



# THAILAND ROAD BRIDGE: IMPACT OF MARINE TRAFFIC IN STRAITS OF MALACCA

MUHAMMAD SYAFIQ IZWAN KAMARUDIN<sup>1,2\*</sup>

<sup>1</sup>Orion Maritime Sdn. Bhd., Bandar Bukit Tinggi, 41200 Klang, Selangor, Malaysia. <sup>2</sup>Faculty of Maritime Studies, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia.

\*Corresponding author: [syafiqizwan.k@gmail.com](mailto:syafiqizwan.k@gmail.com)

ARTICLE INFO	ABSTRACT
<p><b>Article History:</b>                      Received: 3 July 2024                      Accepted: 25 November 2024                      Published: 30 December 2024</p> <hr/> <p><b>Keywords:</b>                      Thailand Land Bridge,                      marine traffic,                      Straits of Malacca.</p>	<p>This research investigates the potential impacts of the Thailand Land Bridge on marine traffic patterns, specifically examining shifts in shipping routes and volumes through the Straits of Malacca (SOM) and identifying the specific types and sizes of vessels most likely to be affected. Through qualitative analysis of interviews with three maritime professionals, the study finds that the Thailand Land Bridge will significantly reduce container traffic through the SOM due to operational efficiencies and cost savings. Large container ships, particularly those carrying high-value and time-sensitive goods will benefit from the shorter, more direct route. Conversely, bulk carriers and tankers are expected to see minimal changes as they rely on specialised port facilities on traditional sea routes. Future research should expand the sample size, incorporate quantitative analysis, and explore environmental and long-term impacts to provide a more comprehensive understanding of the Thailand Land Bridge’s implications for regional maritime logistics.</p>

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## Introduction

The Straits of Malacca (SOM) is one of the most crucial maritime chokepoints in the world, serving as the primary passageway between the Indian and Pacific Oceans. This narrow stretch of water, spanning approximately 900 km, facilitates the movement of about 25% of the world’s traded goods including significant volumes of oil and Liquefied Natural Gas (LNG). Its strategic significance is underscored by over 80,000 vessels traversing this route annually, making it a vital artery for global trade and energy transportation. The high traffic density in the SOM highlights its importance but also presents challenges such as congestion and navigational hazards which the proposed Thailand Land Bridge aims to mitigate by providing an alternative route (Wright, 2024).

Understanding the potential impacts of the Thailand Land Bridge on marine traffic through the SOM is crucial, as this project may significantly alter existing shipping routes. With over 80,000 vessels currently traversing the straits annually, it is essential to determine which types of vessels are most likely to shift their routes from major ports in Malaysia and Singapore to the new deep-water ports in Thailand. This research aims to predict the vessel types and sizes that will be affected, providing insights into how the Thailand Land Bridge might alleviate congestion in the SOM and reshape regional maritime logistics.

## Research Objectives

- To assess the potential changes in marine traffic patterns resulting from

establishing the Thailand Land Bridge, focusing on the anticipated shifts in shipping routes and volumes through the SOM.

- To identify the types and sizes of vessels most likely impacted by the Thailand Land Bridge project.

### Research Questions

- How will establishing the Thailand Land Bridge influence marine traffic patterns, particularly regarding shifts in shipping routes and volumes through the SOM?
- What specific types and sizes of vessels are likely to be most affected by the Thailand Land Bridge project and which vessel operators are expected to shift their operations from major ports in Malaysia and Singapore to the new deep-water ports in Thailand?

This study aims to comprehensively analyse the impact of the Thailand Land Bridge on marine traffic, with a specific focus on the SOM under Malaysian waters. The research will cover the following aspects:

- Marine traffic patterns: Evaluation of anticipated changes in shipping routes and volumes due to the Thailand Land Bridge.
- Vessel types and sizes: Identification of the specific types and sizes of vessels likely to be impacted by the project, including potential shifts in operations from major ports in Malaysia and Singapore to the new deep-water ports in Thailand.

This study acknowledges several limitations, both methodological and practical:

- Geographical focus: The primary focus on marine traffic within Malaysian waters in the SOM may not fully capture the broader regional or global impacts of the Thailand Land Bridge project.

