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Australian Maritime College

*Online Submission:*
*https://www.pc.gov.au/inquiries/current/maritime-logistics/make-submission#lodge.*

11 February 2022

The Australian Government
Productivity Commission Inquiry
CANBERRA ACT 2601

Dear Committee Members

**Re: Inquiry into the long-term productivity of Australia's maritime logistics system**

AMC is pleased to provide a submission for the Productivity Commission's information and consideration.

We look forward to further discussion in relation to this Inquiry.

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Attach.



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# Inquiry into the long-term productivity of Australia's maritime logistics system

Submission by:
the Australian Maritime College.

Date: 11 February 2022

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## Introduction

The Australian Maritime College (AMC) welcomes the opportunity to respond to the Productivity Commission's inquiry into the long-term productivity of Australia's maritime logistics system. AMC has particular interests in providing comments on the following terms of references:

- Examine the long-term trends, structural changes, and impediments that impact the efficiency and dependability of the maritime logistics system, including developing a framework of performance measures to determine port performance and benchmarking Australian ports internationally.
- Examine workforce issues, including industrial relations, labour supply and skills, and any structural shifts in the nature and type of work in the maritime logistics sector.
- Research mechanisms to help improve the sector's resilience and efficiency.

AMC, as the national institute for maritime training, education, research and consultancy, plays a lead role in building the skilled workforce required by industry in Australia to thrive into the future. With a curriculum focused on developing multidisciplinary knowledge and skills, as well as global perspective and social responsibility, our graduates are equipped and inspired to respond to opportunities and challenges in an ever-changing world.

AMC, a specialist institute of the University of Tasmania, offers courses in the following study areas of critical importance to maritime sectors:

- Maritime Business and International Logistics
- Ocean Seafaring
- Maritime Engineering and Hydrodynamics
- Coastal Seafaring.

Courses are offered across all levels, including vocational certificates, diplomas, undergraduate and postgraduate degree programs, and higher degrees by research.

AMC is the only higher education institute in Australia offering courses in maritime logistics management. Courses related to maritime logistics include the following:

- Bachelor of Global Logistics and Maritime Management (with Diploma and Associated Degree nested courses);
- Bachelor of Global Logistics and Maritime Management (Honours);
- MBA in Maritime Management (with Graduate Certificate and Graduate Diploma nested courses); and

- PhD (Maritime and Logistics Management).

Students (around 300) currently studying in maritime logistics courses range from school leavers to industry professionals, both domestic and international. They study either on-campus or by distance modes. AMC plays a significant role in the development of the Australian and international workforce in the maritime logistics sector underpinning international trade.

AMC is one of the seven founding members of the International Association of Maritime Universities (IAMU), which now has 64 members across five continents. Through this and other forum, AMC has established strong branding as a world leader in maritime research, education and training and our alumni work in more than 60 countries around the world.

AMC has strong research capabilities in the field of maritime logistics and supply chains. For example, recent research projects relate to maritime digitalisation including data fusion and machine learning for ship fuel efficiency analysis; an analysis of operational risks in container shipping under the impact of blockchain application; and ports role in hydrogen supply chains.

AMC welcomes and supports this inquiry to address the challenges and issues of Australia's maritime logistics system. This submission provides comments on current Australian maritime logistics systems and also outlines AMC's role in supporting Australia's maritime logistics sector in the long term.

**Examine the long-term trends, structural changes, and impediments that impact the efficiency and dependability of the maritime logistics system, including developing a framework of performance measures to determine port performance and benchmarking Australian ports internationally**

In recent years, the operation and management of port centric logistics/supply chain systems has been affected by market trends such as increased ship sizes, digitalisation and automation, rationalisation and consolidation in the maritime industry, and decarbonisation. These changes, along with unexpected disruptions caused by the COVID pandemic have challenged the resilience of maritime logistics systems. Australian ports play a vital role in the nation's maritime logistics system and their performance in response to these market trends has impacted on Australian businesses competitiveness.

In recent decades, major Australian ports have experienced changes in governance structures that have impacted port performance when viewed from diverse perspectives such as competition, productivity, pricing, investment and relationship management. The commercialisation, corporatisation and privatisation of Australian ports since 1990s, has

resulted in varying types of port governance structure across the nation, with different ownerships and operational models, including tool ports, public landlord and private landlord models (Chen et al. 2017). Despite a marked increase in the role of the private sector in port governance due to port sector reforms, there have been on-going issues and concerns in privatised container ports, including:

- increases in port prices;
- recognition of inconsistent levels of price regulating and monitoring among ports; and
- the uncertainty of long-term port investment in capacity.

