International Transport Forum

SIPA
Sustainable Infrastructure Programme in Asia

Regional freight transport infrastructure and policy in Southeast Asia: An overview

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The Sustainable Infrastructure Programme in Asia

This paper is part of the Sustainable Infrastructure Programme in Asia (SIPA), funded by the German International Climate Initiative (IKI) and led by the OECD. SIPA aims to support countries in Central and Southeast Asia in their transition towards energy, transport and industry systems aligned with the Paris Agreement and Sustainable Development Goals.

The ITF leads the transport component of the SIPA programme (SIPA-T). The SIPA-T project helps decision-makers in Central and Southeast Asia by identifying policy pathways for enhancing the efficiency and sustainability of regional transport networks. Project outputs include two regional studies that explore opportunities to improve the connectivity, sustainability, and resilience of freight transport systems in Central and Southeast Asia.

This paper belongs to a series of ITF expert working papers that collectively provide the contextual and methodological foundation for the two SIPA-T regional freight transport studies. The full series includes six papers.

Regional freight transport and policy review papers:

1. Regional freight transport infrastructure and policy in Southeast Asia: An overview (Atit Tippichai)
2. Regional freight transport infrastructure and policy in Central Asia: An overview (forthcoming)

Methodological papers:

1. *Enhancing freight transport connectivity through analytical frameworks* (Ruth Banomyong)
2. *Enhancing freight transport decarbonisation through analytical frameworks* (Alan McKinnon)
3. *Enhancing freight transport resilience through analytical frameworks* (Jasper Verschuur)
4. *Evaluating the relationships between connectivity, decarbonisation and resilience in freight transport* (Alan McKinnon)

Access these papers, more information, and other SIPA-T project deliverables at the link below:

https://www.itf-oecd.org/sustainable-infrastructure-programme-asia-transport

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Nicholas Caros is the project manager, and Diego Botero is the project coordinator of the SIPA Southeast Asia regional study. Yaroslav Kholodov is the project manager, and Xiaotong Zhang is the project coordinator of the SIPA Central Asia regional study. Guineng Chen is the lead of the overall SIPA-T research programme.

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Table of Contents

Figures

Tables

Introduction

In recent decades, Southeast Asia has emerged as one of the world's fastest-growing consumer markets and a major global manufacturing and trade hub. The region is home to more than 600 million people, forming the third-largest labour force in the world, with considerable diversity in terms of income per capita, culture, language, and religion. The Association of Southeast Asian Nations (ASEAN) member states, comprising Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam, work collaboratively to address the region's transport challenges with the goal of achieving a seamlessly and comprehensively connected and integrated region.

This paper aims to capture Southeast Asia's current freight transport infrastructure landscape and policy and institutional environment. The primary sources of information are academic and policy literature reviews, including existing national and regional strategic transport plans and any existing international connectivity enhancement initiatives. The paper analyses statistical data to understand the trade patterns and flows between the ASEAN region and the world, as well as the intraregional flows among ASEAN Member States. There is a specific focus on the freight transport sectors in each of the SIPA Southeast Asia study's three key countries: Indonesia, the Philippines, and Thailand.

Section 2 describes regional freight transport infrastructure and services in the ASEAN region as a whole. Sections 3 to 5 focus on the key countries: Indonesia, the Philippines, and Thailand. Section 6, the conclusion, summarises the primary findings and reflects on the implications of the state of regional freight transport connectivity in Southeast Asia, providing a clear understanding of the current situation and potential areas for improvement.

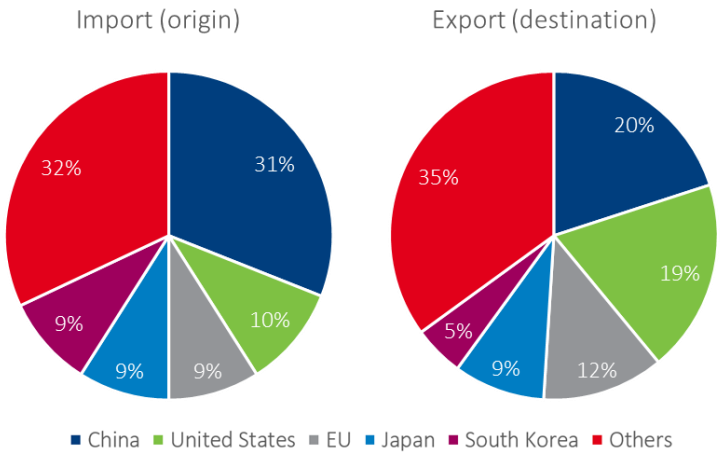
Regional freight transport infrastructure and services in Southeast Asia

Trade overview

Southeast Asia is a significant player in global trade due to its diverse and dynamic regional economy, as well as its strategic geographic location between the Pacific and Indian oceans. While the region's overall trade shrank by 8.3% from 2022 to 2023, the ASEAN region's total merchandise trade has nearly doubled in value since 2010 (ASEAN, 2024a). This strong average annual growth is fuelled by increased steep growth in extra-regional trade due to expanded trade relations with key global partners, including China, the United States, the European Union, and Japan. Intra-regional trade accounts for 22% of all trade value, while trade with China alone accounted for another 19% of regional trade value. The rise in e-commerce and the implementation of the Regional Comprehensive Economic Partnership (RCEP) with nearby trading partners have further boosted trade volumes by reducing tariffs and non-tariff barriers, enhancing market access across the region.

Southeast Asia's intra-regional and international trade is comprised of diverse export and import commodities. The primary exports, measured as percentages of total trading value, include integrated circuits, which comprise approximately 11.4% of total exports, followed by refined petroleum at 5.8%, broadcasting equipment at 4.4% and office machine parts at 3.0%. On the import side, integrated circuits account for about 10.2% of total imports, while refined petroleum constitutes 8.0%, crude petroleum oils 5.5%, and transmit-receive apparatuses (e.g. satellite dishes, antennas) at 2.2% (The Observatory of Economic Complexity, 2024). These figures underscore Southeast Asia's vital role as a manufacturing hub, particularly in electronics and machinery, driven by a robust industrial base and an expanding middle class that boosts demand for various consumer goods.

Figure 1. Share of ASEAN total merchandise trade value by trading partner in 2022



Data source: ASEAN (2023b).

The top partners for trade in goods with the ASEAN region in 2022 are China, the United States, the EU, Japan, and South Korea, as shown in Figure 1. China (20%) and the United States (19%) are the largest

export destinations, followed by the EU (12%), Japan (9%), and South Korea (5%), respectively. China (31%) is also the most significant import partner of the ASEAN member states, followed by the United States (10%), South Korea (9%), the EU (9%), and Japan (9%). Trade between ASEAN member states accounted for around a fifth of total regional international trade, both for imports and exports.

As of 2022, trade flows between ASEAN countries and the rest of the world continue to be dominated by maritime transport, which accounts for approximately 61.0% of total trade value. This is followed by air transport, at around 30.4%, and road and rail transport, at around 7.8% (ASEAN, 2023b).

The logistics sector is a major economic driver in Southeast Asia; in 2019, it accounted for more than 5% of the ASEAN region's GDP and employed approximately 5% of the working population in the region (OECD, 2021).

Freight transport infrastructure

Maritime transport

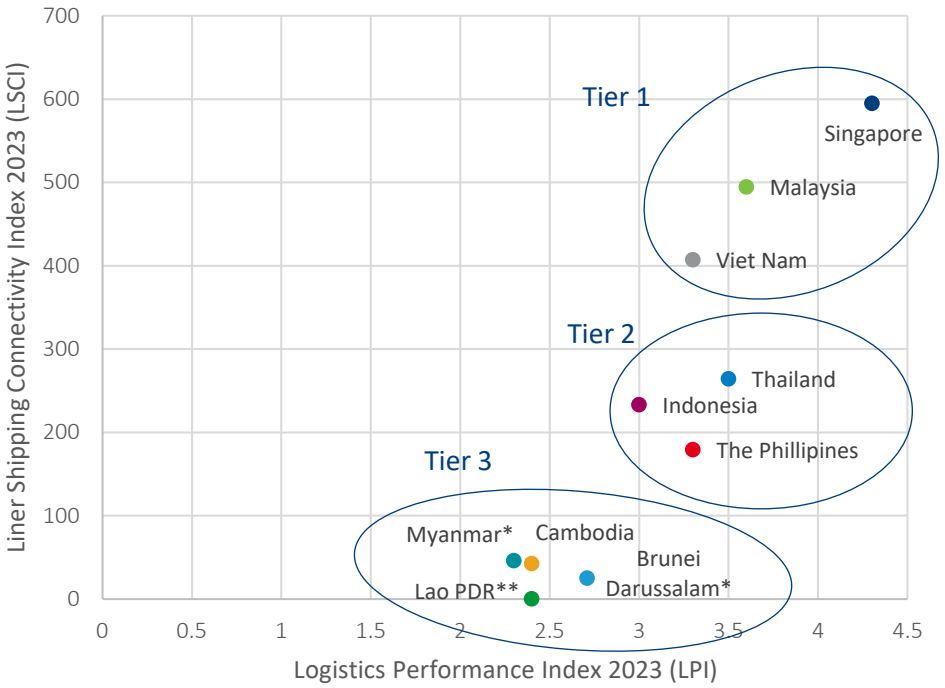
Given the importance of maritime transport, international seaports such as the Port of Singapore, Port Klang (Malaysia), and Laem Chabang Port (Thailand) are the central freight transport hubs in the ASEAN region. Figure 2 shows the location of the region's largest ports.

Figure 2. Location of key ports in Southeast Asia

Source: ESCAP, 2021.

ESCAP (2021) categorised maritime connectivity in the ASEAN region using the 2018 World Bank Logistics Performance Index (LPI) and the 2019 UNCTAD Liner Shipping Connectivity Index (LSCI). Three tiers of marine connectivity in the ASEAN region were identified. Tier 1, which has the highest LSCI values in the ASEAN region, includes Singapore, one of the most significant international trans-shipment hubs, and Malaysia, its neighbouring country. Tier 2 comprises Viet Nam, Thailand, Indonesia, and the Philippines. Tier 3 includes Myanmar, Cambodia, and Brunei Darussalam, while Lao PDR is not considered since it is landlocked. Updated LPI and LSCI data from 2023 are plotted in **Error! Reference source not found.**. Of the A SEAN countries, Viet Nam has improved the most and can now be categorised as Tier 1.

Figure 3. 2023 Logistics Performance Index and Liner Shipping Connectivity Index Scores for ASEAN member states



Note: The Logistics Performance Index (LPI) is a 1 to 5 scale calculated based on six indicators: customs, infrastructure, international shipments, logistics quality and competence, tracking and tracing, and timeliness. The Linear Shipping Connectivity Index (LSCI) is calculated on a 1 to 100 scale, with 100 representing the average score in Q1 2023. * 2018 LPI scores are used for Brunei Darussalam and Myanmar as newer data is not available. ** The LSCI is not applicable to Lao PDR. Data sources: World Bank (2024) and UNCTAD (2024).

As shown in Table 1, Singapore and several ports in Malaysia (such as Port Klang and Tanjung Pelepas) have the highest port LSCI, as they are highly connected to global maritime shipping networks. This reflects the importance of the Strait of Malacca as a common passage of the East-West maritime trade route. Ports in Viet Nam (Saigon and Haiphong), Thailand (Laem Chabang), Indonesia (Tanjung Priok), and the Philippines (Manila) are relatively important at the regional level, while ports in Myanmar (Yangon), Cambodia (Sihanoukville), and Brunei Darussalam (Muara) are less connected.

As of 2023, Singapore remains a critical hub for international and domestic maritime transport, handling a record container throughput of 39 million TEUs (twenty-foot equivalent units), representing a 4.6% increase from the previous year. This surpasses the previous high of approximately 37.6 million TEUs recorded in 2021. The port's strength is attributed to its modern infrastructure, efficient clearance systems, and a robust Electronic Data Interchange (EDI)-based documentation process. Additionally,

Singapore offers services through over 400 shipping lines connected to more than 700 ports worldwide, making it an essential point for interregional transport and logistics. The Port of Singapore handled approximately 591.7 million tonnes of cargo in 2023, an increase from 578.2 million tonnes in 2022 (Rahman, 2024; CNA, 2024). Singapore's strong maritime logistics sector benefits the entire region and helps ASEAN neighbours connect their own goods and services to global markets.