- Learning curve: As the researcher is transitioning from industry to academic research, there is a learning curve in mastering advanced research methodologies, potentially affecting the study's rigour.
- Sample size: The qualitative component of the study relies on semi-structured interviews with three maritime professionals. This small sample size might not encompass the full spectrum of perspectives within the industry, leading to potential sampling bias.
- Time constraints: The research may be constrained by time limitations, potentially affecting the depth and breadth of data collection and analysis.

### Literature Review

#### *Marine Traffic in The Straits of Malacca*

SOM is a narrow stretch of water connecting the Andaman Sea and the South China Sea, located between Sumatra, Indonesia, and Peninsular Malaysia. The Strait of Malacca is a crucial maritime passageway that connects the Pacific Ocean to the east and the Indian Ocean to the west. It spans approximately 930 km (580 miles) in length with a varying width between 38 km (24 miles) at its narrowest point and 250 km (155 miles) at its widest.

The Malaysia Marine Department (MMD) is a government body responsible for ensuring navigational safety, security, and environmental protection in the SOM. This includes regulating shipping activities, maintaining navigational aids, conducting inspections and certifications of vessels, and implementing international maritime conventions. The MMD also plays a crucial role in search and rescue operations, preventing marine pollution, and promoting sustainable maritime practices to safeguard the marine environment. Additionally, it collaborates with other regional and international maritime organisations to enhance the overall security and efficiency of maritime operations in the region.

Traffic Management and Aids to Navigation Division of the MMD plays a crucial role in ensuring the safety, efficiency, and environmental protection of maritime activities in the SOM. This division is tasked with several significant responsibilities that collectively contribute to the smooth operation of one of the world's busiest and most strategically important waterways (Malaysia Marine Department, n.d.).

One of the primary roles of the division is to ensure navigational safety in the SOM. This is achieved by managing and maintaining navigational aids including buoys, lighthouses, and beacons. These aids are essential for providing mariners with the necessary visual and electronic signals to navigate safely through the straits, especially in challenging weather conditions and congested areas. By ensuring that these aids are operational and accurately positioned, the division helps to prevent maritime accidents and enhance the overall safety of navigation in the region.

Traffic monitoring is another critical function of the division. The SOM is a major maritime highway, with thousands of vessels transiting through it annually. To manage this high traffic volume, the division operates the Vessel Traffic Service (VTS). The VTS system is akin to air traffic control for ships, providing navigational advice, information, and real-time monitoring to ensure that vessel movements are orderly and safe. This system helps to prevent collisions, groundings, and other navigational incidents by coordinating the movement of ships and providing them with timely and accurate information.

In addition to traffic monitoring, the division is responsible for ensuring compliance with the Traffic Separation Scheme (TSS) in the SOM. The TSS is an internationally recognised maritime traffic management system designed to organise ship traffic flow in congested and busy waterways. By enforcing compliance with the TSS, the division helps to reduce the risk of accidents. It ensures that vessels follow designated lanes, minimising the chances of

collisions, and enhancing the overall safety of navigation in the straits.

Maritime traffic in the SOM is based on data from the MMD from 2016 until 2023, focusing on trends in different vessel types and overall traffic patterns. The number of ships transiting the SOM has shown variability from 2016 until 2023. The data reveals a fluctuating trend with notable peaks and troughs. For instance, the total number of ships peaked in 2023 at 89,390, while there was a noticeable dip in 2021 with 78,317 ships. For the transportation of general bulk, containers, and liquid bulk cargoes, the number of Very Large Crude Carriers (VLCCs) has generally increased, from 5,418 in 2016 to 9,547 in 2023. The number of tanker vessels has remained relatively stable with minor fluctuations. The consistently high numbers peaked at 20,629 in 2017. Moreover, container vessels have also shown an upward trend with a peak of 24,617 in 2023. The number of bulk carriers has increased steadily, highlighting the straits' role in transporting raw materials. The peak was in 2023 with 18,171 bulk carriers.

