Coastal Shipping Research – Consultant's Concluding Report July 2021

Waka Kotahi NZ Transport Agency Disclaimer and Cover Note to Report

14 August 2023

Disclaimer

1. The views and conclusions reached in the report are the outcomes of the consultant's research into the coastal shipping sector, informed by sector stakeholder interviews, and should not be regarded as representing the views and conclusions of Waka Kotahi.

Background

2. The Government Policy Statement on land transport 2021 introduced coastal shipping as a new activity class.
3. The Waka Kotahi Board allocated $30 million for the coastal shipping activity class through the 2021-24 National Land Transport Programme (NLTP).
4. Waka Kotahi commissioned independent consultants, Pacific Marine Management, to produce a series of reports to inform the coastal shipping activity class investment approach.
5. Waka Kotahi released a Request for Proposal for coastal shipping activities as part of the NLTP in March 2022 and selected four preferred supplies in May 2022. The four suppliers are:
    - Aotearoa Shipping Alliance;
    - Coastal Bulk Shipping Ltd;
    - Move International Ltd; and
    - Swire Shipping NZ Ltd.
6. Implementation of the suppliers' proposals is ongoing.
7. Waka Kotahi committed to publishing the first and third reports. The first report, the Coastal Shipping State of Play report, was published in December 2021, and was available to potential activity class applicants to inform the development of their applications.

Redactions in the report

8. Certain information has been withheld in accordance with the following provisions of the Official Information Act 1982:
    - 9(2)(ba)(i) – to protect information which is subject to an obligation of confidence or which any person has been or could be compelled to provide under the authority of any enactment, where the making available of the information would be likely to prejudice the supply of similar information, or information from the same source, and it is in the public interest that such information should continue to be supplied; and
    - 9(2)(b)(ii) - protect information where the making available of the information would be likely unreasonably to prejudice the commercial position of the person who supplied or who is the subject of the information.

Pacific Marine Management Ltd

Business & Operations Analysts -

Shipping & Ports Sector

Coastal Shipping Investment Approach
Report 3 – Concluding Report

For:

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23 July 2021

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Title page picture:

Clockwise from top left: Anatoki, Moana Chief, Kokako, Proposed Rail Ferries, Buffalo, NZ Maritime School simulator, Southern Tiare, Stewart Island ferry, William Fraser, Strait Feronia.
The Future: Centre left – Wing foils on small container ship, C*entre right* E-Ship 1 (small RoRo cargo ship with Flettner rotors)

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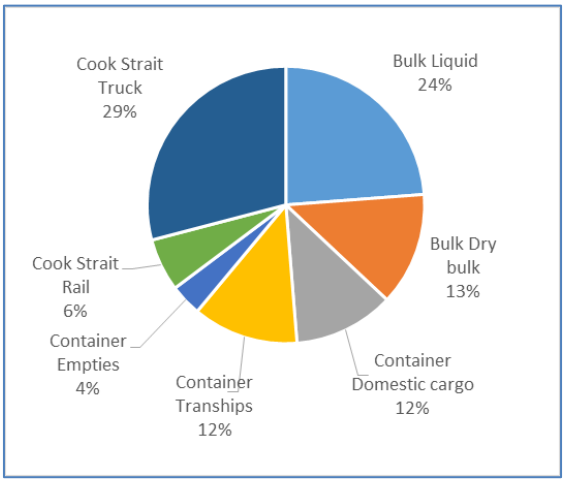
Executive Summary

Coastal shipping is included as a new Activity Class in the Government Policy Statement on Land Transport 2021. (GPS) This report is the third of three commissioned by Waka Kotahi NZ Transport Agency to assist it in delivering advice on how best to invest the $30 to $45 million funding that has been allocated over the next three years for coastal shipping under the GPS. The first report sets out the State-of-Play for New Zealand's coastal shipping sector. The second contains the views of a selection of sector stakeholders. As well as briefly summarising the sector and the views of stakeholders, this third report addresses the sector's challenges, discusses opportunities, and recommends principles and priorities that should guide investment decisions. It also provides advice on what other levers could be effective in achieving the GPS outcomes.

State of Play

The first report provides an overview of domestic shipping's part in the total freight task within New Zealand; about 10 million tonnes pa out of a total of 279 million tonnes pa in 2019, i.e. about 3.5%. That coastal freight task is split between sub-sectors as shown in the following graph:



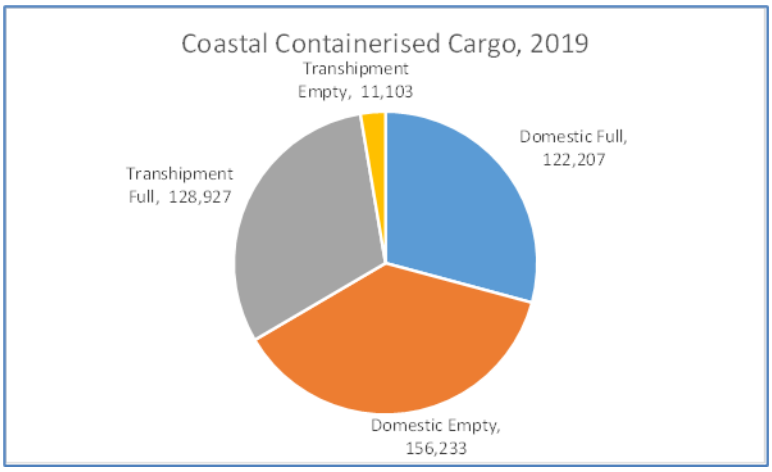
Coastal shipping sector by type of cargo and mode (percentage of total tonnes 2019)

The focus of this project is the possible transfer of more road and rail domestic freight into containers for carriage between the North and South Islands for the purpose of improving economic prosperity and reducing the number of trucks on the road and thereby improving safety while producing fewer carbon emissions.

This report therefore describes the nature and extent of the current coastal freight traffic carried in containers by both international and domestic ships, and the shipping services that are engaged in its shipment.

	Domestic		Domestic Total	Transhipment		T'shipment Total	Total		Grand Total
Row Labels	Full	Empty		Full	Empty		Full	Empty	
International ships	73,567	137,705	211,272	103,957	9,883	113,840	177,524	147,588	325,112
Domestic ship	48,640	18,528	67,168	24,970	1,220	26,190	73,610	19,748	93,358
Grand Total	**122,207**	**156,233**	**278,440**	**128,927**	**11,103**	**140,030**	**251,134**	**167,336**	**418,470**

Coastal Containerised Cargo, 2019 – (Source MoT FIGS data)



It also describes the Cook Strait ferry traffic, as well as briefly discussing liquid and dry bulk cargoes and other coastal shipping activities.

The report reviews the developments in the international shipping scene that have caused a transition to much larger vessels and a marked decline in the supply of what were previously known as "Panamax Container Ships" that were built to transit the old Panama Canal. It was these vessels that used to be deployed by shipping lines for the services to Oceania and for which ports were designed. That size of vessel is not now being built and thus this may leave some of New Zealand's ports with potentially "stranded assets", i.e., too small for the newer generation ships.

Discussion also centres on the changes that are emerging in ship propulsion and low-carbon fuel use and how this might impact on New Zealand's decision making.

A review of the significant international jurisdictions' approaches to coastal shipping policy priorities has also been provided to ensure that New Zealand's policy can reflect other initiatives as may be appropriate to its circumstances.

Stakeholders Views

To ensure that the input and basis for policy direction were both broad and current, the views of several key industry stakeholders were sought and are reflected in the development of the ideas and direction of the recommendations contained in the report. The stakeholders included current ship operators, (including New Zealand and international lines), persons experienced in port and cargo operations, New Zealand maritime unions and the New Zealand Maritime School.

Principles to Guide Coastal Shipping Investment Decisions

Waka Kotahi wishes to achieve impacts that support the utilisation, efficiency, and resilience of the coastal shipping sector. Included in its GPS goals, Government wishes to invoke policies that improve freight connections to support economic development, limit Greenhouse Gases (GHG) emissions and improve road safety by moving freight off road to rail and coastal shipping.

Guiding principles, derived from the GPS, are:

- Primary outcome:
  - Economic prosperity
- Co-benefits:
  - Resilience and security
  - Environmental sustainability

- Healthy and safe people

In looking at policies from other jurisdictions, there is a common theme with respect to coastal shipping. The objectives set out in the New Zealand GPS are all considered in these other jurisdictions, as are also safety and workforce training.

A framework based around these principles has been developed, and weighting given for assessment of proposals for investment under the Activity Class funding:

Criteria		Weighting	
Overall Weighting		100	
Economic Prosperity		50	100
	Return for investment		50
	Market share & Growth		5
	Efficiency gains		5
	Competition gains		5
	Economic returns		35
Resilience		15	100
	Commercial resilience of Coastal Shipping		33
	Physical resilience of the NZ supply chain		67
Sustainability		25	100
	GHG reduction		75
	Air emissions reduction		15
	Other environmental matters		10
Societal Returns		10	100
	Healthy and safe people		70
	Employment		10
	Cultural		10
	Social licence		10

Key Challenges and Opportunities

Several challenges have emerged from the examination of the state-of-play and the discussions with stakeholders. The **key challenges** relate to:

(i) Coastal shipping's part in meeting the major GPS objectives of improving economic prosperity and moving freight off road;
(ii) The part ports should play in providing supply chain resilience;
(iii) Coastal shipping's potential to reduce emissions;
(iv) The suitability and capacity of maritime infrastructure, container ports especially; and
(v) Whether the port ownership legislation should be reviewed.

The **opportunities** that they present cover:

- Integration of coastal shipping in the broader logistics and supply chain
- Maritime infrastructure
- Sustainability
- Legislative/ regulatory issues
- Societal issues

Integration of Coastal Shipping in the Broader Logistics and Supply Chain

The nature of the logistics and supply chain

Perhaps the major challenge facing coastal shipping is that of the broader New Zealand supply chain. The target freight market is made up of domestic general goods, import and export transhipment containers and empty containers being repositioned. All three modes, road, rail and sea compete, especially for the domestic freight.

Choice of mode by domestic consignors is determined not just by price, but by frequency, transit time and reliability of service. Trucking is fastest and can despatch several times a day and therefore is the most convenient, but is the most expensive. Rail is slower but still has daily frequency and it is cheaper. Sea is the slowest and cheapest, but has insufficient frequency. The sea mode also suffers from inconsistent reliability of service of that part of coastal shipping that is provided by the international carriers who carry domestic cargo on coastal transits. As a result, getting long-term commitment to ship on coastal shipping from New Zealand businesses has proven difficult.

A coastal feeder network

A major opportunity is the setting up of a **coastal shipping feeder service** in a hub and spoke network. If commitment could be obtained, then prima facie a three ship per week service should be viable. However, there is not enough domestic cargo alone to provide the required volume. On the other hand, the potential transhipment market is huge and large quantities of empty containers need repositioning. Between them, sufficient volume for a viable service could be realised; three ships carrying domestic cargo and empty repositioning containers primarily from Auckland to the South Island, and returning with transhipments and northbound domestic cargo to Tauranga. That is, operating a domestic cargo service together with a hub and spoke transhipment service, Tauranga and Auckland being the hubs.

Pacifica's Moana Chief

The problem is getting commitment. **The solution may be to provide the commitment through support of such a network from the Activity Class fund, to prove or otherwise the worth of the concept.**

Capacity of hub transhipment terminals

A major associated issue is that of the hub terminals' capacity to cope with a very large, unplanned increase in throughput represented by this increase in domestic cargo, transhipments and empties. A three-ship service would increase throughputs at Auckland and Tauranga by about 250,000 teu pa combined. If this were split 50/50, the increase in throughput would be 16% at Auckland and 10% at Tauranga; a step increase that is 4 to 8 times the annual increase through normal growth. These terminals would need sufficient head room capacity to be able to cope, not just at the berth but in the stack and at the road exchange.

In the **short term**, published information suggests that they can. But the recent fall in operating performance at both ports begs questions as to whether the causal issues will be addressed in time to cope with this potential incremental growth. **We recommend that an external, independent view**

on the real capacity of these terminals be commissioned to demonstrate with confidence that the increased throughput can indeed be accommodated within the existing infrastructure. We believe that this could be carried out in parallel with any call for proposals regarding a coastal feeder network, but should be answered prior to embarking on a course that might not succeed.

In the **medium term**, to be able to provide sufficient capacity to meet the potential increase in domestic cargo and transhipments may mean increasing berth length, crane numbers and stack ground slots beyond those already in existence.

In the **long term**, a transhipment hub strategy will mean that as the use of coastal services for transhipments grows, ultimately a new port will be needed.

Cook Strait

One of the challenges to Cook Strait services will be the continued use of Tory Channel by the much larger new rail ferries, or potentially by all ferries. If use of Tory Channel were to cease, all ferries would have to extend their voyage times by using Queen Charlotte Sound.

A collaborative risk assessment group, which included ferry operators, Maritime New Zealand, Port Marlborough and the Marlborough Harbourmaster was appointed in 2020 to investigate marine safety matters associated with the channel accesses to the Marlborough Sounds and is understood to be near to reporting. **We recommend** therefore that the information resulting from this Tory Channel review be announced in time for potential new entrants into coastal services to better assess the likely extent of their available market.

An artist's rendering of one of the new Interislander ferries to be built in Korea

Another challenge that was raised by stakeholders is the potential for market share distortions created by any Government non-commercial financial support to KiwiRail. **We recommend** that Government consider the degree to which KiwiRail should be permitted to price to attract cargo if this is likely to impact on the market share attracted to both direct competitors on the Cook Strait route and the coastal service.

Other coastal shipping opportunities

There is scope for support for other coastal shipping activities. Some examples of potential are:

- Transport of timber from Nelson to Auckland, using Onehunga, taking freight off road.
- Development of a small commercial port at Kaikōura, providing sea access to a gravel resource and increasing resilience for Kaikōura.
- Coastal repositioning of empty containers, a one-way trade that might be able to be combined with another trade going the other way.

Maritime Infrastructure

Port and Terminal suitability for coastal shipping

Harbour, port and terminal resilience is a looming challenge. Most of New Zealand's container facilities were built for first generation container ships and are now approaching obsolescence. Port infrastructure for those ports at which larger ships will call, will need to be rebuilt. Berths are not long enough, nor have they the required depth alongside. Channels do not have sufficient depth and width, and bends are too tight (there is a resulting risk that a vessel stranding will close a port for a period). Tidal constraints will become an increasing problem, for example at Nelson and Tauranga.

Crane outreach and weight will need increasing, limited ground slots means more land is needed, road/rail interchanges will become insufficient and as is latterly the case, the challenge of converting to automation will need to be overcome. Increased throughput will increase road traffic congestion in the approaches to all ports.

There is a need to assess these physical ship-size limitations of ports independently from the investment decision-making of the port owner. **We recommend** that this form part of MoT's upcoming National Freight & Supply Chain Strategy.

Transport network resilience in emergencies

New Zealand is prone to natural disasters and other disturbances that can disrupt the supply chain. Coastal shipping should be able to provide resilience, but as yet cannot. Ports throughout New Zealand need to be capable of providing the link from ships to their immediate hinterlands, for example through an ability to receive RoRo ships and the maintenance of container handling capabilities, the two maritime transport options that can deliver high volumes of cargo over a short period of time.

There is no known promulgated plan for emergency use by ports or the shipping service providers in the event of such natural disasters. **We recommend** that a review of readiness be undertaken.

Dry Dock

Various members of the New Zealand Shipping Federation commented on their view of the strong case for a New Zealand based (floating) dry dock. We have been unable to establish the status of the assessment of the commercial viability of such an investment. **We recommend** that a full business case be undertaken, looking wider than just the New Zealand ships that might use a facility, and consider what the potential regional market share and thus revenue and benefits such as emission reductions might be, to offset the capital and operating costs.

Shore power for ships

Shore power (cold Ironing) has been mentioned as a challenge on two fronts. Firstly to provide appropriate connections on all wharves to enable the ships of the future to stop diesel generators whilst in port and use cleaner shore energy. And secondly, the issue of the electricity supply in smaller places having sufficient capacity to be able to supply such increased demand for short periods of time. **We recommend** that such investigations into provision of facilities to enable cold ironing take place.

Sustainability

Coastal shipping is acknowledged as having lower emissions per tonne-kilometre than land transport. A wide range of low carbon fuels are in the plans of ship operators, both local and internationally.

The primary sustainability challenge in the New Zealand maritime sector is to transfer freight from land modes to sea. This report makes the case for setting up a coastal feeder network that will treble (or more) the volume of coastal containerised cargo carried in domestic ships (although not all will come off road or rail; some will be increased transhipment volumes).

Another challenge is to try to induce new coastal shipping proposals to adopt new forms of propulsion that enable the efficacy of new technology to be tested without unduly adding to operating costs. We suggest pilot schemes for wind and solar assisted propulsion and low carbon fuels and a more vigorous promotion of IMO's Ship Energy Efficiency Management Plan (SEEMP). Another suggestion is encouraging small ferry operators to be electrically propelled.

Legislative and Regulatory Issues

Port governance and ownership

A number of the stakeholders commented on a lack of a coordinated approach to investment in ports and questioned the way in which New Zealand ports are responding to the challenge of meeting the future needs of shipping. This sentiment was echoed by the Controller and Auditor General's Report on "Results of our 2019/20 audits of port companies" which was released in June 2021. The Auditor-General's Report clearly signals the need for review of the legislation controlling the actions of ports, an approach that we would support.

Port charges

Several references were made by some stakeholders as to the level and structure of port charges for coastal shipping. Stakeholders considered that port charges should be reviewed to determine that they reflect the real cost to ports and are not inhibiting trade unnecessarily. **We recommend** that this issue be addressed by MoT in its upcoming National Freight and Supply Chain Strategy.

Maritime Transport Act s 198 on carriage of coastal cargo

Stakeholders have concerns regarding administration of this section of the Act and of the granting of exemptions. The following changes to administration of this section of the Act would help:

- Establishment of more explicit rules for exemptions.
- Promulgation of information on exemptions.
- Being more strict on applying section 198 (1) (b) which allows a foreign ship to carry any coastal cargo if it is demise chartered and the crew is employed under New Zealand law, rather than giving of exemptions enabling these provisions to be side-stepped.

Societal Issues

Workforce challenges

Some workforce issues were raised by stakeholders, mostly relating to training. In a discussion with the New Zealand Maritime School, it was explained that training establishments can meet an increased demand, but it takes time to add new courses, and even longer for qualified persons to pass through the system. There are very few opportunities on board existing coastal vessels for trainees to obtain the necessary sea-time to qualify, given the lack of cabins/berths on such ships. Training facilities such as engineering workshops need to be kept up to date, necessitating funding. **We recommend** that these concerns are addressed and fulfilled where necessary.

Social licence

Concern was raised by some stakeholders that there is a growing conflict between port city residents and the port operators, especially from incursion of reclamation and wharves into the harbour and

congestion on the access roads. The challenge is to fully appreciate the limits to the compromise between commercial and society interests and the economic costs of the options.

Projects for Activity Class Funding

The projects which may be suitable for GPS Coastal Shipping Activity Class funding can be derived from the key opportunities. The table below lists them, shows the links between related or contingent projects, the priority that we have attached to them, the timing, and the magnitude of funding that would need to come from the Activity Class fund.

ID#	Project	Related projects	Priority	Timing	Responsible party	Early cost estimate	Report reference
A	**Integration of coastal shipping in the broader logistics and supply chain**						
A1	Coastal shipping feeder service support scheme	A2	High	Immediate	Waka Kotahi	$25m to $40m	5.2
A2	Assessing container terminal capacity	A1, B3	High	Immediate	Waka Kotahi	<$500k	5.2.4
A3	Update of Cubic Njord Report on Domestic Container Supply	A2	Medium	Immediate	Waka Kotahi	<$100k	5.1.4
A4	Other coastal shipping opportunities		Medium	Next 3 years	Waka Kotahi	up to $5m each	5.4
B	**Maritime infrastructure**						
B1	Assessment of ports' natural disaster resilience readiness		High	Immediate	Waka Kotahi	$1m	6.3
B2	Business case for a dry dock		High	Immediate	Waka Kotahi	<$250k	6.4
B3	Road and rail interface with ports	A2	Medium	Immediate	Waka Kotahi	<$100k	6.2.3
B4	Implications of Tory Channel navigability on Cook Strait Ferry market		Medium	Next 3 years	Waka Kotahi	<$100k	5.3.1
C	**Sustainability**						
C1	Pilot schemes for low carbon fuels & wind and solar assisted propulsion		Low	Next 3 years	Waka Kotahi	Moderate to high	7.2.1
C2	Investigate shore power (cold ironing) for ships		Low	Next 3 years	Waka Kotahi	Low	7.2.3
C3	Electric ferries		Medium	Next 3 years	Waka Kotahi	$100k to $250k	7.2.4
D	**Societal issues**						
D1	Assistance to training establishments	L5	Medium	Next 3 years	Waka Kotahi	<$100k	9.3.2

Other Levers for Achieving GPS Outcomes

Waka Kotahi has asked for advice in addition to that directly related to coastal shipping, on what other levers could be effective in achieving the GPS outcomes. The following are some such levers.