Table 1. Port Liner Shipping Connectivity Index scores for selected ports in the ASEAN region, 2018-2023

Country	Port	2018	2019	2020	2021	2022	2023
Brunei	Muara	45.43	53.19	51.01	47.31	56.90	63.42
Cambodia	Sihanoukville	80.25	81.79	104.04	96.96	91.94	114.45
Indonesia	Belawan	120.28	110.27	93.12	91.26	90.07	133.93
	Tanjung Priok (Jakarta)	483.18	465.82	445.70	421.81	463.41	495.75
	Makassar	112.57	109.69	105.77	107.37	104.00	103.77
	Tanjung Perak (Surabaya)	340.18	310.22	301.96	308.51	324.95	351.76
Malaysia	Pasir Gudang	174.11	195.53	202.64	205.57	193.13	192.35
	Penang	163.29	163.01	162.69	148.62	159.28	179.88
	Port Klang	984.94	960.80	984.51	998.11	1001.94	1056.06
	Tanjung Pelepas	536.77	543.15	554.73	558.14	592.94	572.96
Myanmar	Yangon	108.64	92.96	96.47	79.24	91.93	110.12
Philippines	Batangas	87.03	90.21	98.23	96.31	85.90	100.33
	Cebu	142.68	142.99	140.01	141.23	134.52	134.56
	Manila	415.18	413.11	401.37	392.69	388.81	455.93
Singapore	Singapore	1758.44	1686.73	1679.03	1688.91	1676.72	1748.59
Thailand	Bangkok	263.32	250.87	248.16	268.98	267.65	260.28
	Laem Chabang	548.03	566.75	582.15	605.41	638.62	683.29
Viet Nam	Danang	114.55	129.61	146.46	149.27	143.72	151.18
	Haiphong	401.72	446.37	474.40	474.23	534.76	578.35
	Ho Chi Minh City (Saigon)	447.78	494.36	517.40	536.08	565.59	582.28
	Vung Tau	302.58	286.16	321.02	340.42	361.47	400.22

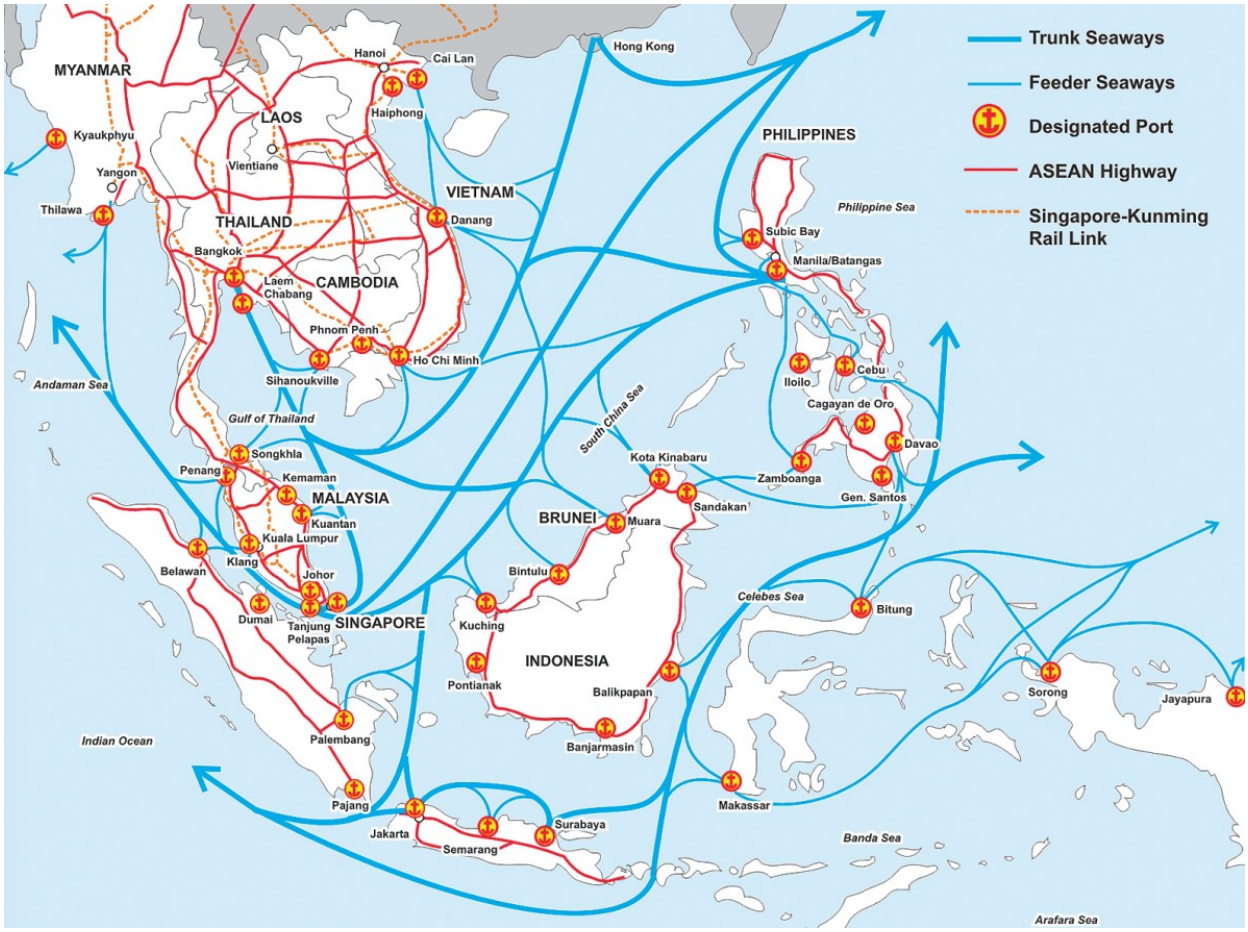
Note: Lao PDR, as a landlocked country, is not included. The Port LSCI is calculated on a 1 to 100 scale, with 100 representing the average score in Q1 2023. Data source: UNCTAD, 2024.

Malaysia and Thailand have recently expanded their direct port connections to enhance regional maritime transport. Port Klang in Malaysia now features 67 direct liner and 38 feeder services, linking it to around 300 ports worldwide. This expansion aims to increase Malaysia's competitiveness in global trade (Medina, 2024a). Similarly, Thailand's Laem Chabang Port is undergoing a significant Phase 3 expansion, which will increase its container throughput capacity to 18 million TEUs by 2029. This expansion includes the development of an integrated rail hub to reduce congestion on the road network and improve the cost-effectiveness of transport to and from the port (Medina, 2022).

Viet Nam is also making strides in its port infrastructure. The country aims to upgrade its port system by 2030, targeting an annual cargo capacity of 1.25 to 1.5 billion tons. Key projects include the development of new deep-water berths at Lach Huyen Port in Hai Phong, which are set to commence operations in 2025. These upgrades are part of Viet Nam's broader strategy to enhance its competitiveness in

international trade (Vietnam Briefing, 2024). These national port developments are responsible for a significant shift in the region's port network dynamics, driven by ongoing investments and strategic planning to capitalise on geographic advantages.

Figure 4. Schematic representation of key maritime transport corridors in Southeast Asia



Source: ASEAN, 2002.

Road transport

Freight transport by road remains limited for international shipments within Southeast Asia. However, road transport is the preferred mode for domestic trade; for example, in Thailand, more than half (53.4%) of total goods are transported by trucks (MOT Thailand, 2020). Five ASEAN Member States (AMS) in the north of Mainland Southeast Asia with extensive land borders have the greatest potential to transport goods by road: Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam. With assistance from the Asian Development Bank (ADB), these five countries and China entered into a program of subregional economic cooperation named the Greater Mekong Subregion (GMS) Economic Cooperation Program in 1992. This subregional cooperation supports the implementation of high-priority subregional projects in many sectors, including transport and trade facilitation (ADB, 2011; ADB, 2017). Figure 5 shows the configuration of existing and potential land transport corridors in the GMS based on recommendations by ADB (2018). The layout of economic zones in the GMS, which act as hubs for surface freight transport and transshipment, can also be found in ADB (2018).

The quality of road transport infrastructure in the GMS varies significantly across countries and is influenced by economic development, geographic terrain, and government investment. Countries like Thailand and Viet Nam generally have better-maintained road networks than Lao PDR, Cambodia, and Myanmar, where rural and remote areas often lack paved roads or suffer from poor road conditions. Broader regional initiatives such as the ASEAN Highway Network and the Belt and Road Initiative could enhance connectivity within and between countries, facilitating regional freight transport by road.

Figure 5. Road transport corridors in the Greater Mekong Subregion

Source: ADB, 2018.

Rail transport

The railway network in Southeast Asia is largely disconnected and would require considerable investment to achieve true regional integration. Currently, there are four cross-border freight railway links between ASEAN member states: between Singapore and Malaysia, Malaysia and Thailand, Thailand and Lao PDR, and Thailand and Cambodia. The limited capacity of international border crossings puts rail at a significant disadvantage relative to road transport for surface freight between Southeast Asian countries (ERIA, 2010).

To improve the competitiveness of freight rail in Southeast Asia, efficient and integrated railway networks are essential. The Singapore-Kunming Rail Link (SKRL) was proposed at the Fifth ASEAN Summit in December 1995. The SKRL Project was prioritised under the ASEAN Transport Cooperation and Master Plan on ASEAN Connectivity (ASEAN, 2017b). The SKRL has two lines: an "Eastern Line" through Cambodia, Thailand, and Viet Nam and a "Western Line" through Myanmar and Thailand, as shown in Figure 6. The SKRL project was subsequently incorporated into the larger "Trans-Asian Railway" that extends across the entire continent (ESCAP, 2021) with two central routes from Bangkok to Kunming: one via Vientiane and Lao PDR, and the other through eastern Myanmar. Currently, thousands of kilometres of missing links or links need rehabilitation in all six ASEAN mainland countries (ASEAN, 2012).

Figure 6. The 2010 Singapore Kunming Rail Link (SKRL) network and missing links

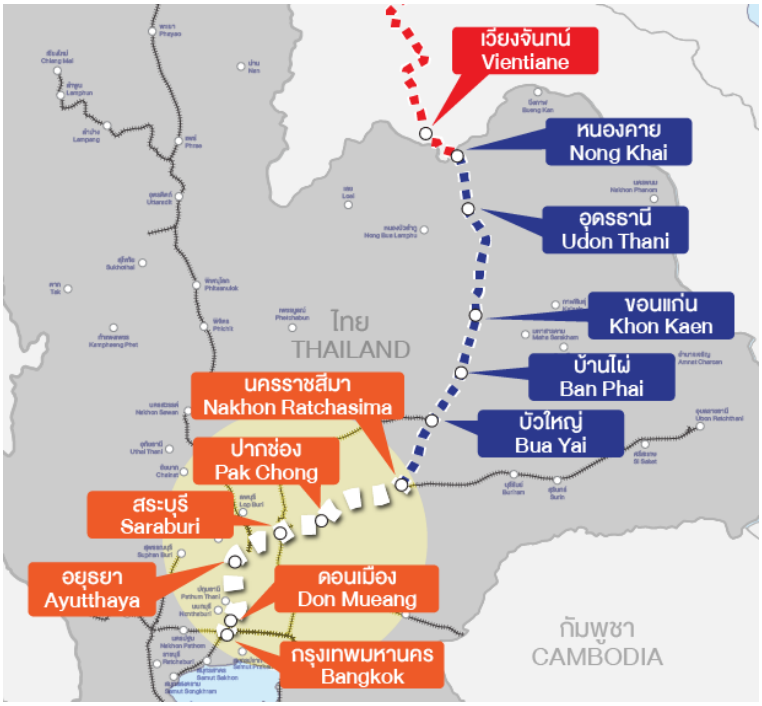
Source: ASEAN Connectivity: Project Information Sheets, ASEAN, 2012.

Considerable progress has been made towards developing the regional railway network in recent years. The newly opened Cambodia-Thailand railway in 2023, located at the Ban Khlong Luek border station, Aranyaprathet District, Sa Kaeo Province, is a prime example. This freight train, operating on the Map Ta Phut—Khlong Luek—Poipet—Phnom Penh corridor, is a collaboration between Royal Railway Public Limited Company of Cambodia and Global Multimodal Logistics Co., Ltd. of Thailand (GML, 2023). The start of this railway connection between Cambodia and Thailand demonstrates the potential for the freight rail transport system to improve efficiency by increasing capacity and reducing travel times.

The Boten-Vientiane railway, the Lao PDR section of the Laos–China Railway (LCR), officially opened on December 3, 2021. This railway, an integral section of the central line on the Kunming–Singapore railway, was constructed as part of the Belt and Road Initiative (BRI) (ASEAN, 2021). The line is expected to significantly boost tourism, with passenger traffic projected to account for most traffic. The Thai province of Nong Khai is also expected to benefit from increased visitors and fruit exports to China, thanks to reduced transport costs.