### ***Thailand Road Bridge***

The idea of the Thailand Land Bridge, connecting the Andaman Sea to the Gulf of Thailand has historical roots dating back several decades and has been proposed in various forms over the years. Initially, the concept emerged alongside the construction of a canal through the Kra Isthmus which was first envisioned in the 17th century to create a direct maritime route between the Indian and Pacific Oceans (Cameron, 2021). The modern version of the Thailand Land Bridge proposal gained traction as a cost-effective alternative to the Kra Canal, particularly in recent years. This initiative was part of broader efforts to improve the country's logistical infrastructure and create new economic opportunities. Under previous Thailand Prime Minister, Prayut Chan-o-cha's administration, significant steps were taken to promote the project including feasibility studies and initial planning phases. The current Prime Minister, Srettha Thavisin has continued to

support and advance the Thailand Land Bridge project. During the Belt and Road Forum in October 2023, Prime Minister Srettha Thavisin invited Chinese investors to participate in the project (The Nation, 2023).

The project which requires an investment of 1 trillion baht will be divided into four phases assigned to the project's implementation, spanning 2025 until 2040. The initial phase will have a cost of approximately 610 billion baht, while the subsequent phase will have a cost of around 165 billion baht. Additionally, the third phase is estimated to cost approximately 229 billion baht and the fourth phase will have a cost of approximately 85.1 billion baht (Carlisle, 2023; Pattaya Mail, 2023; The Nation, 2023; Wacharoen, 2023).

The primary focus of Phase 1 is the construction of two pivotal deep-sea ports in Chumphon and Ranong. These ports are strategically situated to serve as major gateways for international trade. Chumphon, positioned on the eastern coast along the Gulf of Thailand will facilitate access to the South China Sea. In contrast, Ranong, on the western coast along the Andaman Sea will open routes to the Indian Ocean. The development of these ports is a critical future designed to handle up to 20 million Twenty-foot Equivalent Units (TEUs) each compared to the current capacity of less than 100,000 TEUs. This significantly enhances their cargo handling capacities and supports the expected surge in maritime traffic (Cameron, 2021). In addition to port construction, Phase 1 includes the development of essential transport infrastructure connecting Chumphon and Ranong. This involves building a motorway and a dual-track railway to ensure efficient cargo movement between the two ports. This infrastructure is designed to streamline logistics operations, facilitating faster, and more reliable transportation of goods across the isthmus which is crucial for reducing dependency on the congested SOM (Carlisle, 2023).

The overarching objectives of Phase 1 are twofold. First, it aims to establish the foundational infrastructure necessary for

supporting cargo movement between the Gulf of Thailand and the Andaman Sea. This involves the physical construction of ports and transport routes and the implementation of systems and processes to ensure smooth and efficient operations. Second, the phase enhances Thailand's trade and logistics capabilities. The Thailand Land Bridge is expected to alleviate congestion in this critical maritime chokepoint by providing an alternative route to the SOM. This strategic move is anticipated to significantly reduce shipping times and costs. Thus, improving overall trade efficiency and positioning Thailand as a key logistics hub in Southeast Asia (Pattaya Mail, 2023).

Despite the strategic significance and ambitious scope of the Thailand Land Bridge project, the literature reveals several critical gaps that necessitate further exploration. One of the primary deficiencies is the lack of comprehensive studies examining the impact of the Thailand Land Bridge on marine traffic. Specifically, there is a paucity of predictive analysis focused on how this new route will alter maritime traffic patterns in Southeast Asia. Existing research addresses the economic and strategic implications of reducing sea passage via the SOM. However, these studies often overlook the detailed prediction of changes in vessel types and sizes that will be affected by the shift to the Thailand Land Bridge route. For instance, while economic benefits are well-documented, the specific impact on marine traffic including the types and sizes of vessels likely to prefer the new route over the traditional passage through the SOM, remains underexplored. Additionally, there is an absence of in-depth analysis of these shifts' operational and environmental consequences. Current literature does not sufficiently address which specific vessel categories such as Panamax, Post-Panamax, and Ultra Large Container Vessels (ULCVs), will transition to using the Thailand Land Bridge. This gap in understanding hinders the ability to forecast the broader implications for port operations and regional maritime logistics. This study aims to fill this void by providing predictive insights

into the types and sizes of vessels affected, offering a more comprehensive understanding of the project’s implications for maritime logistics in Southeast Asia.