ID#	Lever	Related Levers	User of lever	Issue it addresses	Report reference
L1	MTA s 198		MoT	Perceived shortcomings in application of s 198	8.2.1
L2	Port Governance and Ownership	L3	MoT	Stakeholder dissatisfaction with ports governance	8.1
L3	Port charges for coastal shipping	L2	MoT	Stakeholder dissatisfaction with ports operations	8.1.2
L4	ETS levies		MoT	Perceived un-level playing field	5.5
L5	Integrating coastal shipping into the upcoming national Freight and Supply Chain Strategy (F&SCS)	L6, L7, L8	MoT	Ensuring these coastal shipping initiatives fit in with an overall supply chain strategy	5
L6	Considering the implications of Market Power of Shipping lines in the upcoming (F&SCS)	L5, L7, L8	MoT	Ensuring that international shipping lines do not exert market power over New Zealand ports, coastal shipping operations and cargo interests to the extent that it is to their detriment	5.1.6
L7	Considering ports' physical limitations on ship size in the future in the upcoming (F&SCS)	L5, L6, L8	MoT	Ensuring that long term ports infrastructure expenditure is in line with the (F&SCS)	6.2.2
L8	Considering the ports' road and rail interface capacity in the upcoming (F&SCS)	L5, L6, L7	MoT	Ensuring that hinterland infrastructure expenditure is in line with the (F&SCS)	6.2.3
L9	Degree to which KiwiRail should be permitted to price to attract cargo to their Cook Strait ferries		MoT/NZTA	Preventing Cook Strait or coastal services market share distortions created by any non-commercial financial support to KiwiRail.	5.3.2
L10	Container terminal performance KPIs in FIGS.		MoT	Adding dwell time and stack utilisation data to MoT FIGS.	6.2.5
L11	Funding Wellington & Picton linkspans as part of SH1		Waka Kotahi	To relieve the ferry operators and ports of the financial burden	6.5
L12	Maritime New Zealand Rules		MNZ	Harmonising with other jurisdictions	8.2.2
L13	Promotion of IMO's Ship Energy Efficiency Management Plan (SEEMP)		MNZ	Operational methods for reducing fuel consumption and GHG emissions	7.2.2

1 Introduction

1.1 Background

Coastal shipping is included as a new Activity Class in the Government Policy Statement (GPS) on Land Transport 2021. This report is the third of three commissioned by Waka Kotahi NZ Transport Agency to assist it in delivering advice on how best to invest the $30 to $45 million funding that has been allocated over the next three years for coastal shipping under the GPS.[1] The first report sets out the State-of-Play for New Zealand's coastal shipping sector. The second contains the views of a selection of sector stakeholders. This, the third report, addresses the sector's challenges, discusses opportunities, and recommends principles and priorities that should guide investment decisions.

The Review Team carrying out this work is Mark Oxley and Mick Payze of Pacific Marine Management.

1.2 'State-of-Play'

The first report on the 'State-of-Play' forms the basis for the next two stages of the work, stakeholder views and final report including recommendations, and also is to help government better understand the current state of the sector. The report provides:

- Key information on the scale and nature of the sector as well as the key routes and services that are operating.
- Summary of recent developments in the international shipping industry that have recently affected, or are still affecting, the sector. This touches on the increasing size of ships, matters such as the market power of international shipping lines and recent and ongoing congestion issues at ports worldwide and in New Zealand.
- A brief summary of how alternative fuel sources development is progressing and its potential to replace current fossil fuels in the coastal shipping sector over the short-medium term.
- Information on relevant recent coastal shipping policy developments in other jurisdictions that New Zealand could potentially learn from.

The State-of-Play is summarised in Chapter 2 of this Concluding Report.

1.3 Stakeholder views

The terms of reference for Report Two required that the Review Team should engage with a limited number of knowledgeable coastal shipping sector stakeholders who might be able to give a wide perspective of the ports and shipping industry and who might also fill otherwise important information gaps.

A shortlist of possible stakeholders was established. Meetings were undertaken by the Review Team with Waka Kotahi and MoT representatives in attendance in order to build their direct links with the sector.

Stakeholder representatives were drawn from some major New Zealand and international shipping company operators, including several members of the New Zealand Shipping Federation, as well as persons experienced in cargo movement, rail and ferry operations and with board experience on

[1] The other reports in the series:
Coastal Shipping Investment Approach, Report 1 – State-of-Play, 12 May 2021
Coastal Shipping Investment Approach, Report 2 – Summary of Stakeholder Views, 4 June 2021

New Zealand Port Company Boards. Representatives from MoT and Maritime New Zealand (MNZ) were also consulted, as well as the maritime unions in a collective meeting, and the New Zealand Maritime School.

A list of stakeholders engaged is set out in Appendix 1. The views of stakeholders are reported throughout this Concluding Report, predominantly in Chapters 5 to 9.

1.4 Scope of work for Concluding Report

The Request for Quote for this work describes this third stage as summarising the information from Reports One and Two and providing:

- Information on the key challenges facing the coastal shipping sector.
- Information on the key opportunities the sector currently has or could have over the next 1-2 years.
- A view on the best medium-long term opportunities (2-10 years).
- Recommendations on principles and priorities that should guide investment decisions.
- Additional advice on what other levers could be effective in achieving the GPS outcomes (e.g. regulatory or planning levers).

1.5 Definition of Coastal Shipping

For this work on the Coastal Shipping Investment Approach, Coastal Shipping has been defined as activities conducted by ships, both New Zealand ships and international ships, when carrying coastal cargo (domestic cargo and import/export transships[2]) and repositioning empty containers from one place in New Zealand to another[3]. It includes ships carrying cargo across Cook Strait, i.e. the InterIslander (KiwiRail) and BlueBridge (StraitNZ) ferries.

Note that this differs from the classification of Coastal Shipping in the National Freight Demand Study, in which Cook Strait ferry traffic is counted as rail or road volumes, and in which coastal cargo on international ships (import/export transships, empty containers or domestic cargo) is not considered.

[2] Import transships are cargoes discharged from a first ship at an intermediate port, for example Auckland, then carried by another ship to their final port, for example Lyttelton.

Similarly, export transships are cargoes loaded onto a first ship at an origin port for carriage to an intermediate port where they are discharged, then loaded onto a second ship for final export.

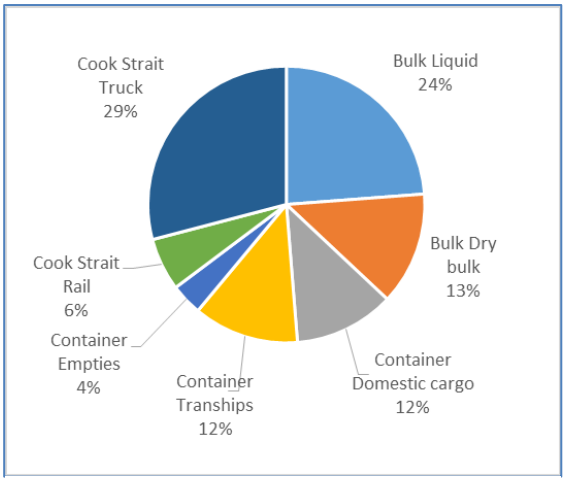
[3] The flow of import and export containers does not exactly match at any given port. A port with more imports than exports (Auckland is an example) has surplus containers that need to be repositioned to a port that has more exports than imports (Tauranga and Lyttelton are examples).

2 State of Play

2.1 The Scale and Nature of the Coastal Shipping Sector

Overview

New Zealand's coastal shipping sector consists of the transport of dry and liquid bulks, containerised and some breakbulk general cargo, rail and road Roll-on Roll-off (RoRo) cargo and passenger services across Cook Strait, small ferry services to Stewart Island, Great Barrier Island and within Auckland and Wellington Cities, and numerous work boats engaged on non-cargo transport tasks. The container services are operated by a single domestic ship operator a well as international ships transiting the coast. Most of the other transport tasks are operated by New Zealand domiciled operators. Of New Zealand's total estimated freight task of 278.7 million tonnes in 2019, coastal shipping comprises approximately 10 million tonnes (3.5%).



Coastal shipping sector by type of cargo and mode (percentage of total tonnes 2019)

Bulk Shipping

Two main bulk commodities are shipped around the New Zealand coast: (i) refined petroleum products (2.7 million tonnes pa), and (ii) cement (1.3 million tonnes pa).

Petroleum products are distributed from the refinery at Marsden Point to port depots at all main ports except Auckland which is supplied by the Marsden Point to Auckland pipeline. The shipping service is provided by Silver Fern Shipping using their two tankers of about 50,000 deadweight tonnes.

The future of the refinery is in question, potentially moving to an import terminal model. This may reduce the demand for coastal tanker distribution as a result of direct fuel deliveries from overseas.

The total **cement** market is about 1.5 million tonnes pa; two-thirds Golden Bay cement and one-third Holcim. Both companies use coastal ships. Golden Bay's Aotearoa Chief operates from their Portland (Whangarei) works supplemented by ISO cement tank containers which are carried by Swire Shipping services loading at Marsden Point.

Holcim lands its 0.5 million tonnes of imports at Auckland and Timaru. From Auckland distribution is by road. From Timaru their ship MV Buffalo hauls cement to other coastal ports, from where it is further distributed by road.

Holcim's Buffalo

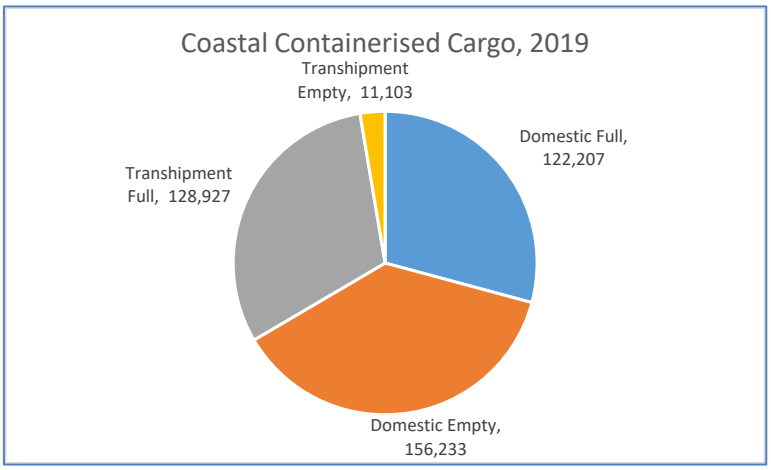
Containerised cargo

Containerised cargo and empty containers are transported by a domestic shipping service (the Pacifica/Swire Shipping service) and by international containerships transiting through New Zealand ports. The cargoes consist of domestic cargo, export and import transhipments and empty repositioning.

In 2019, 418,470 teu[4] were transported; 122,207 teu were domestic cargoes, 128,927 export and import cargo tranships and 167,336 teu empties. The domestic Pacifica service carried 22% of the total, while the remainder (78%) was carried by international ships.

	Domestic		Domestic Total	Transhipment		T'shipment Total	Total		Grand Total
Row Labels	**Full**	**Empty**		**Full**	**Empty**		**Full**	**Empty**	
International ships	73,567	137,705	211,272	103,957	9,883	113,840	177,524	147,588	325,112
Domestic ship	48,640	18,528	67,168	24,970	1,220	26,190	73,610	19,748	93,358
Grand Total	**122,207**	**156,233**	**278,440**	**128,927**	**11,103**	**140,030**	**251,134**	**167,336**	**418,470**

Coastal Containerised Cargo, 2019 – (Source Ministry of Transport Freight Information Gathering System data)



Ferry Services

Two operators provide Cook Strait cargo and passenger services; the InterIslander (KiwiRail) with three ships, one of which has rail capability, and BlueBridge (StraitNZ) with two. The total cargo for both Cook Strait ferry services is about 4.0 million tonnes pa; 3.3 million tonnes by road and 0.7 million tonnes by rail.

There are numerous small ferry services around the New Zealand coast. The most significant are those linking Bluff with Stewart Island, and Auckland with Great Barrier and Waiheke Islands.

[4] A 'teu' is a 'twenty-foot equivalent unit' i.e. one 20-foot container. A 40-foot container is 2 teu, i.e. the amount of space the container occupies in a ship stow or a container terminal stack. Note though, for container handling purposes, the number of units handled by a crane, for example a 20-foot container and a 40-foot container, are both counted as one 'unit'.

New Rail Ferries

KiwiRail announced on 1 July 2021 that it has signed a contract with a Korean shipbuilder to build two new ferries that are considerably larger than the three present vessels, and which they are to replace.[5]

Aratere	
Length	185m
Beam	20.5m
Gross Tonnage	18,000T
Max Draught	5.5m
Service Speed	19.5 knots
Passenger Capacity	650 passengers
Cargo Capacities	
Freight	25 trucks 30 rail wagons
Passenger Vehicles	240 cars (cars only)

New Ferry	
Length	220m
Beam	30.8m
Gross Tonnage	50,000T
Max Draught	7m
Service Speed	20 knots
Passenger Capacity	1910 passengers
Cargo Capacities	
Freight	42 rail wagons + 62 trucks + 170 cars
Passenger Vehicles	652 cars (cars only)

The introduction of the two new ferries will result in a change in the cargo mix carried by the InterIslander services. Their passenger, car and truck capacity is nearly twice that of the present three ferries and the rail capacity three times. It would appear that a considerable increase in rail traffic is planned, presumably freight previously moved in trucks.

Level Playing field

Many stakeholders have questioned whether there is a level playing field in this coastal freight market, particularly the container and Cook Strait ferry sectors. To a **domestic operator**, the biggest impediments are that international ships can marginally price their operations[6]. Levies such as the Emissions Trading Scheme (ETS), which are not levied in New Zealand on ships overseas ships that do not refuel in New Zealand, are stated by domestic ship operators as being inequitable. Some stakeholders consider there to be subsidies or various other means of Government support directly

[5] https://www.kiwirail.co.nz/media/world-renowned-shipyard-chosen-to-build-new-interislander-ferries/

[6] An overseas ship that is for example, carrying imports to discharge at both Auckland and Lyttelton, and calls at both, can carry domestic cargo on this coastal leg at very little extra cost. It is making the journey anyway so most of its fixed daily costs, port charges and fuel consumption are not increased. The domestic cargo needs only pay for cargo handling costs, cargo-related port charges and a profit element, i.e. it can be marginally priced.

or indirectly for other transport modes[7]. Competitive fuel supplies are also difficult to obtain[8]. Similarly, port pricing is perceived as inequitable for domestic cargoes especially as such cargo sometimes uses older non-core long established assets for its operations.

To an **operator of international ships transiting on the coast**, the biggest impediment is the Maritime Transport Act's restrictions on the carriage of coastal cargo. Unless an exemption is granted, the Act does not allow carriage of coastal cargo (which includes transhipments and empties) other than as incidental cargo carried on a direct coastal route determined by that ship's import/ export cargoes.

Inland ports and the Road/ Rail Interface

Coastal shipping shares the same frustrations with the road and rail interface as international shipping. Road congestion is high, especially during the week day high demand period. The ceiling on rail siding capacity in the Auckland and Tauranga terminals and the constraints on the single track portions of the rail system limit use of rail generally. The major inland ports such as MetroPort and Wiri (both in Auckland) help to relieve this to some extent.

Dry Docking and Ship Repair

Ship docking and repair facilities in New Zealand are too small for the larger ships operating primarily in New Zealand, but the financial and economic benefit of providing them locally needs to be justified or alternatively the strategic importance of such facilities needs to be agreed and delivery of the service might then be financially supported if there were a compelling case for public investment.

2.2 Recent Developments in International Shipping affecting Coastal Shipping

Evolution of Mega Shipping

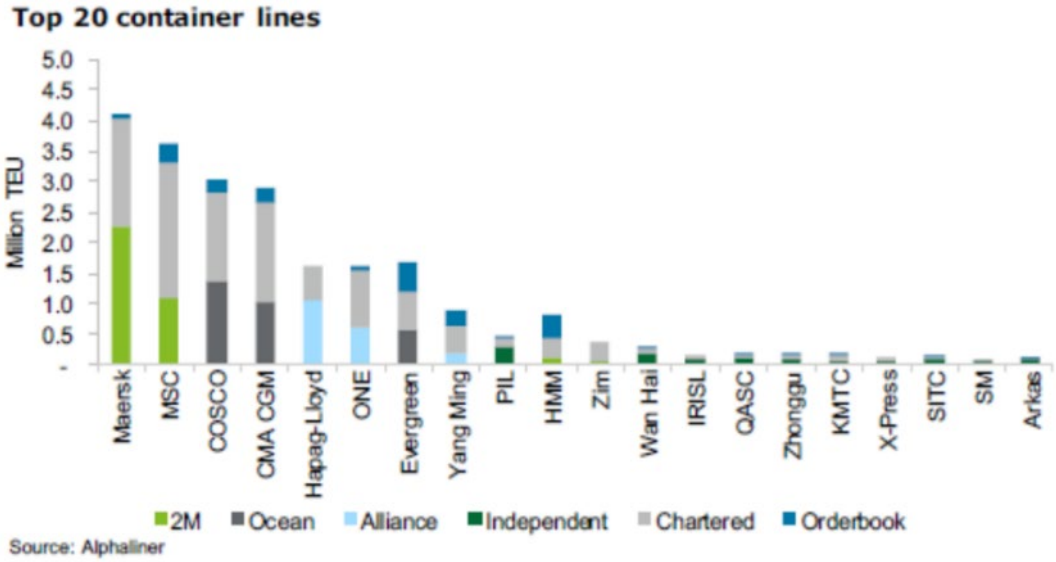
Several recent influences have given rise to the rapid expansion of world trade and thus the level and nature of the required shipping services and the vessels engaged in them; recovery post Global Financial Crisis of 2008, opportunity to increase ship size afforded by the opening of the new Panama Canal, the world-wide consolidation of container ship operators into just three major alliances, and the parallel surge in the building of Ultra Large Container Ships. The implication is two-fold: that there is a danger of an oligopoly in the New Zealand trades resulting from market power being exerted by the international lines dominance; and, that there will be pressure

The new Panama Canal Locks that afford an increase in the size of container ships

[7] Note though that in their 2012 report, the Productivity Commission views the road transport industry to be unsubsidised. https://www.productivity.govt.nz/assets/Documents/f53fe759db/Final-report-v7.pdf . KiwiRail is meant to operate commercially, but it does appear to be subsidised in view of the large funding under the GPS.

[8] Previously, New Zealand coastal ships could use low-cost fuel oil. Recent international rule changes to the MARPOL Convention have dictated that fuels be low sulphur, to decrease air emissions harmful to health. No low sulphur fuel oils are available in New Zealand, forcing ship operators to use the more expensive low sulphur gas oil (the same diesel used by trucks and trains).

for larger ships to be accommodated at New Zealand ports, which will require large investment in port and harbour infrastructure.[9]



New Zealand is predominantly served by virtually all the top 10 shipping lines listed in the chart above; Maersk through to Zim (except for Evergreen and Hyundai Merchant Marine). Some regional operators also provide container services especially to the Pacific Islands including Swire Shipping (who also own Pacifica), Matson and Neptune Pacific.

In most cases, in their New Zealand services the international lines work with the partners in their respective international alliances although Maersk and MSC work separately in their New Zealand trades. Collectively these alliances are said to carry 85% of the world's containers so have very comprehensive services to worldwide destinations. New Zealand market shares are difficult to estimate but based on the service networks they offer, the most significant operators are Maersk, then ANL-CMA CGM followed by MSC, COSCO and then the balance.

The Focus on Sustainability

The international focus on sustainability is also evident in shipping. The international commitment through the IMO to lower shipping Greenhouse Gas (GHG) emissions, to 50% or less of 2008 levels by 2050, can only be fully achieved by changing the fuels and methods for propulsion and it follows that this will mean the timely scrapping of world fleets as they reach the end of their economic life, their replacement by larger, low- to zero-carbon fuelled ships and the greater use of "economies of scale" (bigger vessels).

[9] See address by Rod Sims, Chair of Australia's ACCC, who in a 30 September 2019 address talked about "the desired changes to the protection for shipping lines coordinating their behaviour. https://www.accc.gov.au/speech/accc-perspectives-on-transport-issues

See also shipper group concerns in the EU regarding international carriers' exemption from consortia regulations: https://www.lloydsloadinglist.com/freight-directory/adviceandinsight/Shippers-renew-call-for-block-exemption-to-be-removed/79280.htm#.YOI1e-gzazp

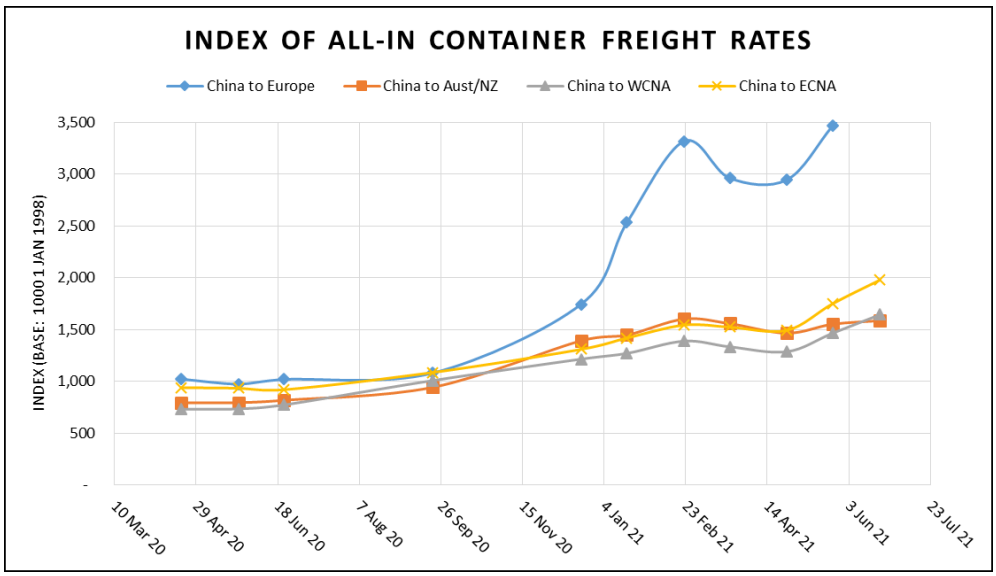
The Covid 19 Pandemic

World markets initially collapsed in early 2020 but then surged when personal expenditure changed from purchases of services to purchases of goods. Ships presented at ports with significantly increased container loads, revealing many weaknesses in the logistic chain no more so than in the container terminals where, through insufficient allowance for peaking, capacity was already tight. Freight rates and time charter rates rose as a result of the shortage of supply of shipping space and containers, and ports lack of capability to handle the surge.