In Thailand, the Thailand-China high-speed rail project (Bangkok-Nong Khai), Phase 1, Bangkok-Nakhon Ratchasima, is expected to open in 2030 (The Nation, 2024). The high-speed rail project, Phase 2, Nakhon Ratchasima - Nong Khai section, has completed the civil design work, and the environmental impact assessment report is underway. Guidelines for connecting projects in the Nong Khai - Vientiane section have been developed, including a feasibility study for constructing a new railway bridge across the Mekong River. This project, which will partially complete one of the central Southeast Asia routes of the Trans-Asian Railroad, is expected to enhance connectivity by addressing the existing regional freight rail network gap between Bangkok and Vientiane.

Figure 7. The Thailand-China high-speed rail project



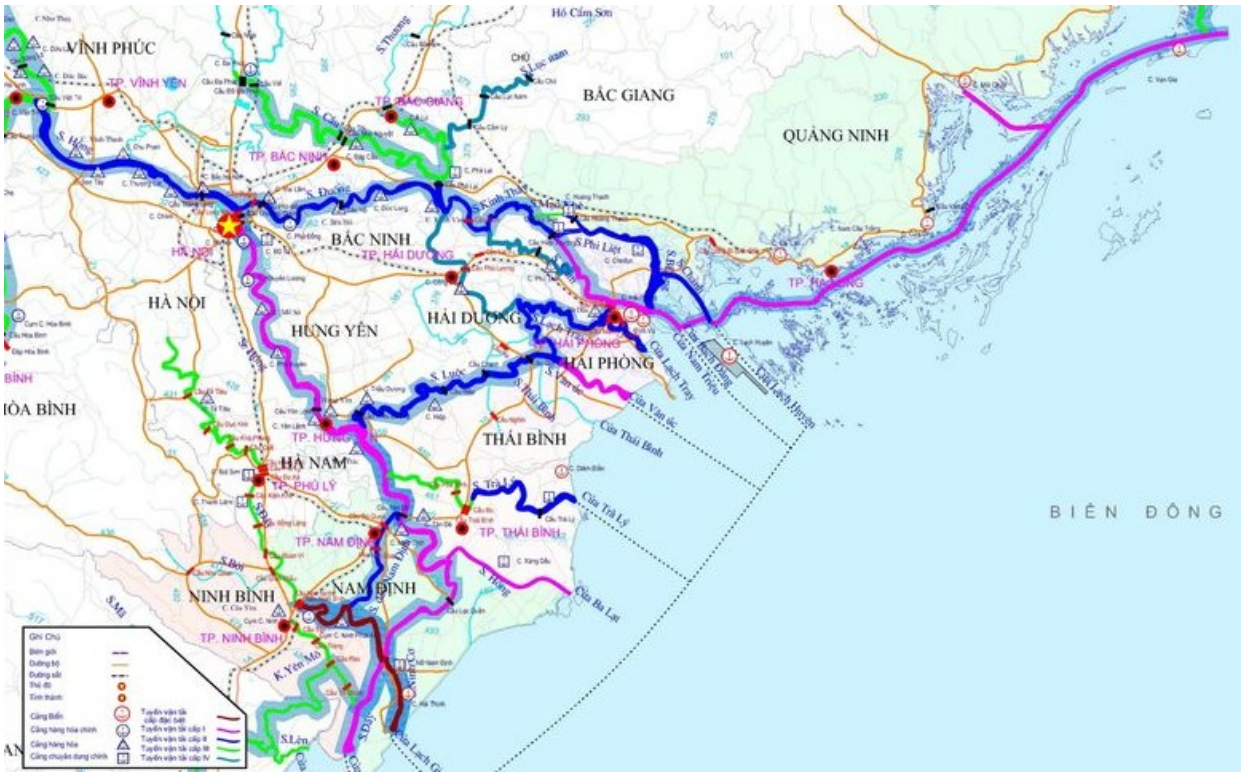
Note: The orange and blue labels represent the Phase 1 and Phase 2 segments of Thailand's High-Speed Rail plan, respectively, while red represents the Lao PDR segments of the project. Source: The State Railway of Thailand, 2024.

Inland waterway transport

Developing inland waterway transport for freight transport in Southeast Asia has become a priority as it can reduce logistics costs and act as a low-carbon alternative to road-based freight transport. There is strong potential for inland water transport, given the region's extensive river systems and the increasing need for sustainable freight transport solutions to meet national climate commitments. Key initiatives in the region include the development of the Mekong River as a major trade route, facilitating the movement of goods between Cambodia, China, Lao PDR, Myanmar, Thailand, and Viet Nam. The ASEAN Transport Strategic Action Plan 2016-2025 (ASEAN, 2015) emphasises improving inland waterway infrastructure. The plan seeks to increase the efficiency of multimodal transport connections between inland waterways and existing road and rail connections to curb transport emissions and reduce congestion on major surface freight corridors.

Currently, inland waterway transport is underutilised in Southeast Asia despite the potential for cost-effective and environmentally friendly freight transport. Countries like Viet Nam and Thailand are focusing on upgrading their river ports and improving navigability to boost the usage of inland waterways for freight. For example, the development of Viet Nam's Mekong Delta logistics network aims to transform the region into a major logistics hub (Nghi, 2023). Similarly, Thailand is working on enhancing its Chao Phraya River system to support more significant freight volumes (Konwai, 2024). Figure 8 shows an example of waterway utilisation in the north of Viet Nam.

Figure 8. Potential inland and coastal waterway corridors in northern Viet Nam



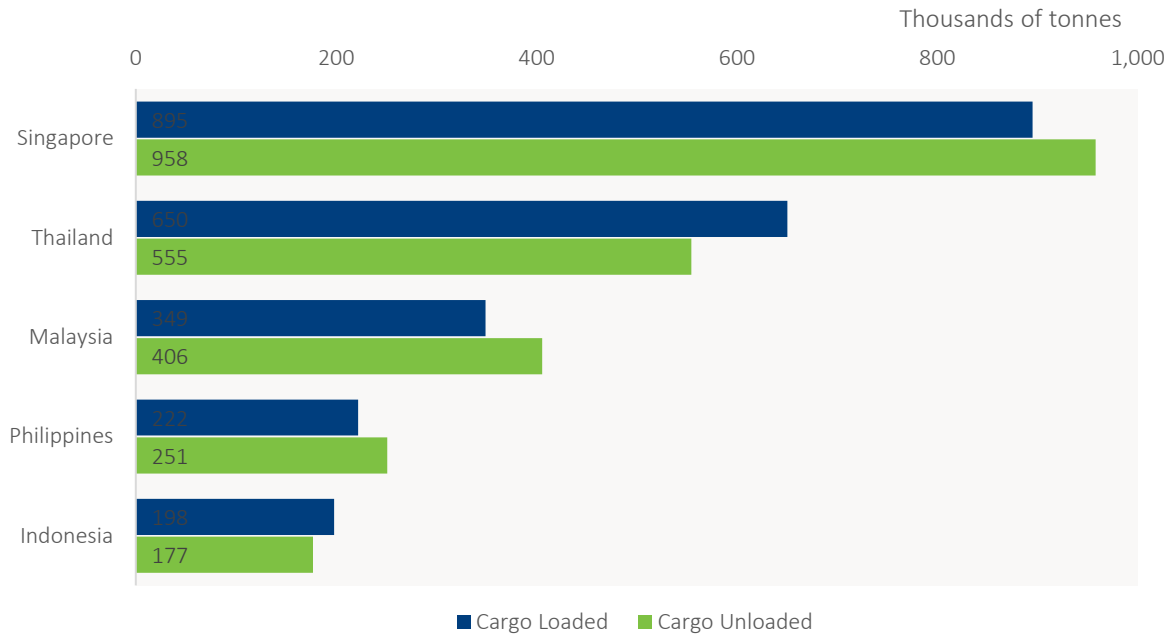
Note: Corridors are classified by colour according to their navigational standards. Source: MOT Vietnam, 2017.

Air transport

Countries in Southeast Asia have long aimed to integrate and boost the air transport sector and advance the full liberalisation of air transport services in Southeast Asia. To support the development of the ASEAN Economic Community (AEC), the Ninth ASEAN Transport Ministers Meeting endorsed a Roadmap on the ASEAN Competitive Air Services Policy in 2003 as the guiding principle for the phased and progressive liberalisation of regional air cargo and passenger services in the ASEAN region, with target completion by 2015 (ASEAN, 2017a). A wide range of instruments for "open skies" have emerged in the intervening years, reflecting the importance of air transport for an integrated ASEAN economy. In particular, the proposed ASEAN–Single Aviation Market (SAM) would eliminate regulatory limits on the frequency or capacity of flights between international airports across the 10 AMS (Zhang et al., 2021).

Air freight transport in Southeast Asia has not yet recovered to pre-COVID volumes (ASEAN, 2024b). Figure 9 shows the estimated international air cargo loaded in selected ASEAN countries in 2022, the most recent year for which verified statistics are available. It shows that Viet Nam, Singapore, and Thailand have the highest air cargo volumes among ASEAN countries. Singapore is a leading cargo hub in ASEAN; Changi International Airport has over 900 cargo flights weekly and connects to over 90 hubs worldwide. Through the deliberate development of multimodal connections, goods landing at Changi Airport can be transported in less than 1 hour to dedicated berths at Singapore's international seaports for shipping around the globe.

Figure 9. International air cargo in selected ASEAN countries in 2022



Data source: ASEANStats, 2023.

Logistics and service providers

The private logistics and freight transport sector in Southeast Asia has grown and evolved rapidly in recent years to meet rising demand driven by increases in international trade and e-commerce activities. The

logistics ecosystem includes diverse private-sector shippers, carriers, freight forwarders, and third-party logistics (3PL) providers, from small firms to large multinational corporations, each playing a crucial role in facilitating regional and global trade.

Private sector shippers in Southeast Asia are primarily large manufacturing and retail companies that produce and distribute goods. Key players include multinational corporations like Samsung, Toyota, and Nestle, which have significant manufacturing operations in countries like Indonesia, Thailand, and Viet Nam. These companies rely on sophisticated logistics networks to manage their supply chains, ensuring timely delivery of raw materials and finished products across the region and beyond (Research and Markets, 2024).

The dominant carriers in Southeast Asia vary by transport mode. Notable maritime carriers such as APL, Maersk, and Ocean Network Express (ONE) dominate the maritime freight sector. In the air freight sector, carriers like Singapore Airlines Cargo, Thai Airways Cargo, and Malaysia Airlines Cargo provide extensive air transport services, connecting the ASEAN region with global markets (ERIA, 2022; ASEAN, 2023). Road transport is heavily utilised for domestic transport and international trade within the region, with companies like Lalamove, Ninja Van, and J&T Express offering extensive last-mile delivery services. Rail transport is also gaining traction, particularly with projects like the Singapore-Kunming Rail Link, which aims to enhance connectivity between Mainland Southeast Asia and China (ESCAP, 2023a).

Freight forwarders in Southeast Asia play a vital role in managing the complexities of international shipping, customs clearance, and multimodal transport. Global logistics companies like DHL, Kuehne + Nagel, and DB Schenker have a significant presence in the region, offering comprehensive logistics solutions that include freight forwarding, warehousing, and supply chain management. Local companies such as Yusen Logistics (Thailand) and Gemadept Logistics (Viet Nam) also provide specialised services tailored to the needs of Southeast Asian businesses (ESCAP, 2023a).

The third-party logistics (3PL) market in Southeast Asia is rapidly expanding, driven by the need for outsourced logistics services that offer flexibility and cost efficiency. Companies like CEVA Logistics, Agility, and Bolloré Logistics provide end-to-end logistics solutions, including transport, warehousing, distribution, and value-added services such as packaging and inventory management. The rise of e-commerce has further boosted demand for 3PL services, with providers increasingly focusing on technology-driven solutions to enhance operational efficiency and customer satisfaction (ERIA, 2022; ASEAN, 2022). Advanced technological innovations for logistics, such as automated cargo handling, artificial intelligence-based routing, and telematics, are in the early stages of adoption in the region (Truong and Truong, 2024). There is potential for much further growth of digital logistics technology in the region, however, especially in rural areas (ASEAN, 2024c).