**Research Methodology**

**Research Design**

The research methodology for this study involves qualitative approaches to comprehensively analyse the impact of the Thailand Land Bridge on marine traffic, focusing on the types and sizes of vessels affected. This methodology includes semi-structured interviews, literature review,

vessel specification analysis, and forecasting using statistical data.

**Sampling Method**

Participants are selected based on specific criteria to ensure a high level of expertise. The study involves three maritime professionals, each with 15 to 20 years of experience in the industry. These individuals hold positions of influence or decision-making within their organisations, ensuring they have substantial insights into maritime logistics and port management. The summary of the participants is detailed in Table 1.

Table 1: Participants in the sampling

Participants	Years of Experiences	Position	Organisations Sector
A	20	Head of marine	Port operator
B	20	Marine advisor	Consultant
C	15	Operation manager	Shipping agent

**Limitations**

This study faces several methodological limitations. As an industry professional new to academic research, mastering research methodologies requires a learning curve which may affect the study’s rigour. The sample size is limited to three maritime professionals, potentially leading to sampling bias and limiting generalisability. Note that the qualitative analysis relies on subjective interpretation which may introduce bias. These constraints highlight the need for cautious interpretation of the findings and suggest further research with larger samples and more comprehensive methods.

2. What are the specific types and sizes of vessels are likely to be most affected by the Thailand Land Bridge project and which vessel operators are expected to shift their operations from major ports in Malaysia and Singapore to the new deep-water ports in Thailand?

We will compare and contrast the responses to highlight similarities and differences in perspectives.

**Results and Analysis**

In this chapter, we present the findings from our qualitative research, analysing the responses from our interviews with three maritime professionals. The analysis focuses on answering the two primary research questions:

1. How will establishing the Thailand Land Bridge influence marine traffic patterns, particularly regarding shifts in shipping routes and volumes through the SOM?

**Impact on Marine Traffic Patterns**

**Reduction in Container Traffic**

**Participant A:** Highlighted that container ships are likely to be significantly impacted by the Thailand Land Bridge due to the faster and more direct route it offers. Participant A stated “Container shipping companies will benefit from reduced fuel costs and transit times which are critical for maintaining efficient global supply chains”. This shift would lead to a noticeable decrease in container traffic through the SOM.

**Participant B:** Emphasised that the Thailand Land Bridge will attract regional container

shipments, particularly between Southeast Asia and South Asia or the Middle East. Participant B stated “The shift to the Thailand Land Bridge would reduce dependency on the maritime route through the Straits of Malacca, affecting feeder services and regional shipping patterns”.

**Participant C:** Confirmed the reduction in container traffic and stressed the need for shipping agents to adapt their logistics planning. Participant C noted “The shorter route provided by the Thailand Land Bridge would attract container ships, leading to a decrease in container traffic through the Straits of Malacca”.

**Similarities:** All participants agree that container traffic will decrease due to the Thailand Land Bridge, primarily because of the shorter and more efficient route it offers.

**Differences:** Meanwhile, Participant A focuses on the operational efficiency and economic benefits for container shipping companies, while Participant B discusses the broader implications of feeder services and regional shipping patterns. Participant C highlights the need for shipping agents to adapt their logistics planning.

#### ***Impact on Feeder Services and Transshipment Hubs***

**Participant B:** Discussed how feeder vessels which connect smaller ports to major transshipment hubs, might see a realignment of their routes to integrate the new Thailand Land Bridge terminals. Participant B noted “Feeder vessels will have to adjust their routes which could alter the volume and patterns of feeder vessel traffic through the Straits of Malacca”.

**Participant C:** Supported this view, noting that feeder services would need to adjust to the new route, potentially impacting traditional shipping routes. Additionally, Participant C highlighted that major transshipment hubs like Singapore and Port Klang might experience reduced container traffic, necessitating strategic adaptations.

**Similarities:** Both participants agree that feeder services and major transshipment hubs will be affected with potential route realignments and decreased traffic volumes.

**Differences:** Participant B focuses on the strategic adaptations at transshipment hubs. Meanwhile, Participant C emphasises the need for shipping agents to adjust their logistics planning.