Surge in Freight Rates

While the worst impact was on the rates ex China to World markets, return rates also climbed, not generally because of lack of ship capacity, but rather the perceived need to return the containers, as empties if necessary, to where there was the highest demand and hence also higher container freight revenue.

The following graph indicates recent fluctuations in the average container freight rates, i.e. spot and contract combined, over the last 12 months.



The above rates are derived from the China Containerised Freight Index (CCFI) which is collated and published by the Shanghai Shipping Exchange Weekly.[10] What shows up is that the Asia European trade is far more volatile than the trades from China to Australia/New Zealand or North America. The Europe trade rates have increased nearly 4-fold (294%), whereas the Australia/ New Zealand trade, West Coast North America and East Coast North America trades increased only 94%, 112% and 115% respectively.

Not all freight has experienced such increases though as rates are often contracted well in advance and thus it is the smaller shippers responding to short term orders who must factor in this impact. Spot rates have shown much greater volatility as the following graph shows, and it is this of course that gets reported frequently.

[10] The CCFI index is based on prices that are all-in rates reflecting actual spot and contract prices including surcharges and exchange rate factors. The base period taken by the CCFI commenced on 1 January 1998 with an index of 1000 points.

A Drewry Container Forecaster Report[11] is quoted as saying ocean freight rates are set to stay elevated until 2023. This they put down to a flurry of new building containership deliveries timed for 2023 which will increase supply of ships and thus reduce rates.

Covid effects on New Zealand Ports

The results of this surge in container volumes played out in New Zealand in the same way as overseas, notably at Auckland's container terminal, which operation was significantly challenged. That port had to absorb the surge in container volumes at the very time that it was just starting to transition to automation; a combination that left it short of capacity. The outcomes included significant delays for vessels berthing at Auckland, reduced productivity, and over-full container stacks, in turn resulting in a further increase in dwell times of containers in the terminal which additionally exacerbated congestion.

Delays in Auckland gave rise to issues further along the supply chain; any ship delayed in Auckland was delayed getting to its next destination and may then have had to wait for another vessel ahead, ships missed transhipment connections, coastal domestic cargoes distributed through Auckland experienced an extension to normal transit times to South Island customers, and to expedite despatch of vessels they often sailed without empty containers contributing to a shortage in supply of containers both in the South Island and in Asia.

Container Ship Charter Rates

Container shipping service operators employ vessels that they deploy through a mix of arrangements which include:

- owned and operated vessels,
- ships demised chartered[12] where a third party owns them and they are hired without a crew for often a long period and the charterer meets all ship operating costs,

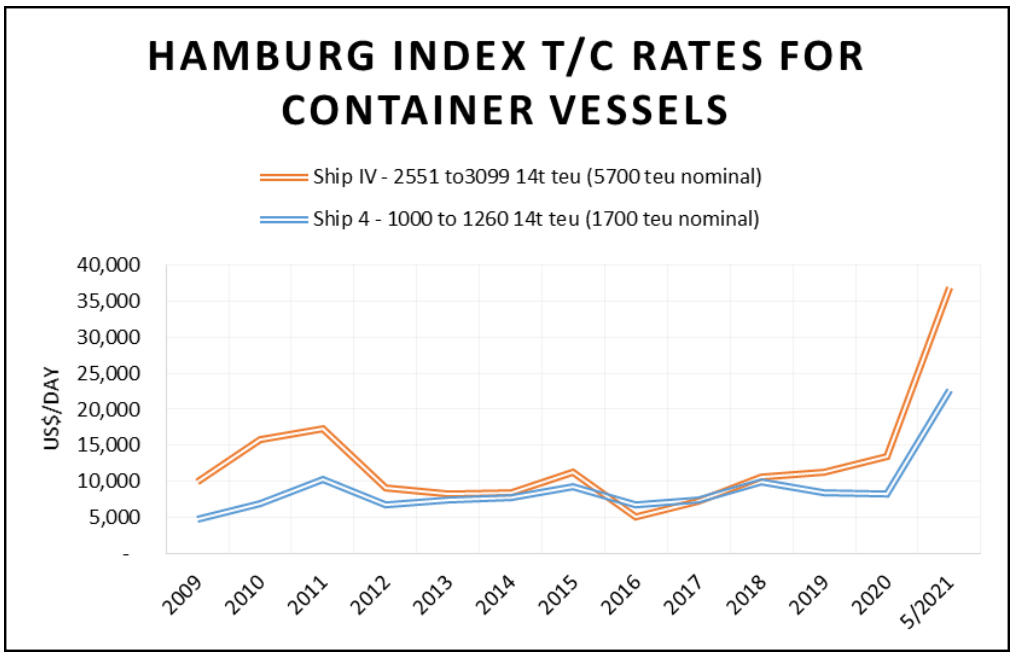
[11] Reported in the 26 April 2021 edition Lloyds Loading List.

[12] Demise charters are also known as bareboat charters. They are similar to a lease of an asset.

- time charters where the vessel is supplied fully crewed and operated with its owner picking up all fixed costs but not voyage or cargo costs, possibly engaged for 6 months to 12 months although up to 5 years is not unknown, and
- spot or voyage chartered vessels with all fixed and voyage costs (but not cargo costs) met by the owner, that are typically operated short term to fulfil a need when unexpected demands require additional capacity.

It is these latter two charter arrangements, time charter and voyage charter, that are most reflected in charter market rate indicators. Their incremental cost impacts on the average container slot per day of an owner's fleet and its effect will vary according to the shipping company's strategy for exposure to this market.

The present very high time charter rates can be compared with those over the last 12 years. The following chart shows typical daily charter rates for two ship sizes, a 5700 teu nominal capacity ship (typical of the international ships trading to New Zealand) and a 1700 teu nominal capacity ship very similar to Pacifica's Moana Chief.[13]



The rates in May 2021 are 246% and 187% above the 12-year average for the 5700 teu ship and 1700 teu ship respectively. Clearly the current peaking demand for ships and resultant high freight rates have enabled container ship operators to charter such vessels despite the high rates while they strive to cover shipper needs. Historically such peaks do not last long, typically 2-3 years at most, as the surge in demand will cause a flurry of new building which when delivered will result in a reduction on the associated income of chartered ships. Such cycles are often said to last about 7 years from one peak to another.

For a New Zealand operator on the New Zealand coast, a bareboat charter is the most likely arrangement. A bareboat charter usually reflects a longer-term expectation of the market than a shorter term time charter. However, a bareboat charter arranged at present for say 3 years would

[13] Rates sourced from the Hamburg Index for containership time charter rates. See www.vhbs.de

factor in this expectation of the present high time charter rates continuing for maybe two years or so.

A ship bareboat chartered now would therefore probably result in the same daily rate difference as a time charter, about US$12.50 (NZ$17.00) per slot per day higher than average for a 1700 teu ship. But significantly the daily cost of operating, including the bareboat component, is less than 5% of the total cost of freight from say an Auckland distribution centre to a Christchurch destination. The impact of the US$12.50 (NZ$17.00) increase in bareboat slot rate is less than 3% of the estimated NZ$2000 per teu total origin to destination freight cost. The additional annual cost per ship is about US$5.5 million (NZ$7.4 million).

The International Power of the Shipping Lines

The Europe-based Global Shippers' Forum has used the current disruption in the World's supply chains to state its dissatisfaction with the shipping industry's apparent collusion that has limited capacity and forced up freight rates whilst service performance such as the predictability of delivery of supply of containers to enable goods to be shipped to consumers has plummeted. At the same time record freight rates have been demanded.[14] They stated that supply of shipping space has appeared to match demand too closely and now exceeds what is available.

Further they noted that the industry does not exhibit any great distinguishing features in the service offered as all were adopting similar service frameworks "effectively creating a commodity service as if it is a commodity". They are further suggesting that the industry should be regulated as if it were a utility, given that it provides a unique commercial and national service effectively by a single supplier.

It was noted that such a system might be similar to that which regulates airline code-sharing agreements which are regulated, reviewed and transparent and which can also be well understood regarding the information that can be exchanged.

The Global Shippers' Forum has been particularly critical of the current consortium exemptions that are provided, not just by the European Union, but by jurisdictions all around the world which it said were unprecedented and affirmed that consignors were in favour of removing the block exemption.

Hubbing

When modern era international trade commenced it was generally carried in small vessels from point to point but as it increased and vessel size and powering systems evolved, the ports through which the cargo was aggregated and dispersed also evolved. As a result, the means of transporting such cargo to and from those ports expanded and in countries with expansive coastlines, this involved sea transport using river and coastal barging services,

By the time that the Suez and then the Panama Canals opened the ships had grown considerably and the largest vessels were almost entirely built so that they could transit the two systems. The earlier ports then expanded rapidly around these specifications.

New Zealand ports evolved during this period. The southern ports were closer to Europe because access to the country was primarily by rounding the Cape of Good Hope southbound and on heading back to Europe the ships then headed east again to round the Horn and head north up the east coast of South America. New Zealand therefore initially developed faster in the South Island until the opening of the Panama Canal gave rise to a more direct route to and from Auckland.

[14] Reported in Lloyds Loading List, 14 June 2021, https://www.lloydsloadinglist.com/freight-directory/adviceandinsight/Shippers-renew-call-for-block-exemption-to-be-removed/79280.htm#.YOOm8ugzazq

In the mid-20th Century, when the Overseas Containers Limited (OCL) and ACT/ANL services started from Europe to Australia via Cape of Good Hope they were quickly expanded to cross over to New Zealand before heading through the Panama Canal back to Europe. The predominant volume of export product available out of the South Island meant that the ships used to schedule the ports of Lyttelton and then Port Chalmers last on their itinerary before leaving and for some of the time they even sailed via the Horn again because the amount of cargo carried meant that there was insufficient depth of water available in the Panama Canal.

The New Zealand regional ports thus evolved as fully fledged container ports during the era of the first generation of container ships.

But trade and technology has moved on – Europe ceased to be the predominant trading partner for Oceania and now the majority of containers by far come to Oceania through South East Asia or China with products from that region and the world being relayed or transhipped through the significant hub ports of that region.

This has changed all manner of aspects of the shipping task including the nature of cargo carried and thus the variety of containers needed to suit the trade. This has meant that services not only need to manage shipping schedules but also container inventories. The latter means that the containers received in a given destination often need to be moved to another location where there is a commodity that needs such equipment. Imbalances of 40ft containers, (that generally move lighter weight manufactured goods), circulate differently to 20ft containers, (that are predominantly used for heavy cargoes and are now more extensively used for grains, seeds, timber, steel etc.)

New Zealand's large population in the upper North Island has meant that this area has evolved as the predominant import region where national distribution centres have been established. The containers used for these imports must then be re-positioned south to enable export cargoes to be shipped out.

Thus far the international lines have mostly provided for this coastal movement of their own empty containers using their own ships, but as the economics of doing this has become more challenging they have for some time progressively been restricting some services to calls at Auckland or Tauranga only whilst using alternative services of their own schedules to tranship international containers or domestic repositioned containers to the South Island.

It is apparent that the economics of doing this is increasingly challenged as the ships get bigger and daily operating costs rise and that a low-cost feeder service out of Auckland and/or Tauranga would make more sense.

Reasons for using hub ports and smaller feeder ships

If vessels deployed on a mainline trade were able to increase in size and take on more cargo, then the cost per slot for carrying the cargo reduces significantly. Thus ship owners will always seek to employ the largest possible ships that can achieve this objective.

Generally in international shipping, the increasing size of ships progressively cuts out ports because of ship size constraints and thus the potential for such larger ships to carry the cargo generated by a port's hinterland diminishes. In other parts of the world, increasingly this is handled by feeder ships aggregating and dispersing that cargo to or from ports that cannot accommodate the larger vessels.

Avoiding extra port calls can save the mainline carrier considerable direct costs:

- Lower steaming distances.
- Less time between ports.
- Lower port charges.

- Simplify and speeding up cargo operations.

It can also enable the larger vessel to:

- Add more lucrative port calls in other parts of its itinerary in the same timetabled rotation thus attracting even more cargo.
- Steam slower on the shortened itinerary and thus burn less fuel (and create fewer green-house gas emissions).
- Enable a whole vessel to be dropped from the fleet required to maintain a fixed weekly schedule if a succession of ports is dropped (in the New Zealand context, such as all ports south of Auckland and Tauranga)

In the long run, ports other than hub ports do not need to develop deeper channels, longer wharves with higher crane-load capacity and larger cranes.

Of course, added back must be the cost of the tranship cargo handling and the feeder vessel that connects to the hub port but if such vessel carries the same amount or preferably more cargo on this route than the partly laden international vessel could, then the costs will be lower because:

- The load factor for the smaller vessel is higher.
- Daily hire charges are lower.
- Engine size is smaller and thus fuel use is diminished.
- Port charges are lower because the ship is smaller.
- The smaller size may also enable berthing to avoid tidal delays.
- More ports of call may be added widening the scope of service advantage to the international carrier.

The above explains why the hubbing trend has been evolving in New Zealand as well as overseas over some years but is now challenged because of a lack of feeder alternatives and why demand might be expected to increase as the old Panamax vessels are withdrawn from service and ship owners seek to charter bigger vessels.

Certainly, new ships slightly larger than the old Panamax may be specifically constructed for the New Zealand trade, but will the international lines want to make such a commitment to what has become an unusual size when they have far more lucrative routes to maintain and most own a relatively small percentage of the ships they employ and are therefore more likely to seek to charter such ships.[15]?

The challenge for today is to enable current demand for transhipping to and from the southern ports to be serviced efficiently and to be aware that this demand will only increase over-time.

[15] FIGS data shows that in 21Q1, 55% of teu loaded or discharged at New Zealand ports were carried by ships between 4000 teu and 6000 teu capacity. As trade grows, the next step up would normally be to the 6000 to 8000 teu size range. But since the new Panama Canal lock system opened in 2016, only 32 out 747 container ships built were in the size range 3000 teu to 8000 teu, (Clarksons data reported in The Naval Architect, February 2021). That is, only 4% of new ships built over the last 5 years have been in the size range presently mostly used in New Zealand's trades and the next size up. Very, very few ships of this size will be available in the charter market, and owners will be wary of building a size for which there is little demand.

An associated issue is that of what size will service New Zealand? It is unlikely that service frequencies will extend to longer than the present weekly services. The implication is that larger ships, perhaps 10,000 to 12,000 teu will be deployed on a combined New Zealand/ Australia trade, much as was the case pre-containerisation and in its immediate introduction.

Ways in which to increase resilience and efficiency of domestic shipping

Several observations arise out of the current predicament:

- The domestic shipping network needs to be independent of the international shipping services, and of the port operations within the terminals that serve them.
- It may be beneficial to handle such coastal vessels through separate, but closely located terminals, or at the very least, within such terminals but with committed berth-window priorities.
- A hub import/export port would appear to be potentially very beneficial. It would allow larger ships to carry out a full discharge and load, with tranships to smaller coastal ships enabling the fuel savings and reduction in emissions that these smaller ships represent.
- This requires a significant increase in the capacity within the domestic fleet; to enable it to carry more than the one-quarter of coastal cargoes presently carried by Pacifica (the other three-quarters, mostly transhipments and empties but also a significant volume of domestic cargoes, being carried by international ships).
- A hub port's long-term location needs confirmation, it being noted that a west coast port within the Manukau Harbour has significantly shorter sea route distances leading to network, financial and GHG emission advantages over the existing east coast ports at Auckland and Tauranga as well as other potential locations such as the Firth of Thames and Marsden Point.

Port infrastructure factors that will shape the future

If the projected larger container ships were to call at New Zealand ports, most of the required port infrastructure would need to be rebuilt. Most berths are too small and demand for increased length, beam and draft poses issues for port entry in some ports. Purpose-built hub port facilities would be able to address these issues from the outset.

Age, structure, and configuration of container terminal infrastructure

Most container terminal berths were constructed for first generation container ships 50 or more years ago and thus never envisaged the berthing of the very much larger vessels that now ply world trades. The New Panamax size vessels that shipping lines might seek to deploy to Australia and New Zealand are perhaps 80% longer than the earlier vessels, 70% wider and 25% deeper draft.

The increase in beam is significant as the greater crane outreach required to load and unload such ships is also expected to handle higher lift weights, (75 tonnes as opposed to perhaps 30-40 tonnes for first generation gantry cranes) and thus the load imposed on the quay-side crane rail is much higher and thus the wharf piles must be able to take extra weight.

Deeper draft requires dredging at the berth. 50-year-old wharves did not contemplate such deepening, and thus piles along the fender line will need replacing at the very least with deeper piles, or alternatively a complete reconstruction of the wharf may be required. Such wharves also need to facilitate the impact of the much higher displacement (weight) of the new generation vessels when they berth.

Increased ship length can result in the loss of a berth; a two-berth quay line for first generation ships becomes just one berth if ship lengths increase by 80%.

Crane berths are often not continuous; in Auckland's case the newest berth has been constructed as a single berth. The cranes can only work on their respective quay faces and when one ship sails you cannot simply move the crane to the adjacent ship. This lowers productivity in Auckland compared with a port with a continuous quay line.

In order for larger ships to call at New Zealand ports, port infrastructure will need to be provided. A hub and spoke system would at least restrict this to just the hub port or ports, rather than all major New Zealand ports.

Harbour access.

The increased length, beam and draft of the latest ships poses issues for port entry. Many of New Zealand's existing ports, Auckland and Tauranga for example, have narrow, winding channels with tight bends which have needed dredging and straightening just to meet present-day depth requirements, and it is possible that several would be unable to meet any significant increase in ship size and safely accept such ships into their current berths. There is the ever-present risk of a ship stranding in the narrow channels and closing the port for what could be an extended period.

As with port infrastructure, a hub and spoke system would at least restrict this requirement for improvement in harbour access to just the hub port, rather than all major New Zealand ports.

The Choice of New Zealand's International and Coastal Service Hub

These lead to the question of which port or ports should be upgraded. Government Ministers and The Ministry of Transport (MoT) commissioned two pieces of work, the Upper North Island Supply Chain Strategy (2019) and the Sapere UNISCS Report (2020).[16] The MoT website summarises the Sapere Report's main findings as including:

- The port's current downtown Auckland location has about 30 years' capacity and there is a 10-to-15-year window for making a final decision on relocation.[17]
- Engineering and consenting could be difficult for all options.
- Manukau Harbour was the highest ranked option, although consenting could be problematic.
- The economic costs would outweigh the economic benefits for all the options, including Manukau[18].

The Review Team note that in addition to the Sapere Report findings, the further development of the Manukau Harbour as the main hub port for New Zealand would not only be of benefit to the upper North Island economy but could be significantly important in that it reduces the round trip coastal distance from Auckland to the main South Island ports, by one-third to/from Lyttelton, and would result in significant coastal shipping efficiency and reduction in GHG emissions.

The implication is that a new, green-field port is not only required at some time, but is economically beneficial. The Sapere Report and the Port Future Study from 2017[19] offer two locations that are realistic; the Manukau and the Firth of Thames. The Firth of Thames, an east coast location, does not

[16] Both available on https://www.transport.govt.nz/area-of-interest/infrastructure-and-investment/upper-north-island-supply-chain-strategy/

[17] But note that an increase in domestic cargo and tranship throughputs created by a hub and spoke feeder service was not included in Sapere's forecast. These additional volumes will bring forward the date when the port reaches capacity.

[18] Some omissions from Sapere's work have been identified by the Review Team which when corrected, raise the economic benefits to equivalence with the assumed benchmark. Note also that that benchmark is an expanded port on the Waitemata achieved by reclaiming on the seabed 800 metres to the east of the existing terminal, which Sapere acknowledges is probably outside the social licence for Ports of Auckland.

[19] Commissioned by Auckland Council. See http://www.portfuturestudy.co.nz/

have those shorter distance advantages that a west coast port brings and has very high capex and ongoing hinterland transport costs because of its greater distance from Auckland.

Additionally, the risk of port closure at a new port site through a ship stranding in an incident similar to Ever Given's stranding in the Suez Canal, would be markedly reduced compared with most current New Zealand ports. The Firth of Thames is open to the Hauraki Gulf and Manukau Harbour has long, wide, straight channels with abundant depth for all except immediate approaches to berth sites and of course its bar. Constructing an entrance channel and berth approaches to PIANC's guidelines[20] for channel dimensions at either site would be straightforward.