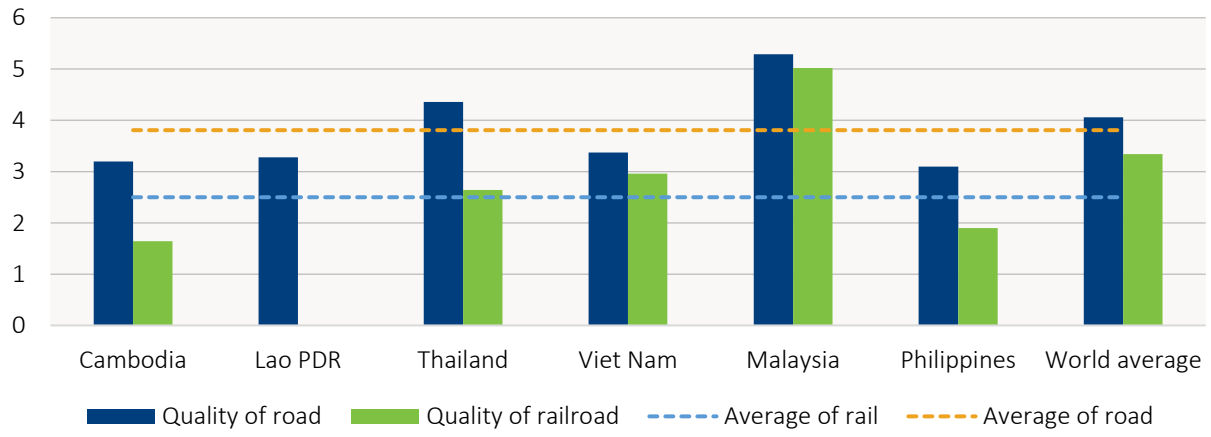
Freight transport challenges in Southeast Asia

The Southeast Asia region faces structural issues that hamper the growth of the sector and result in disproportionately large economic, social, and environmental impacts. Despite the diversity in national geography and socioeconomic conditions, countries in the region have common freight transport challenges (ESCAP, 2022). These include improving logistics cost and efficiency, infrastructure quality and availability, overreliance on road-based modes for surface transport, and environmental and climate change impacts. Addressing the challenges, conflicts and trade-offs associated with freight transport will require deliberate change and innovation in both the public and private sectors.

One of the key challenges for freight transport in Southeast Asia is overall logistics cost and efficiency. Transport of goods is the region's primary driver of logistics costs, accounting for 50-60% of the total (ESCAP, 2023a). Over the past decade, regional countries have made limited progress in improving transport and logistic performance. Thailand and Viet Nam have outperformed their income group peers and the global average when it comes to the quality of logistics services and transport infrastructure, while Cambodia, Lao PDR, and Myanmar have underperformed. The overall improvement was mainly due to enhancements in trade and transport infrastructure and cross-border transport facilities, and reductions in the time required to complete trade transactions.

Transport infrastructure quality is another critical challenge. Countries have increased their annual spending on transport infrastructure over the past decade, recognising its importance (ESCAP, 2023a). However, despite the increase, the quality of transport infrastructure in several countries in the region is generally lower than the world average (see **Error! Reference source not found.**). Moreover, road, rail, and w aterway networks are expected to be inadequate to support the rapidly increasing movement of goods over the next decade.

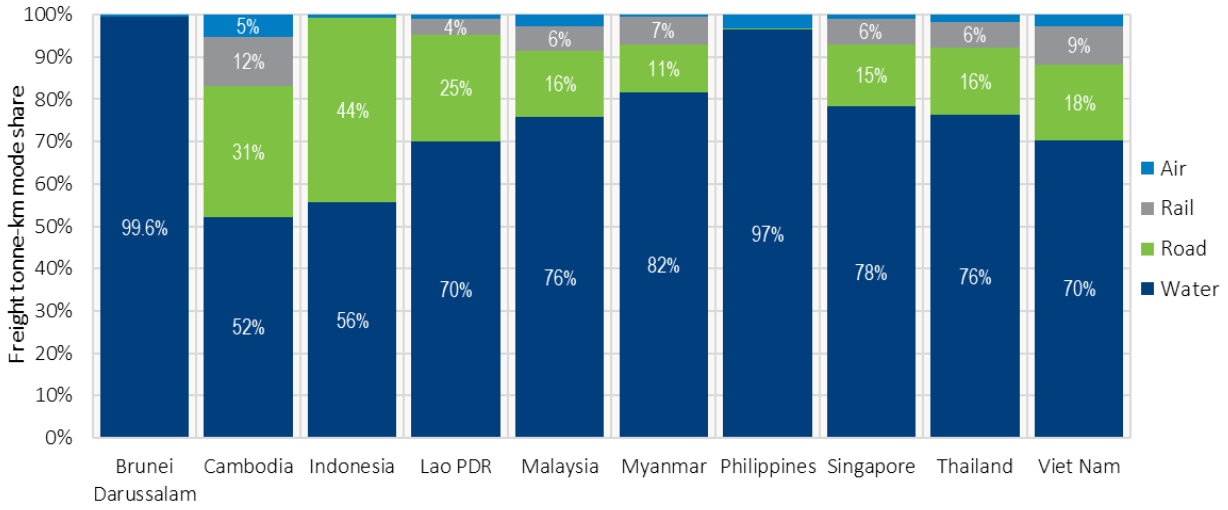
Figure 10. Infrastructure quality score in selected ASEAN countries



Data source: ESCAP, 2023a.

The availability and utilisation of low-carbon freight transport modes remain a top issue. The 2021 total international freight mode share in terms of tonne-kilometres is shown in Figure 11 for all ASEAN member states. While maritime transport dominates the international freight of ASEAN member states, there is also a notable tendency to use road freight over other forms of inland transport. Lower carbon freight transport options, such as rail and inland waterway transport, are often unavailable or uncompetitive due to travel time, cost and reliability. The majority of domestic freight in the region is also transported via road. This is especially true in the Philippines and Indonesia, where more than 90% of domestic goods are transported by road (ESCAP, 2023a).

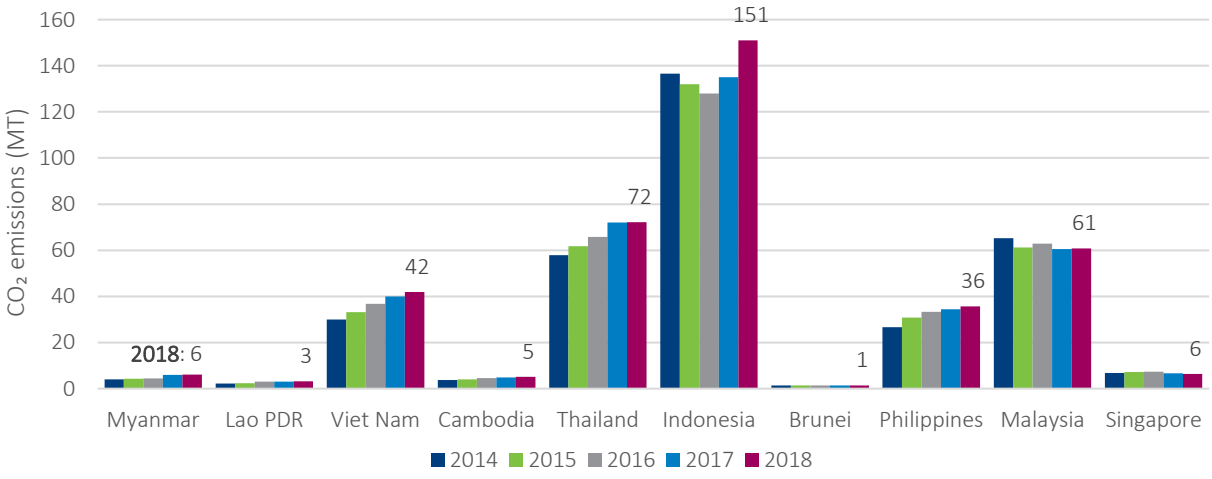
Figure 11. Freight transport mode share (in tonne-kilometres) of international trade in 2021



Data source: UNCTAD, 2024.

Lastly, environmental impacts are a major concern in the regional freight transport sector. CO_2 emissions are a crucial driver of climate change, and countries in the region have individually committed to ambitious climate goals. Yet the increasing demand for freight has increased the sector's carbon footprint as industrialisation in Southeast Asia has led to high growth in shipping activities. Carbon dioxide emissions from the transport sector increased by approximately 15% from 337 million tons in 2014 to 386 million tons in 2018, as shown in Figure 12. In 2019, Indonesia accounted for the largest share of carbon dioxide emissions (about 40%) in the region, followed by Thailand (19.7%) and Malaysia (15.8%). Meanwhile, carbon dioxide emissions from transport in Brunei and Lao PDR increased by just 0.3%, contributing only 0.8% of the region's overall transport carbon dioxide emissions in 2018. However, it is important to note that these numbers represent total CO_2 emissions; per capita and per GDP carbon emissions will result in different rankings.

Figure 12. Transport CO_2 emissions by Southeast Asian countries, 2014-2018



Data source: ESCAP, 2023a.

Regional initiatives on freight connectivity

The ASEAN Secretariat and its member states have been working to improve freight connectivity across the region to enhance economic integration and facilitate trade. These freight connectivity initiatives involve ambitious investment in infrastructure, concerted efforts towards policy harmonisation, and the adoption of cutting-edge digital technologies. These initiatives are laid out in the Master Plan on ASEAN Connectivity (MPAC) 2025, which has 15 initiatives across five strategic areas, namely (a) Sustainable Infrastructure, (b) Digital Innovation, (c) Seamless Logistics, (d) Regulatory Excellence, and (e) People Mobility (ASEAN, 2017b). Challenges remain, including funding for infrastructure investment, harmonising diverse and conflicting regulatory regimes, and ensuring equitable benefits among member states.

Key initiatives and projects underpinning the region's efforts to enhance freight connectivity, focusing on infrastructure development, policy harmonisation, and digitalisation efforts, are summarised below.

Infrastructure Development

Transport infrastructure is the backbone of regional connectivity. The ASEAN Secretariat has three major initiatives to improve infrastructure connectivity across the region.

a. The ASEAN Highway Network (AHN)

The AHN is a flagship initiative to improve road connectivity across ASEAN countries. It involves upgrading and building approximately 38 400 kilometres of highways to allow for efficient cross-border transport of goods. An example of recent progress is Thailand's ongoing efforts to enhance its highway infrastructure. The Department of Highways (DOH) in Thailand has unveiled plans to develop and improve national highways that comprise portions of the ASEAN Highway Network (DOH Thailand, 2021; Carlisle, 2023). In general, highway improvements have been observed across the ASEAN Highway Network, with significant progress in upgrading routes to meet higher standards and increase capacity.

b. ASEAN railways revitalisation

Efforts continue to revitalise and expand the railway networks across the region, including completing the Singapore-Kunming Rail Link (SKRL). Recent developments include the completion of the Laos-China High-Speed Railway in 2021 and the Cambodia-Thailand Railway Link in 2023, as described in previous sections of this report.

c. Port development and maritime connectivity

ASEAN initiatives to improve maritime infrastructure generally involve expanding deep-sea ports and enhancing port facilities to accommodate larger vessels, thus increasing maritime freight capacity in the region. The ASEAN Ports Association (APA) APA facilitates collaboration among port authorities from member countries, focusing on improving port connectivity, logistics efficiency, and sustainable practices. Among ASEAN member states, Indonesia has been particularly active in enhancing its port infrastructure. The country is developing several key ports designated as part of the ASEAN port system (ASEAN, 2002), including Belawan, Dumai, Tanjung Priok, Tanjung Emas, Tanjung Perak, Kariangau and Balikpapan. These developments aim to boost Indonesia's role in regional maritime trade and improve the efficiency and competitiveness of its ports.

Policy harmonisation, regulatory frameworks and digitalisation

In addition to infrastructure development, policy and regulatory frameworks are also important for facilitating the regional movement of goods and services. These efforts include agreements to streamline

trade and goods movements across the region through the use of digital technology. According to the 2023 UN Global Survey on Digital and Sustainable Trade Facilitation, ASEAN member states have made notable progress in implementing digital trade facilitation measures (ESCAP, 2023b).

a. ASEAN Single Window (ASW)

The ASW facilitates the electronic exchange of customs-related documents among ASEAN member states. Streamlining procedures reduces administrative burdens and speeds up customs clearance, significantly enhancing the efficiency of cross-border freight movements. One of the key milestones achieved recently is the full implementation of the electronic Form D (a combined customs declaration and certificate for preferential treatment) for the ASEAN Trade in Goods Agreement (ATIGA) as of January 1, 2024. This development means that all ASEAN member states are now fully equipped to transmit and accept electronic declarations for certain goods, significantly reducing the need for hard copies and expediting customs clearance processes. During the partial implementation in 2022, over 1 million e-forms were exchanged, saving more than 6 million days of processing time and $USD 150 million in costs to businesses (ASEAN, 2024d).

b. ASEAN Economic Community Framework Agreements

The ASEAN Economic Community (AEC) is a mutual agreement by ASEAN member states to integrate customs and transport regulations and procedures to create a single market for goods and services. Framework agreements have been developed under the AEC initiative, including an agreement on infrastructure development as well as regulations and laws promoting the connectivity of the transport system, as shown in **Error! Reference source not found.**. For instance, the objectives of the ASEAN F ramework Agreement on Facilitation of Goods in Transit (AFAFGIT) are to facilitate the transport of goods in transit, to support the implementation of the ASEAN Free Trade Area, and to integrate the region's economies further, to simplify and harmonise transport, trade, and customs regulations and requirements for facilitation of goods in transit; and to establish an effective, efficient, integrated and harmonised transit transport system in Southeast Asia.

