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*Lim Kheng Swe*

RSiS S. RAJARATNAM SCHOOL OF INTERNATIONAL STUDIES
Nanyang Technological University, Singapore

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# The Logistics Ceiling: ASEAN's Freight Infrastructure and the "China Plus One" Strategy

*By Lim Kheng Swe*

## SYNOPSIS

*ASEAN's road-dependent, under-maintained transport infrastructure, now affected by the Hormuz Crisis, threatens to cap its industrial ambitions under the "China Plus One" strategy. Without meaningful investment in road maintenance, rail development, and regulatory reform to attract private capital, ASEAN risks becoming a fragile and unattractive alternative.*

## COMMENTARY

The Hormuz Crisis, triggered by conflict-related disruptions to oil shipping lanes, has caused economic dislocation in Southeast Asia. The region's economies are suffering from spiking petroleum prices, ballooning fuel subsidy budgets, and fuel rationing. A structural reason oil price shocks hit Southeast Asian economies so hard is the region's road-dependent, poorly maintained transport system, which amplifies fuel cost increases for investors and factory owners.

Chinese factories, as well as foreign companies invested in China, are relocating to Southeast Asia to avoid tariffs, address overcapacity, and improve profit margins. Chinese FDI in ASEAN averaged US$10 billion per year from 2022 to 2024, with manufacturing investments accounting for over 50 per cent in 2024. However, poor road and rail logistics are stifling the region's industrial ambitions, meaning ASEAN's hopes of becoming a major node in the "China Plus One" strategy, where companies shift part of their supply chains outside China, are in jeopardy.

### ASEAN's Road Infrastructure – Rapid Growth but Lagging Quality

The Master Plan on ASEAN Connectivity 2025 emphasised the importance of "seamless logistics" to strengthen supply chains. Measured by road length alone,

ASEAN's progress looks impressive. The ASEAN Secretariat's statistics reported that road length across all 10 countries doubled from 1.27 million km in 2008 to 2.46 million km in 2020, with Thailand, Vietnam, Malaysia, and Cambodia doubling or tripling their networks. This trend has continued post-COVID.

Yet, businesses relocating from China to Southeast Asia complain about poor road infrastructure. According to the 2023 World Bank Logistics Performance Index (LPI), all Southeast Asian countries, except Singapore, scored lower than China on the LPI's infrastructure sub-index. In Thailand, where trucking makes up 70 per cent of freight, key corridors such as the Highway 35 connecting Bangkok to the South suffer from prolonged construction delays, while heavy vehicles accelerate road surface deterioration. In the Philippines, only 37 per cent of roads were rated "good" in 2023. In Indonesia, coal and nickel mines in Sulawesi and South Sumatra remain undeveloped or face operational constraints due to poor road access.

Overloaded trucks further compound road damage. In Indonesia, a 2024 study estimated that 38 per cent of trucks exceeded the weight limit. In Thailand, overloaded trucks resulted in an estimated US$600-900 million in additional road and bridge repair costs in 2024. These vehicles, many of which cross into Malaysia, spread the damage across countries.

**Rail Transport in Southeast Asia – Still Lacking Despite Good Intentions**

The growth in the road network masks the dearth of rail transport. In 2021, heavy rail infrastructure in ASEAN averaged 35 km per million people, far below East Asia's average of 108 km per million people. This shifts freight movement onto already congested roads. Urban rail is also limited, at 1.7 km per million residents in 2021, compared with East Asia's 11 km per million residents. This contributes to urban traffic congestion, slowing the last-mile delivery of goods to homes and businesses – one of the most expensive parts of the logistics chain.

The exceptions are the two high-speed railways – the Laos-Kunming and the Jakarta-Bandung lines. Despite their high debt burden – US$5.4 billion for Indonesia and US$4.2 billion for Laos – the high-speed lines were built with clear strategic rationales. Laos wants to boost cross-border connectivity with China to attract business visitors and tourists; Indonesia uses the railway to integrate Bandung with Jakarta.

