being discussed. It has been argued that the weakening of the rupiah against the United States (US) dollar has hindered the growth of the national economy because infrastructure development requires high imports of goods and United States dollars.

2.1.1 Medan–Binjai Toll Road (Tier 2)

The Medan-Binjai Toll Road project is the part of the Trans-Sumatra Toll Road that will span Sumatra Island north–south, connecting Nangroe Aceh Darussalam province and Lampung province. This project will have a positive impact on the overall economy as well as local employment as it will directly link Binjai City to Medan and Kuala Namu International Airport. The toll road on Sumatra is needed to decrease logistics costs and improve the market value of Indonesian products. The head of Badan Pengatur Jalan Tol, the Ministry of Public Works and Housing has argued that this area has huge logistical and economic advantages. The construction of toll roads is expected to accelerate the development of the region in both the long and short term. The existing roads (national and province roads) are unable to support the growing usage of vehicles in the region, and the development of this toll road may gradually increase vehicular traffic from many regions such as Belawan–Medan–Sumatra (Belmera) to the city of Medan. The development of the Medan–Binjai Toll Road will further establish Binjai City as the gateway to the industrial area of North Binjai District.

2.1.2 Medan Kualanamu Tebing Tinggi Toll Road (Tier 2)

The Medan Kualanamu Tebing Tinggi Toll Road links the Medan–Kualanamu–Tebing Tinggi and Parbarakan–Sei Rampah routes for 41.7 km. This toll road has had a huge impact on North Sumatra; it strengthens the metropolitan city arrangement of Medan-Binjai-Deli-Serdang-Karo; connects the primary economic centres across North Sumatra, such as the industrial area of Medan, Kualanamu International Airport, Kuala Tanjung harbour, and Sei Mangke SEZ; and has improved connectivity to facilitate distribution and reduce logistics costs for goods and services. Consequently, goods and services are relatively cheaper than those transported on public roads. The development of the toll road creates opportunities to build new industrial cities in this area and decreases the burden of industrialisation in the city of Medan. In addition to the economic development benefits, the toll road is expected to ease access for tourists to Lake Toba, leading to an increase in tourism by 2020.

2.1.3 Development of the Light Rail Transit Palembang (Tier 2)

The city of Palembang is in dire need of public transportation as a preventive measure to decrease traffic density in the city and overcome congestion risks in the future. This city is

growing more quickly than originally expected due to the construction of the Jakabaring Sport City to support the 2018 Asian Games. The volume of vehicles is expected to continue to increase and there are not enough roads to eliminate the risk of congestion. Two new bridges connecting the Ilir and Ulu areas in the city have also been built, but they do not adequately prevent congestion. To alleviate congestion, the government has begun building mass transportation facilities such as light rail transit (LRT) to support public transportation in the city. This alternative mode is affordable and modern, and its construction does not require a large land acquisition. The physical construction of Palembang's LRT system began on 21 October 2015 with the issuance of Presidential Regulation (Perpres) No. 116 concerning the acceleration of the implementation of LRT systems in the province of South Sumatra. As Article 2 paragraph 1 of the rule states, PT Waskita Karya (Persero) is the implementing contractor, the total project cost is about Rp10.9 trillion (\$760 million), and the project stretches from Sultan Mahmud Badaruddin II International Airport station to Jakabaring Sport City. The LRT is supported by circuit trains from a local manufacturing company, PT Industri Kereta Api (the state railway company). This LRT has also been identified as the first operational LRT system in Indonesia, with a total length of 23.4 km and 13 stops.

The Palembang LRT has been received positively as it is expected to reduce the burden of congestion and pollution. It has been operating since August 2018, but remains intensively monitored due to some technical problems in its operations. The Palembang LRT carried 470,000 passengers between 23 July and 10 October 2018.

2.1.4 Umbulan Water Supply (Tier 1)

One popular water supply system listed as a national strategic project in 2018 is the Umbulan water supply, located in Umbulan Village, Winongan Subdistrict, Pasuruan Regency. The Umbulan water supply reaches a clarity level of 0.02 nephelometric turbidity units, and the current discharge reaches 5,000 litres per second (l/s). Due to the presence of old pipes and deteriorated infrastructure surviving from Dutch colonial rule, Surabaya uses only 150 l/s of water from the Umbulan springs (less than 1% of the total Umbulan water discharge).

Therefore, on 21 July 2016, the East Java Provincial Government with PT Meta Adhya Tirta Umbulan signed the Umbulan water supply improvement concurrence, with a 25-year concession period. The Umbulan water supply venture intends to build water supply infrastructure to meet the water demand needs in the province of East Java. The drinking water limit is 4,000 l/s at Gresik Regency, Surabaya City, Pasuruan City, Pasuruan Regency, and the Perusahaan Daerah Air Minum mechanical region for approximately 320,000 families. Of the financial support for this undertaking, 49% is supplied by the Viability Gap Fund from the Ministry of Finance, with additional support from the Ministry of Public Works and Housing, the Government of East Java, and the Indonesia Infrastructure Guarantee Fund. The aggregate cost is estimated to be Rp2.05 trillion (\$174 million), of which Rp1.232 trillion will be provided by private business and Rp818 million by the Viability Gap Fund.

As of the end of 2018, the transmission pipeline development was 52% complete and is expected to be operational in 2019.

2.1.5 Takalar Coal Power Plant (Tier 3)

The Takalar coal-fired power station is located in Jeneponto City, 70 km from the provincial capital Makassar, South Sulawesi. It has a total installed capacity of 2 units × 100 MW; Unit 1 was formally handed over on 19 July 2018 and Unit 2 on 8 August 2018. It is one of the key projects of the National Second 10,000 MW Power Development Plan. The power generated as a result of this project effectively alleviated the power supply tension in South Sulawesi, met the increasing demand for power supply, and promoted local economic and social development. This coal-fired power plant project, for which the Chinese company, China Gezhouba Group Corporation served as the engineering, procurement, and construction contractor, was financed by Preferential Buyer's Credit of the China Export and Import Bank. Takalar Coal-Fired Power Station was expected to be completed on schedule and to serve as a sample project. Local government officers said that construction of this project would exert comprehensive effects (i.e. increasing tax income, promoting employment, expanding the power supply, and leading to the development of related industries, including steel and cement). As a result, this project has demonstrated a level of speed and performance that is impressive in the history of thermal power construction in Indonesia, and has won high praise from the owners.

At the same location, in Jeneponto City, South Sulawesi, the Jeneponto I Wind Farm was initially set to begin operation in 2019. This wind power plant, which was designed to have a capacity of 72 MW, was followed by the 100-hectare Sidrap Wind Farm in Sindereng Rappang Regency, South Sulawesi, the country's first ever utility-scale wind farm and the biggest in Southeast Asia. The Sidrap Wind Farm, which is part of the 35,000 MW electricity programme, has a capacity of 75 MW and can power up to 70,000 households. It commenced operation on 2 July 2018. These wind farms will help the government achieve its target of renewable energy accounting for 23% of the national energy mix by 2025.

3. Lao People's Democratic Republic

3.1 Vision 2030, 10 Year Development Strategy (2016–2025), 8th Five Year National Socio-Economic Development Plan (2016–2020)

Infrastructure development related to transportation, logistics, energy, and industrial estates is expected to play a key role in transforming the Lao PDR from a land-locked country to a land-linked country. The Lao PDR needs to ensure that the linkages within the country are created by developing road, water, air, electric, telecommunications, and economic infrastructure.

To accomplish substantial infrastructure development, the Lao PDR has created three priority development strategies. Vision 2030 focuses on 'big-picture' goals pertaining to graduating to

an upper middle-income country as well as achieving the Sustainability and Development Goals; Vision 2030 aims to develop public works and transportation sectors that exemplify high-efficiency, modern, safe, and sustainable infrastructure; and the 10 Year Development Strategy creates a framework for these goals through the following seven strategies:

- (i) acceleration of high-quality and sustainable growth,
- (ii) graduation from least developed country status and a focus on the Sustainability and Development Goals,
- (iii) human resource development,
- (iv) good governance and decentralization,
- (v) preservation of natural resources,
- (vi) regional and global integration, and
- (vii) industrialisation and modernisation.

These seven strategies are enacted in the country’s development plans for public works and the transport sector, as well as the electricity sector development strategy and policy.

According to the National Socio-Economic Development Plan, the Lao PDR aims to accomplish a variety of development goals to upgrade public works. The plan also targets graduating from least developed country status by 2020, realising GDP growth of 7.5%, and attracting investment amounting to 30% of GDP. The specific areas of focus in terms of infrastructure categories are outlined in Table 3.4:

Table 3.4: Overview of the National Socio-Economic Development Infrastructure of the Lao People’s Democratic Republic

Infrastructure (Sector)	Projects
Roads	<ul style="list-style-type: none"> • National avenues, linking roads from provinces to districts and villages • Association of Southeast Asian Nations main roads Nos. 2, 3, 8, 12, 13 North, 13 South, 16, and Band No. 9
Railways	<ul style="list-style-type: none"> • Boten–Vientiane • Vientiane–Thakhaek–Muya • Thakhaek–Savannakhet–Champasack–Nong Nok Khien • Champasack–Vangtao
Air transportation	<ul style="list-style-type: none"> • Improve and upgrade domestic and international airports to meet international standards.

	<ul style="list-style-type: none"> • Expand flight routes with countries in the region and provide everything necessary for flights, such as quality personnel, flight radios, and safe air traffic management. • Develop and expand standards for the logistics system in the Lao People's Democratic Republic (PDR).
Water transportation	<ul style="list-style-type: none"> • Improve the waterway from the border of the Lao PDR–China–Myanmar to Houayxai. • Improve services at the Huang-anh ports to facilitate the import and export of goods to and from the Lao PDR at reasonable prices.
Energy	<ul style="list-style-type: none"> • For the energy sector, the plan stresses the development of competitive and sustainable national energy, and aims to ensure power stability for domestic use via hydropower and charcoal. There is also a focus on expanding renewable energy and other alternative energy sources (i.e. solar power, wind power, bioenergy, and biogas).

Source: Author; Government of the Lao People's Democratic Republic, Ministry of Planning and Investment (2016), *8th Five-Year National Socio-Economic Development Plan (2016–2020)*. Vientiane: Ministry of Planning and Investment.

<http://www.la.one.un.org/media-center/publications/258-8th-five-year-national-socio-economic-development-plan-2016-2020> (accessed 30 May 2018).

Developments in energy infrastructure are further supplemented by the National Electricity Development Plan (2016–2020). There are currently a total of 64 power plants with an installed capacity of 7,082 MW; of these, an overwhelming majority are hydropower plants but thermal, solar, and sugarcane plants are also included. Of the 377 projects that have been signed with the Government of the Lao PDR (with a total installed capacity of 23,182 MW), 44 are ongoing and are under construction, 112 are subject to an additional project development agreement, and 221 are currently under a memorandum of understanding. The government plans to build an additional 82 power plants in 2020, which would add a total production capacity of 10,738 MW. This growth is planned to continue, with the construction of 147 plants having a total production capacity of 17,683 MW by 2025, and 205 plants with a total capacity of 21,589 MW by 2030. The energy development strategy not only targets the export of energy to foreign countries, but also the expansion of electricity coverage to rural, remote, and hard-to-access areas, with the aim of providing at least 90% of Lao families with access to electricity by 2020. The energy development plan also aims to expand the electricity sector by 32% per year, on average, thus reducing the negative balance of electricity export and import by limiting electricity imports to no more than 20% of the country's usage by 2020.

Currently, the Lao PDR generates electricity in abundance, mainly in the form of hydroelectric power, and the country exports electricity to Thailand in particular. Therefore, the electricity rate is relatively low in the Lao PDR compared with that in neighbouring ASEAN countries. Regarding the exporting of electricity, the Lao PDR is prioritising supply to the Electricity Generating Authority of Thailand (EGAT). Although the domestic electricity demand has increased, exporting is given precedence, and as a result, the Lao PDR must import electricity

from the EGAT to make up for the ensuing shortage at home. The Lao PDR is currently recording an import surplus in electricity trade, resulting in a deficit of around \$100 million.

3.1.1 National Road 13 North–South and Route 9 (Tier 3)

Since the Lao PDR is located in the middle of the GMS and is a key part of East–West Economic Corridor, connectivity, improvement of logistics, energy, and industrial development are the keys for the Lao PDR to achieve sustainable and inclusive economic growth. It is therefore essential to develop land logistics by road, dry port, and railway. Road construction development has gradually improved, and national roads have been upgraded to the level of ASEAN roads, which link domestic roads with those of neighbouring countries along the regional economic corridors, such as the improved roads along the North–South and East–West economic corridors.