2.3 Alternative Fuel Sources Development

Background to Greenhouse Gas reduction in shipping

In 2012, international shipping was estimated to have contributed about 2.2% to the global emissions of CO2[21]. The International Maritime Organization (IMO)'s Initial GHG Strategy sets a GHG reduction pathway of at least 50% by 2050 based on a 2008 baseline, with a strong emphasis on reducing to 100% by 2050.

The IMO has recently agreed (June 2021) a proposal to improve carbon intensity of ships by 2% annually between 2023 and 2026, ultimately to aim to achieve a 40% reduction in the carbon intensity of the existing fleet by 2030, although some participants in the shipping industry and environmental groups consider the measures are not going far enough.

Methods of reducing GHG emissions

Emission reduction can be achieved by a combination of factors; operational practices, ship design, alternative sources of propulsion such as wind and solar energy, and low- and zero-emission fuels.

Zero-Carbon Fuel Use

To meet the IMO target, zero-emission vessels need to be entering the world's fleet in the 2030s. There are several pathways towards decarbonisation although at this point in time, there is too much uncertainty to decide on one path.

The key primary energy sources options are:

- renewable energy,
    - hydrogen, (e-H2)
    - ammonia, (e-NH3)
    - e-methanol,
    - e-gas oil and
    - electricity for use in batteries.
- bio-energy
    - Bio-diesel
    - Bio-methanol
    - Bio-liquefied natural gas (Bio-LNG)
- fossil fuels with carbon capture and storage (CCS).

[20] PIANC (The World Association for Waterborne Transport Infrastructure) is widely accepted as setting the standards for port infrastructure. Its *Harbour Approach Channels - Design Guidelines*, Report no 121 – 2014 sets channel dimensions. Very few existing New Zealand harbour channels fully comply thus increasing the risk of incidents.

[21] Only five countries have a higher percentage of world emissions: China (28%), USA (15%), India (7%), Russia (5%), and Japan (3%) (Source https://www.ucsusa.org/resources/each-countrys-share-co2-emissions).

- hydrogen and ammonia produced from natural gas with CCS

Wind assisted propulsion

Developments for wind assisted propulsion have reached the production stage after a decade of prototype and pilot scheme testing. The most promising systems appear to be use of wing foils and the use of Flettner rotors. Foils act like conventional sails but are rigid in structure. Flettner rotors are vertical cylinders rotated by a small motor that use the Magnus effect to create lift[22]. Trials have shown that in service, both methods can produce about 20% to 25% of the power needed to propel the ship. Flettner rotors appear to be more favoured as their operation and maintenance requires no particular skill other than that normally found on board ships.

Fixed Foils

Flettner Rotor

To meet the IMO target will require the use of low- and zero-carbon fuels; wind assistance, technology and operational improvements alone are insufficient.

Drivers

Fuel price is the predominant factor that impacts the total cost of operation.

From a **technology readiness** perspective, bio-methanol, bio-LNG and bio-diesel are more mature than hydrogen and ammonia. There are vessels already using these fuels. One of the important barriers for new fuels such as ammonia and hydrogen is the storage and bunkering infrastructure.

Community readiness is an important aspect of readiness for change. Land-use demands loom as a problem for biofuels although different categories of biofuels will invariably require different levels of land-use for their respective input feedstocks.

World Bank work on decarbonising shipping

The World Bank has recently issued (April 2021) two reports on decarbonising shipping in which it concludes that LNG is "likely to play a limited role in decarbonizing the sector and recommends that countries should "avoid new public policy that supports LNG as a bunker fuel, reconsider existing policy support, and continue to regulate methane emissions." It further places ammonia and hydrogen ahead of bio fuels as the most promising zero-carbon bunker fuels, as it sees them as more scalable and cost-competitive than other biofuel or synthetic carbon-based options.

Potential to replace fossil fuels in the New Zealand coastal shipping sector

[22] Magnus effect: wind flowing over a rotating cylinder results in lower pressure on the side rotating away from the wind direction and higher pressure on the other, thus resulting in lift.

New Zealand is high in renewable electricity. Production of green hydrogen, ammonia or e-methanol could be achieved with very low GHG emissions.

The New Zealand View

In the recently released *Increasing the use of biofuels in transport: consultation paper on the Sustainable Biofuels Mandate* (June 2021), The Ministry of Business, Innovation and Employment (MBIE) and MoT state that "as a transition fuel, ships are well-suited to biofuels as marine fuel specifications are much more flexible [than aviation and rail requirements] and biofuels produce much less sulphur pollution [than fossil fuels]. However in the long term, ammonia and hydrogen are likely to be the best low-carbon solutions for shipping." This statement is consistent with that expressed by the World Bank and that of this report's Review Team.

2.4 Recent Coastal Shipping Policy Developments in Other Jurisdictions

Government policy on Domestic Shipping varies throughout the World dependent upon a number of factors and prioritised by criteria often not dictated by the efficiency and needs of the various affected shipping communities but by other more strategic needs such as security and threats of terrorism.

Cabotage

One common feature is restrictions on cabotage, the transport of goods or passengers between two places in the same country by a transport operator from another country. The purpose is to protect the domestic shipping industry from foreign competition, preserve domestically owned shipping infrastructure for national security purposes, and ensure safety in congested territorial waters.

Developments in other Jurisdictions

The **United Kingdom** Government has recently (2019) issued a Maritime Strategy. Its approach is pitched at international shipping and not strictly domestic shipping however it does point to similar policy drivers as those expounded elsewhere internationally in respect to the nurturing of a domestic fleet. As detailed in Report One, it covers: the UK competitive advantage, Technology, People, Environment, Trade, Infrastructure, Security, Resilience and Intermodal Choice.

In the **EU**, maritime transport has always been viewed as having been a significant catalyst for economic development and prosperity. Maritime industries are an important source of employment and income for the European economy. Short sea shipping (including river and canal services) represents one third of intra-EU exchanges in terms of tonne-kilometres and it includes many passenger ferry routes. The European Commission lists the following priorities for all of the transport sector:

- Advance work on the European transport network,
- Decarbonise transport,
- Invest in transport projects offering high added value, and
- In the context of the Action Plan on Military Mobility, adapt sections of the transport network for civilian-military dual-use.

The **USA**'s Jones Act of 1920 requires that all goods transported between USA ports use USA registered ships carrying USA crews and flags and be constructed in the USA. The historic polices were designed to:

- Promote national security,
- Improve economic growth and domestic employment, and
- Allow the USA to better monitor environmental, labour and safety standards.

Unfortunately, these laws have resulted in very high-cost vessels that have highly paid crews which contribute to unaffordable freight rates and hence the law has failed to achieve its objective as evidenced by the sinking size of the USA Merchant Fleet.

The **Australian** Coastal Trading (Revitalising Australian Shipping) Act 2012 had the following objectives:

- Promoting a viable shipping industry,
- Facilitating the growth of the Australian shipping industry,
- Enhancing the efficiency of Australian shipping,
- Maximising the use of vessels registered in Australia in coastal trading,
- Promoting competition in coastal trading, and
- Ensuring efficient movement of passengers and cargo between Australian ports.

The Act appears to have failed in these objectives as the Australian merchant fleet has also progressively reduced in size. The Department of Infrastructure, Transport, Regional Development and Communications released a discussion paper in 2020 on reform of the Act, but this has been delayed for about nine months because of the pandemic.

Policy Drivers

Key drivers of the various Governments domestic shipping policies appear to be:

- Economic improvement or necessity – UK, USA, Australia, Fiji
- Shipping service integrity (maintaining links) – Australia,
- Maintaining shipping standards – UK, EU and Fiji
- Regulating the use of data by such as BlockChain – UK, EU
- Maintaining and developing maritime skills – UK, USA, Australia
- Oversight of shipboard seafarers and safety – UK, EU, USA
- Security and anti-terrorist oversight – UK, EU, USA, Australia
- Environmental security – UK, EU, USA
- Infrastructure – UK

These Policy Drivers drawn from the international list might be appropriate for developing coastal shipping policy in the New Zealand context.

3 Principles to Guide Coastal Shipping Investment Decisions

3.1 Objectives

Waka Kotahi is seeking to achieve impacts with the new coastal shipping activity class that support the utilisation, efficiency, and resilience of the coastal shipping sector. The Government Policy Statement on Land Transport 2021's (GPS) definition of the Coastal Shipping Activity Class is investment in coastal shipping to support two of the above; efficiency and resilience of the coastal shipping sector. It states that we have to be smarter about making the investments in road, rail, ports, freight hubs and coastal shipping so the freight and logistics industry can be as efficient, competitive and sustainable as possible. Of the four GPS Strategic Priorities, the third relates directly to coastal shipping: Improving freight connections to support economic development.

In looking at policies from other jurisdictions, there is a common theme with respect to coastal shipping. The objectives set out in the GPS are all considered, as are also safety and workforce training.

From these statements, the objectives for the outcome of this work can be stated as helping set up a framework to make decisions on opportunities that:

- Support utilisation of coastal shipping.
- Improve the efficiency and competitiveness of freight transport within New Zealand.
- Improve resilience:
    - Commercially of the coastal shipping sector.
    - Physically of the New Zealand supply chain.
- Enhance sustainability.
    - Through mode shift from land to sea-mode
    - Through improved efficiency and decarbonisation of shipping
- Improve safety
    - Within the port and shipping sector, and
    - By reducing land transport movements, and thus reducing road traffic accidents.
- Provide for ongoing workforce capacity.

3.2 Guiding Principles

The GPS states that the key outcomes of improving freight connections generally are:

- Primary outcome: Economic prosperity
    - Productive economic activity will be supported by efficient, reliable and resilient connections.
- Co-benefits:
    - Resilience and security
    - Environmental sustainability
    - Healthy and safe people

The Review Team considers these to be the guiding principles for coastal shipping activity class investments. The overriding principle is that of increasing economic prosperity. The co-benefits of resilience, sustainability and safety are critical in the framework in qualifying the benefit of any proposal.

The GPS also states that the Government's expectation for investment in coastal shipping is

- to embed mode neutrality and choice for freight transporters,
- to allow New Zealand flagged coastal shipping to operate on a level playing field with other freight operators, and
- to enhance the sustainability and competitiveness of the domestic sector [of shipping].

These suggest that inequitable impediments should be removed, but equally, other modes should not be supported to the detriment of coastal shipping. On the other hand, in order to enhance coastal shipping, some interim support may be needed.

3.3 Activity Class Investment Framework

From these guiding principles and expectations, a framework with which to assess and prioritise investment proposals can be developed. A set of criteria and sub-criteria can be given weightings, and proposals can be scored against them, taking the weightings into account.

3.3.1 Investment criteria

The primary criteria are economic prosperity, resilience, sustainability and societal returns. To provide granularity, these can be subdivided as follows:

Economic prosperity

- Investment return: This is a mix of financial return on assets employed, the risk associated with the activity, and the magnitude of capital expenditure required.
- Market share and growth: This measures the future potential for the activity; how well placed the activity is in order to gain market share, and where the market is placed in terms of future growth.
- Efficiency gains: A measure of improvements that the activity represents compared with the status quo.
- Competition gains: Does the activity improve or lessen competition?
- Economic returns: the benefit or otherwise outside the direct financial return of the activity. The economic benefits can be assessed at three levels;
    - direct benefits associated with the sector the activity is in, in this case the domestic freight industry,
    - benefits to the region or regions that the activity is located in, and
    - national benefits.

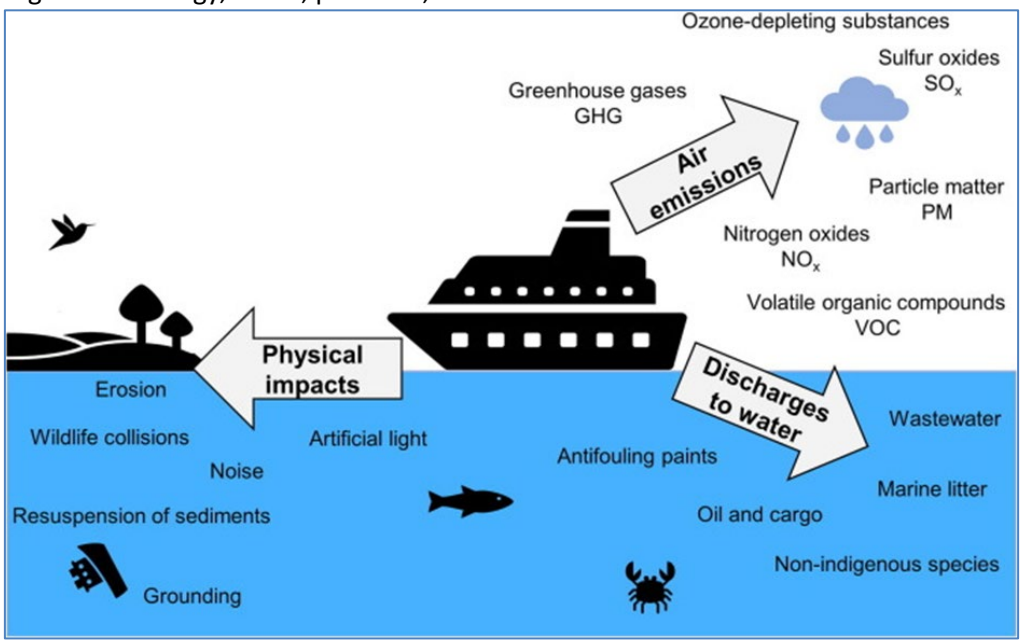
Resilience

- Commercial resilience of the activity: does the activity increase or diminish the resilience of the coastal shipping sector in terms of the sector's commercial viability? This brings in elements of future obsolescence or external developments that might replace the sector.
- Physical resilience of the New Zealand supply chain: Is the maritime infrastructure up to the task? Does the activity improve the supply chain resilience in the event of major disruption to other modes? For example, in the event of a major natural disaster, does the activity provide options for continuance of transport?

Sustainability

- GHG emissions reduction: transport is a major emitter of GHGs. Does the activity result in reduction of overall emissions? To what extent, and is it now or in the future (or both)?
- Air quality improvements: Transport is also an emitter of harmful air emissions, especially internal combustion engine powered transport. The same questions apply; does the activity result in reduction of overall emissions and to what extent?

- Other environmental matters: What is the effect of the activity relative to its options with regard to: ecology, visual, pollution, noise?



Societal returns

- Healthy and safe people: Does the activity improve or diminish health or safety:
  - For employees
  - To third parties within the sector
  - To the general public
- Employment: does the activity provide employment opportunities? Is there a pool of available persons with the requisite skills? Will the resultant employment opportunities help deliver skills for the wider market in the future? Will labour availability or lack thereof cause risk to the activity?
- Cultural: What is the desire of Māori to support or take part in the activity? The same questions with respect to other parts of the New Zealand society. Does the activity comply with New Zealand's international obligations?
- Social licence: Some stakeholders made it very clear that social licence can diminish for an activity, if it impedes on the fabric of life, urban or rural. This has elements that relate to urban growth, land use conflicts, recreation, and general enjoyment of amenities.

3.3.2 Weighting of criteria

Weighting of criteria is very subjective, as is the subsequent scoring. Nevertheless, weightings need to be applied. The criteria are not all equal in terms of their importance. The guiding principles have been derived from the GPS and it is the GPS that also gives a guide to weightings. Economic prosperity is listed as the primary outcome for GPS activities. Resilience and security, Environmental sustainability, and healthy and safe people are listed as co-benefits. The Review Team concurs with this. Our recommendations for weightings and our reasons are set out in the following tables.

Primary criteria

Criteria	Weighting	Comment
Economic prosperity	50%	Shipping is a commercial activity. To induce participants, it needs to hold promise of return on the investment; investment not just of money, but also time of the persons involved. It needs to provide economic returns to society. It needs to be efficient and to have the scope to improve efficiency. For these reasons, the weighting should be high, in the range 40% to 60%.
Resilience	15%	Resilience is important, but it represents a contingency, a safeguard against potential problems, in much the same way as insurance provides a safeguard against losses. Its weighting therefore is low, in the range 10% to 20%.
Sustainability	25%	Sustainability is vital. Shipping is an underutilised way of improving GHG sustainability right now, let alone through future technology improvements. Shipping can provide other environmental benefits. It can also have environmental disbenefits. For those reasons, activity sustainability aspects need to be weighted reasonably high; 20% to 30%.
Societal returns	10%	Shipping and shipping-related activities generally provide or have well managed societal returns. Activities are not likely to make a great difference. Its weighting is therefore the lowest, in the range 5% to 15%
	100%	

Sub-criteria

Sub-Criteria	Weighting	Comment
Economic prosperity		
Investment Return	50%	This is a mix of financial return on assets employed, the risk associated with the activity, and the magnitude of capital expenditure required. These are the primary determinants of commercial decisions to invest. If the commercial shipping sector is to be involved in an activity, it will have to score well for this sub-criteria. We consider this should be weighted very high, at 40% to 60% of the economic prosperity group of sub-criteria.
Market share & Growth	5%	The activity's potential reflects in the risk element of the return for investment, but the market within which it operates needs additional consideration. A modest market share with potential to increase scores well, as does the potential for the market to grow. This sub-criteria is however one of the minor ones. We consider it should be weighted 5%
Efficiency gains	5%	The activity's ability to improve the efficiency of the sector or the economy as a whole should be accounted for.

		This sub-criteria is however also one of the minor ones. We consider it should be weighted 5%
Competition gains	5%	An activity should enhance competition, rather than diminish it. We consider this should be weighted at 5%.
Economic returns	35%	The benefit of an activity outside of its direct financial return is critical. It can affect the sector, the region and the country. It therefore should be highly weighted. We consider it should be weighted in the range 30% to 40% of the economic prosperity group of sub-criteria.
	100%	

Sub-Criteria	Weighting	Comment
Resilience		
Commercial resilience	33%	Commercial resilience measures the impact of the activity on the sector as a whole. It is important, but not as important as physical resilience. We consider its weighting should be half that of physical resilience, i.e. 33% of the resilience group of sub-criteria.
Physical resilience	67%	Thus, physical residence should be weighted 67%
	100%	

Sub-Criteria	Weighting	Comment
Sustainability		
GHG emissions reduction	75%	The GPS holds GHG emission reduction as a primary goal. It therefore needs to be weighted very highly in this group of sub-criteria. We recommend a weighting between 70% and 80%.
Air quality improvements	15%	Air emissions are a health hazard. Health is also considered in societal returns, but it needs to be considered in this group too, as it relates to the type of fuels used, and transport is a major user of fuels. We consider that in the New Zealand context, air quality improvement is not as important as GHG emission reduction. We therefore recommend a weighting between 10% and 20%
Other environmental matters	10%	Other environmental matters need to be considered. We recommend a weighting between 5% and 15%
	100%	

Sub-Criteria	Weighting	Comment
Societal returns		
Healthy and safe people	70%	Healthy and safe people is another primary goal of the GPS. It is an aspect that receives much attention in the transport sector, through training and practice. Sometimes, there are failures, with serious consequences. Therefore any activity that improves health and safety

		should be scored highly. If weighted appropriately, it can then score well in overall terms. We recommend that the weighting should be 65% to 75% of this sub-criteria group.
Employment	10%	The remaining issues are important, but they apply to almost any activity. We recommend a weighting between 5% and 15%.
Cultural	10%	We recommend a weighting between 5% and 15%.
Social licence	10%	We recommend a weighting between 5% and 15%.
	100%	

In summary, the recommended weightings, using the mid-range of the above, are:

Criteria	Weighting	
Overall Weighting	100	
Economic Prosperity	50	100
Investment return		50
Market share & Growth		5
Efficiency gains		5
Competition gains		5
Economic returns		35
Resilience	15	100
Commercial resilience of Coastal Shipping		33
Physical resilience of the NZ supply chain		67
Sustainability	25	100
GHG reduction		75
Air quality improvement		15
Other environmental matters		10
Societal Returns	10	100
Healthy and safe people		70
Employment		10
Cultural		10
Social licence		10

4 Key Challenges and Opportunities

Several challenges have emerged from the examination of the state-of-play and the discussions with stakeholders. The **key challenges** relate to:

(i) Coastal shipping's part in the broader logistics and supply chain, especially to meet the major GPS objectives of improving economic prosperity and moving freight off road;
(ii) The suitability and capacity of maritime infrastructure for coastal shipping, container ports especially;
(iii) The part that ports should play in providing supply chain resilience in the event of natural disasters;
(iv) Coastal shipping's potential to reduce emissions and improve sustainability; and
(v) The question as to whether the port ownership legislation should be reviewed so as to give new emphasis on the role of ports in the economy as opposed to the enterprise model that focuses on profit.