Nevertheless, these projects, particularly given their significant costs, would have stronger impacts on industrial logistics and traffic congestion if they were embedded into a network of regular passenger and freight rail. In China and Japan, high-speed railways facilitate inter-city business and leisure travel, local passenger rail and subways alleviate urban congestion, and freight rail moves the bulk of industrial cargo. In contrast, in Laos and Indonesia, urban passenger rail and freight rail, that is, the two layers that would most directly support industrial logistics, remain underdeveloped.

## Poor Infrastructure Meets an Oil Crisis

Such road dependency, compounded by poor road quality, increases fuel demand, with the Hormuz Crisis acting as a multiplier for an already-stressed system. Poor road quality increases fuel consumption by as much as 15 per cent in urban areas; conditions on rural roads, which are typically worse, are likely to impose even greater penalties.

Generally, an increase in road roughness, measured by the International Roughness Index (IRI), of 1 m/km increases fuel consumption in heavy trucks by 2-3 per cent at 55 km/h. China defines an IRI below 2.3 m/km as "excellent" and below 3.5 m/km as "good". In the Philippines, the average IRI of surveyed roads in 2023 was 4.69 m/km, with the National Capital Region scoring "poor" at 5.15 m/km. Indonesia's threshold for "acceptable" is 4.0 m/km, with many toll roads scoring above 8 m/km. China's national standards for road quality help reduce fuel consumption, while Southeast Asia has set standards it cannot meet.

Such poor infrastructure raises risks for investors in logistics-heavy sectors, which must bear the higher fuel costs. It also causes unpredictability in shipping times, adding a further burden.

## A Question of Institutional Capacity

At heart, this problem touches on Southeast Asia's capacity to accept infrastructure investment. Closing this infrastructure gap requires not just political will but also significant capital, which neither ASEAN governments nor multilateral lenders alone can supply. According to the Asian Development Bank, ASEAN's infrastructure funding gap is huge, at US$184 billion yearly between 2024 and 2031. Such money would greatly help with road maintenance and railway upgrading, but the public sector lacks the funds.

The private sector could help fill the gap, but as the ADB's Managing Director General Woochong Um noted, investors are wary of committing funds due to political risk and regulatory uncertainty. Improving Southeast Asia's institutional readiness is thus critical to accessing greater infrastructure funding.

## A Cap on ASEAN's "China Plus One" Hopes

ASEAN's hopes of becoming a node in the China Plus One strategy are based on the assumption that Chinese companies, once they arrive, will definitely stay. Chinese companies, though, cite shifting government policies and a shortage of skilled workers as among the reasons they remain cautious about deepening investments in the region. The deeper issue, however, is structural. China's superior logistics have created a formidable competitive moat that other countries struggle to replicate.

Chinese manufacturers in Southeast Asia must accept this fragile land infrastructure as a cost of doing business, reducing any room for error. If the business environment worsens, they may choose to move their factories back to China, where this problem

doesn't exist, thus making Chinese investment less permanently embedded in the local economy than it appears.

## Conclusion

The Hormuz crisis demonstrates Southeast Asia's economic fragility in the face of external shocks, and the region should take this as a wake-up call. To improve their resilience to future shocks, governments should identify and address inefficiencies within their economies, most notably in their overburdened road freight transport system.

To do so, ASEAN governments should first improve their institutional capacity to unlock private sector funding for transport infrastructure. They should then devote these resources to road maintenance, to ensure that road quality does not pose a burden to road users. Finally, governments should develop their railway networks, ease road congestion and reduce fuel consumption.

Otherwise, ASEAN's poor land infrastructure will forever make it vulnerable to external oil shocks, and investors will think twice about relocating from China to the region.

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*Lim Kheng Swe is co-founder of SEAIEA Consulting Pte. Ltd. (www.seaieaconsulting.com), an advisory firm that assists companies seeking to understand and engage Southeast Asian markets through business consulting, market analysis, and strategic insights. He publishes China-SEA Market Signals on Substack (https://substack.com/@kslim2), covering China-Southeast Asia business and investment trends. He was a former Research Analyst with the China Programme at the S. Rajaratnam School of International Studies (RSIS), Nanyang Technological University, Singapore.*

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**S. Rajaratnam School of International Studies, NTU Singapore**
Block S4, Level B3, 50 Nanyang Avenue, Singapore 639798

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