#### ***Regional Traffic Redistribution***

**Participant A:** Suggested that the density of ships in the SOM would decrease, easing congestion, and enhancing navigational safety. Participant A stated “The redistribution of traffic will make the straits safer for navigation by reducing congestion and the risk of maritime accidents”.

**Participant B:** Supported this view, highlighting that the Thailand Land Bridge would lead to logistical adjustments and a re-balancing of shipping lanes and traffic volumes. Participant B added “With more ships opting for the Thailand Land Bridge, we will see a smoother flow of traffic through the Straits”.

**Similarities:** Both participants agree on the redistribution of regional traffic and the potential reduction in congestion.

**Differences:** Participant A focuses more on the safety and navigational benefits, while Participant B emphasises the logistical and strategic adjustments.

#### ***Strategic and Logistical Adjustments***

**Participant B:** Discussed how shipping companies would undertake thorough cost-benefit analysis to determine the viability of using the Thailand Land Bridge versus traditional sea routes. Cost savings, transit times, and reliability will be critical in their decision-making processes. Participant B stated “Shipping companies will carefully weigh the benefits of the Thailand Land Bridge, considering cost efficiencies and potential time savings”.

**Participant C:** Added that shipping agents need to diversify cargo handling and strengthen regional partnerships to adapt to the changes brought by the Thailand Land Bridge. Hence, improving operational efficiency and maintaining a customer focus will be essential for staying competitive. Participant C noted “Shipping agents must evolve by diversifying services and enhancing operational efficiencies to meet new demands”.

**Similarities:** Both participants emphasise the need for strategic and logistical adjustments to adapt to the changes brought by the Thailand Land Bridge.

**Differences:** Participant B focuses on the cost-benefit analysis and decision-making processes of shipping companies, while Participant C highlights the need for shipping agents to diversify and strengthen partnerships.

#### *Impact on Specific Types and Sizes of Vessels Container Ships*

**Participant A:** Highlighted that container ships, especially those running on strict schedules would benefit from the faster transit times offered by the Thailand Land Bridge. Participant A noted “Large container ships travelling between East Asia and destinations such as Europe and the Middle East will find the Thailand Land Bridge route highly advantageous”.

**Participant B:** Noted that medium-sized container ships and smaller feeder vessels would likely shift their routes to connect with the new Thailand Land Bridge terminals. Participant B emphasised “The Thailand Land Bridge offers significant cost savings and operational efficiencies, making it an attractive alternative for medium-sized container ships”.

**Participant C:** Added that vessels carrying high-value and time-sensitive cargo such as electronics and pharmaceuticals would prefer the overland route offered by the Thailand Land Bridge. Participant C stated “The speed and reliability of the Thailand Land Bridge will attract vessels transporting high-value goods”.

**Similarities:** All participants agreed that container ships, particularly medium-sized and feeder vessels will be significantly impacted by the Thailand Land Bridge.

**Differences:** Participant A focuses on operational efficiency and schedule benefits, while Participant B and Participant C also consider the impact on vessels carrying high-value and time-sensitive cargo.

#### *Bulk Carriers and Tankers*

**Participant A:** Suggested that the impact on bulk carriers and tankers would be less significant, as these vessels often benefit from the economies of scale and specific port facilities that maritime routes offer. Some high-value bulk cargoes could switch to the Thailand Land Bridge but the impact would be minimal. Participant A noted “Bulk carriers and tankers rely heavily on specific port facilities and economies of scale, making them less likely to shift to the Thailand Land Bridge”.

**Participant B:** Supported this view, noting that bulk carriers and tankers would continue to rely on traditional sea routes due to the lack of specialised infrastructure at the Thailand Land Bridge. Participant B stated “The Thailand Land Bridge is not equipped to handle the specific needs of bulk carriers and tankers, so their traffic through the Straits of Malacca will remain relatively stable”.

**Participant C:** Added that bulk carriers and tankers would see minimal change as their cargo is not suited for overland transport. Participant C emphasised “The nature of bulk cargo makes overland transport via the Thailand Land Bridge impractical, ensuring these vessels continue to use maritime routes”.

**Similarities:** All participants agreed that bulk carriers and tankers will be less affected by the Thailand Land Bridge.