From 2003 to 2005, Route 9 of the East–West Corridor was implemented with loans from Japan and ADB. From 2012 to 2015, 58.1 km of this road was restored through a Japanese loan, leaving 80% of the road (184 km) incomplete. Route 13 is still in the feasibility study stage. In early 2019, construction began to upgrade National Road 13 North, Phase 1 (13N) from Sikeut–Vangvieng and Sikeut–Phonehong, under a loan negotiated with the World Bank. Phase 2 (13N) from Vangvieng–Luang Prabang and Phase 3 (13N) from Luangprabang–Borten are both in the pre-feasibility study stage, and National Road 13 South from Donnoun–Ban Hai and Ban Hai–Paksan is in the feasibility study stage. The projects to construct the Sikeut–Vangvieng Highway and upgrade National Road 13 North from Luang Prabang–Pakmong are moving from the feasibility study to the construction stage. Construction will begin on the Sikeut–Vangvieng Highway in early 2019. This project is the first part of the planned Vientiane–Boten expressway, which, if realised, will link Vientiane with the northern province of Luang Namtha, which shares a border with China. Later, the government will proceed to the next step of realising the second section linking Vangvieng with northern Luang Prabang province, and the third section linking Luang Prabang with Boten in Luang Namtha. Efforts have also been made to improve the connectivity and flow of goods in the region between Viet Nam and the Lao PDR. At the Lao Bao (Viet Nam) and Dane Sawan (Lao PDR) border, a single stop (one-time procedure to be carried out in importing and exporting countries at the time of crossing a border) will be implemented. The move towards the early implementation of the Cross-Border Transportation Agreement in six GMS countries (Thailand, Cambodia, Myanmar, the Lao PDR, Viet Nam, and China) is progressing slowly.

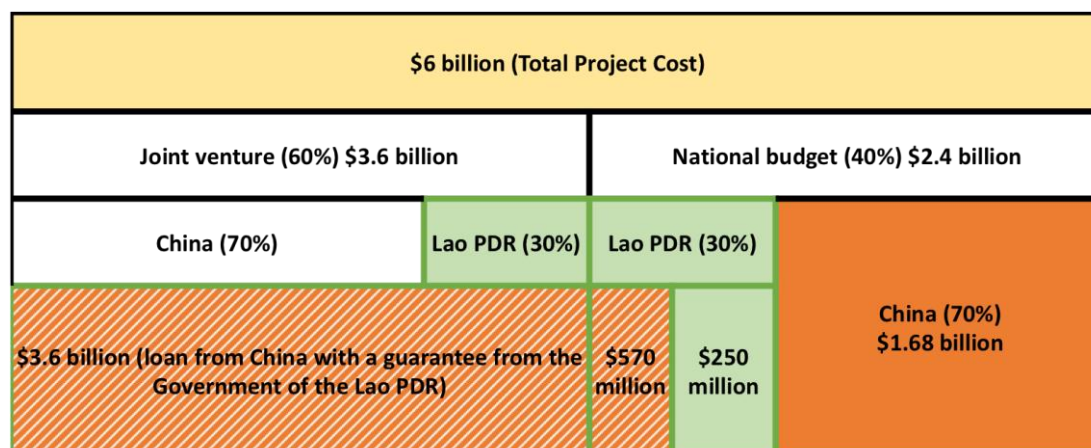
These projects are typically financed under a BOT model. BOT is a form of project financing wherein a private entity receives a concession from the private or public sector to finance, design, construct, and operate the facility described in the concession contract. Nevertheless, many road and bridge projects have been delayed due to financial and technical difficulties in both the public and private sectors, and many remain in the conceptual and planning stages. The Lao PDR's development plans have steadily supported the expansion of the road network

(in line with the current emphasis on regional connectivity), but also recognise the limitations imposed by funding constraints.

3.1.2 Lao People’s Democratic Republic–China Railway (Tier 2)

With respect to railway development, the most progressive project is the construction of the Lao PDR–China railway that kicked off in December 2016. Construction has begun on the Boten–Vientiane Rail Link, which will connect Boten (in the Lao PDR, on the border with China) and Vientiane. This project is a part of the larger Belt and Road Initiative that aims to connect China with surrounding countries. This project will include the construction of a 427 km single-track railroad. The building of bridges and tunnels accounts for about 70% of this project. The railway will be operational by 2021 and will be able to reach speeds of 120 km/h for freight and 160 km/h for passengers. The total project cost is approximately \$6 billion. The project is a joint venture between China and the Lao PDR, and 60% of total construction funds will be borrowed from China with a Lao PDR government guarantee. Of the remaining 40% of construction costs, 70% (\$1.68 billion) will be paid by China and 30% (\$720 million) by the Lao PDR. Of this \$720 million provided by the Lao PDR, \$250 million will be provided by the Lao PDR national budget, and the remaining \$570 million will be a loan from the China Development Bank (at an interest rate of 2.3%).

Figure 3.4: Lao People’s Democratic Republic–China Railway Financing Breakdown



Source: Authors; N. Yamada (2018), *Laos–China High-Speed Rail Project*. Institute of Developing Economies, Japan External Trade Organization. <http://hdl.handle.net/2344/00050461> (accessed 30 May 2019).

Although this project will improve the connection between Vientiane and Boten, we cannot estimate how many passengers will take this railway and therefore how big its economic impact on the Lao PDR will be. It is also important to note that construction related to this railway is

being led by Chinese labour, which has given rise to many concerns about the employment of Lao people.

At present, the project is 40% complete, with 60 tunnels (measuring 61,588 km long, in total) and 92 bridges being constructed. Despite this progress on construction, the project is still lagging behind schedule due to various difficulties related to the geographical landscape (mountainous areas in particular). However, notwithstanding these delays, the Boten–Vientiane Rail Link project is scheduled to be completed in 2021.

3.1.3 Nam Ngiep 1 (Tier 2)

Nam Ngiep 1 is a 290 MW hydropower project under construction in the Bolikhamxay and Xaysomboun provinces of the Lao PDR. The project is being built and will be operated by the Nam Ngiep 1 Power Company. The goal of the project is to build a socially and environmentally responsible power project that will provide clean renewable electricity and contribute to poverty reduction in the Lao PDR. The two dams and power stations are under construction along the Ngiep River in Bolikhamxay. The main 167 m high dam will create a water storage reservoir covering an area of 67 square km extending into Xaysomboun province. Around 4,000 people, mainly ethnic Hmong, will be resettled in the Houaysoup area of Bolikhamxay to facilitate the creation of the plant. Nam Ngiep 1 is working with local people and authorities to build new, high-quality houses and community facilities for the villagers moving to the Houaysoup area. The company is also developing a range of livelihood programmes for people directly affected by the project.

At the main dam site, a primary power station will generate around 272 MW of electricity for export to Thailand and will release water to a regulating pond where a second dam and power station will generate around 18 MW of electricity for local use. Although this local use energy is intended for Paksan, it is not needed in this region, as there is already a surplus supply there. Despite this mismatch of demand and supply, the excess energy cannot be exported due to technical and contractual barriers. Électricité du Lao PDR, the Lao PDR national energy authority, should therefore invest in expanding transmission, distribution, and substation infrastructure to ensure consumption of this energy supply in other domestic regions. As Électricité du Lao PDR faces financing challenges in accomplishing its goals to expand domestic transmission and distribution infrastructure, external development support is required.

Expanding transmission would allow the Lao PDR to take advantage of its abundance of cheap electricity. The underdeveloped ICT centres in the Lao PDR in conjunction with the emergence of new innovative technologies provide a unique opportunity to develop the energy infrastructure network and promote sustainable economic development in the Lao PDR. As a result of the arrival of technologies based on a blockchain, which has been attracting much attention in recent years, new businesses, such as fintech and currency mining, have emerged. Since these technological innovations are electricity-hungry, they are promising industrial fields in the Lao PDR. To promote ICT in the heavy use of cheap electricity in the Lao PDR, it is essential

to invite data centres and other ICT industry businesses while promoting the Lao PDR's domestic ICT industry.

The re-regulating dam will ensure the smooth release of water to minimise disruption of water levels in the river downstream. Construction of the generation facilities began in 2014 and is expected to be completed this year. The project is operated, financed, and sponsored by Japanese, Thai, and Lao PDR stakeholders, along with support from ADB. KPIC Netherlands B.V. (Japan) controls 45% of the project in cooperation with the EGAT International Company (Thailand), which holds 30%, and Lao Holding State Enterprises (Lao PDR), which holds 25%. The project financing (\$746 million in total) was supported by the Japan Bank for International Cooperation (31%), and other international development agencies such as ADB (69%). The project utilises a BOT agreement with a 27-year span before the asset will be transferred to the Government of the Lao PDR.

Although the dam will be transferred to Lao control at the end of the 27-year agreement, there was limited local labour onsite; instead, a large share of operational labour at the dam site was from Thailand, and most of the construction team came from Viet Nam. Management cited the cost and skill benefits of hiring outside labour sources, with Viet Nam and Thailand having a high-skilled labour force at a medium cost, and the Lao PDR having a low-skilled labour force at a low cost. Management consisted primarily of Japanese employees. This may prove to be a challenge for the Lao government once they inherit control of the asset.

Figure 3.5: Nam Ngeip 1 Hydropower Dam Site



Source: Authors.

4. Malaysia

The Pakatan Harapan Administration and the Mid-Term Review of the 11th Malaysia Plan 2006–2020

Infrastructure development and planning in Malaysia can be best explained with reference to its 5-year plans. It is worth noting that the 11th Malaysia Plan 2016–2020 does not disclose the exact financial commitment for infrastructure spending during this period. However, the commitment is expected to represent half of the total allocation for development expenditure (a ceiling of RM260 billion, or \$62.6 billion). This plan includes public transport and logistics; and the expansion and upgrading of rural basic infrastructure, digital infrastructure, and public amenities (particularly water and energy-related projects). While there are some specific references to large-scale projects (such as the Klang Valley Mass Rapid Transit, Pan Borneo Highway, Electrified Double-Track Railway, and LRT extension), the list of infrastructure projects is not exhaustive. The East Coast Rail Link (ECRL) and Kuala Lumpur–Singapore High-Speed Rail projects were not specifically mentioned in the 11th Malaysia Plan.

Following the watershed 14th general elections held on 9 May 2018, the new administration of Pakatan Harapan has undertaken a comprehensive review of large infrastructure projects committed to by the previous Barisan Nasional administration. These reviews are being made ostensibly for two reasons. The first of these is the allegations of bloated costs resulting from directly awarded tenders and the lack of transparency. Further, Pakatan Harapan has claimed that the country's current debt levels (RM1 billion) mean that it cannot afford megaprojects without a substantive review. The second reason relates to Pakatan Harapan's Buku Harapan (i.e. election manifesto), wherein the administration stated that 'initiating a comprehensive review of all megaprojects that have been awarded to foreign countries' was one of its 10 promises to be delivered within the first 100 days of administration. This was seemingly intended to be a review of the Chinese-linked infrastructure projects committed to during former Prime Minister Najib Razak's tenure; however, to avoid highlighting this, all projects have come under review.

The present status of infrastructure construction in Malaysia is still within expectations. Despite the postponement or cancellation of selected big-ticket and politically charged projects, such as the ECRL in Peninsular Malaysia and water-related projects in Sabah and Sarawak, many projects are proceeding or have been completed according to plan. Thus, it appears that infrastructure development will remain a means for the new government to support economic growth and achieve its economic development objectives.

However, the number and the type of projects that the administration will support to achieve economic growth and development goals in the near future remain largely ambiguous at this stage. Although the Mid-Term Review of the 11th Malaysia Plan unveiled in October 2018 outlined the previous administration's aspirations to address the planned projects, there are still no new projects in the pipeline. This may be related to perceived elevated levels of public debt,

or because the announcement of new large-scale projects is still deemed premature at the current juncture.

Kuala Lumpur–Singapore High-Speed Rail (Tier 1)

On 5 September 2018, the Government of Malaysia agreed with the Government of Singapore to freeze construction of the high-speed railway connecting the capitals of the two countries until the end of May 2020, and to consider measures for future realisation. There are two primary reasons for the postponement of this project: (i) the total amount of Malaysia's national debt has increased to RM1 trillion (\$240 billion), putting pressure on project financing; and (ii) the new government has ended the consumption tax (an election pledge), thus decreasing the total tax revenue that can be used to support projects.

On 19 July 2016, this plan was concluded between the Government of Malaysia and the Government of Singapore under a basic agreement (memorandum of understanding) on high-speed railway planning; a bilateral agreement was also concluded. There were high expectations for improved connectivity between the two countries, whose capitals are about 350 km apart. Bidding coordinated by AssetsCo, a railway asset company, began in December 2017. Diplomatic presentations from the representatives of Japan and China, and local presentations and exhibitions by the ministers in charge were held during the planning process for this project.

Plans were made to install a total of nine stations (eight in Malaysia and one in Singapore) to connect Kuala Lumpur and Singapore with a nonstop express route, as well as domestic stops at each station in Malaysia, and a shuttle between Singapore and Johor Bahru, Malaysia. Customs, entry and exit management, and quarantine systems would be installed at three stations in Kuala Lumpur, the Malaysian terminal station, and Singapore.