Table 2. ASEAN transport agreements by transport mode

Mode	Transport Agreements
Road Transport	• ASEAN Framework Agreement on Facilitation of Goods in Transit (AFAFGIT) • ASEAN Framework Agreement on the Facilitation of Inter-State Transport (AFAFIST) • ASEAN Framework Agreement on Multimodal Transport (AFAMT) • Roadmap for the Integration of Logistics Services
Maritime Transport	• ASEAN Single Shipping Market (ASSM) • Roadmap towards an integrated and Competitive Maritime Transport in ASEA
Air Transport	• ASEAN Single Aviation Market (ASAM) • Roadmap for Integration of Air Travel Sector (RIATS)

Source: OTP, 2015.

c. Cross-Border Transport Agreement (CBTA)

The CBTA is a crucial legal framework aimed at simplifying cross-border transport procedures. It includes measures such as the mutual recognition of vehicle standards and driver qualifications, which ease the movement of freight vehicles across borders. Recent developments in the CBTA have focused on enhancing connectivity and streamlining trade logistics in the GMS. A significant milestone was the "Early Harvest" implementation in 2018, which allowed commercial and passenger vehicles to move more freely along designated routes. Efforts have been made to build technical capacities among transport officials

and operators through workshops and training programs to improve coordination and implementation of the agreement's provisions (Greater Mekong Subregion, 2024).

d. The ASEAN Smart Logistics Network (ASLN)

The ASEAN Smart Logistics Network (ASLN), launched in 2020, is a key initiative to modernise and integrate logistics infrastructure across the region. Two projects have since been launched under the ASNL: the Vinh Phuc ICD Logistics Centre in Viet Nam and the Phnom Penh Logistics Complex in Cambodia (IFC, 2023). Both projects are collaborations between the host government and Singapore's YCH Group and feature road, rail, air and maritime transport connections. These efforts bring modern, world-class logistics hubs to Southeast Asia that leverage state-of-the-art technology for efficient handling and tracking of shipments.

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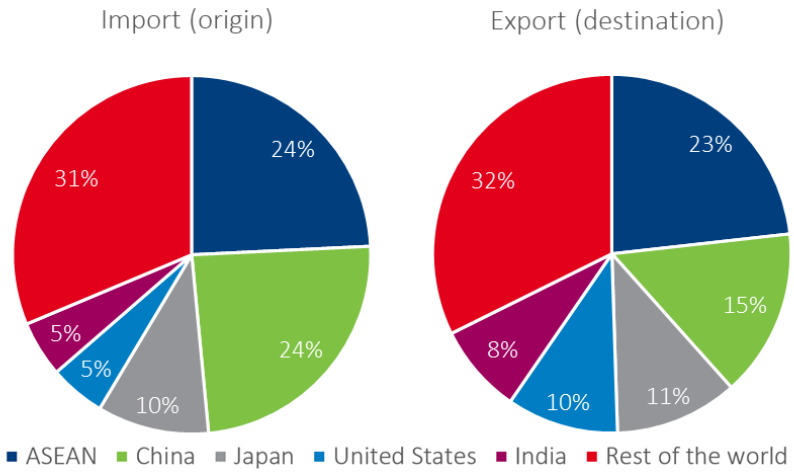
Freight transport in Indonesia

Trade and transport performance overview

Indonesia is the largest country in Southeast Asia in terms of both population and GDP, although it ranks behind Malaysia, Singapore, Thailand and Viet Nam in terms of international trade in goods by value (ASEAN, 2024a). In 2022, Indonesia exported goods worth $USD 320 billion and imported goods worth $USD 230 billion. Indonesia's main trading partners are Asian countries, including China, other ASEAN member states, Japan, India, and South Korea. The United States was the biggest partner outside of Asia. In 2022, 21% of Indonesia's global exports went to China, while 31% of its imports were from China (Figure 13). ASEAN partners remain an important market for both exporting and importing products. The largest commodities exported by Indonesia are raw materials, led by coal briquettes (15.9%), palm oil (9.0%), ferrous alloys (4.3%) and petroleum gas (3.7%). Fossil fuels are the top imported commodities, with refined petroleum (10.1%), crude petroleum (4.4%), petroleum gas (2.1%), followed by motor vehicles, parts and accessories (1.8%), and broadcasting equipment (1.7%) (The Observatory of Economic Complexity, 2024).

Figure 13. Indonesia's main partners (by value), 2022



Data source: The Observatory of Economic Complexity, 2024.

The Indonesian government has implemented various trade facilitation reforms since the early 2000s to support economic growth and sustainability (Narjoko and Bunyamin, 2021). Table 3 presents the change from 2015 to 2018 in several trade facilitation indicators based on World Bank data. Improvements can be seen in three leading indicators: (i) the time to fulfil the documentary compliance to export was reduced by 15% from 72 hours to 61 hours, (ii) the time to fulfil the documentary compliance to import was reduced by 17% from 144 hours to 119 hours, and (iii) the cost to fulfil the documentary compliance to export was reduced by 18% from $170 to $139.

Table 3. Indonesia's Trading across Borders performance indicators, 2015-2019

Indicator	2015	2018	2019
Rank – Trading across borders		112	116
Distance to frontier – Trading across borders	64	67	
Documentary compliance			
Time to export (hours)	72	61	61
Time to import (hours)	144	119	106
Cost to export ($)	170	139	139
Cost to import ($)	164	164	164
Border compliance			
Time to export (hours)	53	53	56
Time to import (hours)	99	99	99
Cost to export ($)	254	254	211
Cost to import ($)	383	383	383

Note: Distance to frontier reflects the costs and time required for exports and imports. Data source: World Bank, 2020.

As of 2019, the most recent year of collection, Indonesia ranks 116 out of 190 economies in the "Trading Across Borders" index (World Bank, 2020), although the time and cost to import have generally improved over time, especially for documentary compliance. The World Bank report notes that Indonesia made trading across borders easier between 2017 and 2020 by introducing an electronic single billing system, improving the Indonesia National Single Window, and streamlining the online processing of export customs declarations. Since 2019, Indonesia has improved substantially in the UN Global Survey on Digital and Sustainable Trade Facilitation by introducing new cross-border paperless trade initiatives and enhancing institutional cooperation across the government (ESCAP, 2023b). Evidently, Indonesia has made significant strides in improving its trade processes, including reducing the time required for documentary and border compliance. However, ongoing reforms are essential to further enhance cross-border trade efficiency.

Logistics costs remain a significant challenge for Indonesia despite strong progress in recent years. Over the past decade, logistics costs have been reduced from 24% to 14% of GDP, and the government has set a target of just 8% of GDP by 2045 (Jakarta Post, 2024). Previous studies by the World Bank have shown that the primary contributor to these costs is the dwell time at ports, which adds 6 – 15% to the price of goods for consumers (Faruddin, 2023).

Infrastructure

Indonesia, an archipelagic country with over 17 000 islands, has considerable regional disparities in freight transport infrastructure and connectivity. The efficient movement of goods across this diverse geographical landscape is critical for domestic economic activities and international trade. Like many Southeast Asian countries, Indonesia's primary transport infrastructure is generally in good condition but does not reach the level of leading industrial nations, and transport services in rural areas can be limited (Wahyuni et al., 2022).

Maritime freight infrastructure

Due to the national geography, maritime transport infrastructure plays a pivotal role in Indonesia's domestic and international freight networks. Indonesia is positioned along busy international shipping lanes used by freight travelling between the Asia-Pacific and ports on the Indian and eastern Atlantic

oceans. There are several major international ports in Indonesia, such as the Port of Tanjung Priok in Jakarta (Java), the Port of Belawan in Medan (North Sumatra), and the Port of Tanjung Perak in Surabaya (Java). These ports handle most of Indonesia's international trade, including exports of natural resources and imports of manufactured goods and raw materials.

The Indonesian government has been actively improving its maritime infrastructure through the Sea Toll Road programme, which is intended to reduce domestic shipping costs by improving national port infrastructure and creating regular shipping routes to ports in Eastern Indonesia. Key infrastructure projects under this initiative include the expansion of Tanjung Priok Port to increase its capacity, the development of the new Kuala Tanjung Port as a major international hub, and the construction of Makassar New Port (South Sulawesi) to support maritime trade in Eastern Indonesia. Additionally, the programme includes upgrading Bitung International Hub Port (North Sulawesi) and expanding Sorong Port in West Papua. These efforts are part of Indonesia's broader strategy to modernise its maritime infrastructure, thereby boosting national economic growth and integration across the country (Iskandar, 2019).

Air freight infrastructure

Air freight in Indonesia is used to transport high-value and perishable goods. The country's air freight network is centred around Soekarno-Hatta International Airport in Jakarta, the central hub for international and domestic air cargo. Other significant airports include Ngurah Rai International Airport in Bali and Juanda International Airport in Surabaya.

The Indonesian government and private sector have invested in expanding and modernising airport facilities and cargo handling capabilities to accommodate the growing demand for air cargo. This includes the development of dedicated cargo terminals and the adoption of advanced logistics technologies. For example, there are plans to enhance cargo handling capabilities at Soekarno-Hatta and Kertajati airports through the development of expanded “cargo villages” that leverage digital cargo handling technology (Antara News, 2022).

Rail freight infrastructure

Rail transport in Indonesia is primarily concentrated on the island of Java and, to a lesser extent, on Sumatra. The rail network is used for transporting bulk commodities, such as coal, palm oil, agricultural products, and containerised goods. The Indonesian government has been making efforts to revitalise and expand the rail freight network, with projects aimed at enhancing the capacity and efficiency of rail transport, including the construction of new railway lines and the upgrade of existing ones. Recent railway developments in Indonesia include the Jakarta-Bandung High-Speed Railway, which will significantly cut travel time between these cities (State Council of China, 2024). Additionally, the government is developing a massive railway network to connect the new capital, Nusantara, with Balikpapan and other key areas in East Kalimantan, enhancing regional connectivity and supporting economic growth (Jakarta Post, 2023).

Road freight infrastructure

Road transport is widely used for intra-island freight in Indonesia, offering door-to-door service and essential connectivity for rural and urban areas alike. However, the road network faces challenges such as congestion, especially in major urban centres, and varying road conditions across the country. Indonesia's road network is diverse, with major highways in good condition in urban areas but often poor or underdeveloped in rural and remote regions (Wahyuni et al., 2022; Indonesia Sentinel, 2024). This disparity affects the efficiency, cost, and reliability of freight transport and hinders economic growth in rural areas.

The government has been focusing on infrastructure improvements to address these issues in order to enhance the country's logistics capabilities and support economic development. Recent infrastructure initiatives include the Trans-Sumatra Toll Road megaproject, expected to span nearly 3 000 kilometres when complete (Sipahutar, 2024), and additional toll roads around the new capital, Nusantara (Llewellyn, 2024).

Policy and regulatory environment

Indonesia's freight transport sector is governed by a robust policy framework and regulatory environment. This section describes the various policies, laws, and regulations addressing freight transport logistics and infrastructure development challenges.

Key policy: the National Logistics System (NLE)

In 2019, the National Logistic Ecosystem (NLE) was launched to facilitate trade in a more integrated and holistic manner (Government of Indonesia, 2020). The NLE is a logistics ecosystem that synchronises the flow of international goods and documents, from the arrival of the means of transport, such as ships, planes, and trucks, to the arrival of the goods at the warehouse. The NLE achieves this by using a national single window system that incorporates cooperation between government and private agencies through data exchange, simplifying processes, eliminating repetition and duplication, and applying an IT system that connects all related logistics processes and existing logistics systems.