Of note, the high port costs contribute to Australia's overall trade costs which are higher than for many other high-income OECD countries (World Bank 2019). As such, the outcomes of privatisation in relation to port management and operations need to be evaluated. Such evaluation would assist policy makers, business leaders and other maritime stakeholders in understanding the link between port governance and the nation's supply chain costs and trade efficiency.

Port performance measurement and monitoring are crucial to the effectiveness of maritime logistics systems. Considering the recent market trends and structural changes in the global maritime logistics system, traditional approaches to measure port performance based on competitiveness focussed factors such as physical productivity, efficiency or costs, may be inadequate to assess the full measure of port performance. Instead, port performance measurement and monitoring should be based on a multi-scalar approach.

Currently, each Australian port company/authority publishes their own performance results covering financial (only public ports' financial performance are publicly available), trade, operations, environmental, and social performance to a varying degree. A notable exception is the BITRE publication Waterline which reports the performance of five major container ports in Australia based on the measures of throughput, productivity and port interface costs. As a consequence, there is a lack of national standard for measuring port performance from a multi-scalar approach, and no monitoring report of performance of ports other than the major container terminals and smaller ports

AMC suggests there is a need for government to develop a national performance guideline or framework for measuring port performance from multiple perspectives, for example: operational performance (efficiency, productivity), port interface costs, environmental performance (carbon footprint, circular economy hubs), connectivity (seaside and landside), social-economic performance, port governance, and resilience.

**Examine workforce issues, including industrial relations, labour supply and skills, and any structural shifts in the nature and type of work in the maritime logistics sector**

A talented workforce with advanced skills is required for shaping the maritime logistics sector over the next 30 years. The Australian Bureau of Statistics (ABS) includes the maritime logistics workforce under several sub-categories comprising the Transport, Postal and Warehousing (TPW) industry. These sub-categories include transport support services, warehousing and storage services, water transport, rail and road transport related to freight service. According to the national profile of TPW workers in 2016, 25.4% of TPW workers were aged 55 and over (21.9% for transport support services), which was higher than the all-industry figure of 19.2% (BITRE 2019). The report indicates that people employed in the TPW industry were generally less educated than the average Australian worker, with 53% holding a recognised post-school qualification (compared to 66 per cent of all employed persons), while 16% held bachelor degree or higher qualifications (24.2% for transport support services workers; 13.9% for warehousing and storage services), compared to 31% of all employed persons.

Australia's maritime logistics sector is undergoing transformation driven by technology developments (e.g. automation and digitalisation) and decarbonisation, which must be underpinned by development in workforce skills. For example, the emerging hydrogen (and its derivatives), and offshore wind farm sectors require skilled maritime logistics professionals to coordinate, manage and operate relevant logistics activities for exporting hydrogen/green ammonia and facilitating offshore wind farm projects. Considering its aging workforce and lower education and training qualification profile, the success of the industry transformation in the long term will depend upon ongoing professional development of the existing workforce and attraction of new young talent to the industry through higher education programs. Therefore, to enhance the productivity of Australia's maritime logistics systems in this era of sector transformation, AMC suggests a comprehensive research and workforce analysis addressing the port-centric logistics system, to include workforce trends, required skills and knowledge, and education and training frameworks.

The research undertaken by AMC staff in collaboration with IAMU members in the USA and Canada (Chen et al. 2018), revealed key employability knowledge and skills required for maritime logistics degree graduates. Industry participants in the research emphasised the need for specific skills including communication, analytical and problem solving, adaptability, self-management, teamwork and digital literacy and technology. Demand for digital literacy and technology knowledge, and data management and analytical skills continues to increase due to digitalisation and automation. Industry participants also listed the knowledge requirements necessary for working in maritime logistics organisations including: transport systems, shipping and port management, logistics and supply chain management, information communication technology in the maritime logistics sector, and business

knowledge such as financial management. Other specific knowledge of environmental issues such as climate change and decarbonisation were also highlighted.

AMC is ideally positioned to enhance the knowledge and skills of the Australian workforce in maritime logistics management through higher education. Curriculums are aligned with future workforce requirements and changing industry needs through regular industry engagements, and AMC is very keen to partner with governments and industry for educating and training the workforce that will shape Australia's maritime logistics sector over the next 30-50 years.