Under these plans, the development, construction, and maintenance of civil engineering infrastructure and stations would be the responsibility of both individual governments and each business entity: InfraCo and MyHSR (a business company wholly owned by the Ministry of Finance of Malaysia) for Malaysia, and the Land Transportation Authority in Singapore. AssetsCo would be in charge of supplying and maintaining high-speed railway assets such as vehicles, tracks, power, signals, and communication equipment; and operations would be conducted by OpCo International, which would operate the express and shuttle services, and OpCo Domestic, which would operate domestic services. OpCo receives fares and other charges from users, and pays concession and track fees to InfraCo; while AssetsCo has a scheme of receiving 'availability payments' from InfraCo. According to the economic effect calculated by the Institute of Developing Technologies-Japan External Trade Organization's geographical simulation model, annual economic profit is estimated to reach \$1.6 billion per year in Malaysia in 2030 and \$6.4 billion in Singapore.

With respect to South Johor Bahru and Singapore, China continues to support the construction of new commuter railways connecting the two sections. The project will be elevated over the Johor Strait via a 4 km train linking the Woodlands North Mass Rapid Transit Station in Singapore and the Bukit Chagar Station in Johor Bahru. This railway improvement plan is linked to the plan of Iskandar, a large city in Johor Bahru in southern Malaysia. This plan aims for urban

development integration with Singapore, with financing from China. The project is currently the subject of continued negotiations with the new administration.

Figure 3.6: China Railway High-Speed Railway Exhibition in Kuala Lumpur Station



Source: Authors.

Malaysia East Coast Development Plan (East Coast Rail Link, New Deep-Water Terminal—Tier 2, and Malaysia-China Kuantan Industrial Park—Tier 1)

The ECRL project connects the three eastern coast states of Malaysia and Kuala Lumpur, from Kota Bharu near the Thai border, passing Kuantan on the east coast, and crossing the Malay Peninsula east-west. The project covers a total extension of 688 km connecting the ports. Construction began at the end of August 2017 with a maximum speed of 160 km/h, 1,435-millimetre standard gauge, dual-purpose train for freighters, and an estimated construction cost of RM65.5 billion (\$15.8 billion). This Chinese-led transportation construction project is expected to be completed by 2024.

However, construction was interrupted in August 2018, at which point approximately 15% of the construction had been completed. The total project cost has increased to RM80 billion (\$19.2 billion) based on a reassessment by the new administration. In addition, the project has been plagued by high-interest loans and opaque transactions linked to politics.

This project is of great importance to Chinese stakeholders as it will reduce the risks of the Malacca Dilemma. The Malacca trade route, which currently handles Chinese imports of resources from the Middle East region, is facing the strategic risk of being sealed off by Singaporean and United States interests. By developing a railway connecting the east and west coasts of the Malay Peninsula, China will be able to improve the trade route in its own favour and gain greater control of commerce in the region.

In early April 2019, Malaysian and Chinese parties reached a compromise to ensure the continuation of the ECRL. Under the new agreement, the cost of the ECRL has been reduced from RM65.5 billion to RM44 billion (\$10.68 billion).

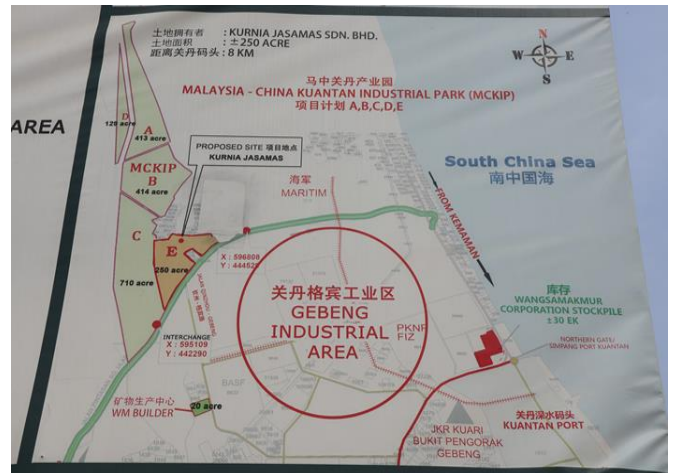
This rail project is further complemented by the development of Malaysia's first industrial park in Kuantan on the east coast. Kuantan, which is a transit station, is home to the Malaysia-China Kuantan Industrial Park (MCKIP), which is currently under development and attracting a total of RM13.4 billion (\$3.2 billion) in investment. The Kuantan Port New Deep-Water Terminal is also under construction, and is a vital part of China's strategy to expand trade and commerce in the region.

The New Deep-Water Terminal is an expansion project consisting of two phases—Phase 1A (operational) and 1B (expected to be completed by mid-2019)—and is partially in operation. This project is intended to expand the existing capacity of the Kuantan Port in line with the advanced demographic and economic growth in the area. At present, Kuantan Port's limited capacity means that it can only accommodate ships with a maximum capacity of 40,000 deadweight tonnage. This expansion project is intended to cater to larger ships, such as bulk carriers of up to 200,000 deadweight tonnage or 18,000 20-foot equivalent unit container ships.

The MCKIP in Pahang is the first industrial park to be accorded national status in Malaysia. The MCKIP is modelled after its sister park, the China-Malaysia Qin Zhou Industrial Park in Guangxi Province, China, which targets high-end industries from not only China and Malaysia, but also other parts of the world. MCKIP Phase 1 (1,200 acres) is operational, Phase 2 (1,000 acres) is completed but not yet operational, and Phase 3 (800 acres) is in the construction stage.

Figure 3.7: East Coast Development (East Coast Rail Link: Row 1, Kuantan Port: Row 2, Malaysia-China Kuantan Industrial Park: Row 3)





Source: Authors.

5. Myanmar

Myanmar Sustainable Development Plan

During a period marked by increasing political unrest and government accountability, Myanmar is continuing its efforts to develop a comprehensive infrastructure network. There currently is no project left at the conceptual stage from the 2015 infrastructure development plan; however, some ongoing projects have been cancelled with no further explanation. Some ministries have initiated new projects, and some projects are delayed due to financing barriers. Projects related to the development of SEZs continue to lag in becoming an operational reality. Although connectivity, logistics, and industrial development are the keys to national development planning, the present government has discontinued the National Comprehensive Development Plan, a 20-year plan (2010–2030) that highlighted and prioritised infrastructure development across multiple sectors. Instead they launched the Myanmar Sustainable Development Plan highlighting peace and stability.

A sound infrastructural foundation is the key to overall socioeconomic development in Myanmar. The Government of Myanmar still needs to improve its ability to sequence government priorities and interventions to underpin long-term national development. Also necessary is the creation of frameworks to ensure macroeconomic and financial stability, legal and institutional arrangements to foster private sector development, the strengthening of government institutions to ensure environmentally sustainable development, the accumulation of human capital, and infrastructure development.

In Myanmar, most infrastructure projects are burdened with a multitude of steps at each stage of the project development process. Some projects that were overly delayed have been abandoned and discontinued due to the burden of fiscal restraints or changing policy priorities. Myanmar's infrastructure networks in transportation, energy, and telecommunications urgently require prioritisation to obtain needed upgrades and expansions.

Myanmar's economic growth rate is predicted to continue to exceed 7% on average in the coming years, and massive investment from the government, development finance institutions, and the private sector will be required to sustain this growth. Such financing will be a major component in the development of the country's national and cross-border infrastructure.

Reforms made in the past 5 years to promote private investment, realise connectivity between urban and rural centres, and encourage investment have stagnated as national regulations have become distorted and changed. Concerns over accountability, transparency, and civil unrest as well as Parliament's ability to function and the press to be free have stifled investment. These financial market distortions have met with little counteraction. Frameworks for effective macroeconomic policies are becoming fragmented, causing problems with policy coordination and implementation.

There are also regionally based concerns and considerations with respect to the national infrastructure development plans, primarily those influenced by China. Myanmar appears ready

to be integrated into Beijing's Belt and Road Initiative via the China–Myanmar Economic Corridor despite criticisms and concerns over a potential debt trap. This has increased other investors' caution.

The development of Myanmar's infrastructure holds the key to increasing connectivity within the region considering its geographic position and wealth of natural resources. However, there are many challenges. Ageing road and rail networks, urban and port congestion, and a lack of multi-modal connectivity have made rising transport costs a major impediment to new foreign investment. Most overseas experts have identified that Myanmar needs investment in hard infrastructure, as well as governance know-how, processes, and legislation.

The government is moving to address these challenges by developing a National Transport Master Plan (NTMP), which should lead to large-scale public investment in new transport infrastructure in the coming years. Planned projects include dozens of new north–south and east–west highways, refurbishment of the national railway (the Yangon circular line will undergo modernisation and the Yangon–Mandalay line will be refurbished), and a port expansion program that could enable the country to become a major regional trans-shipment hub. The Ministry of Transport and Communications is the primary leader of the NTMP as it oversees the transport sector and its various departments, directorates, and state-owned companies that are also tasked with managing their respective sub-segments (these include Myanmar Railways, the Road Transport Administration Department, Inland Water Transport, and Myanmar National Airlines).

Moreover, a long-term transport policy is enshrined in the NTMP, which calls for MK26.7 trillion (\$21.7 billion) of new investment in road, rail, port, and aviation infrastructure projects between 2014 and 2030. JICA plans to provide support to develop road, railway, seaport, aviation, and inland water projects.

The NTMP is premised on the development of transport corridors, including 36 north–south and 45 east–west highway projects, cutting across seven regions and seven states. Rail and highway upgrades are the most critical near-term priorities under the plan, which envisions allocating 87% of planned capital formation to trunk systems between 2014 and 2020. This is a solid strategy: the total length of Myanmar's road network was estimated at 148,000 km in 2013, and the majority of it (79%) is unpaved. Meanwhile, the master plan for Myanmar's expressways and arterial roads was created in partnership with the Korean International Cooperation Agency and a consortium of Korean engineering firms between 2013 and 2015. It calls for more than 34,000 km of highway and road development by 2035.

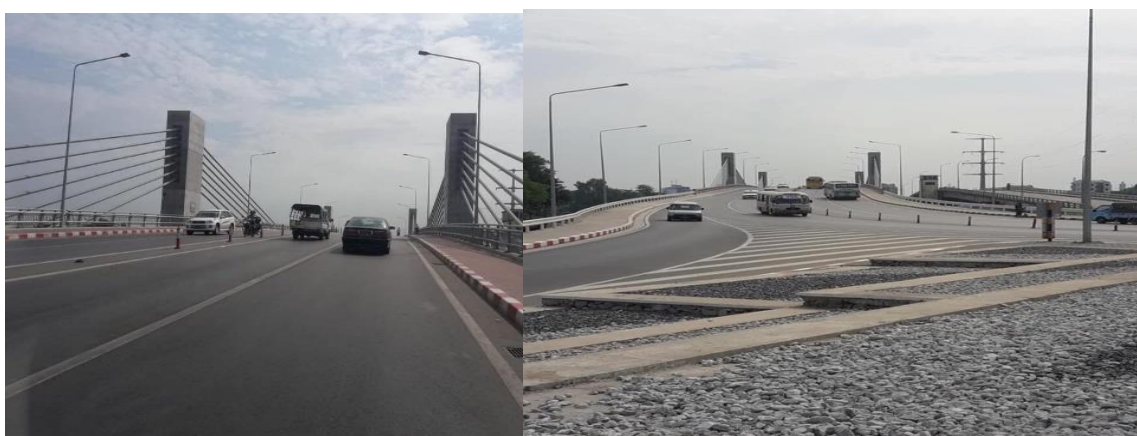
Plans are currently under way to build a new centre for aviation outside Yangon, although some stakeholders have expressed concerns about long-term excess capacity. The industry as a whole remains well positioned for substantial future expansion, with further foreign investment, international assistance, and new PPPs expected to make a significant impact in addressing the country's infrastructure gap. Although Myanmar's widening infrastructure deficit continues to pose a major challenge across the rail, road, and port sectors, the country is poised for significant near-term growth, with private investment set to rise on the back of a bold transport agenda

supported by multiple neighbours. New investment in road and rail networks will complement ongoing work through a network of SEZs, bolstering cross-border connectivity and reducing port congestion. While overcapacity in the aviation sector could pose a long-term challenge, rising passenger and cargo volumes indicate plenty of space for further investment across all segments of the industry.

Thaketa Bridge Construction (Tier 2)

The objective of the Thaketa Bridge Construction Project is to enhance transportation between east and southeast Yangon by replacing a bridge that has created bottlenecks. The new bridge was designed to increase the traffic capacity across Pazundaung Creek and alleviate congestion. The Thaketa Bridge is a key junction tying together the Thaketa district, Yangon district, and Yangon International Airport. It is positioned to be a major roadway in the future. The project aims to reduce transportation costs and improve the living conditions and environment of local residents; and a smoother flow of people and goods over this bridge is expected to contribute to the economic development of the Yangon metropolitan area and Myanmar overall. JICA provided assistance in enacting the Project for Comprehensive Urban Transport Plan of the Greater Yangon, by formulating a master plan that includes a road network, public transportation, and transportation management plan for 2035. The Thaketa Bridge project was also included in the Master Plan for the future of Yangon. As traffic volumes are expected to increase in Yangon, further economic development in the greater Yangon metropolitan area is needed to solve issues pertaining to traffic congestion and safety, thus ensuring further economic growth. The final product was a bridge 253 m long at a cost of \$42 million.