To further facilitate trade through the NLE, Indonesia has enacted regulations that simplify the process of unloading goods, allow for periodic loading and unloading permits, and provide risk management. The NLE platform also allows for the submission of unloading permits. Furthermore, customs issued additional regulations that address technical services. These include expanding the availability of online services, rewarding warehouse entrepreneurs, setting customer service standards, harmonising customs areas, and facilitating the use of warehouses under customs control. Additionally, they have made provisions for free-trade zones (Bunyamin and Yulianto, 2023).

Key policy: The Sea Toll Road Program

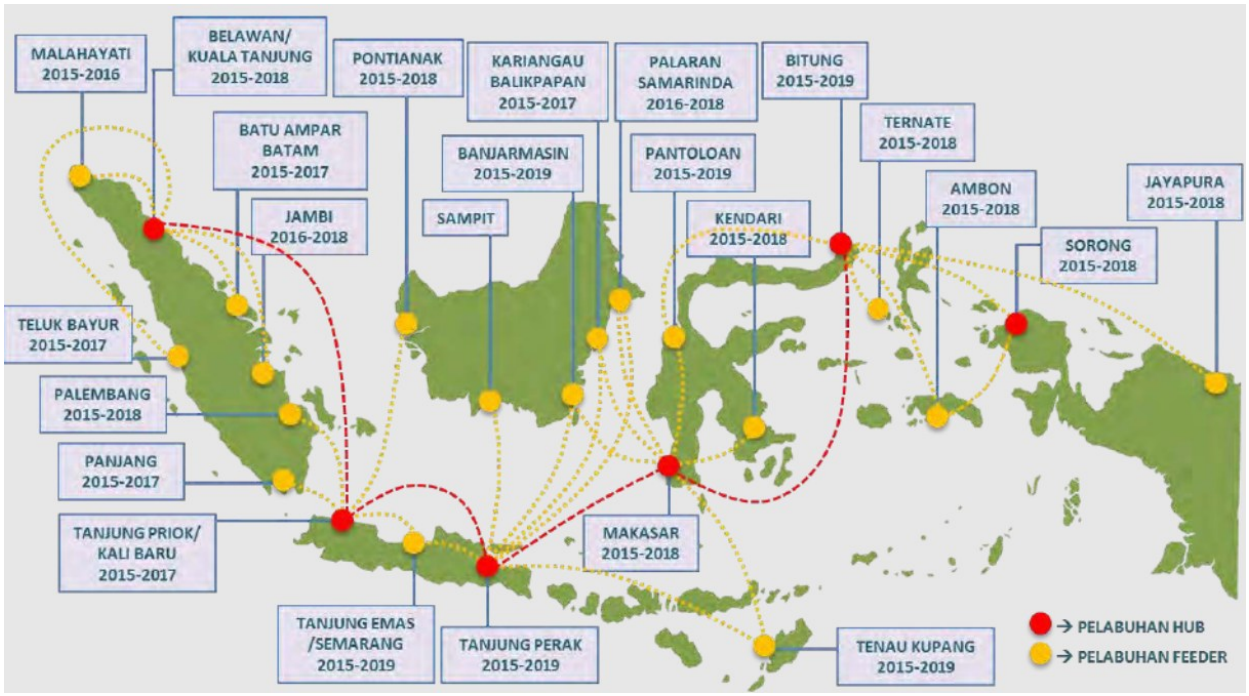
The Sea Toll Road Program, launched in 2015, aims to reduce logistics costs and enhance maritime connectivity across the Indonesian archipelago. The primary objectives are to lower the price disparity of goods between the western and eastern regions, support economic development in remote areas, and establish Indonesia as a significant maritime hub in the Asia-Pacific region. Operators of the Sea Toll Road routes are subsidised by the government in order to bring down the cost of goods for consumers in remote and rural islands (DGST Indonesia, 2015; Wancharoen, 2023).

Since its launch, the program has seen substantial progress in several areas:

- Route Expansion: The number of routes has increased from 3 to over 30, serving more than 100 ports. By 2024, 42 routes are expected to be operational (Wancharoen, 2023).
- Port Development: The Ministry of Transportation allocated IDR 1.59 trillion for 35 sea toll routes and additional pioneer and livestock transport routes. In 2023, the ministry focused on developing port facilities at 46 locations with a budget of IDR 1.82 trillion (Nugroho, 2023).

- **Digital Transformation:** Collaborations with tech companies like Gojek aim to increase transparency and efficiency in the sea toll system, addressing issues like monopoly practices and high shipping costs (Antara News, 2020).

Figure 14. Hub and feeder ports for Indonesia's Sea Toll Road Program



Source: Juliadi et al., 2023.

Customs and excise policies

The Directorate General of Customs and Excise has implemented reforms to streamline customs procedures and facilitate trade. Key initiatives include adopting electronic customs processing systems and establishing a single submission portal for import and export documents. These measures aim to reduce port dwell times, expedite cargo clearance, and enhance the overall efficiency of freight transport. The reforms include introducing the Indonesia National Single Window (INSW) system, which integrates various government agencies into one platform to simplify and speed up the customs process (WTO, 2024). Implementing automated risk management systems further accelerates the clearance of low-risk cargo, reducing delays and costs associated with manual inspections. These reforms have significantly improved Indonesia's logistics performance, making it more competitive in the global market and attracting greater foreign investment (State Department, 2024).

Ministry of Transportation regulations

The Ministry of Transportation (MoT) plays a pivotal role in regulating the freight transport sector and issuing regulations covering freight services, safety standards, and environmental compliance. The MoT's oversight extends across all modes of freight transport, including maritime, air, road, and rail, facilitating a cohesive and integrated approach to freight logistics.

Environmental and safety regulations

Environmental sustainability and safety are integral to mitigating the negative externalities posed by Indonesia's freight transport sector. The regulatory framework includes emissions standards for freight vehicles and vessels; the Indonesian Ministry of Environment and Forestry has implemented regulations mandating Euro 4 emissions standards for all new diesel vehicles. The government also promotes eco-friendly transport modes, such as electric and hybrid vehicles, through incentives like tax reductions and subsidies under the Low Carbon Emission Vehicle (LCEV) program.

Safety regulations cover regular vehicle maintenance, driver qualifications, and protocols for safely transporting hazardous materials. The Ministry of Transportation requires periodic vehicle inspections and certifications to ensure roadworthiness. Additionally, drivers must undergo specialised training and obtain certifications for handling and transporting hazardous materials, as mandated by the Regulation of the Minister of Transportation No. 60/2019. These measures are designed to protect public safety and the environment, ensuring a sustainable and secure freight transport system in Indonesia.

Challenges and future directions

Indonesia faces several structural challenges in its freight transport sector. Key issues include the need for enhanced surface transport infrastructure, improved port connectivity, effective management of shipping patterns, and efficient customs procedures. For land transport, the expansion of the rail network and integration of rail with key maritime and dry ports will provide a convenient and sustainable alternative to congested road networks. Improving the throughput of ports across the country and establishing direct shipping routes to trading partners are recommended for low-cost connectivity to domestic and regional markets. With respect to trade facilitation, the implementation of the Indonesia National Single Window (INSW) system is a positive step towards streamlining customs processes through a unified digital platform. Future efforts to streamline the INSW, expand the National Logistic Ecosystem, and move towards a unified ASEAN Economic Community could be expected to make Indonesia more competitive by reducing the costs of freight transport.

Freight transport in the Philippines

Trade and transport performance overview

The Philippines, like Indonesia, is an archipelagic Southeast Asian nation with a strong maritime freight transport sector. It is the fourth largest economy among ASEAN member states in terms of GDP and had the highest GDP growth rate from 2022 to 2023 at 5.5%. The Philippines ranks sixth in total imports and exports by value (ASEAN, 2024a). In recent years, the Philippines has experienced fluctuations in trade. In 2022, the country's trade saw an annual increase in value of approximately 7% (World Bank, 2025). However, in 2023, there were several periods of decline. For instance, the total external trade in goods registered an annual decrease of 8.7% in December 2022 and continued to face a decrease of 3.5% in December 2023. In 2023, the Philippines' total external trade in goods amounted to USD 199.83 billion, reflecting a 7.8% decrease from USD 216.80 billion in 2022 (PSA, 2023). In 2023, the top export partners were China, the United States, Japan, and South Korea, while for imports, they were China, Japan, Indonesia, the United States, and Thailand, respectively. ASEAN member states constitute a significant portion of the Philippines' trade activities: in 2023, ASEAN countries accounted for USD 11.22 billion or 15.2% of the Philippines' total export revenue, while imports from ASEAN totalled USD 37.68 billion or 29.9% of the country's total imports by value. The Philippines' ASEAN neighbours provide a robust export market and a reliable source of essential imports.

The World Bank's trading across borders indicator noted improvements in the Philippines' trade facilitation environment from 2006 to 2015, showing a 30% reduction in the cost to export and a 20% reduction in the cost to import. The improvement in the cost reductions was complemented by a decrease in the time to export, from 17 days to 15 days, while the time to import was shortened from 18 days to 15 days. However, from 2015 to 2019, the performance of imports declined due to the introduction of additional inspections (World Bank, 2022).

Table 4. The Philippines' Trading across Borders performance indicators, 2015-2019

Contents	2015	2018	2019
Rank – Trading across borders		99	113
Distance to frontier – Trading across borders	69.39	69.39	
Documentary compliance			
Time to export (hours)	72	72	36
Time to import (hours)	96	96	96
Cost to export ($)	53	53	53
Cost to import ($)	50	50	68
Border compliance			
Time to export (hours)	42	42	42
Time to import (hours)	72	72	120
Cost to export ($)	456	456	456
Cost to import ($)	580	580	690

Note: Distance to frontier reflects the costs and time required for exports and imports. Data source: World Bank, 2022.

Since 2019, the Philippines has undertaken several reforms to improve the efficiency of imports and exports, such as adopting electronic processing systems and enhancing customs procedures. These efforts are aimed at reducing port dwell times, expediting cargo clearance, and ultimately improving the overall efficiency of freight transport. In 2023, the Philippines ranked second among ASEAN member states on the UN Global Survey on Digital and Sustainable Trade Facilitation (ESCAP, 2023b) after making substantial progress on paperless trade initiatives. Challenges remain, however; unlike Indonesia and Thailand, the Philippines has not yet reached full implementation of an Electronic Single Window System.

Infrastructure

The Philippines, comprised of over 7 000 islands, faces unique challenges and opportunities in developing its freight infrastructure to support economic growth, enhance connectivity, and integrate into the global trade network. The country's freight infrastructure includes maritime, air, road, and rail transport systems, each playing a crucial role in the movement of goods domestically and internationally.

Maritime freight infrastructure

Given its geography, maritime transport is the backbone of the Philippines' freight system. The Philippines has several major ports, with the Port of Manila (including its North and South harbours), the Port of Cebu, and the Port of Davao being the most prominent. These ports handle most international cargo, facilitating the importing of electronic products, garments, and automotive parts and exporting goods such as electronics and agricultural products.

The Philippine government has initiated various projects under the "Build, Build, Build" program to improve maritime connectivity and efficiency. Initiated in 2017, the program includes several key port development projects to enhance maritime transport. Notable projects are the expansion of the Port of Batangas and the Port of Cebu, which involve increasing cargo handling capacity and modernising facilities, and the development of the Cavite Gateway Terminal, which offers a short-distance ferry and barge connection to the Port of Manila, thereby relieving truck traffic in Metro Manila.

Air freight infrastructure

The Ninoy Aquino International Airport (NAIA) in Manila is the primary gateway for international air cargo in the Philippines. The Clark International Airport and the Mactan-Cebu International Airport serve as significant secondary hubs. To address the challenges of capacity and efficiency, the government and private sector are investing in expanding airport infrastructure, including developing new terminals and cargo handling facilities. The Clark Airport, in particular, has seen strong investment from the private sector in air freight infrastructure, with UPS and FedEx both investing in logistics hubs in recent years (BCDA, 2024). The "Build, Build, Build" program includes improvements to air freight infrastructure, aiming to enhance airports' operational capacity and efficiency across the country. New and expanded domestic airports financed under the program have helped to connect the more remote and less accessible regions of the Philippines to the main economic centres (Lamentillo, 2021).

Road freight infrastructure

Road freight transport in the Philippines is essential for first- and last- mile connections. Yet the sector faces significant challenges, including congestion in urban areas, particularly Metro Manila, and varying road conditions in rural regions. The development of efficient road transport is further complicated by the

geographical fragmentation of the country, necessitating a combination of road and ferry services to achieve seamless inter-island connectivity. The government's infrastructure development efforts include constructing and upgrading national highways and bridges to improve connectivity and reduce freight transport times and costs. These efforts include the expansion of Roll-On/Roll-Off (RoRo) ferry services as part of the Strong Republic Nautical Highway to enhance logistical efficiency between the islands.