**Differences:** Participants A and B focus on the economic and infrastructural reasons for this minimal impact, while Participant C emphasises the suitability of their cargo for traditional sea routes.

## Discussion

### *Impact Marine Traffic Patterns*

Establishing the Thailand Land Bridge is anticipated to significantly influence marine traffic patterns, particularly by reducing container traffic through the SOM. The interviews with maritime professionals revealed that this shift is primarily driven by the operational efficiencies and cost savings offered by the Thailand Land Bridge. This finding aligns directly with our research objective to assess the potential changes in shipping routes and volumes resulting from the Thailand Land Bridge.

**Reduction in container traffic:** All participants emphasised that container ships, especially those carrying high-value and time-sensitive goods would prefer the shorter and more direct route provided by the Thailand Land Bridge. This preference is expected to lead to a noticeable reduction in container traffic through the SOM as these ships seek to minimise transit times and operational costs.

Participant A highlighted that container ships, critical to global supply chains, operate on very tight schedules, and specific routes. The Thailand Land Bridge offers a faster and potentially cheaper alternative to the longer maritime route through the SOM. This shift is about reducing the number of ships and changing the dynamics of global shipping patterns. By bypassing the SOM, shipping companies can avoid the congestion and navigational hazards that have historically been associated with this busy maritime chokepoint.

Participant B supported this view by pointing out that the Thailand Land Bridge will attract regional container shipments, particularly between Southeast and South Asia or the Middle East. This shift could significantly alter regional shipping patterns, as feeder services will need to adjust their routes to integrate with the new Thailand Land Bridge terminals. This realignment could impact the volume of traffic handled by major hubs like Singapore and Port Klang, requiring these ports

to adapt and to maintain their competitive edge strategically.

Participant C added that shipping agents will need to adapt their logistics planning to accommodate the changes brought by the Thailand Land Bridge. This adaptation could involve restructuring shipping routes, renegotiating contracts, and investing in new infrastructure to handle the shifts in traffic patterns.

### **Feeder services and transshipment hubs:**

The interviews indicated that feeder vessels connecting smaller ports to major transshipment hubs would need to adjust their routes to integrate with the new Thailand Land Bridge terminals. This realignment could alter traditional shipping patterns, impacting the volume of traffic handled by major hubs like Singapore and Port Klang.

Feeder's vessels play a crucial role in regional maritime logistics, linking smaller ports to major transshipment hubs. Participant B noted that with the Thailand Land Bridge providing a direct overland route, feeder services might be reconfigured to connect with the new deep-water ports in Thailand. This adjustment could result in a redistribution of regional traffic, reducing the dependency on traditional maritime routes through the SOM.

Participant C highlighted that major transshipment hubs like Singapore and Port Klang will need to adapt to these changes by enhancing their operational efficiencies and diversifying their services. These ports have historically been key nodes in global shipping networks, handling significant volumes of container traffic. The shift in traffic patterns necessitated by the Thailand Land Bridge could challenge their dominant positions, requiring strategic adaptations to maintain their competitiveness.

### *Impact on Specific Types and Sizes of Vessels*

Our research aims to identify the types and sizes of vessels most likely affected by the Thailand

Land Bridge. The qualitative data highlighted that container ships, particularly medium-sized and feeder vessels will be significantly impacted.

**Container ships:** Participants consistently noted that container ships would benefit from the Thailand Land Bridge's reduced transit times and cost efficiencies. This shift aligns with the operational needs of container shipping companies which prioritise speed and efficiency in their operations. The finding supports our objective of identifying the specific vessel types most affected by the Thailand Land Bridge project.

Participant A emphasised that large container ships such as ULCVs, would find the Thailand Land Bridge route highly advantageous due to the substantial time and cost savings. These ships which carry significant cargo volumes will benefit from the shorter route, reducing the overall transit time and operational costs.

Participant B pointed out that medium-sized container ships and feeder vessels would also be significantly impacted. These vessels which typically operate on regional routes will benefit from the Thailand Land Bridge's ability to bypass the congested SOM, providing a faster and more efficient route. This shift will enable shipping companies to optimise their operations, improving overall efficiency and competitiveness.