Figure 3.8: Thaketa Bridge



Source: Authors.

The Kyaukphyu Special Economic Zone and the Kyaukphyu Deep Sea Port (Tier 2)

Myanmar's Ministry of Commerce recently signed a framework agreement with the China International Trust Investment Corporation (CITIC) Group, a Chinese state investment

organization, concerning the Kyaukphyu SEZ, which includes the development of the Kyaukphyu Deep Sea Port project in Rakhine State. This SEZ was initiated under the previous government but had been delayed due to the project's ownership structure. Under the previous government, CITIC had won the original tender to build the port based on an 85:15 ratio. After months of difficult negotiations between CITIC Group and the Government of Myanmar, a new agreement was reached, changing the share ratio to 70:30. CITIC Group initially won the tender to construct the Kyaukphyu SEZ with an estimated investment of \$7 billion in December 2015. It was agreed that, for the first phase, the deep-sea port would be implemented with \$1.3 billion (MK2.4 trillion) in funds. Under the original agreement, two other terminals were slated to be built in Made Island and Ramree Island. The original estimated cost of development for the entire project was \$7.2 billion, with the first phase expected to cost \$1.6 billion. According to the Framework Agreement signed on 10 November 2018, both sides agreed to implement the first phase of the deep-sea port supported by further investment from the government.

The development of SEZs in Myanmar originally attracted consistent interest, despite concerns pertaining to infrastructure deficiencies. Most companies originally hoped to take advantage of the large investment gaps that persisted within the country due to its previous international seclusion.

Myingyan Power Generation Project (125 Megawatts) (Tier 2)

The Myanmar Energy Master Plan, which was launched by Myanmar's National Energy Management Committee in 2016, has not functioned well. The plan provides supply strategies through viable energy mix scenarios to secure a long-term, stable, and reliable energy supply. Moreover, this master plan was developed to ensure the efficient use of energy sources, create an effective investment environment, employ innovative technologies, and minimise the environmental and social impacts. The plan also includes a projection for the electricity mix in 2030, which shows a drastically different picture from the 2012 baseline. According to the plan, from 2012 to 2030 the share of hydropower is projected to decrease from almost 70% to 57%, and that of natural gas from 28% to 85%. It also showed an increase in solar photovoltaics from 0% to 5%, and coal growth from 2% to almost 30% during the same period. Much of this growth will be fueled by private investment.

The Myingyan Power Generation project site (11.6 hectares) is situated within a larger (280-hectare), government-owned and -operated steel mill site. While the project site will be constructed on government land, alignment of the transmission line, water supply and water waste pipeline, and gas pipeline are likely to involve some degree of involuntary resettlement, including economic displacement. The plant is expected to have a capacity of 225 MW with a 230 kV overhead transmission line. When commissioned in 2018, the project became one of the largest gas-fired power plants in the country. Currently in operation, it is expected to reach full operational capacity in 2020 when construction is completed. The total project cost is approximately \$300 million.

Myanmar Electric Power Enterprise is leading the land acquisition process for the water pipeline and transmission lines. A resettlement framework has been prepared to enact the procedures to be adopted by Sembcorp to ensure compliance with ADB safeguard requirements, and to bridge the gaps between the national requirements and the ADB safeguard requirements. Sembcorp will implement the provisions of the resettlement framework and report to ADB on its compliance with the safeguard requirements.

The environmental impact assessment and social impact assessment identified the potential environmental and social impacts and risks of the project, and assessed the cumulative air quality impacts in the airshed. The project will minimise its contribution to background air quality through the use of gas turbines incorporating dry, low nitrogen oxide burners. The project utilises a closed-loop water-cooling system, which minimises water extraction and thermal discharge impacts. To meet ADB’s requirements, adequate mitigation measures are incorporated in the environmental management plan of the environmental impact assessment.

The project is expected to improve the reliability and stability of Myanmar’s power supply at a competitive tariff. As the first competitive tender for a gas-fired independent power producer project in Myanmar, the successful financial close and operation of this project is expected to mark a major milestone in the power sector. With ADB’s substantial participation, this project demonstrated the benefits of improving the power supply through low-cost PPP arrangements, and signals to the government, multinationals, and international financiers that private sector-led infrastructure investments can be undertaken successfully within legal and regulatory frameworks.

Figure 3.9: Myingyan Power Plant



Source: Authors.

6. Philippines

The Philippine Development Plan (2017–2022)

The Philippine Development Plan (2017–2022), which is the infrastructure development programme of the Government of the Philippines, provides the blueprint for the country's medium-term development agenda. Its goals are to achieve inclusive growth, a high-trust and resilient society, and a globally competitive knowledge economy by 2022. The plan identifies the following four areas for strategic policies, programmes, and projects to help realise the country's long-term vision for development:

- (i) building a prosperous, predominantly middle-class society where no one is poor;
- (ii) promoting a long and healthy life;
- (iii) becoming smarter and more innovative; and
- (iv) building a high-trust society.

The plan rests on three pillars that provide a foundation for the development policies, programmes, and projects: (i) enhancing the social fabric through people-centred and efficient governance; (ii) inequality-reducing transformation through inclusive opportunities in the markets; and (iii) increasing growth potential through investments in human capital, technology, and innovation.

The National Spatial Strategy (NSS) is a key strategy to implement the Philippine Development Plan. The NSS seeks to guide public investments and catalyse private investments to maximise agglomeration efficiencies, enhance connectivity, and build resilience to natural hazards. The NSS identifies areas for metropolitan, regional, and subregional centres of growth; networks of sustainable urban and rural communities; and hubs of development that in turn will require adequate infrastructure and connectivity. It also is needed to guide public investments for disaster-resilient communities. Overall, the Philippine Development Plan envisages a substantial increase in spending on public infrastructure, and thus seeks to improve linkages across the government's planning, programming, and budgeting processes while enhancing cooperation with the private sector.

2018 National Budget Priorities

To achieve its goals of inclusive growth, the government has drawn up its spending priorities (including infrastructure development) in the annual budgetary appropriation that it submits to Congress for approval. In 2018, the National Budget includes the following policy directions and priorities:

- (i) A credible and disciplined fiscal policy. Maintain the budget deficit at a manageable 3% of GDP while pursuing reforms to generate the needed revenues. These include improvements in tax laws and non-tax bases as well as governance reforms.

- (ii) A fiscal space focused on equitable progress and social order. Increase outlays in infrastructure development and social services, ensure improvements in quality and quantity, and target emerging growth centres and lagging communities, particularly in disaster- and conflict-affected areas.
- (iii) Accelerated infrastructure development. Vigorously pursue the government's infrastructure development programme (the 'Build-Build-Build' programme), which aims to increase infrastructure spending from 5 to 7% of GDP.
- (iv) Commitment to transparency, participation, and accountability. Require government agencies to be responsible and accountable for the proper implementation of their budgets, and encourage them to involve people in the selection and monitoring of the use of government funds.
- (v) Support and enhance partnerships with local governments, especially in more isolated and depressed areas, to ensure sustainable and inclusive development.
- (vi) Restructure the agency budget for fiscal year 2018 using the Program Expenditure Classification approach, which shifts the classification and focus of government programmes, projects, and activities from output-based to results-based programmes, thereby clearly reflecting the agencies' policies and priorities.
- (vii) Strengthen the implementation of the two-tier budgeting approach, which separates the review of ongoing programmes and projects from new and expanded programmes. Proposals are evaluated based on implementation readiness, agency absorptive capacity, and consistency, with priorities stated in the Budget Priorities Framework.

Infrastructure Strategies

Infrastructure development is seen as one of the government's priority efforts to support a higher growth trajectory and improve quality of life in both urban and rural communities. Infrastructure development supports all three pillars of the Philippine Development Plan (enhancing the social fabric, reducing inequality, and increasing the country's growth potential).

The four main strategies for achieving the targets in the infrastructure sector are as follows: (i) increase spending on public infrastructure, (ii) implement strategic infrastructure for the various infrastructure subsectors, (iii) ensure the preservation of infrastructure assets (e.g. roads), and (iv) intensify research and development on technologies that are cost-effective over the whole project life-cycle.

In this regard, the government has committed to accelerate public infrastructure spending as a share of GDP from 5.4 % in 2017 to at least 7.3 % by 2022, with a total funding requirement of about ₱8.13 trillion (\$155.8 billion) over the medium-term (Table 3.5).

Table 3.5: Targeted Infrastructure Spending

Public spending on infrastructure	Annual targets (obligation-based)						
	2017	2018	2019	2020	2021	2022	Total
Spending targets							
(₱ billion)	858.2	1,097.5	1,295.4	1,456.6	1,583.9	1,840.2	8,131.8
(% of GDP)	5.4%	6.3%	6.8%	6.9%	6.9%	7.3%	

Source: Government of the Philippines, Department of Budget and Management (2018), *Technical Notes on Proposed 2018 National Budget*. Manila: Department of Budget and Management.
<http://www.dbm.gov.ph/wp-content/uploads/Our%20Budget/2018/TechNotes%202018%20for%20posting.pdf> (accessed 13 January 2018).

To underscore the high priority given to infrastructure development, the government has launched what it calls the ‘Build-Build-Build’ infrastructure programme. Past studies have identified the serious lack of adequate infrastructure as a critical development constraint. ‘Build-Build-Build’ is meant to address poor infrastructure quality, and promote the transparency and efficiency of major infrastructure agencies in implementing government infrastructure projects according to schedule.

Public Investment Programme

Based on the current plan, the expected outcomes for 2017–2022 under the infrastructure development component of the public investment programme will generate a total of 4,490 infrastructure programmes, activities, and projects on transportation, water, energy, information and communications technology (ICT), social, and other public infrastructure. The total investment requirement will be ₱7,738.28 billion (\$148.3 billion) over the medium term.

The government will use a combination of tax financing, ODA from its bilateral and multilateral partners, and PPP arrangements to build and finance its public investment programme. Backed by robust macroeconomic fundamentals and enhanced fiscal space arising from recent tax and budgetary reforms, around ₱4,820.89 billion (62.3% of the total investment requirement) will be funded using tax financing. Around ₱1,005.33 billion (13%) will be sourced through ODA, and ₱1,279.73 billion or (16.5%) through PPP (Table 3.6). The 4,490 infrastructure projects will contribute directly to increased production in the construction, communication, electricity, public administration, air, land, and water transportation industries. Of the total investment requirement, ₱6,957.71 billion (almost 90%) will be invested in the construction industry alone.

Table 3.6: Mode of Financing of Investment Requirements

Mode of Financing	No. of Projects	Investment Requirements (₱ billion)							
		2017	2018	2019	2020	2021	2022	Total	% of Total
NG-GAA	4,095	574.18	988.68	903.51	901.79	734.63	718.09	4,820.89	62.30%
ODA	68	21.99	82.87	165.12	276.68	264.63	194.05	1,005.33	12.99%
PPP	39	99.83	166.06	219.00	254.73	271.79	268.33	1,279.73	16.54%
Others ^a	288	1.05	105.26	135.26	132.87	130.14	127.74	632.32	8.17%
Total	4,490	697.05	1,342.87	1,422.90	1,566.07	1,401.18	1,308.21	7,738.28	100.00%

NG-GAA = National Government-General Appropriations Act, ODA = official development assistance, PPP = public-private partnership.

^a Purely private investments, corporate funds of government-owned and/or -controlled corporations, and internally generated funds of government financial institutions and infrastructure projects whose mode of financing will be determined later.

Source: Philippine Development Plan 2017–2022; Government of the Philippines, Department of Budget and Management (2018), *Technical Notes on Proposed 2018 National Budget*. Manila: Department of Budget and Management.

<http://www.dbm.gov.ph/wp-content/uploads/Our%20Budget/2018/TechNotes%202018%20for%20posting.pdf> (accessed 2 January 2019).

Key Measures to Facilitate the Implementation of Infrastructure Projects

The Infrastructure Flagship Projects (IFPs) initiative, which was implemented under the monitoring of the National Economic and Development Authority (NEDA) board, approved the adoption of 75 high-impact infrastructure projects that represent the major capital undertakings that the government will implement in the medium term. These projects are envisaged to promote growth centres outside the urban-industrial region centred on Metro Manila, with 45 projects located in Luzon, 10 in Visayas, and 17 in Mindanao. To ensure the efficient implementation of the IFPs, achieve their outlined development goals, and thus realise the resulting economic benefits, the government has established the Project Facilitation, Monitoring and Innovation Task Force. The task force's primary functions are to recommend government-wide operational measures to resolve development and implementation issues, risks, and bottlenecks relating to the IFPs; institute coordination mechanisms between oversight and implementing agencies to facilitate the above function; and facilitate the deployment of resources through the national government budget, ODA, and other sources to oversight and implementing agencies to fast-track the development and implementation of the IFPs.