The **opportunities** that they present also provide opportunities to resolve supplementary challenges, challenges that are not critical in themselves but will support addressing the primary challenges. These are all set out in the following Chapters and cover:

- Integration of coastal shipping in the broader logistics and supply chain
    - Logistics and supply chain challenges
    - Coastal feeder network
    - Cook Strait challenges
    - Other coastal shipping opportunities
    - Level playing field
- Maritime infrastructure
    - Stakeholder views
    - Port and terminal suitability for coastal shipping
    - Transport network resilience in emergencies
    - Dry dock
    - Ferry Stern-ramp access and linkspans
    - Shore power for ships (Cold ironing)
- Sustainability
    - Transfer freight off land modes to sea
    - Other sustainability opportunities
- Legislative/ regulatory issues
    - Port Ownership and Operations
    - Other Legislative/ Regulatory Issues
- Societal issues
    - Workforce challenges
    - Social licence
    - Societal returns

5 Integration of Coastal Shipping in the Broader Logistics and Supply Chain

5.1 Logistics and Supply Chain Challenges

Perhaps the major challenge facing coastal shipping is that of the broader New Zealand supply chain. The GPS identifies moving freight off road onto rail and sea as a major objective. This raises several related challenges. Choice of mode by domestic consignors[23] is determined not just by price, but by frequency, transit time and reliability of service. Imports and exports rely on effective port operations and connections to and from the hinterland. Imports and exports also generate empty container imbalances that need to be transported. The Cook Strait is a vital component in the supply chain and has to be compatible with demand. Additionally port operations and charging regimes have to be equitable in order to avoid distortions to the provision of transport.

5.1.1 The Nature of Inter-Regional Logistics

Domestic cargo consignors vary according to the size of their business, the value of their goods, perishability, the goods' suitability for containerisation and Just in Time expectations of the sector's customers.

The Domestic Market can be considered to have three sectors:

- Major customers with more than one distribution centre (DC) in places like Auckland, Palmerston North, and Christchurch, using sea and rail.
- Other large customers, the majority with only one DC, usually in Auckland, who mostly use rail.
- Commodity forwarders who want fast delivery with high frequency of opportunity to ship, and are prepared to pay for this by using trucks.

Market feedback regarding the sector included the following comments:

- Trucking is fastest but most expensive.
- Rail is slower, but cheaper.
- Sea is slowest and cheapest, but has insufficient frequency.

To succeed, coastal shipping needs frequency (at least 3 times a week on the main route), a network of ports and service reliability (berthing priorities). Anything less than 3 times a week, or poor schedule integrity, requires considerable storage space at each end, especially for fast-moving retail items. A network is needed in order to provide connections outside the main centres and transit times for sea transport are long, compared with rail and especially road. A truck can be loaded and dispatched from Auckland at midday, and arrive in Christchurch during the following day.

Southbound domestic cargo, the dominant direction for services, uses both Pacifica's dedicated coastal service and slots on international ships. Northbound however, cargo is nearly entirely placed on Pacifica. The international ships do not call again at Auckland, so are not suited to transporting northbound domestic cargo. They are instead concentrating on loading exports and transporting export transhipments.

[23] 'Consignor' is used in this report to mean 'Shipper', that is the person who sends the cargo. 'Shipper' has been avoided as often that term is misused to mean the shipping company. The Consignor can be a freight forwarder, a cargo owner or an agent who consigns the cargo on behalf of the cargo owner.

Consignor commitment

During the stakeholder consultation process, various associated issues were mentioned. The major issue is that of commitment. Getting long-term commitment to ship on coastal shipping from New Zealand businesses for domestic cargoes and from international lines for transhipments is difficult because despite lower prices, the frequency of Pacifica's service is poor (once per week), and the international ships have less reliable timetables and are known to leave domestic cargo behind, treating such as a "filler cargo".

Other logistics issues

Additionally, storage capacity is seen as a problem. Just in Time deliveries have been failing and there is no capacity to hold inventory. Rail capacity inter-island is stretched when a ferry is out of service for docking. Incentives are required to encourage customers to receive and despatch containers 24/7. Some empty container facilities in Auckland are already limited in the ability to despatch increased numbers of containers on rail. Freight is more normally handled by small forklift trucks suiting them to the side loading of curtain sided trucks rather than containers with end-doors adding to the preference for road transport. The challenge is to ensure that each sector of the market has adequate uninterrupted service opportunities at every step of the logistics chain.

5.1.2 Moving domestic freight from land modes to sea

To help achieve the GPS major objectives of reducing emissions and improving supply chain resilience, domestic freight needs to be moved from land modes to sea. Although sea freight prices are lower than land modes, sea freight volume of domestic cargo is nevertheless small compared with total inter-island movements of domestic cargo (about 1.3 million tonnes out of 5.3 million tonnes or 25% of tonnage). The reasons for this are outlined in section 5.1.1 above. In summary:

- The timetabled coastal services are not frequent enough.
- Transit times are relatively long compared to land mode services.
- The alternative use of international ships is less reliable as domestic cargo is treated as a filler cargo which is sometimes left behind and this has resulted in a reputation of unreliability for the international ships that engage in carriage of domestic cargo.

These have resulted in a lack of commitment from domestic cargo consignors. The challenge is to overcome these prior perceptions.

5.1.3 Transhipment cargoes

The relatively small volume of coastal domestic cargo, existing and potential, means that transhipment cargoes are essential to the viability of any coastal feeder network. Although the potential for transhipments is high[24], international lines prefer to control the movements of their own cargoes.

The challenge is to provide a coastal service that will satisfy their requirements for service delivery, reliability and cost and then to sell this opportunity to the international shipping lines as and when the port facilities can accommodate the additional demand.

[24] At present there are nearly 130,000 teu pa of transhipments. The potential transhipment volume consists of the imports and exports that are for/ from the regions outside the upper North Island. In 2019 this totalled about 900,000 teu. At present less than 15% of these imports and exports are transhipped. See section 5.2.4 below.

5.1.4 Empty repositioning

Empty repositioning is one of the international lines' greatest challenges and it has a direct bearing on the economics of moving domestic cargoes particularly from Auckland to the South Island ideally using the international empty containers when they are re-positioned South for the purpose of uplifting export cargoes.

As can be seen from the data in section 2.1, empties make up more than one-third of the present coastal cargo volume. Export cargo bookings need to be matched with appropriate container equipment that often needs to be re-positioned from the point at which it was last unpacked. Container equipment is not just 20 foot or 40 foot but includes containers that are able to be cleaned to food grade standards, maybe high cube (9 foot 6 inch high not 8 foot 6 inch), perhaps be specially fitted with fans for cargoes such as onions, as well as refrigerated containers, open top, flat racks etc. All pose a separate logistics challenge to meet client requirements.

It is unclear as to the general needs of the cargo types that have to be moved and where and how such traffic is divided amongst the various categories of shipping container. Anecdotal discussions with an experienced container logistics operator indicated that the movements are not optimal. More information is needed to ensure that demand for imports, exports, Inter Island and Intra Island repositioning is fully understood and that the peak demands thus resulting can be properly assessed and optimally satisfied.

This issue was the topic for an in-depth study by Cubic Njord undertaken for the New Zealand Transport Agency in 2009.[25] The main purpose of this Container Supply Study was to investigate the size of the container pool available for NZ domestic containerised freight distribution – both in the trading environment that then existed, and in a future "hubbing" environment such as is the subject of this present report. The project scope included investigating and suggesting solutions to supply restraints that existed at that time or were expected to exist in the future. The general pattern may be relatively unchanged but detail such as the availability of specialist containers within the 40ft/20ft split remains somewhat elusive and the manner in which this might prove an additional barrier for captive coastal services needs to be understood.

The challenge is to get a greater understanding of these needs and then match them with appropriate services. **We recommend** that an update of the Cubic Njord Report be undertaken to provide greater understanding for parties who elect to bid to offer to provide a coastal service.

5.1.5 Port operations

Stakeholders questioned the level of port operations for coastal ships and their cargo. It is clear that coastal ships need berth and stevedoring priorities if they are to commit to timetables on their relatively short transport distances. We understand that at present, such priorities are given. An increased coastal shipping activity through terminals and ports would require this to be continued.

5.1.6 Market Power of Shipping Lines

It was generally clear that the international shipping lines, to various degrees, are driven by their own goal of optimising freight liftings and revenue, consistent with the optimal use of their container equipment and with less interest in providing reliable comprehensive coastal services.

In some cases the larger shipping lines are now using the power of the volume of cargo that they control to dictate terms to the port companies and the terminals at which they call, negotiating large

[25] See Domestic container supply study | Waka Kotahi NZ Transport Agency (nzta.govt.nz)

tariff discounts and other benefits with the threat of taking volume elsewhere. The risk is that ports invest in infrastructure against such promises, only to find that a line acts on its threat and moves elsewhere.

Currently the carriage of domestic coastal cargo by international vessels predominantly only occurs in the event that such cargo can be moved in containers otherwise required for a subsequent export cargo. Often international carriers may even move empty containers directly back to the high demand areas in Asia and forego New Zealand export cargoes in pursuit of even higher financial returns and to satisfy more influential shippers. Port rotations can change at relatively short notice and thus the lines prefer only to use their own containers to carry their own cargoes to enable them to make decisions unfettered by partner concerns.

The fact that they do carry some domestic cargo can distort the pricing model as any contribution to the otherwise cost of moving the container empty is potentially acceptable to them.

In a large market this might not matter but in the relatively small New Zealand coastal market it is clear that the loss of this volume to a domestic operator undermines the potential to create a critical mass sufficient to support more captive coastal vessels while at the same time leads to creating concerns for shippers as to the reliability that such services can offer.

Whilst domestic cargo is permitted to be carried on such vessels it is clear that authority should perhaps only be permitted if the opportunity so created is open for "common user" use over a committed period and thus avoid a situation where the carrier's own international transhipment cargo and empty container moves thus carried make such route or routes unviable for another to offer that service.

Internationally the rapidly reducing number of shipping lines, the largest of whom have formed into three major consortiums, is giving rise to concerns being expressed for international trades. Lines are considered to vary their services often with little regard for the customer's businesses who depend on them. The Global Shippers' Forum, a European consignor body, has concerns relating to lines controlling supply of ships, and the perceived need to regulate lines as if they were a utility similar to electricity. This Forum has used the current disruption in supply chains to renew its call for the removal of the EU consortia block exemption regulations which exempt shipping consortia from consortia rules that apply to other commercial sectors. The CEO, James Hookham said "the industry does not exhibit any great distinguishing features in the service it offers. It is a commodity service and if it is a commodity, then the feeling is it should be regulated as a utility would be, a utility that provides a unique commercial and national interest provided by, effectively, one supplier."[26] See the footnote and section **2.2** above for more detail.

The challenge is to ensure that international shipping lines do not exert market power over New Zealand ports, coastal shipping operations and cargo interests to the extent that it is to their detriment.

[26] Reported in Lloyds Loading List, 14 June 2021, https://www.lloydsloadinglist.com/freight-directory/adviceandinsight/Shippers-renew-call-for-block-exemption-to-be-removed/79280.htm#.YOOm8ugzazq

5.2 Coastal feeder network

5.2.1 Stakeholder views

There was general consensus with which we concur that to meet its strategic needs, New Zealand should have a hub and spoke (feeder) service around the coast for containerised cargo. The benefits of this were noted as follows:

- The service would carry **domestic cargoes**, shifting such from rail and road to sea:
  - Improving the efficiency and competitiveness of freight transport within New Zealand
  - Increasing resilience of the supply chain,
  - Improving road safety through road traffic reduction, and
  - Reducing GHG emissions.
- It would also carry **transhipped cargo and empty containers** from/to import/export shipping services, allowing the larger overseas ships to reduce port calls.

Additionally there is the possible potential for a small bulk carrier/container vessel that could integrate bulk, breakbulk, empty container repositioning and outlying container port feeding.

There was a question, however, as to the **capacity of the existing main ports** to handle the increased container handling required to service a surge in the volume of transhipments.

5.2.2 A Key Opportunity: A Coastal Feeder Network

The main challenge and opportunity that arises is to put in place a structure that enables a coastal feeder network to be viable. Analysis of the logistics and economics suggests that it should be so[27], but the weakness is the perceived lack of commitment from potential users. **The solution may be to provide the commitment through support of such a network from the Activity Class fund, to prove or otherwise the worth of the concept.**

Clearly such a service needs to be viable in the long term. The present one-ship domestic service is prima facie viable, but only half its cargo is domestic freight; the balance consists of transhipped and empty containers. Support for three ships would therefore need three times the cargo, more than can come from just the domestic freight market. The only way to achieve viability and fulfil the GPS objectives is thus to include transhipments and empties in the target volumes.

	Domestic		Domestic Total	Transhipment		T'shipment Total	Total		Grand Total
Row Labels	Full	Empty		Full	Empty		Full	Empty	
International ships	73,567	137,705	211,272	103,957	9,883	113,840	177,524	147,588	325,112
Domestic ship	48,640	18,528	67,168	24,970	1,220	26,190	73,610	19,748	93,358
Grand Total	**122,207**	**156,233**	**278,440**	**128,927**	**11,103**	**140,030**	**251,134**	**167,336**	**418,470**

The present domestic cargo volume is 122,000 teu pa. In addition to the 93,358 teu pa of domestic ship (Pacifica) volumes shown in the table, Pacifica's owners, Swires, also ships 30,000 to 40,000 teu

[27] In summary, it is cheaper to turn large ships around with a full load and discharge and transfer the cargo for onward destinations into smaller feeder ships, than it is for the larger ships to complete their itinerary only partly laden. The cost of the transfer is significant but is offset in the long run by not having to develop all ports to accommodate the ever-increasing size of the large ships.

Additionally, the GHG emissions from the smaller ships are much less than from the larger ships were they to complete their itineraries.

pa of coastal cargo on international ships, some on their own, but mostly on other Lines. The data in the table shows that 73,567 teu were carried on international ships in 2019, indicating that another 30,000 to 40,000 teu pa is shipped by other international carriers. Some at least of this 73,500 teu pa is potentially available to a more frequent coastal service.

The Pacifica ship also carried 18,000 teu of domestic empties and 26,000 teu of transhipments (full and empty) in 2019. Inevitably, international carriers would choose to place additional transhipments and empties on a frequent and reliably timetabled coastal service, if only when faced with a delay to their own service, so that their own ship(s) can catch up on their schedules. This trend is likely to increase over time, making the coastal service even more profitable. It is probable that three times the present one-ship volume could be achieved.

5.2.3 Market impediments to overcome

The question needs to be asked, if a coastal feeder network is economically efficient and viable, why has one not already evolved in the present free marketplace?

Stakeholders identified the main reasons that a coastal shipping feeder network does not already exist:

- Domestic cargo consignors prefer more frequent, less complex services and faster transit times.
- International carriers prefer to control the transhipment of their own cargo and repositioning of empty containers.

We concur. The challenge is to remove these two obstacles.

Domestic cargo requirements

The largest number of domestic cargo consignors, who together control well over half the domestic inter-island market, seek small but regular shipments, several each week, and largely they require direct delivery to their clients in the fastest possible time. Often price is less of a concern. Hence their preference for truck or train rather than ship.

Complexity of shipment is also a major constraint. The premises of such consignors and their consignees are often limited in size, with no room for containers to be presented for end-loading nor means to unload them onto the ground if they do. Their freight is more normally handled by small forklift trucks suiting them to the side loading of curtain sided trucks. The conversion of such consignors to a coastal container service may be a significant challenge for many. This is as much a challenge for rail as it is for sea, as KiwiRail and the major rail forwarders have tended to use containers. KiwiRail is about to introduce side opening containers to address this very problem.

Both the rail and sea transport logistics chains require multiple handlings resulting in additional costs compared with road. An example showing the relative complexities of some of the different handling systems that are currently offered for the main Auckland to Christchurch Inter-Island trade is given in Appendix 2, “Transport Mode Comparison”.

We believe that introducing more regular coastal service sailings per week addresses the main challenge facing consignors. Satisfying the change to warehouse loading operations and multiple handling requirements will be another challenge and is likely to limit the incursion that rail and sea can make into the road freight market unless future services permit the longer distant transport of trailer units on the coastal ships such as occurs in the Toll and SeaRoad services across Bass Strait in Australia.

International carriers' needs

It was clear from stakeholders that international carriers prefer to control the transhipment of their own cargo and repositioning of empty containers. They like to make decisions at short notice regarding their ship itineraries and the repositioning of empties. If they are to use third party services, having a choice of options will be critical. This demands a service that has frequency and a wide range of destinations in the network. Price is also important as their alternative is to do it themselves, with very little additional cost.

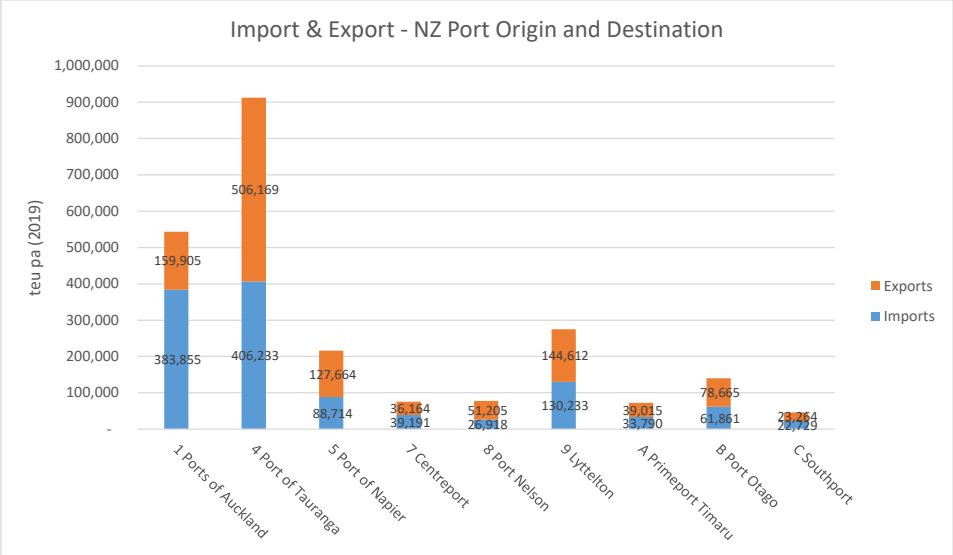
5.2.4 Capacity of hub transhipment terminal(s)

Domestic cargo increase

One logistics specialist stakeholder estimated that a more frequent service could double the amount of domestic cargo that moves by sea. At present this is about 120,000 teu pa, so it could increase to about 240,000 teu pa[28]. If this increase in volumes were to be carried on a coastal feeder service, the hub ports and regional ports would experience an increase to their throughputs.

Transhipment cargo increase

Import and Export containerised cargoes from southern New Zealand ports are the potential catchment for a feeder service based on northern port hubs. The import and export quantities from the hinterland of each port are shown in the following column chart.[29]

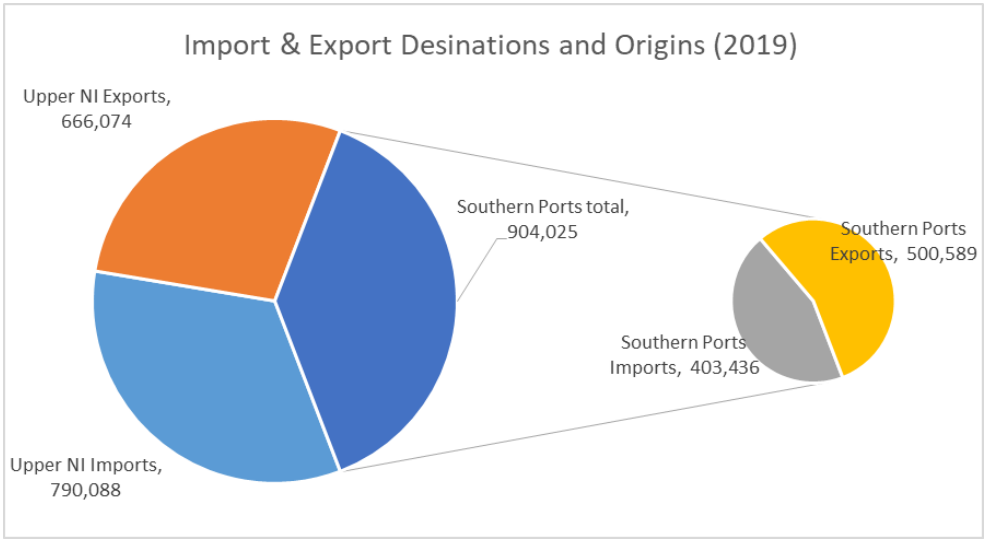


If transhipment volumes are to increase, the sheer import/ export volume through Auckland and Tauranga confirms that collectively they should both be hub ports. The maximum potential for transhipments is the total of the imports and exports to/ from the southern ports, a total of 904,025 teu in 2019, which is

[28] Note that this is not sufficient to make a three-ship service viable. It would need other cargo, the most probable being transhipments.

[29] Derived from Freight Information Gathering System data. Transhipment exports and imports have been added to the export and import data at the ports where they were loaded or discharged respectively and deducted from the ports where they were discharged or loaded respectively, so that the region of origin (or at least, the port in the likely region of origin) is identified. That is, for a given port: Exports + Transhipment exports loaded - transhipment exports discharged = Exports from that port (and its hinterland). Similarly for Imports.

about 775,000 teu pa or six times more than the present tranship throughput (about 130,000 teu pa):



It would take quite some time for anything like most of this potential to transfer into feeder ships, but even if the present volume of tranships, about 130,000 teu pa, were to increase by 50%, the annual increase would be 65,000 teu pa, still only 8% of the potential.

Tranships require two movements per cargo unit. This increases the use of available berth space and adds to crane exchange moves. Thus, 65,000 teu pa of additional tranships equates to 130,000 teu pa of increased berth throughput. Tranships also need additional, often scarce, stack ground slots creating additional congestion.

