Bigger ships – what are the implications for New Zealand?

Past, present and future implications for New Zealand supply chains

NZIER report to New Zealand Shippers' Council

5 December 2017

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NZIER was established in 1958.

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Recommendations

1. Government should focus on maintaining strong domestic competition across the shipping sector

- To support New Zealand's potential gains from the emergence of bigger ships, the government needs to ensure sound competition across the supply chain.
- Improving the domestic competitive environment would ensure that port investment would be appropriate for individual ports' business models (including investing to the right size of vessels that will be deployed for their port)[1].

2. Officials should closely monitor global shipping fleet developments

- International shipping lines consolidation, while not yet identified as a major risk to New Zealand shippers, requires monitoring to manage the risk of diminishing competition.

3. Government as an infrastructure provider must work closely with industry stakeholders to minimise total transport costs

- If New Zealand is to keep pace with the global shipping industry's move to larger container ships, there must be integrated planning of investments.
- The opportunity and challenge for government is understanding how it can support supply chain coordination that is already taking place, and provide greater certainty for industry stakeholders.

4. Any future Ports study should look 'beyond the border' too

- Any future ports strategy work needs to be widened to become a supply chain strategy to ensure integrated planning of investments or policy affecting road, rail, ports and coastal shipping.
- Government must align its policies on 'behind the border' infrastructure provision (road and rail) with its coastal shipping and port strategies to the reality of bigger ships so that shippers, ports and shipping lines can invest with greater certainty.

[1] Policies to foster sound competition across the supply chain recommended by the NZPC's 2012 international freight transport services inquiry have yet to be fully implemented. We think these represent a good starting point.

Key points

We have been asked to revisit the issue of bigger ships in New Zealand

This research tests the conclusions reached in the New Zealand Shippers' Council's (NZSC) 2010 and 2012 reports in light of recent developments globally and in New Zealand. We then review potential implications of bigger ships for New Zealand.

We do not attempt to identify New Zealand's optimal port configuration, although we do make some suggestions about factors that need to be considered.

NZSC was concerned about transhipment risks and recommended all New Zealand ports become bigger ship capable over time

The NZSC's 2010 report identified the risk that shipping services might become 'boutique' in New Zealand (that is, serviced by smaller and old vessels) or might increasingly be hubbed through Australia.

It recommended that two ports (Tauranga (POT) and Lyttelton Port) invest to become 7,000 TEU ships capable over the next 5 years and that all four major container ports in New Zealand (Ports of Auckland (POAL) and Port Otago along with POT and Lyttelton Port) become bigger ships capable eventually.

5 years on from NZSC's 2010 and 2012 reports, what has happened?

Our 2017 review shows that the concern that gave rise to the NZSC's 2010 and 2012 reports is now unlikely to be realised.

The scenario that large volumes of New Zealand's imports and exports would be transhipped through Australia has not materialised. **New Zealand will not be bypassed by bigger ships**.

Instead, **ports have invested in their capacity to cater for bigger ships** and are looking to increase it going forward.

Between 2012 and 2017, the number of port visits by ships with a capacity greater than 4,000 TEU has dramatically increased at New Zealand's largest international ports. Furthermore, **most New Zealand ports have invested or have plans to invest to accommodate bigger ships** with a capacity ranging from 6,000 to 9,500 TEU.

The increases in capacity at New Zealand ports since 2012 are broadly in line with the NZSC's 2010 and 2012 recommendations.

Since the global financial crisis (GFC), growth in capacity through the building of bigger ships globally has outpaced sluggish demand and depressed freight rates worldwide, leading to the consolidation of shipping lines. This overcapacity has been the result of the introduction of mega-ships or ULCVs.

Hence since the original NZSC reports, while bigger ships have indeed been introduced to New Zealand and lowered freight rates, global shipping overcapacity has had a much greater impact on New Zealand's export and import costs.

New Zealand is currently benefiting from historically low freight rates. The cost per TEU is now a third of what it was in 2009 on the Shanghai to Australia/New Zealand route (UNCTAD, 2016).

Looking ahead, two different visions exist for the future of New Zealand's international freight system

Shippers, ports and shipping lines interviewed as part of this study described one of two potential future freight systems:

- Hub-spoke model – two ports would accommodate larger ships (over 6,000 TEU). Other ports would retain some international calls but would provide feeder service – spokes – to the hub ports.
- String service model – bigger ships would call along the East Coast to four ports. The size of ships under a string service model are expected to be in the order of 6,000 TEU.

They are not mutually exclusive and to some extent will coexist. The debate is a matter of degree between the two visions rather than a strict one or the other choice.

Since mid-2016 there are signs that, and an emerging debate on, the port sector is moving towards a hub-spoke model given the recent significant increase in transhipment volumes (40% between 2016Q3 to 2017Q2).

The future structure of New Zealand's supply chains and where investment should take place remain uncertain

The two different future visions for New Zealand's supply chain reflect the fact that supply chains could evolve in many ways as container ships increase in size.

Because it is uncertain as to how bigger ships will be introduced in New Zealand, there is uncertainty about where investment by shippers, ports and shipping lines should take place and what the future transport costs for New Zealand shippers might be.