The Infrastructure Development Program Fund formulated master plans to aid the NEDA Board–Investment Coordination Committee in evaluating projects, help the implementing agencies in their respective planning and programming exercises, and guide various stakeholders in undertaking appropriate actions relevant to their respective sectors. The Infrastructure Development Program is implemented in conjunction with the updating of other sectoral master plans, including the Philippine Transport Systems Master Plan, Manila Bay Sustainable Development Master Plan, and Philippine Water Supply and Sanitation Master Plan.

Finally, the NEDA Project Development and Other Related Studies Fund, which amounts to ₱1.595 billion (\$30.5 million) under the 2018 National Government-General Appropriations Act establishing the budget of NEDA, is envisioned to support the development of strategic infrastructure programmes and projects, with the goal of providing a sound basis for project evaluation and ensuring the timely implementation of said initiatives. The fund seeks to address implementation delays arising from inadequate project preparation (i.e. re-evaluation and re-approval by the Investment Coordination Committee) resulting from implementing agencies' lack of technical capacity in preparing pre-investment or feasibility studies.

Each of these programmes provides transparency services, acts as a source of information and guidance for project development and regulation navigation, and creates new financing mechanisms to further incentivise PPPs.

The infrastructure cluster under the Government Cabinet Cluster System was created pursuant to Executive Order No. 24 s. 2017 to focus on the government's infrastructure development agenda. It is tasked with (i) enhancing the delivery of public infrastructure by ensuring the efficient and transparent management of assets and resources, with a focus on both the management of assets and the shift to service-oriented approaches that enable stakeholders to become co-producers of services; (ii) improving the quality and reliability of public infrastructure and efficiency of public investment; (iii) strengthening the implementation capacity and budget execution of government agencies involved in infrastructure development; and (iv) ensuring equitable access to infrastructure services.

In terms of monitoring, the cluster will focus on the operationalisation of and performance-tracking for infrastructure projects. Since the Project Facilitation, Monitoring and Innovation Task Force was created to monitor project milestones for the 75 IFPs, the cluster will direct its attention to cross-cutting or overarching operational and implementation issues of other major capital projects or non-IFP Core Investment Programs. The infrastructure cluster consists of the chair of the Department of Public Works and Highways, the Office of the President-Office of the Executive Secretary, Office of the President-Cabinet Secretary, Office of the President-Presidential Management Staff, NEDA, Department of Budget and Management, Department of Finance, Department of the Interior and Local Government, Department of Transportation, Department of Information and Communications Technology, Department of Trade and Industry, Department of Agriculture, Department of Health, Department of Social Welfare and Development, Department of Education, and Department of Tourism.

The \$100 million Infrastructure Preparation and Innovation Facility aims to address key constraints on project planning, design, and implementation; and to accelerate progress in infrastructure delivery by supporting the two key agencies responsible for national public infrastructure projects, namely, the Department of Public Works and Highways and the Department of Transportation. The facility will help deliver more effective and innovative infrastructure projects by conducting effective pre-investment activities that will help accelerate the approval process and ensure timely, high-quality procurement and implementation of projects. It also intends to enhance national capacity and enable the Department of Public Works and Highways and Department of Transportation to incorporate expertise and innovation in project formulation and implementation.

Arterial Road Bypass Project, Phase II (Arterial Highway Bypass) Project (Tier 2)

On 30 April 2018, the Arterial Road Bypass Project, Phase II was inaugurated. This road is 24.61 km long and it traverses five municipalities in Bulacan (Balagtas, Guiguinto, Plaridel, Bustos, and San Rafael), bypassing the Philippines–Japan Friendship Highway (also called the Maharlika Highway). This road is expected to ease traffic congestion on the Maharlika Highway and can accommodate 15,000 vehicles per day, cutting travel time between the North Luzon Expressway in Balatagas and the Maharlika Highway in San Rafael by 30 minutes. Moreover, this road is expected to boost economic activity around the northern suburbs of Metro Manila by facilitating the movement of goods and services. This project was funded by the governments of the Philippines and Japan through JICA.

General Santos City Port (Makar Wharf Expansion) Project (Tier 3)

General Santos City, which is known as ‘the tuna capital of the Philippines,’ is famous for its fishing port, and the city’s main industry is fishing. The port modernisation project, which is included in the city authority’s locally funded projects, aims to construct wharfs for rail-mounted gantry cranes at the ports of Iloilo, Makar (General Santos), Cagayan de Oro, and Zamboanga. The Philippine Ports Authority (PPA) committed to complete civil works for these ports. According to the PPA Year-End Accomplishment Report [Calendar Year] 2017, the PPA has completed the remaining portion of the construction works for Makar (General Santos), including a 700 square m (m²) extension, the renovation of 600 m² of the port area, construction of additional berthing areas, reinforcement of the wharf columns, and repairs to the container yard rails. General Santos port is also one of three priority routes under the ASEAN Roll-On Roll-Off Connectivity service in the Master Plan on ASEAN Connectivity. This route connects General Santos and Bitung in Indonesia. In April 2017, the Roll-on Roll-off service commenced operations, but it has been halted because the volume of goods has been too low.

Busuanga Airport Development Project (Tier 2)

The new Busuanga Airport development project was finished in early 2018. This project aims to replace the existing Busuanga Airport facility in the municipality of Coron, in the province of Palawan. The ₱4.1 billion (\$94 million) project involves the construction of a new runway and passenger terminal, enabling the airport to handle jet services. Busuanga Airport is an emerging holiday destination to attract international and domestic travellers, and the new aerodrome will accommodate the expected growth in passenger traffic.

Bonifacio Global City to Ortigas Center Road Link (Phases I, IIA, and IIB) Project (Tier 1)

This project aims to construct a 613.77 m bridge connecting Ortigas Center and Bonifacio Global City. The project is divided into three phases. Ground was broken on 19 July 2017. Civil works for phases I and IIA are ongoing (13.8% actual accomplishment against a 13.3% target), as are negotiations and coordination efforts with the local government of Makati to resolve right-of-way concerns. A draft memorandum of agreement for relocation assistance has already been prepared. This project is also one of the 75 IFPs.

Figure 3.10: Bonifacio Global City–Ortigas Center Link



Source: Authors.

7. Thailand

Thailand Development Pathways—Twelfth National Economic and Social Development Plan

Thailand must confront the middle-income trap and inequality trap in its future development. The 5-year duration (2017–2021) of the Twelfth National Economic and Social Development Plan represents a critical period of reform and transformation for the country to advance towards the economic structure known as Thailand 4.0. This new structure must be resilient and

responsive to new risks and threats. Under the Twelfth Plan, Thailand must be transformed extensively due to prevailing conditions and the development environment. Fundamental problems, persistent weaknesses, and restrictions can be overcome by reform and change. Meanwhile, a proactive strategy of risk management and building resilience is needed to utilise the country's strengths for long-term development. The main emphases and development issues of the Twelfth Plan focus on interconnected and integrated issues that will provide the basis for budget allocation, plan implementation, and monitoring and evaluation. Although Thailand 4.0 and its objectives are consistent with this development plan, achieving them will be difficult. The key to Thailand 4.0's success lies in (i) improving human resources by drastically reforming and improving the education system to produce specific workers for specific roles; (ii) encouraging creativity, innovation, critical thinking, entrepreneurship, sustainability, and inclusiveness; (iii) ramping up digitalisation and automation; and (iv) putting into place the necessary infrastructure demanded by these advancements.

The 20-Year National Strategy

In his national address on 29 July 2016, Prime Minister General Prayut Chan-o-cha mapped out the Twelfth National Plan in line with the 20-Year National Strategy. This strategic plan covers six primary efficient national development strategies: (i) security, (ii) competitiveness enhancement, (iii) human resource development, (iv) social equality, (v) green growth, and (vi) rebalancing and public-sector development. It also includes four supporting strategies involving (i) infrastructure development and the logistics system; (ii) science and technology, research, and innovation; (iii) urban, regional, and economic zone development; and (iv) international cooperation for development. Development under the Twelfth Plan (2017–2021) covers the first 5 years of the implementation of the 20-Year National Strategy (2017–2036), which is Thailand's development master plan for steering the country towards security, prosperity, and sustainability.

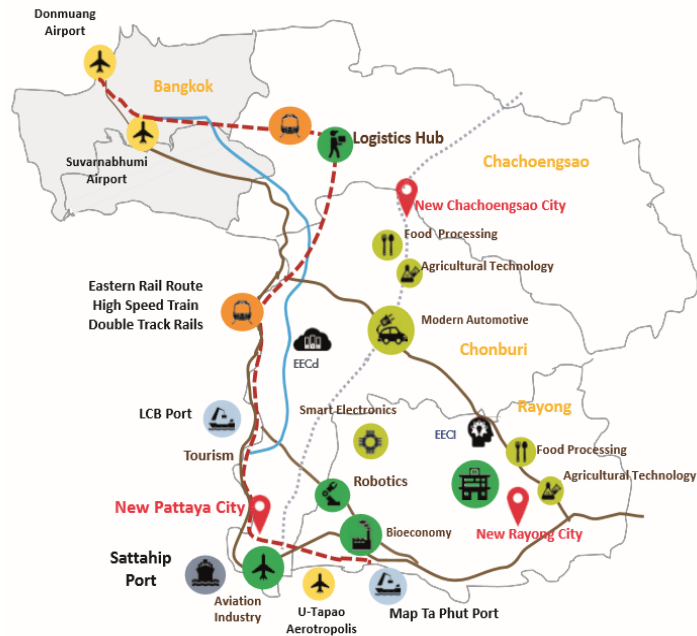
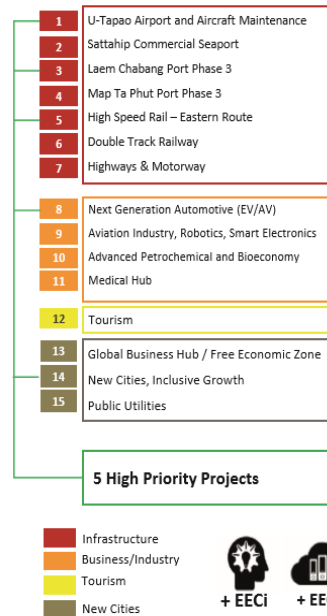
Eastern Economic Corridor

To date, the Government of Thailand has been pursuing a variety of economic development strategies, one of which, increasing foreign direct investment (FDI) flows, is popular among developing countries. However, this has gradually changed since the 1980s when the ICT revolution began to reduce the costs of coordination at distance. Lower costs of service and control linkages made it possible to fragment production blocks in different locations to exploit the input sectors advantage. However, this requires a trade-investment-services nexus supported by physical and institutional connectivity.

Figure 3.11: The Eastern Economic Corridor Project

EASTERN ECONOMIC CORRIDOR (EEC)

4 Core Areas 15 Projects and
5 High Priority Projects



EECd = Digital Park Thailand, EECl = Eastern Economic Corridor of Innovation, EV/AV = electric vehicles/autonomous vehicles, LCB Port = Laem Chabang Port.

Source: Eastern Economic Corridor Office of Thailand (2018), *Investment Statistics*.

<https://www.eeco.or.th/en/content/investment-statistics> (accessed 2 January 2019).

The Eastern Economic Corridor (EEC) Development Plan under the Thailand 4.0 scheme aims to revitalise and enhance the well-known Eastern Seaboard Development Program that supported Thailand as a powerhouse of industrial production for over 30 years. The EEC Development Plan will lead to a significant development and transformation of Thailand’s investment in physical and social infrastructure in the three eastern provinces of Chachoengsao, Chonburi, and Rayong (Figure 3.11).

The EEC development plan has highlighted opportunities and investment trends in 10 key industries, which will improve Thailand’s competitiveness. These 10 industries are divided into two categories as follows: (i) first ‘S-curve’ industries, including (a) the next-generation automotive industry, (b) the intelligent electronics industry, (c) the advanced agriculture and biotechnology industries, (d) the food processing industry, and (e) the high-wealth and medical tourism industries; and (ii) new ‘S-curve’ industries, covering (a) the digital industry, (b) the robotics industry, (c) the aviation and logistics industry, (d) the comprehensive healthcare industry, and (e) the biofuel and biochemical industries. The statistics for 2017 show direct investments in 259 projects in the EEC region valued at B310.337 billion (\$9.7 billion), relating to infrastructure and connectivity of the EEC with Thailand, the Lao PDR, China, and Cambodia

through the development of double-track railways. The EEC project focuses on implementing infrastructure development projects and the seamless operation of transportation. Massive infrastructure projects on the EEC development list include the U-Tapao Airport expansion, the Map Ta Phut Deep-Sea Port expansion, the Laem Chabang Deep-Sea Port expansion, the double-track railways, the high-speed train, and the motorway (Table 3.7).