Industry engagement suggests that there is a growing demand for the workforce in the maritime logistics sector, but the supply is not sufficient from domestic sources. It seems that the general public and the school leavers have insufficient knowledge of, and/or interest in the maritime logistics sector and its career opportunities. While the reasons for this apparent lack of interest may be varied and complex, the short/medium term needs of the sector can be met through government support for skilled migrants. For example, the current migration policy discourages employers from recruiting AMC's international students even if they have a graduate visa to work. Given the specialist nature of maritime skills, employers seek long-term investment in the workforce, but the current policy restricts the employment of graduates to only two years.

In Australia, there are no professional standards for port professionals other than certain competencies in the VET sector. Successful and sustainable transformation of the sector will depend on the leadership and managerial qualities of the workforce underpinned by high-level analytical skills, critical thinking, creativity and resilience attributes. From a learning perspective, such qualities can be enhanced by educational programs that are contextualised to the unique and specialist nature of the industry. Generic business degrees may not be the most effective and efficient way to skill the port professionals of the future.

AMC plans to utilise its international links to embed contemporary professional standards into its curricula as well as to offer upskilling opportunities for existing port professionals. For example, AMC is partnering with USA's International Association of Maritime and Port Executives (IAMPE) to upskill port professionals in contemporary best practice. However, the development of a sustainable existing and future workforce requires input from all relevant stakeholders. AMC suggests that the government consider working with industry and academia to develop standards of knowledge and skills for port professionals, and these will guide education and training programs to meet the industry requirements.

## Research mechanisms to help improve the sector's resilience and efficiency

- Research into digitalisation of the maritime logistics system (e.g. Maritime and port 4.0)

Contemporary maritime logistics systems require real time and reliable data for decision making to ensure their efficiency and resilience. Australian major container ports have adopted automation; however, compared to ports in Europe such as Antwerp, Hamburg and Rotterdam adopting digitalisation rapidly, Australian ports lag behind. For example, European ports have developed port community systems (PCS), which provide logistics information to all actors involved in freight distribution through the port, and stakeholder interactions are facilitated in real time. No such system exists in Australia.

Currently, port and terminal operators have their own databases and management systems for operations, but there isn't a portal to link them together, within a defined, standard protocol. AMC recognises some efforts on this digital innovation have been attempted in Australia as early as 2011, including the National Port Community System project, Trade Community System project (Port of Brisbane), and the recent initiative NSW Freight Community System strategic business case. However, it is counter productive for each state to develop their own digital freight system, as it generates operational inefficiencies. AMC understands that the federal government has a national digital economy strategy and encourages ports and logistics industry for technological innovation. However, for the consistency of systems and significant capital expenditure in technology, AMC suggests that the federal government, in collaboration with state and territory governments and ports and freight industry, take the lead in developing a national port/or freight community platform to enable all supply chain participants to collaborate around Australian ports, and to enhance international maritime supply chain's operationality, visibility and traceability. It will also improve Australia's global trade competitiveness, through greater efficiencies and effectiveness, and security. Slow progress in digital transformation for international freight systems is evidenced as one of the major reasons for the significant drop of Australia's global ranking of Trading Across Borders, from 27$^{th}$ in 2010 to 106$^{th}$ 2020 (Work Bank 2020).

Industry 4.0, including digitalisation, robotics, artificial intelligence (AI) and big data has been developed and integrated into the maritime transport logistics system (e.g. maritime 4.0, port 4.0). The application of industry 4.0 is vital to continuously improve operational efficiency and effectiveness of Australian ports and their networks and ensure a sustainable maritime transport logistics system. Research focus can be on how informatics improves the quality of decision-making to increase efficiency, productivity, safety and sustainability of maritime logistics chains. Governments could collaborate with research institutions and the industry to undertake research in this area to benefit the stakeholders in the Australia's maritime logistics system.

- Research into decarbonisation of the maritime logistics system

To counter climate change and improve sustainability, ports and their related transport networks have a key role in greening the Australian economy. Research into strategies to decarbonise the maritime logistics system is crucial. Research focuses should include, for example, how Australian ports implement a circular economy, how ports can apply digitalisation to coordinate their transport networks to optimise use of port infrastructure to reduce unnecessary emission; and alternative fuels and technology development to achieve carbon free ports.

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