Presently a fair amount of transhipment happens at both Auckland and Tauranga. Shipping lines that have several services have already rationalised their operations to provide better port coverage. They will require at least that level of service connectivity to willingly cede their current competitive advantage.

Total increase in terminal throughputs

The two large upper North Island ports, Auckland and Tauranga, would need to have sufficient capacity. In 2019, in total Auckland handled about 790,000 teu and Tauranga 1,210,000 teu. If another 120,000 teu pa of domestic cargo and twice 65,000 teu pa of transhipss were split 50/50 between them, this total 250,000 teu pa increase in throughput would amount to 16% increase at Auckland and 10% at Tauranga; a step increase that is 4 to 8 times the annual increase through normal growth. These upper North Island ports, and to a lesser extent the southern ports, need sufficient head room capacity to be able to cope, not just at the berth but in the stack and at the road exchange.

In the **short term**, published information indicates that Auckland and Tauranga can cope. The Sapere Report[30] comments on Ports of Auckland's (POAL) 30 year plan for its container terminal. They conclude that the POAL plan will enable sufficient operating capacity for approximately 30 years, covering growth at a rate that will double the throughput in that time. Tauranga is planning to

[30] Sapere-UNISCS-Report-v2 on https://www.transport.govt.nz//assets/Uploads/Report/Sapere-UNISCS-Report-v2.pdf

construct a new southern berth now at its Sulphur Point terminal that will increase its berth capacity from three to four and provide for a larger area for container stacks. These earlier capacity indications by the respective ports suggest that this should have been well within their capacity to cope with the current surge in cargo volumes. The surge has put both Auckland and Tauranga under pressure, this despite a 19% reduction in throughput at Auckland from a peak in 2018 of 818,000 teu to 666,000 teu in 2020.[31] The fall in terminal operating performance at both begs questions as to whether the related issues will be addressed in time to cope with the potential incremental growth in short term tranship throughputs.

We recommend that an external, independent view on the real capacity of these terminals be commissioned to determine the root cause or causes of the current disruptions, and the remedial measures that may be needed, in order to demonstrate with confidence that the proposed increase throughput can indeed be accommodated within the existing infrastructure. We believe that this could be carried out in parallel with any call for proposals regarding a coastal feeder network, but should be answered prior to embarking on a course that might not succeed.

In the **medium term**, it is imperative that Tauranga and Auckland provide sufficient capacity to meet this growing tranship trend and the potential increase in domestic cargo. If a coastal feeder network is established, this may well mean increasing berth length, crane numbers and stack ground slots beyond those already in existence.

In the **long term**, a tranship hub strategy will mean that as the use of coastal services for tranships grows, ultimately a new port will be needed. The step increase makes it certain that the two existing upper North Island ports, Auckland and Tauranga, will reach maximum capacity sooner than otherwise, and they both have limited ability to expand further.

5.3 Cook Strait Challenges

5.3.1 Tory Channel

One of the challenges to Cook Strait services will be the continued use of Tory Channel by the much larger new rail ferries, or potentially by all ferries. If use of Tory Channel were to cease, all ferries would have to extend their voyage times by using Queen Charlotte Sound. The extended voyage times would challenge the ability to provide three round voyages a day. The implications of this on the rail ferry freight network capacity are unclear.

[31] MoT FIGS data. Tauranga's throughput is reported to be reasonably stable; 1,156,000 teu in 2018 and 1,176,000 teu in 2020.

The uncertainty is also a matter for competing operators from all modes to consider before making commitments to enter or re-invest in the Inter Island market.

It is evident that decisions will soon be made as to the use of Tory Strait. On 15 February 2021, "Stuff" reported that a collaborative risk assessment group, which included ferry operators, Maritime New Zealand, Port Marlborough and the Marlborough Harbourmaster was appointed in 2020 to investigate marine safety matters associated with the channel accesses to the Marlborough Sounds.[32] It was stated that the group will make a number of recommendations, including better aids to navigation (lighthouses, marks, warning signs) more communication between stakeholders, and identification of suitable safe places where a large ship could be beached in an emergency. The Harbour Master stated in the article that the context in which the ships are operating is also really important in the approach (taken by the group) noting that Tory Channel is a really busy stretch of water in terms of recreation use and thus a far more challenging and complex shared space for a ship master.

The review has included work to identify the controls, including the operational and risk management practices that need to be in place, to enable the ongoing safe transit of vessels through Tory Channel as well as surveys to assess perspectives and tolerance for risk, establishment and implementation of agreed optimal operational best practices, enhanced tide and current monitoring and modelling, real time wake monitoring and enhanced remote monitoring of operational practices.

According to Stuff, changes to the navigation bylaws were expected to be advised in May 2021 and it was stated that the new ships KiwiRail proposed could, in theory, go through the Tory Channel although this was subject to further work.

While the scheduling of the InterIslander service is the commercial prerogative of KiwiRail, it is obvious that their achievable market share will be influenced directly by the number of sailings that they achieve each week.

Also to note is that StraitNZ are understood to have commenced a market sounding for the sale of their operation and potential buyers need to understand the risk posed by this issue. If efficient use of resources is to be achieved and competitors are to come forward, the capacity of the current and future Cook Strait ferries needs to be more clearly signalled.

The future impact of the new rail ferries will materially change the market when they are introduced in three to four years' time and the ability of such larger vessels to make more trips each day will depend on the route they can take. For this reason, their ability to transit Tory Channel will make a significant difference and should be advised to avoid confusion as to the intent.

We recommend therefore that the information resulting from this Tory Channel review be announced in time for potential new entrants into the Coastal Services to better assess the likely extent of their available market and thereby avoid a miscalculation as to the viability of an enhanced coastal container feeder service.

5.3.2 Government Financial Support to KiwiRail

Another challenge that was raised by stakeholders is the potential for market share distortions created by any Government non-commercial financial support to KiwiRail.

The dilemma for Government is how to prevent that support, intended to revitalise the rail network, from being used to compete unfairly in the truck sector of the Cook Strait trade. Government also

[32] https://www.stuff.co.nz/marlborough-express/news/300229495/bigger-ships-prompt-review-of-tory-channel-maritime-risk

needs to consider how to avoid conflicts of purpose between financial support for rail with the potential financial support for coastal shipping.

We recommend that Government consider the degree to which KiwiRail should be permitted to price to attract cargo if this is likely to impact on the market share attracted to both direct competitors on the Cook Strait route and the coastal service.

5.4 Other Coastal Shipping Opportunities

There is scope for support for other coastal shipping activities. In the bulk and break bulk sectors there are several operators: Chatham Islands Shipping, Coastal Bulk Shipping, and McCallum Bros. Some examples of potential are:

5.4.1 Transport of timber from Nelson to Auckland, using Onehunga

Nelson to Onehunga is a short distance, 280nm (520 km) compared with 875 km by road and ferry. This route transfers freight off road, and considerably reduces emissions. It would also provide an option for repositioning containers and provide some added resilience in the event of a major issue with the Waitemata port.

Onehunga Wharf is owned by Panuku, an organisation of Auckland Council. It has a longer term plan to develop the wharf as a public space, as it has with Queens Wharf in the city, which in the short to medium term has continued to be used for port operations. To do so at Onehunga would need the port at Onehunga to be reopened for this limited purpose, the Manukau bar and channel to be hydrographic surveyed, and a pilot to be re-licenced.

5.4.2 Development of a small commercial port at Kaikōura

This stretch of eastern South Island coast has no port between Picton and Lyttelton, yet in Kaikōura has a gravel resource near to Wellington, a major demand area. By creating a small port/ landing place and placing the cargo in barges, landing craft or small bulkers, such a development would take freight off the roads, and provide some additional resilience for Kaikōura.

5.4.3 Coastal repositioning of empty containers

This is very much a one-way trade. If it could be combined with another trade, such as a bulk or general cargo going the other way, the efficiency of exporting containerised cargo could be improved. But ships need to be suitable to carry containers (many are but may need special fittings) and ports need to be able to handle what are very small ships for terminals. Support might be in the form of making ships and ports suitable for this kind of operation.

5.5 Level Playing Field

There have been many issues raised by industry stakeholders that work against coastal shipping.

- Several were concerned about the market power exerted by international lines' dominance who in some cases prefer to work alone to preserve control. This is viewed as a major concern by the Review Team. See Section [link].
- Additional operating costs arising from the employment of New Zealand crew costs is obvious and was mentioned, although one coastal operator said this was just one of several additional costs, and could be lived with.
- New Zealand ETS levies are not charged to international ships. They may also not be similarly levied by their country of registration or source of bunker fuels. Some stakeholders claim that this gives international ships a cost advantage over ships that bunker fuels in New Zealand. However, we consider this to be less of an issue. Increasingly, other jurisdictions

are imposing carbon taxes or levies on international carriers, and in the domestic market, ETS levies apply equally to sea, rail and road.

- As a result of Annex VI to the 1973 MARPOL Convention[33], instead of fuel oil, coastal carriers are of necessity soon to be required to use low sulphur gas oil (diesel), as are road and rail already, as there is no low sulphur fuel oil supply in New Zealand. The cost associated with this erodes coastal ship competitiveness compared with road and rail whose cost structures have not similarly changed.[34] It is our view that that the increased cost is warranted; it levels an inequity that rail and road have had to bear.
- International ships can marginally price when they carry coastal cargoes because they incur very few additional costs when carrying such incremental cargoes in addition to imports and exports that are directly delivered. Our view is that this is the nature of commercial activity. If carriage of coastal cargo by international ships is allowed, then the cost benefits should be allowed to flow to the consumer.
- Government financial support for KiwiRail raises the issue of fair competition for its self-funding ferry competitors and operators from other modes. The Review Team considers this to have the potential to distort the market, as nearly all subsidies do. Is it reasonable? This is a far greater question than a coastal shipping commentary can answer; the answer lies in overall supply chain objectives. See also section 5.3.2 above.
- Perceived port charge inequities add cost and thereby reduce competitiveness with road and rail. We have some sympathies with this. The charging of cargo port charges such as wharfage and stevedoring do not appear to differentiate between the space, dwell and handling requirements of coastal cargoes and imports/ exports.

[33] The international community has already embraced the IMO MARPOL VI requirement for low-sulphur fuels. The New Zealand Parliament has a bill before it to ratify this addition to the Convention, https://www.parliament.nz/en/pb/bills-and-laws/bills-proposed-laws/document/BILL_111372/maritime-transport-marpol-annex-vi-amendment-bill

[34] Based on posted prices of fuel in Singapore, and allowing for shipping costs of fuel to New Zealand, this has increased coastal carriers' fuel costs by 33% compared with their previous use of non-low sulphur fuel oil, disbenefitting them compared with road and rail under the prior regime.

International ships are however able to purchase low sulphur fuel oil offshore and therefore to not have to resort to marine diesel and as such the coastal ships are also disadvantaged against these vessels. Note though that this is a smaller disadvantage; about 18% when compared with the price of low sulphur fuel oils purchased for example in Singapore. But perhaps this is reasonable, given that sulphur emissions are a health hazard.

6 Maritime Infrastructure

6.1 Stakeholder views

Issues raised by stakeholders specifically about infrastructure included:

- Dedicated berths/ berth priorities needed for and suited to coastal ships.
- Inland depots should be linked by rail to ease port congestion.
- Inland ports at major centres such as Hamilton and Palmerston North should be 'common user' with respect to port affiliations, to increase competition between ports and provide choice.
- RoRo linkspans[35] could be treated as part of SH1 and funded accordingly.
- Road links to ferry terminals should be reviewed for adequacy.

Additionally, we have identified above a need to ensure that container terminals have the capacity to cope with increased throughputs that new domestic cargo and increased transhipping represent.

As a separate issue, it would appear that, from a stakeholder comment, there is no plan or preparation for the use of coastal shipping in the event of a natural emergency.

6.2 Port and terminal suitability for Coastal Shipping

6.2.1 Domestic and tranship cargo terminal throughputs

Section 5.2.4 above sets out the major impact that a hub and spoke coastal feeder service will have on container terminal throughputs. In summary, the cargo generated by the proposed coastal feeder service, both domestic cargo transferred off land modes and the tranship and empty repositioning from overseas ships will increase the hub terminal throughputs by perhaps 250,000 teu pa, a 10% to 16% increase through both Auckland and Tauranga.

Planners need to be certain that the ports can cope. The present fall in terminal operating performance at both Auckland and Tauranga begs questions as to whether the related issues will be addressed in time. Although the ports claim that they have the headroom, we consider that an external, independent view on the real capacity of these terminals needs to be carried out, and we have recommended this as an item to be funded under the Activity Class. This could however, be in parallel with any call for proposals regarding a coastal feeder network.

6.2.2 Harbour, port and terminal resilience

Associated with resilience challenges is the capability and condition of ports. Most of New Zealand's container facilities were built for first generation container ships and are now approaching obsolescence. This issue is addressed in detail in Section 2.2 in a sub section on port infrastructure factors that will shape the future (p 14) and is summarised here.

> *In order for the projected larger container ships to call at New Zealand ports, port infrastructure for those ports at which larger ships will call, will need to be rebuilt. Increased length, beam and draft poses issues at several ports. Berths are not long enough, nor have they the required depth alongside. Channels do not have sufficient depth and width, and*

[35] The bridge that connects the stern door of the ferry to the shore. See also footnote38.

bends are too tight.[36] There is a resulting risk that a vessel stranding will close a port for a period.

Crane outreach and weight will need increasing, limited ground slots means more land is needed, road/rail interchanges will become insufficient and as is latterly the case, the challenge of converting to automation will need to be overcome.

This ever increasing and changing nature of shipping means that ports are for ever speculating as to how they might accommodate them. With each step forward this creates more challenges and leads to either a narrowing of safety margins or considerable expenditure on infrastructure. Challenges include:

- As ships get larger, ports may not be able to accommodate them. Terminals and berths may not have the capacity, strength or dimensions required. Channel widths will be insufficient for beamier ships and the bend radius of some access channels may be insufficient for longer container ships. There is a risk of a stranded ship closing a port for some time.
- Tidal constraints will become an increasing problem e.g. Nelson, Tauranga.
- Land-side access within ports, especially rail, is becoming an increasing issue as throughputs increase.
- Increased throughput will increase road traffic congestion in the approaches to all ports.

There are signs that capability to cope for peaks has been underestimated as evidenced in the post-Covid import surge at Auckland and to a lesser extent the other ports. Climate and geopolitical events may result in similar wide fluctuations in cargo throughputs to those presently being experienced. Cargo throughput directly determines the number of berths required.

There is a need to assess these physical ship-size limitations of ports independently from the investment decision-making of the port owner. That is, assessments that are not influenced by commercial considerations only, but that also consider the wider strategic policies decision-making of the government. **We recommend** that this form part of MoT's upcoming National Freight & Supply Chain Strategy.

The capability of ports not primarily engaged at present in significant inter-island cargo handling should also not be ignored as they would become vital elements of the transport chain in the event of significant damage to the current prime ports.

6.2.3 Road and rail interface with ports

Notwithstanding the preference for coastal service terminals to operate with priority in order to fast track container movement, it is evident from stakeholder concerns that the Auckland and Tauranga Container Terminals suffer from some congestion delays at the interface with road and rail which adds cost and can compromise timely deliveries.

[36] Both Tauranga and Auckland have shipping channels that are narrow and with very tight bends. The channels have needed to be extensively dredged to provide depth, width, and larger bend radius. In contrast, except for the bar, Manukau Harbour has long, wide, straight channels with abundant depth for all except immediate approaches to berth sites.

The stranding across the fairway of Ever Given in the Suez Canal illustrates the risk. A port cannot afford to be closed for a sustained period by a stranding. The solution is to build entrances wider than the length of the largest ship. This is a major task if not impossible at both Auckland (200m wide in Rangitoto Channel) and Tauranga (240m wide at entrance), but a green field port can be constructed accordingly.

Rail

During the discussions with the various parties interviewed in this process, there was doubt cast on the present and potential capacity of the rail exchange areas in both the Auckland and Tauranga container terminals and the rail track systems connected therewith.

Aspirations of Government to maximise freight movement using the rail mode needs to be tempered with a clear knowledge of the implications of such delivery including the extent of the related track work and indeed the terminals' abilities to handle the train moves and the container exchanges that relate to them. Increases in the intra island use of rail will compete with inter-island freight movement for space and additionally, hubbing in Auckland and Tauranga may well see more exports using rail to access those ports.

Such systems are only as good as the weakest link and thus confirmation that the capacity of the track and the marshalling areas at each hub point are equal to the task would seem prudent.

Road

The access to the current container terminals in Auckland and Tauranga has evolved predominantly through single access routes coupling such terminals to the motorway linking system. It was reported that there is growing evidence that, owing to congestion, such routes are not always followed and also that any delays to receiving containers into the terminal can lead to challenging congestion in the access roads. The ability of increased levels of road transport to be accommodated should also therefore be determined to ensure that the forecast moves will be able to be accommodated without unacceptable delays to trucks nor also adding to urban transport congestion.

We recommend that a thorough check of operational capacity of road and rail be determined and that confirmation is sought that this too can provide for significant peaks when these occur for seasonal and other reasons such as shipping disruptions causing bunching of ships.

6.2.4 Inland depots and ports

The role of inland ports and depots mainly affects the ability of significant quantities of containerised exports to be forwarded to container ports by rail. Fonterra's Crawford Street depot in Hamilton is a good example, placed so that export dairy products can be routed through either Tauranga or Auckland, using rail.

Domestic freight that might be carried by sea does not appear to move in sufficient quantities to induce such short-haul train transport but may well take advantage of the aggregation of export cargo to the respective container ports. The efficient turn round of such rail traffic is therefore important if finely tuned connections with coastal services are to be achieved.

6.2.5 Port Operating Key Performance Indicators (KPIs)

One alarming factor that came to light during various discussions was that KPIs for the recent spike in container stack utilisation and stack dwell times were not often mentioned. The continuous arrival of ships and peaking throughputs and related longer dwell times, not surprisingly led to much higher stack storage utilisation and that almost certainly will have added to reducing the speed of container picking, both for those being delivered to transport and also those to be moved to the ship's side for loading.

It would seem that such statistics should be widely promulgated to give early warning of possible problems, for example in MoT's Freight Information Gathering System (FIGS) data.

In general, all the FIGS data relating to container terminal performance should be more timely so as to alert the market as to pending issues. It would be surprising if ports do not already produce the information to at least daily KPI levels. Information systems should therefore be able to produce this at better than the current quarterly reporting. To be useful, FIGS reporting needs to have a period of at least monthly and a time lag of one to two weeks only.

We recommend therefore that statistics sought for inclusion in the MoT's FIGS data include the following information:

- The average dwell time for all containers passing through the terminal for the prior period; and
- The average stack utilisation (actual teu/useable teu space).

Such data to be promulgated for access by the industry not less than monthly or even more frequently, and within two weeks of the period end.

6.3 Transport Network Resilience in Emergencies

6.3.1 The Emergency Resilience Challenge

New Zealand is prone to natural disasters and other disturbances that can disrupt the supply chain. In the past, the supply chain has been disrupted by several severe events such as:

- 2021 South Canterbury floods
- 2020 Covid 19 lockdowns
- 2016/17 Kaikōura earthquake closure of SH1 and rail between Picton and Christchurch and port of Wellington
- 2010 & 11 Christchurch earthquakes closure of Port of Lyttelton
- 1968 Inangahua earthquake, closing roads in the area
- 1953 Tangiwai railway accident, closing the Main Trunk
- 1931 Napier earthquake closure of Port of Napier
- 1929 Arthur's Pass and Murchison earthquakes, closing the road to the West Coast for several months
- 1855 Wairarapa earthquake, which lifted Wellington, destroying port access and roads and lifted the Basin Reserve, thus draining it.

Several ports are located on earthquake fault lines; Tauranga, the Thames estuary and Auckland's Waitemata port are all on the same fault.

Parts of New Zealand are at risk of volcanic eruption. In times of habitation in Aotearoa, Rangitoto emerged from the Waitemata only about 600 years ago, Tarawera erupted in 1886 and Whakaari/ White Island serves as a reminder. Tsunami and floods are a constant threat.

Coastal shipping should be able to provide resilience, but as yet cannot. The ports throughout New Zealand need to be capable of providing the link from ships to their immediate hinterlands, for example through an ability to receive RoRo ships and the maintenance of container handling capabilities, the two maritime transport options that can deliver high volumes of cargo over a short period of time. It is a safeguard with close parallels to insurance. The risk is so severe and beyond a region's capacity to survive alone, the insurance is the ability to receive assistance from elsewhere, and the premium is the cost of being prepared. At present:

- There is no known promulgated plan for emergency use by ports or the shipping service providers in the event of such natural disasters.

- It is unlikely that any ports have alternative facilities to enable use of RoRo ships (presently in service or otherwise) at short notice or for subsequent extended periods.
- It is essential that ports that presently have good container crane handling operations retain that capability given the reduction in geared container vessels calling at New Zealand ports.

The challenge is develop a coordinated natural disaster plan that incorporates readiness of key infrastructure.

6.3.2 Ports and Coastal Shipping Natural Disaster Resilience Readiness

Such a plan for emergency use of ports and coastal shipping in the event of such natural disasters is required:

- Initially to ensure safeguard of life.
- Subsequently to enable continuation of supply chain throughout recovery.
- Then to return the region back to as near normal as is possible and until the former supply chain routes are restored, and
- To ensure fuel supply backup systems are in place.