Table 3.7: Thailand Eastern Economic Corridor Project Overview

Project name	Summary	Budget (billion)	Progress
U-Tapao Airport expansion and related projects	<ul style="list-style-type: none"> • Passenger terminal building expansion • Installation of a maintenance, repair, and overhaul centre • Construction of a second runway • Approval of private airport operation rights • Development of an aviation industrial park • Human resources training centre for the aviation industry and maintenance centre for aircraft 	200.0	<p>The second terminal, which has a capacity of 3 million people a year, was partially opened in November 2018, and construction for a capacity of 5 million people is underway in the year 2020.</p> <p>The second runway with a length of 3,500 meters will begin construction in 2019.</p>
Map Ta Phut Port expansion work	<ul style="list-style-type: none"> • In connection with the first phase of the port facility, development of 88 hectares of foreland, and 72 hectares of hinterland • Two tanker shore ports of liquefied natural gas and three gas transfer piers • Construction of a cargo warehouse, natural gas-related establishment, sludge reservoir, and breakwater 	55.4	<p>The Japan Bank for International Cooperation is a primary financial supporter as of March 2019. The project is currently entering Phase 3 to expand imports of raw materials for the petrochemical industry and bio-economy.</p>
Construction of the Pattaya-Map Ta Phut Motorway	<ul style="list-style-type: none"> • The motorway follows the route of the Pattaya-Map Ta Phut section of National Highway No. 7. • At present, works on a 32 km extension are progressing, and this is scheduled to open in 2019. 	35.3	<p>In 2016, construction and management of the expropriation of land began. The project is now under construction, and was 70.4% complete as of February 2018. It is expected to be open for service in early 2020.</p>
Construction of the Bangkok-Rayong high-speed railway	<ul style="list-style-type: none"> • The railway connects the U-Tapao, Suvarnabhumi, and Don Mueang airports. • The railway connects the Don Mueang and U-Tapao airports within 1 hour, and the Suvarnabhumi and U-Tapao airports within 45 minutes. • Operated under a PPP system, the railway can transport 110 million people each year. 	158.0	<p>Under consideration for PPP, and an environmental impact assessment report is being considered. The details of the bidding document (terms of references) are being studied.</p>

Laem Chabang Deep-Sea Port extension work	<ul style="list-style-type: none"> • Construction of a wharf to increase the port's handling capacity from the current 7 million tonnes of cargo per year to 18 million tonnes per year • Building a pier 18.5 metres deep, making it possible to anchor a large ship with a capacity of 160,000 tonnes. • Developed under the PPP method 	88.0	<p>2011–2017: The feasibility study related to economic, engineering, environmental, and detailed design was carried out.</p> <p>2018: The report was submitted and approval obtained from the Port Authority of Thailand board, Ministry of Transport, related organisations, and the Cabinet.</p> <p>2019: Contractors will be found to lead construction (about 6 months)</p> <p>2019–2024: Construction of port infrastructure will begin (5 years).</p> <p>The consultant stopped working on the environmental health impact assessment report on 7 September 2012, but the Port Authority of Thailand approved the resumption of the study from 27 May 2016 to October 2017; the report is now in progress.</p> <p>The Cabinet approved the expenditure base and limit as per the EEC's approval by letting the Port Authority of Thailand invest jointly with the private sector and borrow money to proceed with the Tha Laem Chabang Port Development Project, Phase 3.</p>
Construction of the double-track railway	Double tracking of the existing railway between Laem Chabang Port and Map Ta Phut Port	64.3	The feasibility study is ongoing.

PPP = public–private partnership.

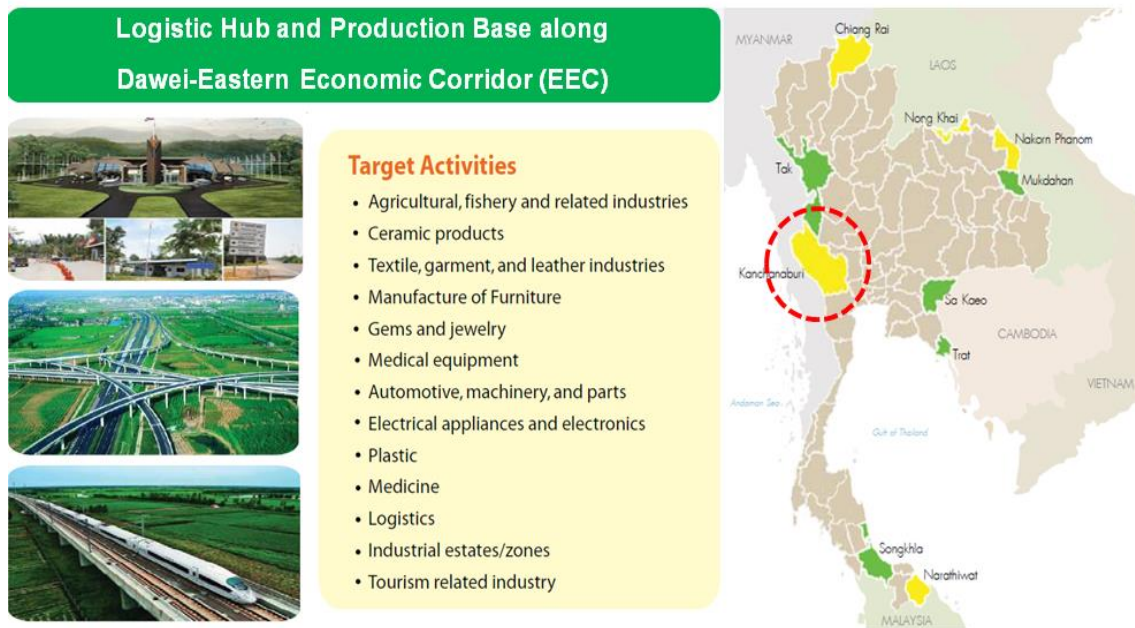
Source: Authors.

Thailand's Special Economic Zones

Thailand's SEZs were established in 10 provinces: Tak, Mukdahan, Sa Kaeo, Trat, and Songkhla (under the first phase); and Nong Khai, Narathiwat, Chiang Rai, Nakhon Phanom, and Kanchanaburi (under the second phase) (Table 3.8).

The Kanchanaburi SEZ location will be a logistics hub and production base along the Dawei SEZ–Thailand EEC, and the government will provide necessary infrastructure such as Highway No. 367, the Bang Yai–Kanchanaburi motorway project and customs, immigration, and quarantine facilities. The project targets the automotive, electronics, food and agriculture, and plastics industries. Shipping is accessible through the Dawei Seaport to economies in the Indian Ocean region, Middle East, and Europe; and through the Laem Chabang Seaport to economies in Asia and the Pacific region. Moreover, the Dawei SEZ would strengthen supply chain linkages with Thailand's EEC, providing opportunities for co-manufacturing linkages and inducing economic activities along the corridor (Figure 3.12).

Figure 3.12: Thailand's Special Economic Zones



Source: Office of the National Economic and Social Development Board. 2016. *Thailand's Special Economic Zones*. Bangkok: Office of the National Economic and Social Development Board.

Table 3.8: Thailand Special Economic Zone Project Overview

Project name	Summary	Budget (\$ million)	Progress
Tak	The Tak SEZ comprises 14 subdistricts in the three districts (Mae Sot, Phop Phra, and Mae Ramat) of Tak province: a total area of 1,419 km ² .	39	The IEAT is waiting for the Treasury Department to transfer the land and aims to start operations by 2018. The IEAT is revising the environmental impact assessment report.
Mukdahan	Development of SEZ state land (1.728 km ²)	28	The Treasury Department has opened the land for development by the private sector; the bidding process (2nd round) is now underway.
Sa Kaeo	The Sa Kaeo SEZ comprises four subdistricts in the two districts (Aranyaprathet and Watthana Nakhon) of Sa Kaeo province: a total area of 332 km ² .	38	The study is finished. The Treasury Department has not transferred the land to the IEAT as there are disputes over land ownership. The project is expected to take place in 2018–2019. Phase 1 of the project is complete. Phase 2 is under construction and is scheduled to be finished in 2019.
Trat	Development of state land in the Trat SEZ (1.432 km ²)	22	The Treasury Department has opened the area for development by the private sector. The lease contract for winning bidders will last for 50 years. Development proposal plans must be submitted to the Treasury Department.
Songkhla	The Songkhla SEZ comprises four subdistricts in the Sadao district of Songkhla province: a total area of 552.3 km ² .	36	The study is finished. The IEAT is waiting for the Treasury Department to transfer the land. The project will take place in 2018–2019.
Nong Khai	Development of state land in the SEZ (1.1488 km ²)	N/A	The Treasury Department has opened the land for private sector development; the second round of the bidding process is underway.
Narathiwat	The Narathiwat SEZ comprises five subdistricts in the five districts (Mueang Narathiwat, Tak Bai, Yee Ngor, Waeng, and Su-ngai Kolok) of Narathiwat province: a total area of 235.17 km ² .	N/A	Negotiations to buy land for the project are underway with the IEAT. The project is planned to take place in 2018–2019.

Chiang Rai	The Chiang Rai SEZ comprises 21 sub-districts in the three districts (Chiang Khong, Chiang Saen, and Mae Sai) of Chiang Rai province: a total area of 916.2 km ² .	N/A	Review to allow the Treasury Department to hold title to the land is ongoing. Proceedings are underway to issue an announcement to withdraw the land from the public domain.
Nakhon Phanom	The Nakhon Phanom SEZ comprises 13 subdistricts in the two districts (Mueng Nakhon Phanom and Tha Uthen) of Nakhon Phanom province: a total area of 794.79 km ² .	N/A	Review to allow the Treasury Department to hold title to the land is ongoing.
Kanchanaburi	The Kanchanaburi SEZ comprises two subdistricts in the Muang Kanchanaburi district of Kanchanaburi province: a total area of 260.79 km ² .	N/A	Review to allow the Treasury Department to hold title to the land is ongoing. The Treasury Department already has an investor and developer, and will proceed to lease further plots for business development.

IEAT = Industrial Estate Authority, km² = square kilometres, N/A = not applicable, SEZ = special economic zone.

Source: Authors.

8. Viet Nam

Program Towards 2020

The goal of the Program Towards 2020 is to ensure the establishment of a framework for the Master Plan on ASEAN Connectivity, especially with respect to transport infrastructure, and to connect in a relatively synchronous way Viet Nam's domestic infrastructure with the ASEAN infrastructure, especially the main axis of the East–West Economic Corridor. Other goals of the programme are to build domestic transport synchronously; combine the development strategies among branches to develop multi-modal transportation; raise Viet Nam up as a gateway connecting Southeast Asia to the Indian Ocean; harmonise the country's enterprise, investment, and immigration policies with those of other countries in the region to ensure commercial intercourse; and improve the effects of investment in infrastructure.

The Government of Viet Nam is working to synchronise infrastructure development policy. In 2016, Prime Minister approved the project Policy on Synchronous Development of Infrastructure, to Connect the Development of Domestic Infrastructure with the Regional Infrastructure Network based on the following goals:

- (i) Develop domestic infrastructure and link this development with regional infrastructure networks while ensuring full compliance with the commitments to the Master Plan on ASEAN Connectivity to meet the requirement for the establishment of the ASEAN community and Greater Mekong Subregion Cooperation Programs.
- (ii) Orient the development of infrastructure towards modernity to keep pace with developing trends in science and technology and the development of smart infrastructure.
- (iii) Encourage innovative thinking in the investment and development of infrastructure with the aim of changing the mechanism and enhancing the efficiency of public investment, and implementing the allocation and use of resources based on market principles.
- (iv) Maximise the mobilisation of resources to strengthen connectivity between domestic infrastructure and regional networks.
- (v) Identify innovative mechanisms and modes of investment, trade, and management to mobilise all resources from non-state sectors for the development of infrastructure enabling the state to change gradually from making direct investments to creating favourable conditions and sharing risks with the private sector in constructing infrastructure on the basis of PPP.
- (vi) Ensure sustainable development with respect to environmental protection, green development, and responses to climate change.

The Program Towards 2020 framework includes guidelines for the development of logistical and energy infrastructure. Logistics focuses on roads, rail, and ports and outlines broad goals. The

government aims to develop a consistent and modern traffic infrastructure system in the country based on the appropriate use of resources. Furthermore, the programme prioritises projects with a pervasive influence that can be linked to transport modes, major economic centres, key economic regions, and important traffic gateways connected with regional traffic infrastructure networks. These developments will be accomplished by the financing of the construction of a number of high-speed roads totalling 6,400 km in length, of which approximately 2,000–2,500 km will be constructed by 2020. This road development will also include the construction of 601 km of the Ho Chi Minh Road by 2020 to improve connection to these routes. In terms of railways, the programme focuses on financing the upgrading of the north–south railway route, by renovating and upgrading the Hanoi–Ho Chi Minh City railway route, increasing speeds to 80 km/h–90 km/h for passenger trains and 50 km/h–60 km/h for cargo trains, and expanding the traffic capacity of the entire route.