The Roll-on, Roll-off (RoRo) network was initiated in 2003. The primary aim was to create an integrated system of highways and ferry routes that would improve inter-island connectivity, reduce transport costs, and promote regional economic development. The program began with developing three "nautical highways": Western, Central, and Eastern. By 2008, significant progress had been made in establishing key routes and infrastructure, leading to the full operational status of the initial phases of the nautical highways. In 2017, the Department of Transportation (DOTr) launched a modernisation program to upgrade and expand the RoRo network. This includes the construction of new ports and the upgrading of existing facilities. The Philippines also expanded the RoRo network internationally by launching the ASEAN RoRo Shipping Network, connecting Mindanao with Bitung in Indonesia. This route aims to boost regional trade and reduce shipping times significantly. As of 2023, the DOTr announced plans to allocate PHP 1.4 billion to construct 14 new RoRo ports by 2025. This effort aims to further develop the network by adding new routes and enhancing the capacity and efficiency of existing ports (Piad, 2023).

Rail freight infrastructure

The rail freight system in the Philippines is currently limited, with existing rail transport focused on passenger services. However, there is potential for growth in rail freight, particularly on the island of Luzon. The North-South Commuter Railway (NSCR) project, which aims to connect New Clark City to Calamba over 147 kilometres, includes plans for freight services. This development could provide a more efficient and sustainable alternative for transporting goods, reducing road congestion and offering a cost-effective solution for surface cargo movement between Metro Manila and the surrounding provinces (Ong, 2024).

The Philippine government is also considering operating freight services on existing tracks that currently offer passenger services, providing alternative freight connections between key economic zones and industrial areas (Rosales, 2024). New dry ports will be included to provide efficient intermodal connectivity. Additional cargo routes have been proposed in the south of Luzon (Zurbano, 2024), but rail infrastructure on other islands is not under consideration.

Policy and regulatory environment

Recognising the critical role of efficient freight transport systems, the Philippine government has introduced a comprehensive policy and regulatory environment. The following frameworks aim to enhance the freight transport sector's efficiency, sustainability, and competitiveness, addressing the logistical complexities of inter-island connectivity and international trade.

Key policy: National Transport Policy (NTP)

The National Transport Policy (NTP) is at the forefront of the policy framework for freight transport in the Philippines. It provides a strategic direction for developing and integrating the transport sector. The NTP emphasises the importance of a coordinated and multimodal approach to transport infrastructure development, aiming to improve accessibility, reduce logistics costs, and enhance the competitiveness of Philippine products in global trade (National Economic and Development Authority, 2017).

Key policy: The "Build, Build, Build" and "Build Better More" programs

A pivotal initiative underpinning the development of freight transport infrastructure in the Philippines is the "Build, Build, Build" program. This ambitious infrastructure development agenda aims to decongest urban centres, enhance island connectivity, and improve domestic and international market access. The many projects include the construction and upgrading of ports, airports, roads, and bridges, which are essential for efficiently moving goods across the archipelago and supporting the country's growing economy (Presidential Communications Operations Office, 2018). The "Build Better More" program, introduced in 2022, is the successor to Build, Build, Build, with ambitious goals for transport infrastructure development between 2022 and 2028 (Manhit, 2024).

Key policy: The Customs Modernization and Tariff Act (CMTA)

The Customs Modernization and Tariff Act (CMTA) represents a significant reform in the regulatory framework for freight transport in the Philippines, specifically in facilitating trade and customs processes. Enacted to modernise customs procedures, the CMTA aims to streamline customs operations, enhance transparency, and reduce the cost and time of cargo processing. It introduces provisions for electronic transactions, simplified documentation, and expedited clearance procedures, aligning with international standards for trade facilitation (Bureau of Customs, 2016).

Department of Transportation (DOTr) regulations

The Department of Transportation (DOTr) is the primary regulatory body overseeing the Philippines' freight transport sector. It formulates and implements policies, regulations, and programs that govern the operation of land, sea, and air freight services. These include standards for transport operators, vehicle safety and emissions, and compliance with international transport regulations. The DOTr's regulatory oversight is intended to promote freight transport safety, efficiency, and environmental sustainability (Department of Transportation, 2019).

Environmental and safety regulations

Environmental and safety regulations are integral to the Philippine freight transport sector's policy and regulatory framework. These regulations aim to minimise the environmental impact of freight operations, promote clean and sustainable technologies, and ensure safe transport. Specific regulations include the Clean Air Act of 1999 (Republic Act No. 8749), which sets emission standards for vehicles and industrial sources to control air pollution. Additionally, the Department of Energy (DOE) promotes the use of alternative fuels through the Biofuels Act of 2006 (Republic Act No. 9367), encouraging the adoption of biofuels to reduce dependence on fossil fuels and lower greenhouse gas emissions.

The Department of Environment and Natural Resources (DENR) enforces regulations on hazardous materials transport under the Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990 (Republic Act No. 6969), ensuring safe handling, transport, and disposal of hazardous substances. The Maritime Industry Authority (MARINA) implements safety protocols for maritime transport, including the International Maritime Organization (IMO) regulations on the safe transport of hazardous goods.

Challenges and future directions

The Philippines faces several key challenges in its freight infrastructure. Significant investment is needed to modernise ports, railways, and road networks to meet increasing freight demands. Projects like the expansion of Manila North Harbor and the development of the Mindanao Container Terminal are crucial for enhancing port capacity and handling larger vessels. Integrated multimodal transport systems are hindered by infrastructure gaps and logistical inefficiencies. The North-South Commuter Railway (NSCR) project aims to improve this integration by providing an alternative to road transport.

Addressing climate change impacts, such as rising sea levels and extreme weather, is another challenge. The modernization of the Sorsogon RoRo Terminal to enhance resilience against natural disasters is one such effort. Additionally, leveraging technology and digitalization is essential for improving efficiency and reliability. The Philippine National Single Window (PNSW) system is an initiative to streamline customs processes and reduce cargo handling delays, but additional efforts could further reduce the costs of freight transport in the Philippines.

Future directions include continued investment in transport infrastructure, improving intermodal connectivity, and adopting innovative and sustainable solutions. Projects like the NSCR, Cavite Gateway Terminal, and the construction of new RoRo ports are part of this effort. The National Transport Policy, the "Build Better More" program, and expanding trade facilitation initiatives under the Customs Modernization and Tariff Act are strong steps towards enhancing domestic and international freight transport connectivity. Strengthening regulatory consistency, adapting to technological advancements, and enhancing resilience to climate change are also future areas for improvement.

Freight transport in Thailand

Trade and transport performance overview

Thailand is known for having one of the most open economies within the ASEAN region (Chirathivat and Cheewatrakoolpong, 2015). It has the second-largest economy in the region and ranks fourth in international trade by value (ASEAN, 2024a). As of 2023, Thailand's total trade volume relative to GDP was approximately 129%. This marks a notable recovery from previous years, reflecting an increase in both exports and imports as the country continues to engage actively in global trade. In earlier years, Thailand's trade volume reached its peak at about 140% of GDP in 2010. However, by 2018, this figure had decreased to 121%, primarily due to fluctuations in global trade dynamics and economic conditions (The Observatory of Economic Complexity, 2024). In 2023, Thailand's top trading partners were China, the United States, Japan, Malaysia, Viet Nam, Australia, Indonesia, Singapore, India, and Korea. Collectively, these countries accounted for 63% of the total trade value. China is Thailand's largest trading partner, with 18% of total trade value, followed by the United States and Japan, which have 12% and 10%, respectively. As for ASEAN countries, Indonesia, Malaysia, Singapore, and Viet Nam are the most significant trading partners, with intra-ASEAN trade making up 20% of Thailand's trade value (Trade Map, 2025).

Table 5 shows the primary products that Thailand exports and imports from abroad. Office machine parts, integrated circuits, cars, and delivery trucks are the top exports, accounting for 17% of total exports in 2022. This reflects the significance and steady growth of consumer goods production in the country. Thailand imports a variety of high-value goods that are essential for its manufacturing industries and consumer markets. Thailand's top ten import products comprise 33% of the total import value, with crude oil ranking first by a significant margin, followed by integrated circuits and gold.

Table 5. Thailand's top 10 export and import commodities in 2022

No.	Main Export Products	Main Import Products
1	Office Machine Parts	Crude Petroleum
2	Integrated Circuits	Integrated Circuits
3	Cars	Gold
4	Delivery Trucks	Petroleum Gas
5	Refined Petroleum	Broadcasting Equipment
6	Rubber	Cars
7	Fruits (e.g., durian, mangosteen, longan)	Refined Petroleum
8	Processed Meat (e.g., shrimp, tuna, chicken)	Office Machine Parts
9	Air or Vacuum Pumps	Aircraft, Spacecraft
10	Polyacetal/Ether/Carbonates	Rubber

Data source: The Observatory of Economic Complexity, 2024

From 2006 to 2015, there were significant improvements in the trade facilitation environment in Thailand, resulting in a 47% reduction in the cost of exports and a 45% reduction in the cost of imports (World Bank, 2020). The improvement in cost was complemented by a shorter time to export, from 24 days to 14 days,

while the time to import was shortened from 22 days to 13 days. However, from 2015 to 2019, performance remained relatively constant, as shown in Table 6. The introduction of the E-Matching system for electronic cargo control in 2019 reduced the time required to comply with customs documentation for exports (World Bank, 2020). New paperless trade initiatives boosted Thailand's score on the UN Global Survey on Digital and Sustainable Trade Facilitation from 2019 to 2023 (ESCAP, 2023b).

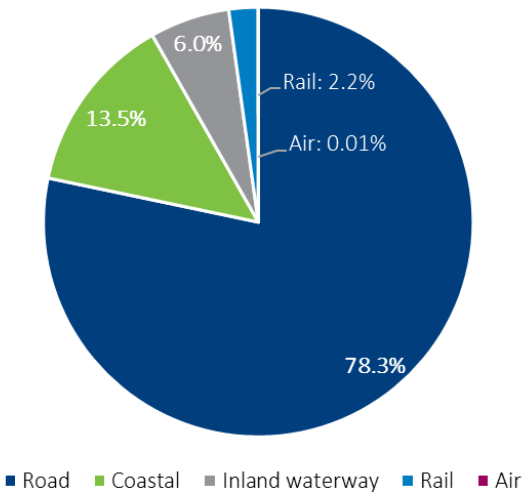
Table 6. Thailand's Trading across Borders performance indicators, 2015-2019

Contents	2015	2018	2019
Rank – Trading across borders			62
Documentary compliance			
Time to export (hours)	11	11	11
Time to import (hours)	4	4	4
Cost to export ($)	97	97	97
Cost to import ($)	43	43	43
Border compliance			
Time to export (hours)	51	51	44
Time to import (hours)	50	50	50
Cost to export ($)	223	223	223
Cost to import ($)	233	233	233

Note: Distance to frontier reflects the costs and time required for exports and imports. Data source: World Bank, 2020.

In 2023, road freight accounted for 78% of Thailand's total domestic freight by volume, as illustrated in Figure 15. The convenience of door-to-door transport makes trucking via highways and local roads the primary transport mode for domestic freight in Thailand. However, the Ministry of Transport actively promotes rail and domestic maritime transport use to reduce logistic costs, traffic congestion, and greenhouse gas emissions. These efforts have proven effective; the overall mode share of rail and waterborne transport for domestic freight has seen a modest increase from 2019 to 2023 (NESDC, 2024). In the future, the Eastern Economic Corridor (EEC) Development Plan aims to use rail and water transport, including projects like the high-speed rail connecting major airports and the expansion of Laem Chabang Port to support coastal shipping (Eastern Economic Corridor Office, 2019).

Figure 15. Thailand's domestic freight transport mode share by volume, 2023



Source: NESDC, 2024.

Logistics costs remain a concern for Thailand, representing 14.1% of GDP in 2023, a ratio that has been increasing over recent years (NESDC, 2024). In 2023, transport accounted for 47.3% of logistics costs, with inventory holding costs (45.3%) and administration costs (7.4%) making up the remainder. Transport costs have increased somewhat over recent years due to the growth of e-commerce and the corresponding demand for last-mile delivery activities.

Infrastructure

Unlike Indonesia and the Philippines, Thailand is located on the mainland and has extensive land borders with neighbouring countries. It is, therefore, much more reliant on surface transport infrastructure for both domestic and international trade. The primary traffic and transport routes are in good condition but do not reach the level of the leading industrial nations. According to the World Bank's Logistics Performance Index (LPI) 2023, Thailand scored 3.5 out of 5 in the "Quality of trade and transport-related infrastructure" category, ranking 34th globally and ranking third among ASEAN countries, behind Singapore and Malaysia (World Bank, 2024). This indicates that while Thailand's infrastructure is relatively well-developed within the region, it has room for enhancement to match the standards of more advanced economies.