Participant C highlighted the impact on high-value and time-sensitive cargo. The Thailand Land Bridge offers a faster and more reliable route for transporting such cargo, making it an attractive option for shipping companies. This shift could significantly redistribute container traffic, with more vessels opting for the Thailand Land Bridge route.

**Bulk carriers and tankers:** Conversely, bulk carriers and tankers are expected to experience minimal impact. These vessels often benefit from economies of scale and specialised port facilities, more readily available on traditional sea routes through the SOM. This distinction between container ships and bulk carriers or

tankers underscores the varied impact of the Thailand Land Bridge based on vessel type. It supports our objectives to delineate the specific vessel categories affected.

Participant A noted that bulk carriers transporting raw materials and commodities typically require specialised handling facilities at traditional ports. These vessels benefit from economies of scale, making the traditional sea route through the SOM more suitable for their operations.

Participant B emphasised that tankers which transport liquid bulk cargoes such as oil and LNG, rely on the specialised infrastructure available at traditional ports. The Thailand Land Bridge does not provide the necessary facilities for handling these types of cargo, making it less attractive for tankers.

Participant C added that the nature of bulk and liquid cargo makes overland transport impractical. These vessels will continue to rely on traditional maritime routes, as the specialised handling and economies of scale provided by traditional ports are essential for their operations.

### Limitations and Future Research

This study has several limitations that must be acknowledged. Firstly, the small sample size of three maritime professionals limits the generalisability of the findings. Meanwhile, the insights provided are valuable. A larger and more diverse sample would offer a broader perspective on the impacts of the Thailand Land Bridge.

Secondly, the qualitative nature of the research relies on subjective interpretations which can introduce bias. The findings are based on the personal experiences and opinions of the participants which may not fully represent the broader industry views. Additionally, the reliance on interviews means that the data is limited to what the participants chose to share, potentially overlooking other relevant insights.

Lastly, the study focuses primarily on the anticipated impacts and does not include empirical data on the actual outcomes of the

Thailand Land Bridge, as the project is still in development. Future research could benefit from longitudinal studies that track the real-world impacts of the Thailand Land Bridge over time.

### **Future Research**

To build on the findings of this study, future research should aim to address these limitations. Expanding the sample size to include a wider range of maritime professionals including those from different sectors and regions would provide a more comprehensive understanding of the Thailand Land Bridge's impacts.

Note that quantitative studies could complement qualitative insights by providing statistical evidence of the changes in marine traffic patterns, transit times, and cost savings. Data on traffic volumes, shipping routes, and economic impacts would enhance the robustness of the findings and offer more concrete evidence of the Thailand Land Bridge's effects.

Exploring the environmental implications of the Thailand Land Bridge is another important area for future research. Thus, analysing potential reductions in emissions and environmental benefits of the shorter route could provide valuable insights for policymakers and industry stakeholders focused on sustainability.

Finally, investigating the long-term impacts of the Thailand Land Bridge on regional maritime logistics and global trade patterns would offer a deeper understanding of its broader implications. Longitudinal studies tracking these changes over time would provide valuable data on how the Thailand Land Bridge reshapes the maritime industry and influences global trade dynamics.

### **Conclusions**

This study investigated the impacts of the Thailand Land Bridge on marine traffic patterns, particularly focusing on shifts in shipping routes and volumes through the SOM and identifying the specific types and sizes of vessels most likely to be affected. Qualitative interviews with maritime professionals revealed

that the Thailand Land Bridge is expected to significantly reduce container traffic through the SOM, driven by operational efficiencies and cost savings. Container ships, especially medium-sized and feeder vessels will benefit most from the shorter route. At the same time, bulk carriers and tankers will see minimal impact due to their reliance on specialised port facilities.

The study's limitations include a small sample size and reliance on qualitative data, suggesting the need for future research to expand the sample, incorporate quantitative analysis, and explore environmental and long-term impacts. Despite these limitations, the findings provide valuable insights into the broader implications of the Thailand Land Bridge, offering guidance for maritime stakeholders to navigate the evolving global trade and logistics landscape. Future research should aim to validate and expand upon these findings to provide a more comprehensive understanding of the Thailand Land Bridge's impact.

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### **Conflict of Interest Statement**

The author has no conflict of interest.

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