Seaways, waterways, and airways are also included in the logistics plan for Viet Nam. A primary goal is the completion and operation of the Lach Huyen Port area belonging to the Hai Phong international gateway port. There are also plans to complete the construction of navigable channels for large ships (with a high carrying capacity) to enter the Hau River, with a focus on the renovation and upgrading of navigable channels leading to important seaports, which would double the existing total capacity of all seaports up to 680 million tonnes per year by 2020. Inland, technical efforts are being made to ensure the continuous operation of important inland waterway routes, with priority given to the upgrading of connections between areas in the Mekong River Delta and Ho Chi Minh City, and the Tien, Hau, Red, and Thai Binh rivers, thus increasing the length of operated river routes. Goals related to airways focus on checking and financing the upgrading and modernisation of international airports. These modernisation efforts aim to increase the airports' total traffic capacity to 100 million passengers per year (approximately 1.5 times the capacity in 2015).

Policies on the development of energy infrastructure aim to expand domestic connections with regional energy infrastructure networks. The 2020 goals focus on connecting Viet Nam's roads with the regional infrastructure that currently exists between China, the Lao PDR, and Cambodia. The integrated GMS power system will utilise 500 kV transmission lines to accommodate the differences in grid voltage infrastructure among the countries. Developing the transmission grid in this way will synchronise power plant operations and energy distribution. This will be furthered by the application of smart electrical grids and state-of-the-art technologies to enhance the quality of distribution networks, and by connecting Viet Nam's power system to regional power networks to manage demand response.

Lach Huyen International Port (Tier 1)

The Lach Huyen international port in the northern port city of Hai Phong uses Japanese ODA funding, and is the first ODA project implemented in the form of a PPP between Viet Nam and Japan. On 13 May 2018, a grand opening ceremony for the Lach Huyen international port was held on Cat Hai Island in Hai Phong. In addition, the Tan Vu intersection (of the Hanoi–Hai Phòng

expressway, Tan Vu-Lach Huyen road, and ring road of Hai Phong City) is under construction and is expected to be completed in 2019. The project will help meet the growing demand for cargo handling in Viet Nam and enhance the northern region’s international competitiveness.

Many investors attracted by the upcoming new port have already found their way to Hai Phong and the surrounding industrial zones like the Deep C and Dinh Vu industrial zones. The FDI figures reveal that investments in north Viet Nam are outperforming the traditional investment locations in the south of the country (i.e. Ho Chi Minh City), with the majority of FDI going to the Hai Phong area since construction of the new port began. Serious advantages like improved infrastructure (e.g. highways and airports) and an abundant, cost-efficient, and skilled labour force are contributing to the recent growth of industrialisation of the Hai Phong area in north Viet Nam. The project is also expected to be a good model for other PPP projects in the port industry amid a number of barriers, including a lack of risk-sharing mechanisms on exchange rates and the absence of a revenue guarantee, which have been discouraging foreign investors from joining transport projects.

Figure 3.13: Lach Huyen International Port



Source: Hai Phong Department of Planning and Investment. <http://haiphongdpi.gov.vn/eng/dinh-vu-cat-hai-economic-zone/> (accessed 30 May 2019); and authors.

Hoa Lac–Hoa Binh Highway (Tier 1)

The Hoa Lac–Hoa Binh Highway is 25.6 km long and required a total investment of D2,700 billion (\$115.5 million). It was put into operation in October 2018. Constructed under a BOT model, the project was intended to meet the demand for transport on the road corridor between the northwest region and Hanoi, and to increase the efficiency of the Thăng Long Boulevard route. The project helped improve the transportation infrastructure in Hoa Binh province, reduced the distance from Hoa Binh to Hanoi to 20 km, and shortened the travel time from Hanoi to Hoa Binh from 2 hours (by National Highway No. 6) to 1.5 hours. This project will be a driving force of socioeconomic development in the northwest of the country in general and in the province of Hoa Binh in particular.

Hai Phong–Ha Long Highway (Tier 2)

The Hai Phong–Ha Long Highway project starts from National Highway No. 18, in Dai Yen ward, Ha Long and ends at the intersection with the Hanoi–Hai Phong expressway, in Dong Hai ward, Hai Phong. The total project investment is about D13,000 billion (\$556.2 million). The project is divided into two subprojects: the highway and Bach Dang bridge. The highway is invested under a BOT model with a total investment of about D7,270 billion (\$311 million). The Bach Dang bridge is 5.4 km long and 25 m wide and has a special design spanning Hanoi–Hai Phong–Ha Long. The project, which became operational in September 2018, shortened the distance from Ha Long to Hanoi from 180 km (3–4 hours) to 130 km (1.5 hours), and from Ha Long to Hai Phong from 75 km (2 hours) to 25 km (30 minutes).

The project not only adds more value to the Hanoi–Hai Phong Expressway, but also develops the connections between Hanoi, Hai Phong, and Ha Long, opening more chances for economic development in these areas. This project also adds value to Ha Long City by connecting Ha Long to Van Don, where the Van Don airport is located. When the Van Don–Mong Cai highway is finished in the near future, travel will be possible from Hanoi to Mong Cai along modern highways from Hanoi through Hai Phong, Ha Long, and Van Don to Mong Cai. This area is attracting many foreign and domestic investors because of its transportation advantages, and is expected to see the formation of many industrial zones, economic zones, and smart cities in the near future.

Da Nang–Quang Ngai Highway (Tier 2)

The Da Nang–Quang Ngai Highway is a part of the highway connecting Hanoi to the south of the country. It stretches from Tuy Loan (742 km from Hanoi), Hoa Vang, Da Nang City to Nghia Ky, Tu Nghia, Quang Ngai province (130 km from Danang). The total project investment is D34.500 billion (\$1.5 billion). The highway is designed for speeds of 120 km/h, and has reduced travel time from Da Nang to Quang Ngai from 3 hours (using the National Highway No. 1) to 1.5 hours.

The Da Nang–Quang Ngai Expressway is expected to create opportunities for central localities to make breakthroughs, attract investment, and promote the development of industrial parks

and tourism along the country's central coast. It will play an important role in accelerating the development of the central region's economic hub, as well as strengthening the links between Da Nang and the provinces of Quang Nam and Quang Ngai. This project will reduce transportation accidents and ensure smooth and safe transport (especially in the rainy season). In addition, it will boost the socioeconomic development of the three localities through which it runs, ensure their security and defence, and enhance the living conditions of their residents.

It is also hoped that the project will boost transport connectivity from the Viet Nam–Laos–Cambodia economic triangle, through the East–West Economic Corridor, to seaports in the central region.

Bibliography

Augustine, I. (2018), Kata KPPIP, Proyek Prioritas Kemungkinan Tidak Ditambah, Tetap 37. *Bisnis*. <https://industri.bisnis.com/read/20180223/45/742342/kata-kppip-proyek-prioritas-kemungkinan-tidak-ditambah-tetap-37-> (accessed 13 January 2018).

BAPPENAS (2018), *Public Private Partnership Book*. Jakarta: BAPPENAS. <https://www.bappenas.go.id/files/PPP%20Book/PPP%20Book%202018%20FINAL.pdf> (accessed 27 May 2019).

Baxter, B.W. (2017), Thailand 4.0 and the Future of Work in the Kingdom. March 29. Geneva: International Labour Organization. https://www.ilo.org/asia/events/WCMS_549062/lang--en/index.htm (accessed 2 January 2019).

Bukht, R. and R. Heeks (2018), Digital Economy Policy: The Case Example of Thailand. *Development Implications of Digital Economies. United Kingdom*. <http://diode.network/publications/> (accessed 2 January 2019).

CNN Indonesia (2018), 53 Proyek Berpotensi Dicores dari Proyek Strategis Nasional. <https://www.cnnindonesia.com/ekonomi/20181010113942-532-337232/53-proyek-berpotensi-dicores-dari-proyek-strategis-nasional> (accessed on 13 January 2018).

Digital Economy Promotion Agency (2017), Digital Transformation in Thailand: Policy and Institutional Reform. www.depa.or.th (accessed 2 January 2019).

Eastern Economic Corridor Office of Thailand (2018), Investment Statistics. <https://www.eeco.or.th/en/content/investment-statistics> (accessed 2 January 2019).

Economic Research Institute for ASEAN and East Asia (ERIA) (2015), *The Comprehensive Asian Development Plan 2.0 (CADP 2.0): Infrastructure for Connectivity and Innovation*. Jakarta: ERIA. <http://www.eria.org/publications/the-comprehensive-asian-development-plan-20-cadp-20-infrastructure-for-connectivity-and-innovation> (accessed 14 April 2018).

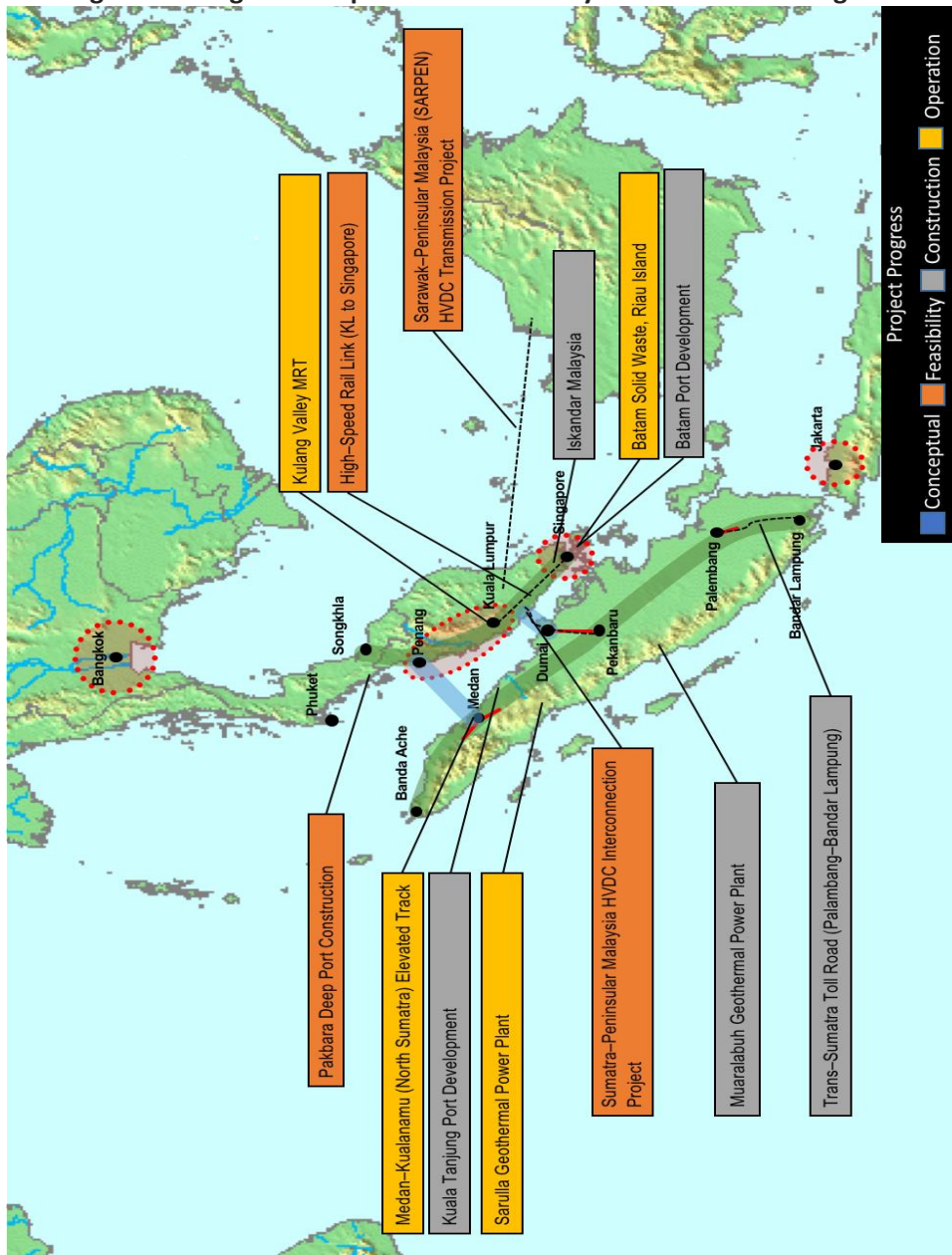
- Electricity Authority of Cambodia. <https://eac.gov.kh/site/index?lang=en> (accessed 30 May 2019).
- ERIA (2017), *Progress Survey Report of Infrastructure Projects in CADP 2.0*. Jakarta: ERIA. <http://www.eria.org/research/2017-progress-survey-report-of-infrastructure-projects-in-cadp-20/> (accessed 14 April 2018).
- Government of the Lao People's Democratic Republic, Ministry of Planning and Investment (2016), *8th Five-Year National Socio-Economic Development Plan (2016–2020)*. Vientiane: Ministry of Planning and Investment. <http://www.la.one.un.org/media-center/publications/258-8th-five-year-national-socio-economic-development-plan-2016-2020> (accessed 30 May 2018).
- Government of the Philippines, Department of Budget and Management. *Philippine Development Plan 2017–2022, Technical Notes on Proposed 2018 National Budget*. Manila: Department of Budget and Management. <https://www.dbm.gov.ph/wp-content/uploads/Our%20Budget/2018/TechNotes%202018%20for%20posting.pdf> (accessed 13 January 2018).
- Government of the Philippines, Department of Budget and Management (2016), *Program Expenditure Classification*. Manila: Department of Budget and Management. <https://www.dbm.gov.ph/images/pdf/files/PREXCBrifer6.20.2016.pdf> (accessed on 13 January 2018).
- Government of the Socialist Republic of Vietnam, Policy of Synchronous Development of Infrastructure (2018), *Electronic Information Portal Transportation Ministry* <http://mt.gov.vn/vn/tin-tuc/44489/chinh-sach-phat-trien-dong-bo-ket-cau-ha-tang.aspx> (accessed 2 January 2019).
- Government Public Relations Department (2016), *Thailand's 20-Year National Strategy and Thailand 4.0 Policy*. Bangkok: Government Public Relations Department. http://thailand.prd.go.th/ewt_news.php?nid=3578 (accessed 2 January 2019).
- Green Growth Knowledge Platform (2017). *Thailand Twelfth National Economic and Social Development Plan (2017–2021)*. <http://www.greengrowthknowledge.org/national-documents/thailand-twelfth-national-economic-and-social-development-plan-2017-2021> (accessed 2 January 2019).
- Hai Phong Department of Planning and Investment <http://haiphongdpi.gov.vn/eng/dinh-vu-cat-hai-economic-zone/> (accessed 30 May 2019).
- Indonesian Ministry of National Development Planning (BAPPENAS) (2018), *Government in the National Medium-Term Development Plan (RPJMN)*. Jakarta: BAPPENAS. https://www.bappenas.go.id/files/publikasi_utama/Evaluasi%20Paruh%20Waktu%20RPJMN%202015-2019.pdf (accessed 15 April 2018).