Maritime freight infrastructure

Maritime transport is a key component of Thailand’s freight sector, given its extensive coastline along the Gulf of Thailand and the Andaman Sea. The Port of Laem Chabang, Thailand's most prominent and one of Southeast Asia's busiest ports, is the main gateway for deep-sea maritime transport. Collectively, Laem Chabang, the Port of Bangkok and the Port of Map Ta Phut handle over 10 million TEU per year in container traffic (NESDC, 2022), including Thailand's key exports such as electronics, automotive products, and agricultural goods.

The Thai government has been actively investing in expanding and modernising its port facilities to increase capacity and improve efficiency. This includes the development of the Eastern Economic Corridor (EEC), which aims to enhance infrastructure and connectivity in the eastern provinces, including significant upgrades to Laem Chabang Port (Medina, 2024).

Thailand's inland waterways span over 4,000 kilometres, with major rivers like the Chao Phraya and Mae Klong facilitating domestic transport, especially between key cities such as Ang Thong, Ayutthaya, and Pathum Thani. The country also has a 3,219-kilometer coastline, supporting coastal shipping routes that connect major ports like Laem Chabang, Map Ta Phut, and Bangkok. Despite their cost-effectiveness, inland waterways and coastal shipping account for only 4.8% and 4.7% of Thailand’s total freight transport, respectively (MICE, 2025).

Air freight infrastructure

Suvarnabhumi Airport in Bangkok is the primary hub for international air cargo, complemented by other significant airports like Don Mueang International Airport in Bangkok and Chiang Mai International Airport. These facilities are equipped with advanced cargo handling systems and have been undergoing expansion to accommodate growing freight volumes. The government and private sector are keen to further develop Thailand's air freight capabilities. They will focus on increasing cargo capacity, enhancing security measures, and adopting digital technologies to streamline operations (OTP, 2019).

Road freight infrastructure

Road transport is the backbone of Thailand's domestic freight transport sector. Thailand boasts an extensive network of highways and roads, facilitating efficient transport from manufacturing hubs to ports and airports. However, challenges such as traffic congestion in urban areas, particularly in Bangkok, and the need for maintenance in rural regions are being addressed through significant investments in road infrastructure. Key projects include the Bang Pa-in – Nakhon Ratchasima Motorway (M6), a 196-kilometre-long motorway aimed at reducing travel time and alleviating congestion, and the Bang Yai – Kanchanaburi Motorway (M81), a 96-kilometre route to improve connectivity between western and central Thailand. Additionally, the expansion of Rama II Road, which connects Bangkok to the southern provinces, and the third phase of the Outer Ring Road around Bangkok are critical projects designed to reduce congestion and streamline freight movement. These infrastructure projects are complemented by initiatives to promote eco-friendly transport solutions, such as subsidies for electric vehicles (EVs) and investments in charging infrastructure (Arunmas and Apisitniran, 2024).

Rail freight infrastructure

While currently less dominant than road transport, rail transport in Thailand offers significant potential for growth as a cost-effective and environmentally friendly freight mode. The State Railway of Thailand (SRT) operates the country's rail network, undertaking expansion and upgrades as part of national infrastructure development plans. This includes the construction of dual-track railways and the development of high-speed rail links with neighbouring countries, thus enhancing Thailand's connectivity within the region. Key projects such as the China-Thailand high-speed railway aim to transform the rail system into a competitive option for long-distance freight transport, thereby reducing dependency on road transport and contributing to a more balanced multimodal transport system (Medina, 2024b). In addition to these upgrades, Thailand is pursuing the Land Bridge Project, which will connect the Andaman Sea to the Gulf of Thailand through a land transport corridor across the Thai portion of the Malay Peninsula. This project is expected to facilitate faster transport of goods between ports and reduce transport times between the Indian and Pacific oceans (Arora, 2024). The Southern Economic Corridor further complements these efforts by improving infrastructure and logistics capabilities in southern Thailand, linking major trade routes and enhancing trade with Malaysia and beyond (Bangkok Post, 2024).

Policy and regulatory environment

The Thai government has implemented a robust set of policies and regulatory measures to enhance the domestic freight transport sector's efficiency, sustainability, and competitiveness.

Key policy: The National Logistics Committee

The National Logistics Committee (NLC) is a policy coordinating body chaired by the Prime Minister. Its primary objective is to create comprehensive logistics and transport strategies to reduce logistics costs and improve operational efficiency, thus increasing the competitiveness of Thai products globally (NESDB, 2010). This includes the development of logistics plans, such as the Action Plan on Thailand Logistics Development 2023-2027, which sets ambitious targets for rail freight mode share (≥ 7%), LPI ranking (≥ 25th), and the ratio of transport cost to GDP (≤ 5%) (Asian Transport Outlook, 2024).

By aligning national logistics strategies with broader economic policies and coordinating efforts across government agencies, the NLC ensures that logistics infrastructure supports Thailand's economic

development and integration into global markets. Specific initiatives include encouraging investment in logistics infrastructure through public-private partnerships (BOI Thailand, 2019a), promoting the adoption of digital technologies such as electronic data interchange (EDI) and smart logistics solutions (BOI Thailand, 2019b), and implementing training programs to improve the skills of logistics professionals (Reuters, 2024). The NLC also integrates environmental considerations into logistics planning, promoting eco-friendly transport solutions and sustainable practices. These efforts enhance efficiency, transparency, and speed in logistics operations, thereby reducing costs and improving service quality (PAT, 2023).

Key policy: The Eastern Economic Corridor (EEC)

A cornerstone of Thailand's freight transport infrastructure development is the Eastern Economic Corridor (EEC) initiative. The EEC project was launched in 2017 and covers three eastern provinces (Chachoengsao, Chonburi, and Rayong) (Senarak, 2020). This ambitious project is designed to bolster infrastructure and connectivity within the eastern provinces, which are well-positioned for trade with nearby neighbouring countries such as Cambodia, Laos, and Viet Nam. Key projects under the EEC initiative include the expansion of Laem Chabang Port, the transformation of U-Tapao International Airport into a central aviation hub, and the development of high-speed rail links connecting major economic zones. These projects aim to enhance freight transport's efficiency and capacity, attracting further investment in Thailand's logistics and supply chain sectors (Eastern Economic Corridor Office, 2019).

Key policy: Customs and Excise Department reforms

Reforms within the Customs and Excise Department have been pivotal in streamlining customs procedures and enhancing trade facilitation in Thailand. The introduction of the National Single Window (NSW) for electronic trade documentation is a significant reform that has reduced processing times and costs for exporters and importers (ICTB, 2018). The Customs Department has also enhanced its risk management system, utilising advanced data analytics to expedite low-risk shipments while focusing on high-risk ones, thus improving both efficiency and security in trade processes (APEC, 2023).

Ministry of Transport regulations

Thailand’s Ministry of Transport (MOT) is responsible for regulating the freight transport sector across all transport modes. Specific regulations include the Land Transport Act B.E. 2522 (1979), which sets safety and operational standards for road transport, and the Railway Act B.E. 2545 (2002), which regulates rail transport infrastructure and safety. Maritime transport is governed by the Merchant Marine Act B.E. 2534 (1991), ensuring compliance with international maritime standards, while the Civil Aviation Act B.E. 2558 (2015) oversees air transport safety and security in line with International Civil Aviation Organization (ICAO) standards.

Environmental and safety regulations

Environmental sustainability and safety considerations are integral to Thailand's regulatory framework for freight transport. Implementing Euro 5 emission standards ensures freight vehicles meet stringent environmental criteria to reduce air pollution. The Promotion of Environmental Quality Act B.E. 2535 (1992) mandates using clean energy sources and sets guidelines for managing emissions from freight operations. Additionally, the Hazardous Substances Act B.E. 2535 (1992) regulates the safe transport of hazardous materials, ensuring that such materials are handled, stored, and transported to minimise risk to public health and the environment. Further safety measures include the Road Traffic Act B.E. 2522

(1979), which sets standards for vehicle maintenance and driver conduct to enhance road safety, and the Railway Act B.E. 2545 (2002), which includes provisions for the safe operation of freight trains and the maintenance of railway infrastructure. These comprehensive regulatory measures are crucial for sustaining Thailand's environmental commitments while fostering a safe and efficient freight transport system.

Challenges and future directions

Thailand's freight infrastructure faces several challenges, including the need for greater investment across all transport modes, better multimodal logistics solutions, and adaptation to digital transformation. Key issues include urban traffic congestion in Bangkok, maintaining rural road networks, and improving port and airport efficiency to reduce transport costs. Integrating various transport modes for seamless logistics operations is also crucial.

To address these challenges, Thailand is investing in significant projects such as the expansion of Laem Chabang Port, the development of high-speed rail networks, and the enhancement of major highways like the Bang Pa-in – Nakhon Ratchasima Motorway and Bang Yai – Kanchanaburi Motorway (OTP, 2019). The government is also promoting eco-friendly transport solutions, including electric vehicles, and leveraging technology and digital platforms to boost efficiency and sustainability (Thailand Business News, 2024; UNDP, 2024).

Future efforts will focus on enhancing multimodal connectivity, adopting digital technologies, and improving resilience to climate change and global economic shifts. Key initiatives include expanding the National Single Window (NSW) and moving towards an ASEAN Single Window (ASW) system, both of which streamline customs procedures and reduce costs associated with border and customs compliance. Through strategic investments and policy innovations, Thailand aims to strengthen its position as a leading logistics hub in Southeast Asia, supporting regional development and integration into the global economy.

Conclusion

Southeast Asia has become an important hub for global trade due to its vibrant economy and strategic geographic location. Yet, there remain gaps in freight transport policy and infrastructure that continue to hinder intra-regional and international trade. National governments have ambitious plans to address these connectivity gaps and create an integrated regional economy, as described in the ASEAN Economic Community (AEC) Blueprint 2025. Progress has been made in upgrading infrastructure across all transport modes — road, rail, maritime, and air freight— through such initiatives as the ASEAN Highway Network (AHN) and the Singapore-Kunming Rail Link. Moreover, advancements in digital technology implementation, such as the ASEAN Single Window, have streamlined customs processes and reduced delays in logistics.

Indonesia faces considerable freight connectivity challenges, primarily due to congestion at major ports and regional disparities in transport infrastructure. In recent years, however, the Sea Toll Road project has helped to connect remote islands and improve the distribution of goods. Recent and ongoing expansions of Tanjung Priok Port, the country's busiest and most well-connected international trade hub, have reduced congestion-related delays and increased container handling capacity. However, high logistics costs and uneven infrastructure between the eastern and western regions continue to pose challenges.

In the Philippines, the island geography also heavily influences the transport system, resulting in high reliance on maritime and air freight. The development of the RoRo nautical highway system has helped to address inter-island connectivity challenges. The government's "Build, Build, Build" and "Build Better More" infrastructure programmes have focused on upgrading major ports like Manila North Harbor to ease congestion and enhance cargo handling. However, the Philippines continues to rank behind other ASEAN nations when it comes to direct international shipping routes, and outdated customs procedures pose additional challenges for the sector.

Thailand has seen progress in recent years towards greater regional connectivity and the use of rail and waterborne modes for domestic freight. The Eastern Economic Corridor initiative is one effort that aims to further increase connectivity with Thailand's eastern neighbours by enhancing transport infrastructure links through public-private partnerships. Additionally, the Southern Economic Corridor (SEC) is a similar critical initiative designed to promote trade and investment in southern Thailand, connecting major trade routes from the Andaman Sea to the Gulf of Thailand with new ports and surface transport corridors. Despite these initiatives, Thailand must address ongoing issues such as road traffic congestion and logistics costs to fully realise its potential for international trade. Improved customs procedures and inter-agency coordination will be essential to streamline cross-border transport and enhance the efficiency of both the EEC and SEC initiatives.

In summary, the countries of Southeast Asia have made notable improvements in freight transport connectivity through regional coordination and large-scale infrastructure investment programmes. These advancements include the development of maritime, air, road, and rail infrastructure tailored to each country's economic and geographic conditions. Despite ongoing challenges, ambitious future plans will focus on creating fully multimodal transport systems, leveraging digital technologies to reduce compliance costs, and building resilience against global economic changes and climate impacts. Strengthening freight connectivity is vital for Southeast Asia's competitiveness in the global market, facilitating trade, encouraging economic growth, and fostering a more integrated and sustainable regional economy.

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Regional freight transport infrastructure and policy in Southeast Asia: An overview

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