What is needed is:

- Development and promulgation of a disaster management plan to ensure that all stakeholders are aware of the roles that they will be expected to play in the event of a significant emergency.
- Enhancement of coastal shipping which directly improves resilience by providing New Zealand-controlled vessels that can easily be requisitioned in the event of a disaster.
- Development of places to land RoRo stern ramps (including those of the new and existing Cook Strait Ferries) at a range of ports to be investigated in case the infrastructure presently in use were to be destroyed or be inoperable after an event.
- Ensuring that Regional Ports remain container capable especially as the trend to gearless container vessel[37] continues.
- Undertaking of condition and capability assessments of all ports to form a baseline from which to plan resilience.

The proposed restructure of coastal shipping services provides an opportunity to plan to enable an emergency, whether short or longer term, to be managed effectively and achieve delivery of all necessary supplies and resources. This requires that in the event of a significant catastrophic event, ports have the capability to:

- Load and discharge RoRo ferries both in the short and longer term.
- Load and discharge containers from coastal or international carriers (that do not have ships gear).

Similarly, that there is the capability for regions to have access to alternate fuel supply-chain routes.

We recommend that a review of readiness be undertaken. Specifications for the delivery of such a review might require that the task includes:

- Ports condition assessments and resilience evaluations.
- Assessment of peak capacity readiness.

[37] A gearless container vessel is a ship without its own cranes, and needs shore cranes to load and discharge cargo. Conversely, a geared ship has its own cranes. Note though that cargo handling rates are much faster when using shore cranes.

- Specification and design of changes required.
- Making sure coastal shipping port requirements are integrated into any ports' strategy.
- Plan for all fuel depots located at ports to be able to cover other ports.
- For Auckland, provide alternate fuel route through the LPG sea island on Manukau Harbour:
    - Modify the LPG pipeline to be able to receive fuels for Wiri tank farm.
    - Modify (if necessary) the Tauranga bunker barge to be able to deliver fuels at the Manukau LPG sea island to Wiri from e.g. New Plymouth or Marsden Point.

6.4 Dry dock

Various members of the New Zealand Shipping Federation commented on their view of the strong case for a New Zealand based (floating) dry dock. The case appears to be founded on the number of New Zealand based vessels that are too big for the current dry-docks and slipways and as a consequence must seek bookings in overseas docks which inevitably means that such vessels must consume large amounts of fuel transiting to a dock and be out of service for an unacceptable period of time. The vessels that will gain most from such a facility will be the Cook Strait ferries, larger coastal container vessels, coastal tankers, cement ships, New Zealand Navy and NIWA.

We have been unable to establish the status of the assessment of the commercial viability of such an investment. It is envisaged that the facility will need financial support unless it can attract Pacific Islands based vessels as well as those of the port and offshore industries.

We would recommend that a full business case be undertaken, looking wider than just the New Zealand ships that might use a facility, and consider what the potential regional market share and thus revenue and benefits such as emission reductions might be, to offset the capital and operating costs.

6.5 Ferry Stern ramp access and linkspans

Roll on Roll off ships use their own stern ramps or a shore linkspan[38] so that trucks (or rail wagons for rail ferries) can drive onto or leave a ship from/to land. In section 6.3.1 above we have identified a need for ports to have suitable places for ships' stern ramps to be used in the event of emergencies created by natural disasters or other port disruptions so as to allow such ships to provide an alternative supply chain route.

A separate issue raised by some stakeholders is the linkspans at Wellington and Picton which have a significant high cost to install and maintain. Given they are essential should they be funded as part of SH1 by Waka Kotahi?

[38] RoRo ships need a bridge connection with the shore. Rail ferries by their nature need a link span, a shore based major structure. In ports with high tidal ranges, car and truck ferries also benefit from a shore- based link span, especially if the ships call at high frequency.

Alternatively, for car and truck access, a ship based stern ramp (a much lighter structure) can be used. BlueBridge ferries have stern ramps that land on shore link spans. The new InterIslander ferries are to have removable stern ramps that can be fitted in emergency. It is these stern ramps that would be used in an emergency at ports that do not have linkspans.

6.6 Shore power for ships (Cold ironing)

Shore power (cold Ironing[39]) has been mentioned as a challenge on two fronts. Firstly to provide appropriate connections on all wharves to enable the ships of the future to stop diesel generators whilst in port and use cleaner shore energy. And secondly, the issue of the electricity supply in smaller places having sufficient capacity to be able to supply such increased demand for short periods of time. These challenges need:

- Investigation to determine possible demand and timeframe for delivery at some or all ports.
- Confirmation especially at Picton that the overall town power supply will be sufficient to allow for the very high demand for quick battery recharging required by the new InterIslander ferries which are to manoeuvre in the berth approaches using battery power.

We recommend that such investigations into provision of facilities to enable cold ironing take place as indicated above.

[39] Ships connected to shore power do not have to run their own generators in port, thus reducing emissions of sulphur and nitrogen oxides and particulate matter that are harmful to health. To be meaningful, the price of shore supply power needs to be cheaper than burning fuel in the ship's generators.

Cold ironing is a shipping industry term that first came into use when all ships had coal-fired engines. When a ship tied up at port there was no need to continue to feed the fire and the iron engines would literally cool down, eventually going completely cold, hence the term cold ironing.

7 Sustainability

If New Zealand is to be seen to maximise its delivery of the international commitment to lower maritime GHG emissions, its only real opportunity lies in respect of the few ships that it can control. Stakeholders recognised this requirement:

- Coastal shipping acknowledged as lower emissions per tonne-kilometre than land transport.
- A wide range of low carbon fuels are in the plans of ship operators, both local and internationally.

The primary sustainability challenge in the New Zealand maritime sector is to transfer freight from land modes to sea.

Another challenge is to try to induce new coastal shipping proposals that adopt new forms of propulsion that enable the efficacy of new technology to be tested without unduly adding to operating costs.

7.1 Transfer freight off land modes to sea

This report makes the case for setting up a coastal feeder network that will treble (or more) the volume of coastal containerised cargo carried in domestic ships. Although some of this cargo is already carried by sea, in international ships transiting the coast, it still represents a significant transfer of freight off road and rail.

7.2 Other sustainability opportunities

7.2.1 Pilot schemes for wind and solar assisted propulsion and low carbon fuels

The Review Team understands that Chatham Islands Shipping is contemplating a new ship for its trade. A new build provides the opportunity to install a dual fuel engine suitable for a biofuel or hydrogen as well as diesel, and possibly, given the ocean environment the ship operates in, to fit a wind assistance device such as a Flettner rotor.[40]

MV Fehn Pollux fitted with Flettner rotor. Fehn Pollux is similar in size to the Chatham Islands ship

Dual fuel engine technology is past prototype stage and into production but supply, handling and storage of biofuels and sustainable energy produced fuels such as hydrogen, ammonia and methanol are not yet commercially developed. The opportunity exists to trial fuel systems ashore and use the fuels on an actual ship.

Wind and solar assisted propulsion are also at post-prototype stage, or nearly so. Wind assistance can provide 10% to 15% of the power required for a small ship such as that operating to the Chatham Islands. Solar power from electro-voltaic panels on awnings can provide sufficient power for a small ship when in port, thus reducing the requirement to run its diesel generators.

[40] For details of this prototype ship, Fehn Pollux's results see: https://wind-ship.org/wp-content/uploads/2019/07/FehnPollux_ShipOffshore_Greentech2019_Vahs-et-al.pdf

7.2.2 Promotion of IMO's Ship Energy Efficiency Management Plan (SEEMP)

IMO promotes the efficient design and operation of ships as part of its programme to reduce GHG emissions through its Ship Energy Efficiency Management Plan (SEEMP). This is an operational measure that establishes a mechanism to improve the energy efficiency of a ship in a cost-effective manner. The SEEMP also provides an approach for shipping companies to manage ship and fleet efficiency performance over time.

A Government agency, perhaps MNZ as part of is environmental protection responsibilities, could promote SEEMP more vigorously within the New Zealand maritime industry, especially in smaller ships such as fishing boats and small commercial craft.

7.2.3 Commence installation of shore power connections to enable "cold ironing"

Shore power for ships in port reduces harmful air emissions. Depending on the source of the shore power, it can also reduce GHG emissions. There is the opportunity to provide shore power to ships, large and small, at New Zealand ports.

7.2.4 Electric ferries support

Small ferries operating on short routes can sometimes store enough energy in batteries to be electrically propelled. The capability depends on the energy storage required, a combination of propulsion power and battery size, which is very much a function of ship size and route distance. It also can depend on the period of time available for recharging. Too short a turn-round requires such high recharging power that it can become impractical.

There is the opportunity for small ferry operators to refit or build new ferries with electric motors that are battery powered. Examples of ferries that might be suitable are cross-harbour services such as Auckland ferries, Eastbourne and Diamond Harbour services.

8 Legislative/ Regulatory Issues

8.1 Port Ownership and Operations

8.1.1 Port Governance and Ownership

A number of the stakeholders commented on a lack of a coordinated approach to investment in ports and questioned the way in which New Zealand ports are responding to the challenge of meeting the future needs of shipping. Several questioned the very premise under which ports operate under the Port Companies Act. It was suggested that the ports are, on the one hand highly motivated by maximizing profit and at the same time are tending towards investment in assets that may exceed that which is optimal for the country. The lack of a coordinated approach was of real concern.

This sentiment was echoed by the Controller and Auditor General's Report on "Results of our 2019/20 audits of port companies" which was released in June 2021 with a perspective on the operation of the nation's ports which aligns closely with that of those stakeholders and the Review Team.

While the Auditor General's Report focused somewhat on the financial aspects of the ports it also made some sound comments on the direction of their operations with which we would concur. The Auditor General's Report overview stated that *"there is also a risk that without a comprehensive supply chain strategy for the freight logistics sector, port companies will anticipate growth that competing port companies might also have factored into their business cases. Stranded assets, underperforming capital and low returns or further asset write downs are a likely consequence of this"*.

He challenged whether capital expenditure that had been undertaken was always a good use of shareholder funds and whether such decisions were based on the delivery of a robust business case. He expressed concern at the potential for over-investment or "stranded assets" if there is not a level of national co-ordination through a comprehensive supply chain strategy. He also commented on the need for ports to establish business continuity plans for emergencies and to consider the impact they are having on the environment.

The variety of methods of financial reporting was noted with a clear message that these should be aligned to a common framework, although no mention was made of how the ports justified or promulgated their tariffs for the services that they provide.

No mention was made either as to the need for resilience in respect to the ever-present risk of seismic, volcanic or extreme weather events that can put the supply chain into disarray and the need to both cater for such events and ensure with other ports that there is an understanding as to how the country will respond on such occasions.

The Auditor-General's Report clearly signals the need for review of the legislation controlling the actions of ports, an approach that the Review Team would support.

We recommend that such a review of the Port Companies Act consider a wide array of policy and objective matters including:

- The determination of the framework for establishing the future needs of the port users and related stakeholders.
- The ownership, control and direction of such companies.
- The coordination of the development and approval of significant resources.
- The sharing of assets where appropriate.

- Encouraging the contracting or concessioning of the financing and operation of new infrastructure.
- The alignment of the financial reporting of all such ports to more easily compare performance.
- The introduction of funding mechanisms for key essential infrastructure.
- The introduction of a common approach to the justification and approval of capital expenditure.
- The centralisation of key port emergency procedures and policies to enable a coordinated approach to national emergencies.
- The full public disclosure of all port service tariffs which should not bundle charges.

Whist it is clear that a change in focus seems timely, the challenge is to determine the extent of change that is necessary. This may best be achieved by a more direct discussion as to the short-comings of the current structure, rather than wholesale change which may introduce new unhelpful issues as opposed to building on past benefits. An industry review and subsequent conference may be a way to approach such issue.

8.1.2 Port Charges

Several references were made by some stakeholders as to the level and structure of port charges. Examination of the referenced details demonstrated that there is a trend to bundle marine charges, for example tug charges with port entry dues, such that, regardless of the service required the full cost is incurred. Tariff structures also make understanding of charge structures difficult and thus new service studies very difficult to undertake. It was further found that core costs such as the standard container terminal handling charges are largely missing in published tariffs perhaps because they are considered confidential or so that the level of discount from tariff cannot be determined.

There was a clear view that ports should be required to promulgate their base charges and not bundle them or if they do, the component parts should also be offered separately. The reasons for not publishing charges eludes us. We consider that charges should all be published openly in order to increase competition between ports and further, that these published tariffs should include discounted rates, to increase further the competition between ports.

The justification for high port charges for domestic “Coastal Cargo” being levied at the same rate as “International Freight” was also mentioned. There are differences in work that needs to be performed for these two classes of cargo. The amount of time in storage also varies. The charges should not exceed the port’s cost of providing the related services and the differences between domestic cargo movement costs and those of imports/ exports should be reflected in the pricing.

Stakeholders considered that port charges should be reviewed to determine that they reflect the real cost to ports and are not inhibiting trade unnecessarily.

We recommend that this issue be addressed by MoT in its upcoming National Freight and Supply Chain Strategy.

8.2 Other Legislative/ Regulatory Issues

A wide array of legislative and regulatory issues were raised by stakeholders and most had considerable consensus. The challenges are detailed below:

8.2.1 Maritime Transport Act s198

Section 198 of the Maritime Transport Act (MTA) allows exemptions for foreign ships to carry coastal cargo. At present, little information on exemptions granted is available. Stakeholders felt

exemptions need to be promulgated for data and transparency to enable the potential of such cargo to be identified.

There are stakeholder concerns regarding exemptions for ships without New Zealand crews, thereby giving such ships an advantage over ships crewed by more costly New Zealand crews employed according to New Zealand employment law. There are also concerns over exemptions given for bulk cargoes such as fertiliser. Without promulgation of information, it is difficult to monitor whether these exemptions are being issued without compromising opportunities for New Zealand domiciled vessels.

It would appear that the following changes to administration of this section of the Act would help:

- Establishment of more explicit rules for exemptions to this section of the Act and promulgation of information:
    - Set rules for period and commitment for exemptions to s198.
    - Publish exemption information such as cargo and route, period of exemption, reasons for issuing exemption.
- Be more strict on applying section 198 (1) (b) which allows a foreign ship to carry any coastal cargo if it is demise chartered to a New Zealand based operator, and the crew is employed under a contract for services governed by New Zealand law. There is a tendency to give an exemption to foreign ships rather than require compliance with s198 (1) (b), thus enabling the Act's intention to be side stepped. The enforcement of this aspect of the law should possibly be strengthened to deliver the intent of the law.

Consideration may be required to changing s198 so that authority to carry coastal cargo in non- New Zealand ships is only permitted if the opportunity so created is open for "common user" use, in order to avoid a situation where a carrier transports only its own international tranship cargo and empty containers, making such route or routes unviable for another complying operator.

A further long term consideration is whether s198 should be removed from the Act and reinstated elsewhere? It is an economic regulation immersed in an Act that is concerned with safety and environmental protection.

These are all matters for MoT to consider. Some are administrative changes, but the last two require amending legislation, and could be kept until there are other changes proposed for the MTA. The challenge is how to adjust the management of this section of the MTA, or even whether it should be amended.

8.2.2 Maritime New Zealand (MNZ) Rules

A stakeholder requested that MNZ's Rules relating to ship design, construction and equipment be looked at for harmonisation with other countries. This is important when considering the purchase of second-hand ships that may comply with international standards but not with New Zealand's. MNZ have advised that they have commenced a review of the 40-Series of Rules, those that relate to ship design, construction and equipment.

A stakeholder considered that crewing scales need review. These dictate the minimum number of persons in a crew, from a safety viewpoint. The challenge is to test whether New Zealand's crew scales are in line with international standards.

Other stakeholders felt the role of integrated ratings and able seamen (AB) needs updating. The international standards do not cover the situation where integrated ratings are desirable[41], and training systems are not tailored to suit. The challenge is to provide for this.

[41] An integrated rating can cover for both an AB deck crew and an AB engine room crew, thus enabling fewer persons.

9 Societal Issues

9.1 Workforce challenges

There were several different stakeholder perceptions as to the present ability of the industry to find and train new entrants but on investigation the following views were reached:

- Supply of seafarers is satisfactory.
- However, the ageing workforce is of some concern.
- Training schools provide good training.
- But Covid 19 interruptions to enrolments led to the cancellation of some vital courses which is not acceptable if training is to continue to be offered and be able to provide a secure pathway forward in which entrants can progress their qualifications.
- Additional berths on ships are needed to meet ongoing sea-time training requirements.
- The cost of training needs to be supported regardless of normal education expectations for the justification for such resources.

In a discussion with the New Zealand Maritime School, they explained that training establishments can meet an increased demand. There is a risk, however, that if existing courses are cancelled because of insufficient numbers in the short term, when the aging workforce retires or to meet increased demand, there will be no replacements. It takes time; three years to fully implement new training courses. It takes even longer to get seafarers fully trained suitable for top positions; 10 years for Masters and Chief Engineers. There are very few opportunities on board existing coastal vessels for trainees to obtain the necessary sea-time to qualify, given the lack of cabins/berths on such ships. Training facilities such as engineering workshops need to be kept up to date, necessitating funding.

We recommend that these concerns are addressed and fulfilled where necessary.

9.2 Social licence

Concern was raised by some stakeholders with knowledge of current port operations that there is a growing conflict between port city residents and the port operators regarding the pressure that these businesses are now putting on the respective communities especially from incursion of reclamation and wharves into the harbour and congestion on the access roads.

The challenge is to fully appreciate the limits to the compromise between commercial and society interests and the economic costs of the options. Specifically:

- Auckland port's social licence is already being severely challenged, and
- There is looming as a problem for Tauranga especially regarding the effect road and rail access traffic has on the adjacent city CBD and on residential areas through which the rail corridor runs.

9.3 Societal returns

9.3.1 Healthy and safe people

Most opportunities that return safer and healthier people are described above:

- Reduction in road freight transport by transferring freight to sea, making roads safer.
- Reduction in emissions for freight transport by transferring freight from land modes to sea.
- Providing increased resilience of ports and regions in the event of emergencies.
- Sustainability projects such as low carbon fuels and wind/ solar assisted propulsion.

- Promotion of IMO's SEEMP.
- Installation of shore power for ships in port (cold ironing).
- Electric ferries.

9.3.2 Employment

The development of a coastal shipping service will increase permanent employment opportunities across a wide range of skills and abilities. Although, on the other hand, it will reduce employment on road and rail transport.

We recommend that this opportunity is used to ensure that training establishments are funded adequately to provide the facilities they require, such as engineering workshops.

9.3.3 Cultural

The use of our coast-line for commercial purposes has wide cultural implications, especially (but not only) for Māori, remote and regional communities and with trade unions. It provides commercial opportunities for participation and for employment. It may cross some boundaries. Consultation is always ongoing and should be continued.

9.3.4 Social licence

Closely associated with cultural matters is that of social licence. We have seen Ports of Auckland lose its social licence for infrastructure developments and nearly so for cargo operations. The Port of Tauranga has a similar issue looming with respect to the road and rail interface with the city. It is also facing resistance to its plan to extend its container wharf southwards, an essential requirement for the development of a coastal shipping service.

The opportunity exists to use coastal shipping to smooth these concerns by consultation and involvement.

10 Projects for Activity Class Funding

The projects which may be suitable for GPS Coastal Shipping Activity Class funding can be derived from the key opportunities. We have described below the key ones below. The potential projects fall into four of the five categories identified in Chapters 4 - Key Challenges and Opportunities:

- Integration of coastal shipping in the broader logistics and supply chain
- Maritime infrastructure
- Sustainability
- Societal issues

The table below lists them, shows the links between related or contingent projects, the priority that we have attached to them, the timing, and the magnitude of funding[42] that would need to come from the Activity Class fund. A reference link is given to sections of the report where more detailed discussion is contained.

ID#	Project	Related projects	Priority[43]	Timing	Responsible party	Early cost estimate	Report reference
A	**Integration of coastal shipping in the broader logistics and supply chain**						
A1	Coastal shipping feeder service support scheme	A2	High	Immediate	Waka Kotahi	$25m to $40m	5.2
A2	Assessing container terminal capacity	A1, B3	High	Immediate	Waka Kotahi	<$500k	5.2.4
A3	Update of Cubic Njord Report on Domestic Container Supply	A2	Medium	Immediate	Waka Kotahi	<$100k	5.1.4
A4	Other coastal shipping opportunities		Medium	Next 3 years	Waka Kotahi	up to $5m each	5.4
B	**Maritime infrastructure**						
B1	Assessment of ports' natural disaster resilience readiness		High	Immediate	Waka Kotahi	$1m	6.3
B2	Business case for a dry dock		High	Immediate	Waka Kotahi	<$250k	6.4
B3	Road and rail interface with ports	A2	Medium	Immediate	Waka Kotahi	<$100k	6.2.3
B4	Implications of Tory Channel navigability on Cook Strait Ferry market		Medium	Next 3 years	Waka Kotahi	<$100k	5.3.1
C	**Sustainability**						
C1	Pilot schemes for low carbon fuels & wind and solar assisted propulsion		Low	Next 3 years	Waka Kotahi	Moderate to high	7.2.1
C2	Investigate shore power (cold ironing) for ships		Low	Next 3 years	Waka Kotahi	Low	7.2.3
C3	Electric ferries		Medium	Next 3 years	Waka Kotahi	$100k to $250k	7.2.4
D	**Societal issues**						
D1	Assistance to training establishments	L5	Medium	Next 3 years	Waka Kotahi	<$100k	9.3.2

[42] Note: these are the consultant's order-of-magnitude indicative estimates based on experience with similar infrastructure and transportation projects. Further cost estimates would need to be conducted.