- Kingdom of Thailand, Neighbouring Countries Economic Development Cooperation Agency (2016), *The Construction of Stung Bot Border Crossing Facilities (BCF) and Access Road to National Road No. 5 Project*. Bangkok: Neighbouring Countries Economic Development Cooperation Agency. <https://www.neda.or.th/home/en/uploads/download/YRrGxfe1dLCsLK14p2r.pdf> (accessed 27 May 2019).
- Lamonphet, A. and P. Apornrath (2017), Who Wants in on the EEC? *Bangkok Post*. <https://www.bangkokpost.com/news/politics/1339203/who-want> (accessed 5 October 2018).
- Ministry of Commerce of the Republic of the Union of Myanmar (2017), *Dawei Special Economic Zone*. Nay Pyi Taw: Ministry of Commerce of the Republic of the Union of Myanmar. <http://www.thaibizmyanmar.com/docs/Dawei%20SEZ.pdf> (accessed 27 September 2018).
- Ministry of Energy and Mineral Resources (2018), *Decree of Ministry of Energy and Mineral Resources No 1567 K/21/MEM/2018 on the Electricity Supply Business Plan (RUPTL) for the Period 2018–2027*. Jakarta: Ministry of Energy and Mineral Resources. [http://www.djk.esdm.go.id/pdf/Coffee%20Morning/Jul%202016/Rencana%20Usaha%20Penyediaan%20Tenaga%20Listrik%20\(RUPTL\)%202016-2025%20--%20PLN.pdf](http://www.djk.esdm.go.id/pdf/Coffee%20Morning/Jul%202016/Rencana%20Usaha%20Penyediaan%20Tenaga%20Listrik%20(RUPTL)%202016-2025%20--%20PLN.pdf) (accessed 2 January 2019).
- Ministry of Information and Communication Technology (2016), *Thailand Digital Economy and Society Development Plan*. Bangkok: Ministry of Information and Communication Technology. www.digitalthailand.in.th/ (accessed 2 January 2019).
- N. Yamada (2018), *Laos–China High-Speed Rail Project*. Institute of Developing Economies, Japan External Trade Organization. <http://hdl.handle.net/2344/00050461> (accessed 30 May 2019).
- National Economic and Development Authority, Department of Finance, and Department of Budget and Management (2017), Joint Memorandum Circular. <http://www.neda.gov.ph/wp-content/uploads/2017/09/NEDA-DOF-DBM-JMC-on-PMFI-Task-Force.pdf> (accessed 13 January 2018).
- Office of the National Economic and Social Development Council (2017), *The Twelfth National Economic and Social Development Plan (2017–2021)*. Bangkok: Office of the National Economic and Social Development Council. www.nesdb.go.th (accessed 2 January 2019).
- Presidential Regulation No. 4 Year 2016 on the Acceleration of Infrastructure Development in Electricity Sector.
- Presidential Regulation No. 56 of 2018 on the Second Amendment to Presidential Regulation No. 3 of 2016 on Acceleration of National Strategic Projects Implementation.

- Presidential Regulation No. 58 of 2017 on the First Amendment to Presidential Regulation No. 3 of 2016 on Acceleration of National Strategic Projects Implementation.
- Rachman, F.F. (2018), Daftar Proyek Strategis Jokowi yang Kelar hingga Oktober 2018. *detikfinance*. <https://finance.detik.com/infrastruktur/d-4251706/daftar-proyek-strategis-jokowi-yang-kelar-hingga-oktober-2018> (accessed 13 January 2018).
- Republic of Indonesia, Ministry of Transportation (2018), *Transport Infrastructure Funding Gap*. Jakarta: Ministry of Transportation. https://www.bappenas.go.id/files/lakip/LAKIP_2017.pdf (accessed 15 April 2018).
- Royal Thai Embassy (2019), *National Strategy Thailand 4.0 Officially Launched*. Washington, DC: Royal Thai Embassy. <https://thaiembdc.org/2018/10/22/national-strategy-thailand-4-0-officially-launched/> (accessed 2 January 2019).
- Socialist Republic of Viet Nam Government Portal. <http://www.chinhphu.vn/portal/page/portal/English> (accessed 2 January 2019).
- Technical Notes on Proposed 2018 National Budget. <http://www.dbm.gov.ph/wp-content/uploads/Our%20Budget/2018/TechNotes%202018%20for%20posting.pdf> (accessed 2 January 2019).
- Thailand Board of Investment (2015), *A Guide to Investment in the Special Economic Development Zones*. Bangkok: Thailand Board of Investment. https://www.boi.go.th/upload/content/BOI-book%202015_20150818_95385.pdf (accessed 2 January 2019).
- The Prime Minister's Office (2016), Granting Approval for Project 'Policies on Synchronous Development of Infrastructure in the Country, Linking Domestic Infrastructure Development with Regional Infrastructure Networks'. <https://thuvienphapluat.vn/van-ban/Giao-thong-Van-tai/Quyet-dinh-1734-QD-TTg-phat-trien-dong-bo-ket-cau-ha-tang-gan-phat-trien-ket-cau-ha-tang-trong-nuoc-2016-321403.aspx> (accessed 2 January 2019).
- Tin, T. (2015), Approximately 2.140 Billion VND to Expand National Road 1A Through Quang Ngai. *Thien Tan Group*. <http://en.thientangroup.vn/appoximately-2-140-billion-vnd-to-expand-national-road-1a-through-quang-ngai.html> (accessed 2 January 2019).
- Vov (2018), The Attendance of Some 'Super Projects' Started in 2018. *Hanoimoi* <http://hanoimoi.com.vn/Infographic/Kinh-te/893173/diem-danh-mot-so-%E2%80%9Csiêu-du-an%E2%80%9D-khoi-cong-nam-2018> (accessed 2 January 2019).
- Warta Ekonomi (2018), 79 Proyek Strategis Nasional Rampu. <https://www.wartaekonomi.co.id/read207257/79-proyek-strategis-nasional-rampung-di-2019.html> (accessed 13 January 2018).

Figure A2: Regional Map—Indonesia-Malaysia-Thailand+ Subregion

Selected representative infrastructure projects in the IMT+ subregion

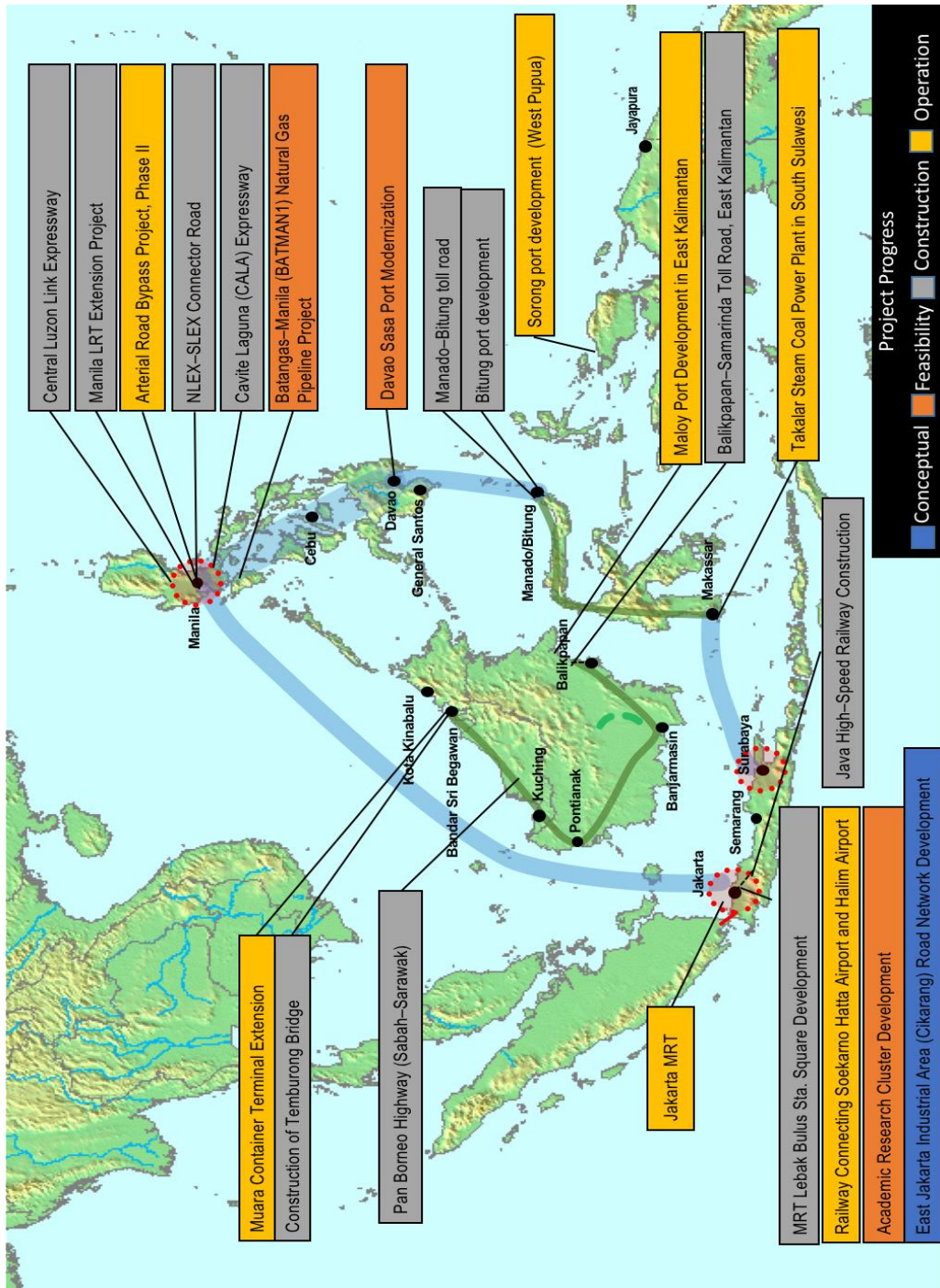


HVDC = high-voltage direct current, IMT+ = Indonesia-Malaysia-Thailand+, KL = Kuala Lumpur, MRT = mass rapid transit.

Source: Economic Research Institute of ASEAN and East Asia (2015), *Comprehensive Asian Development Plan 2.0*. Jakarta: Economic Research Institute of ASEAN and East Asia; and authors.

Figure A3: Regional Map—Brunei Darussalam-Indonesia-Malaysia-Philippines+ Subregion

Selected representative infrastructure projects in the BIMP+ subregion



BIMP+ = Brunei Darussalam-Indonesia-Malaysia-Philippines+, LRT = light rail transit, MRT = mass rapid transit, NLEX = North Luzon Expressway, SLEX = South Luzon Expressway.

Source: Economic Research Institute of ASEAN and East Asia (2015), *Comprehensive Asian Development Plan 2.0*. Jakarta: Economic Research Institute of ASEAN and East Asia; and authors.