[43] Priorities: High – Best framework scoring, strongly recommended for funding. Medium – Reasonable scoring, recommended for funding. Low – Lower scoring, fund if funds permit or fits well with other strategies.

Brief descriptions of these project proposals follow.

10.1 A - Integration of coastal shipping in the broader logistics and supply chain

10.1.1 A1 - Coastal feeder shipping support scheme

There is an opportunity to set up a **coastal shipping feeder service in a hub and spoke network**. Refer to section 5.2. But ship operators have been reluctant to make the investment in feeder ships to a level that will cause a mode shift of New Zealand domestic freight from land modes to sea. The uncertainty of support from consignors appears to be the main reason. In order to persuade (encourage) ship operators to make the investment, it is proposed that the Activity Class fund be used to provide support for a feeder service for a period of up to three years, to prove or otherwise the worth of such a network.

The premise is that given a regular service that is also reliable, domestic consignors and eventually international shipping lines will choose to use such a service.

The proof will be in the outcome; if successful the support can be phased out or even ceased.

Structure for a support scheme

Several options can be considered for supply of the vessels and their commercial support:

- Joint venture between private sector and Government
- Injecting capital as a grant
- Subsidies for charter of ships
- Subsidies for operating costs
- Subsidies for operating revenues
- Loan guarantees or support
- Underwriting of profitability

It is the last of two of these that are the most attractive, **loan guarantees or underwriting of profitability**. If the concept is sound, it will cost nothing, or at least very little in the early stages perhaps. As support grows, the amounts required to underwrite will diminish to zero.

Risk to Government

If the private sector will not take the risk, why should Government? The premise is that if support can be obtained from cargo consignors, a service should be viable. Obtaining consignors' support requires better frequency and reliability than at present. Pacifica's single-ship service appears to be viable and therefore three ships, with three times the cargo support, should result in acceptable profit levels. That represents approximately only 180,000 teu pa more than presently carried, out of a potential market of over 1 million teu pa, a quantity that seems probable[44].

If the cargo were to build up to that level over say 18 months, our rough order-of-magnitude estimate of the potential underwriting amount during the build-up period (based on our estimate of a required slot contribution from revenue of between NZ$195 and NZ$235 per teu) is $25 million to $30 million, that is, most of the $30 million to $45 million allocated to the Activity Class.

[44] Refer to the data in section 5.2.4 in which the total tranship potential is shown to be over 900,000 teu pa. This added to say 100,000 teu pa of domestic cargo transferred off land modes provides a potential market of over 1 million teu pa.

If consignors' support were not forthcoming, it would become apparent early on, say within 12 months. At that point, the amount of underwriting support may have reached $30 million to $35 million (including perhaps a commitment to redeliver the ships). This would start to endanger the entire Activity Class fund, so pulling out at this point might be the sensible outcome. That is, there is an escape route. We would recommend that there is a contractual arrangement for withdrawing from supporting the service, triggered by some pre-agreed limit.

At best, a scheme based around underwriting profit might cost $25 million and could perhaps be restricted to no more than $35 million through termination provisions within the arrangement.

Seeking proposals

The scope for structuring support for a coastal service is so wide that we consider it best to avoid prescribing its structure, and go to the industry to seek their proposals. Some objective-based goals could be stated, leaving proponents to devise methods of structure. If a request for proposals is fashioned properly, it could require proposers to take some risk, and thus do their own due diligence. However, we recommend that the financial feasibility first be assessed, covering the market share potential and ensuing revenue base, and match this against the cost of a service that might evolve. This would provide a better gauge of the likely success and a more certain estimate of the amounts that might be needed by way of Government financial or underwriting support.

Potential participants are:

- Existing coastal operators; container ships operators or otherwise
- International lines already with services calling at New Zealand
- Specialist feeder ship services from overseas
- Non ship operating participants who could contract in ship management services

Priority

This project satisfies most of the guiding principles. It has very good potential to be financially viable and economically desirable. A coastal service adds considerably to supply chain resilience. It moves freight out of trucks, thereby improving road safety. And it moves freight off rail as well as road, resulting in a reduction in GHG and improvement in air quality.

It would be a heavy user of the Activity Class fund, but the rewards are high. If the overall objectives are to be achieved and the market is to be transitioned to deliver the required GPS objectives, **we rate this project with a high priority.**

10.1.2 A2 - Assessing container terminal capacity

Associated with a coastal feeder shipping service is the issue of capability of the container terminals to cope with the increased throughputs that a feeder service would present.

The performance of New Zealand ports during the Post Covid 19 boom has brought into question the resilience of ports and their respective container terminals to cope with such incremental volumes. Whilst it is understood that the fall in performance in terms of crane rates and ship rates has been created by added unexpected peaks and the timing coinciding with the attempts to automate the terminal in Auckland, the slow recovery has confirmed the doubts of some that the real capacity, especially of Auckland, is less than was previously suggested.

It is noted however that the Port of Tauranga proposal to expand its berths to the south is essential to meeting the additional demand that coastal shipping would impose. The Port went through a fast track process under the Provincial Growth Fund but was not successful and is now proceeding through the Environment Court with a Resource Management Act consent application. It is expected

to meet resistance. The development should be encouraged, supported, and fast tracked within the current approval process framework.

Ambitious targets have been variously reported as to the capacities of the existing Sulphur Point and Fergusson Container Terminals but these have been noted with a degree of scepticism by industry participants especially following recent service failures. There would seem to be good reason to get an **external, independent view on the real capacity of these terminals** based on their plans but determined by an outside party, specialising and knowledgeable in the operation and potential of automated terminals, given the strategic importance of this information in the context of the forward planning for the restructuring and support of coastal shipping. It is likely that such a party would be a European, Singapore or North American based consultancy or similar, rather than New Zealand or Australia in order to provide the level of expertise required combined with independent objectivity.

We recommend that proposals are sought under the Activity Class to carry out the following investigation to provide a check on the existing ports' capabilities:

- Independent review of Auckland and Tauranga terminal capacities
  - Berth occupancy levels at present and forecast, including increase in domestic cargo and tranship volumes, taking account of expected crane utilisation and handling rates.
  - Yard stack capacities taking account of coastal cargo handling, dwell times and stack densities.
  - Interface with land side.
  - Recommendations as to other means of improving productivity by changed procedures, working arrangements or additional infrastructure.
- Provision of detailed specification of any requirements resulting from the above.

The timing of this activity could be in parallel with setting up of a coastal feeder service. Provided a positive outcome is arrived at, the feeder service can then proceed without delay. A worst case would require deferring the feeder service until the terminals have improved their capability sufficiently.

We also recommend that Government and its agencies support Port of Tauranga's move to extend its wharf to the south to facilitate an additional coastal feeder vessel berth, including fast tracking if required in order to enable the port to expand sufficiently in a timely manner.

Priority

This project is essential if a coastal shipping network is to be set up. The resulting step increase in tranship throughputs through the hub terminals at Auckland and Tauranga will test their capabilities and capacities. But the economic returns are high. The support that this project provides to a coastal shipping network means that it shares all of its attributes too. **We rate this project with a high priority.**

10.1.3 A3 - Update of Cubic Njord Report on Domestic Container Supply

Empty repositioning is one of the supply chains' greatest challenges, vital for moving surplus empties in Auckland to places where they are needed for export. This was the topic for an in-depth study by Cubic Njord undertaken for the New Zealand Transport Agency in 2009. The general pattern may be relatively unchanged but detail remains somewhat elusive and the manner in which this might prove an additional barrier for captive coastal services needs to be understood.

We recommend that an update of the Cubic Njord Report be undertaken to provide greater understanding for parties who elect to bid to offer to provide a coastal service.

Priority

This project will help improve the efficiency and competitiveness of freight transport within New Zealand and for the export industries. It will assist parties who elect to bid to offer to provide a coastal service. **We rate this project with medium priority.**

10.1.4 A4 - Other coastal shipping opportunities

There may well be several other projects worthy of consideration for Activity Class funding. Three are mentioned in Section 5.4 above. The potential projects relating to these examples are:

Transport of timber from Nelson to Auckland, using Onehunga.

The opportunity is the reopening of the port of Onehunga. This would require:

- Arranging with the wharf owner, Panuku, for this commercial activity to be allowed
- Sounding at both the bar and berth
- Possibly some dredging at the berth
- Getting a pilot recertified
- Use of the berth and some wharf area for cargo handling.

Development of a small commercial port at Kaikōura.

The opportunity is to create a small port/landing place, to enable cargo to be loaded into barges, landing craft or small bulkers. This would require a barging terminal with some sort of shelter from the prevailing weather/sea and a suitable hard stand area.

Coastal repositioning of empty containers.

The opportunity is to enable smaller ships that operate around the coast to carry empty containers. This might be in the form of special fittings, or modifying berths to suit what are very small ships.

Proposals might be sought from coastal operators for projects of this nature.

Priority

These projects remove trucks off roads, albeit in a small way. They are potentially more efficient than the alternative land transports, so score highly for economic value. Two of the examples open up new minor ports at very low cost, providing increased resilience. **We rate these projects with medium priority.**

10.2 B – Maritime Infrastructure

10.2.1 B1 - Assessment of ports' natural disaster resilience readiness

The readiness of ports to accommodate ships in an emergency is not known. A suitable project might be to carry out an assessment of ports' readiness and specify what changes may be needed. The review might cover:

- Ports condition assessments and resilience evaluations.
- Assessment of peak capacity readiness.
- Specification and design of changes required.
- Plan for all fuel depots located at ports to be able to cover other ports.
- For Auckland, provide alternate fuel route through the LPG sea island on Manukau Harbour:
    - Modify the LPG pipeline to be able to receive fuels for Wiri tank farm.

- Modify (if necessary) the Tauranga bunker barge to be able to deliver fuels at the Manukau LPG sea island to Wiri from e.g. New Plymouth or Marsden Point.

This could then be followed by making sure coastal shipping port requirements are integrated into any national ports' strategy.

Priority

This project stands out as essential. It forms the insurance policy for the national supply chain. **We therefore rate this project with a high priority.**

10.2.2 B2 - The case for a dry dock

The New Zealand shipping industry clearly favours the provision of a floating dock or dry dock. However, it does not appear that a proper study has been carried out. See section 6.4. Activity Class funding could be used for developing a business case.

Priority

We consider the case for a dry dock to be uncertain, but the majority of stakeholders interviewed considered it to be a requirement. It needs to be resolved. **We therefore rate this project with a high priority.**

10.2.3 B3 - Road and rail interface with ports

The importance of enabling coastal feeder vessels to have berth priorities and unimpeded turn-rounds has been stressed throughout this Report as fast transit times are essential if domestic cargo is to be induced to use the Inter Island coastal service. Fundamental to this efficiency is an unimpeded access to the respective container terminals.

Industry stakeholders have expressed concern about gate turnaround times and access to the respective terminals not only for road, which we expect most domestic cargoes would mostly use, but also rail.

The opportunity may be considered for a review of gate performance for all such terminals to establish what they achieve now and their capacity to increase throughputs in the future.

Priority

This project is not essential for coastal shipping, although it may well be judged so for its import/ export trade implications. **We rate this project with a medium priority.**

10.2.4 B4 - Implications of Tory Channel navigability on Cook Strait Ferry market

Changes in the services across Cook Strait are at planning stages now with the recent order of the two new InterIslander rail ferries. StraitNZ have likewise commenced a market sounding for the sale of their operation and buyers would no doubt be addressing replacement options.

Clarity as to the potential number of voyages that the new rail ferries and existing services might achieve will be important information for forecasting market shares that might evolve and it would appear important to give transparency to this as soon as possible.

Priority

This project is not essential for coastal shipping, although it may well be judged so for its impact on rail and road commercial operations. **We rate this project with a medium priority.**

10.3 C - Sustainability

10.3.1 C1 - Pilot schemes for wind and solar assisted propulsion and low carbon fuels

Section 7.2.1 makes reference to projects that could be set up to promote the development of use of low carbon fuels and wind and solar assisted propulsion. Although past prototype stages, this technology is still in its infancy and we suggest adopting a pilot scheme approach. We understand that Chatham Islands Shipping is contemplating a new ship for its trade. A new build provides the opportunity to install a dual fuel engine suitable for a bio-fuel or Hydrogen as well as diesel, and, given the ocean environment the ship operates in, to fit a wind assistance device such as a Flettner rotor.

Priority

These projects are not essential for coastal shipping at present, although it may well be judged so for their future contribution to sustainability. **We rate this project with a low priority.**

10.3.2 C2 - Shore power (cold ironing) for ships

See section 6.6 above. There are two separate projects relating to shore power:

- Provision of shore power at Picton and Wellington for the new rail ferries
- Provision of shore power to ships at all ports could be investigated.

Priority

The first of these, shore power for the new rail ferries, is part of the project for acquisition for the ferries, and is, we understand, in hand and not therefore likely to seek funding from the Activity Fund.

This second, power at all ports, is not essential for coastal shipping, although it may well be judged so for their future contribution to sustainability and health. **We rate this project with a low priority.**

10.3.3 C3 - Electric ferries

Proposals might be sought from harbour ferry operators for assistance with the replacement of existing ferries with electrically propelled vessels.

Priority

This project is not essential for the wider coastal shipping, although it may well be judged so for its contribution to sustainability and health. It could have a relatively low cost to implement, giving good economic returns. **We rate this project with a medium priority.**

10.4 D - Societal returns

10.4.1 D1 - Assistance to training establishments

ss 9(2)(b)(ii) & 9(2)(ba)(i)

A decision is required as to who should fund such assets that are essential to the New Zealand maritime training requirements. The School might be asked to make a proposal for funding this under the Activity Class.

This project is important to coastal shipping. Without it, there is the risk that seafarer education cannot supply the numbers needed. It could have a relatively low cost to implement, giving good economic returns. **We rate this project with a medium priority.**

11 Other Levers for Achieving GPS Outcomes

Waka Kotahi has asked for advice in addition to that directly related to coastal shipping, on what other levers could be effective in achieving the GPS outcomes. They suggest that these might be regulatory or planning levers although not limited to these. The following are some such levers, described very briefly above, that came to light during discussions with stakeholders or occurred to the Review Team.

Levers

ID#	Lever	Related Levers	User of lever	Issue it addresses	Report reference
L1	MTA s 198		MoT	Perceived shortcomings in application of s 198	8.2.1
L2	Port Governance and Ownership	L3	MoT	Stakeholder dissatisfaction with ports governance	8.1
L3	Port charges for coastal shipping	L2	MoT	Stakeholder dissatisfaction with ports operations	8.1.2
L4	ETS levies		MoT	Perceived un-level playing field	5.5
L5	Integrating coastal shipping into the upcoming national Freight and Supply Chain Strategy (F&SCS)	L6, L7, L8	MoT	Ensuring these coastal shipping initiatives fit in with an overall supply chain strategy	5
L6	Considering the implications of Market Power of Shipping lines in the upcoming F&SCS	L5, L7, L8	MoT	Ensuring that international shipping lines do not exert market power over New Zealand ports, coastal shipping operations and cargo interests to the extent that it is to their detriment	5.1.6
L7	Considering ports' physical limitations on ship size in the future in the upcoming F&SCS	L5, L6, L8	MoT	Ensuring that long term ports infrastructure expenditure is in line with the F&SCS	6.2.2
L8	Considering the ports' road and rail interface capacity in the upcoming F&SCS	L5, L6, L7	MoT	Ensuring that hinterland infrastructure expenditure is in line with the F&SCS	6.2.3
L9	Degree to which KiwiRail should be permitted to price to attract cargo to their Cook Strait ferries		MoT/NZTA	Preventing Cook Strait or coastal services market share distortions created by any non-commercial financial support to KiwiRail.	5.3.2
L10	Container terminal performance KPIs in FIGS.		MoT	Adding dwell time and stack utilisation data to MoT FIGS.	6.2.5
L11	Funding Wellington & Picton linkspans as part of SH1		Waka Kotahi	To relieve the ferry operators and ports of the financial burden	6.5
L12	Maritime New Zealand Rules		MNZ	Harmonising with other jurisdictions	8.2.2
L13	Promotion of IMO's Ship Energy Efficiency Management Plan (SEEMP)		MNZ	Operational methods for reducing fuel consumption and GHG emissions	7.2.2

Appendix

Appendix 1: Stakeholders Engaged

The following stakeholders were engaged.

Company	Contact	Role	Meeting date	Meeting time
Coastal Ship Operators - RoRo ships				
KiwiRail (InterIslander)	s 9(2)(ba)(i)		24-May	11:30
StraitNZ (BlueBridge)			11-May	10:30
Coastal Ship Operators - Other ships				
Coastal Bulk Shipping	s 9(2)(ba)(i)		7-May	10:00
Swire (Pacifica)			7-May	12:00
International Shipping Lines				
CMA CGM/ANL	s 9(2)(ba)(i)		2-Jun	10:30
Maersk			24-May	14:00
NZ Logistics sector Commentators				
s 9(2)(ba)(i)			14-May	15:00
			25-May	10:30
			26-May	10:30
Maritime Trade Unions				
Aviation & Marine Engineers Association (AMEA)	s 9(2)(ba)(i)		28-May	10:00
Maritme Union of New Zealand (MUNZ)			28-May	10:00
Merchant Service Guild (MSG)			28-May	10:00
Industry Training Provider				
NZ Maritime School			18-May	9:00

Appendix 2: Transport Mode Comparison

Location	Transport by Truck Door to Door		Transport by Container on Rail		Transport by Container on Coastal Ship	
	Vehicle	**Activity**	**Vehicle**	**Activity**	**Vehicle**	**Activity**
Auckland	Truck	Despatched to Distribution Centre	Truck	Despatched to Empty Container Yard	Truck	Despatched to Empty Container Yard
	Small Fork Lift	Packs Curtain Sided Truck	Fork Lift	Loads empty container at Container Yard	Fork Lift	Loads empty container at Container Yard
			Truck	Carries container to Distribution Centre	Truck	Carries container to Distribution Centre
			Fork Lift	Grounds container at Distribution Centre	Fork Lift	Grounds container at Distribution Centre
			Truck	Returns to Depot	Truck	Returns to Depot
			Small Fork Lift	Packs Container on ground	Small Fork Lift	Packs Container on ground
			Truck	Relocates to Distribution Centre when container is packed	Truck	Relocates to Distribution Centre when container is packed
			Container Fork Lift	Places container on truck	Container Fork Lift	Places container on truck
			Truck	Despatched Distribution Centre to Railhead	Truck	Despatched Distribution Centre to Container Terminal
			Large Fork Lift	Places Container into Railhead stack	Straddle Carrier	Received into Container terminal
			Truck	Returns from Railhead to Depot	Truck	Returns from Auckland Terminal to Depot
			Large Fork Lift	Loads container on railway wagon	Gantry Crane	Loads container onto ship at Auckland
Linehaul	Truck	Carries Load Auckland - Wellington	Diesel Train	Hauls container from Auckland to start of electrification		
			Electric Train	Hauls container from start of electrification to end of electrification		
			Diesel Train	Hauls container from end of electrification to Wellington Railyard		
Wellington	Truck	Queues in Wellington Ferry Terminal	Shunter	Marshalls wagon from rail yard to ferry area		
	Truck	Drives onto Ferry	Shunter	Loads wagon on ferry		
Linehaul	Ferry	Travels Wellington - Picton	Ferry	Travels Wellington - Picton	Ship	Travels Auckland to Lyttelton
Picton	Truck	Drives off ferry and onto Christchurch	Shunter	Unloads ferry and marshalls into train consists		
Linehaul	Truck	Carries Load Picton - Christchurch	Train	Hauls wagon from Picton to Christchurch		
Christchurch	Truck	Arrives Christchurch Distribution Centre	Large Fork Lift	Unoads container from train into Rail Head	Gantry Crane	Unloads container from ship at Lyttelton
	Small Fork Lift	Unloads Truck	Empty Truck	Positions from Depot to Railhead	Truck	Travels from Depot to Lyttelton Terminal
	Truck	Departs for next job	Large Fork Lift	Loads out the container onto Truck	Straddle Carrier	Loads container onto truck
			Truck	Delivers container to Distribution Centre	Truck	Delivers container to Consignee
			Large Fork Lift	Unloads Truck and places container on the ground	Large Fork Lift	Unloads Truck and places container on the ground
			Small Fork Lift	Unpacks container	Small Fork Lift	Unpacks container
			Truck	Departs empty for depot	Truck	Departs empty for depot
			Truck	Returns from depot to collect empty container	Truck	Returns from depot to collect empty container
			Fork Lift	Loads empty container on truck	Fork Lift	Loads empty container on truck
			Truck	Delivers empty container to Empty Container Depot	Truck	Delivers empty container to Empty Container Depot
			Fork Lift	Unloads container	Fork Lift	Unloads container
			Truck	Returns to Depot or next job.	Truck	Returns to Depot or next job.