The hottest debated issue currently is by far potential overinvestment at ports.

This would occur because shipping lines introducing bigger ships would call fewer ports – only those with sufficient container volumes to justify introducing bigger ship services in New Zealand.

The objective of shippers, ports, shipping lines and government is to minimise total transport cost as bigger ships are introduced

Bigger ships are beneficial to New Zealand if they reduce total transport cost. The total transport cost is the cost of moving containers across the supply chain, not just the shipping cost. Total transport cost is broken down into two parts:

1. **Handling costs** – the transport cost between the gate and the port (including the handling cost at the port)
2. **Vessel cost** – the shipping transport cost (OECD/ITF, 2015).

As ships get bigger, the shipping transport cost (or vessel cost) per container falls but these may not be entirely passed on, as shipping lines recover from years of losses.

Conversely the handling cost per TEU tends to increase as ships get bigger if the port sector consolidates into a small number of hubs which could increase handling costs (especially in the most remote regions to hub ports).

Who pays for the investment cost to cater for bigger ships also needs to be considered. Another risk for shippers is around port investment. If a port invests in getting bigger ship capable but bigger ships do not call that port, existing shippers may have to bear the cost of the sunk investments but without the savings that come with bigger ships.

Defining the underlying problem caused by bigger container ships

Bigger ships have drawn attention to port capacity (particularly dredging because it is costly). But the supply chain response to leverage the benefits from bigger ships is equally if not more important, for both industry and public policy.

The core of the big ships issue is not the ability of ports to invest but ensuring that the whole of the supply chain can adapt to bigger ships and gain competitiveness by lowering total transport cost.

The overarching question which needs to be answered is **how to best ensure that New Zealand's future freight system configuration accommodates larger ships in a way that minimises total transport costs.**

The challenge for ports, shipping lines and government is to coordinate investments to best deal with the uncertainty bigger ship create and maximise the benefits and minimise the costs of bigger ships for New Zealand.

The problem definition for government is to improve the quality of the regulatory environment and its approach to providing infrastructure in response to container ships increasing in size.

Maintaining sound competition is New Zealand's key insurance for maximising benefits from bigger ships

Maintaining a sound competitive environment, whether the port sector evolves as a hub-spoke or string system (or anywhere in between), is in our view the best approach to ensuring that total transport cost is minimised. If government wishes to take a more hands-on approach, it is unlikely that total transport costs will be minimised.

Bigger ships are already having important implications for New Zealand's supply chains

The increasing ship size in New Zealand and internationally is already having an impact on supply chains. Coordination is taking place across the supply chain between shippers, ports and shipping lines to provide greater certainty for investment.

Government must work alongside these efforts and consider how its own actions either improve or worsen the certainty with which shippers, ports and shipping lines can respond to ships getting bigger.

Both the domestic and international supply chain competitive environments are affected. The consolidation of international shipping lines is of concern to shippers particularly, who are worried that competition between shipping lines is diminishing. Shipping lines, ports and shippers interviewed as part of this project do not yet deem this a major risk.

Domestically, the industry considers the competitive environment as generally sound. There are no major concerns around current or future increases in bargaining power that might compromise efforts to minimise total transport cost.

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1. Scope and approach

1.1. Research questions

The purpose of this research is to test the conclusions reached in the New Zealand Shippers' Council's (NZPSC) 2010 and 2012 reports considering developments globally and in New Zealand since those reports were published. Specifically, this report seeks to answer the following research questions:

- In 2017, in light of the developments, including significant consolidation of shipping lines in the shipping industry, are the conclusions still valid?
- Given significant reductions in freight rates over the last two years, do the previous conclusions that bigger ships will drive lower freight rates hold true in the current environment and what would that do to sustainability?
- What is the impact for New Zealand shippers if multiple ports invest in dredging and other infrastructure improvements to compete for bigger ships? For shippers is this a good or a bad thing?
- Are there new implications that need to be considered?
- Are there new policy recommendations?

1.2. Our approach

Our approach consists of a desktop-based review of the global and New Zealand trends affecting the shipping industry since 2012, followed by stakeholder interviews. The list of interviewees is provided in Appendix B.

The project had three main stages:

- **Desktop review of trends** – review both global and New Zealand trends including data analysis (lower trade volumes, capacity oversupply, shipping industry alliances) but also the current or potential impacts of investments (e.g. widening of the Panama Canal)
- **Develop hypotheses based on trends** – how might the trends identified above contradict or confirm NZSC's earlier conclusions? Have those trends increased or reduced New Zealand's need to accommodate bigger ships?
- **Key stakeholder interviews** – test the hypotheses with key stakeholders, supported by our desktop analysis.

1.3. Our focus

Our focus is on the impact of bigger ships on New Zealand's freight system taken as whole and whether there are new implications or recommendations for action at a high level.

We do not investigate whether specific actions by actors in the supply chain (ports, shippers, shipping lines) have been beneficial or not. Similarly, we were not asked to determine the optimal port configuration as ships get bigger.

2. Background on bigger ships

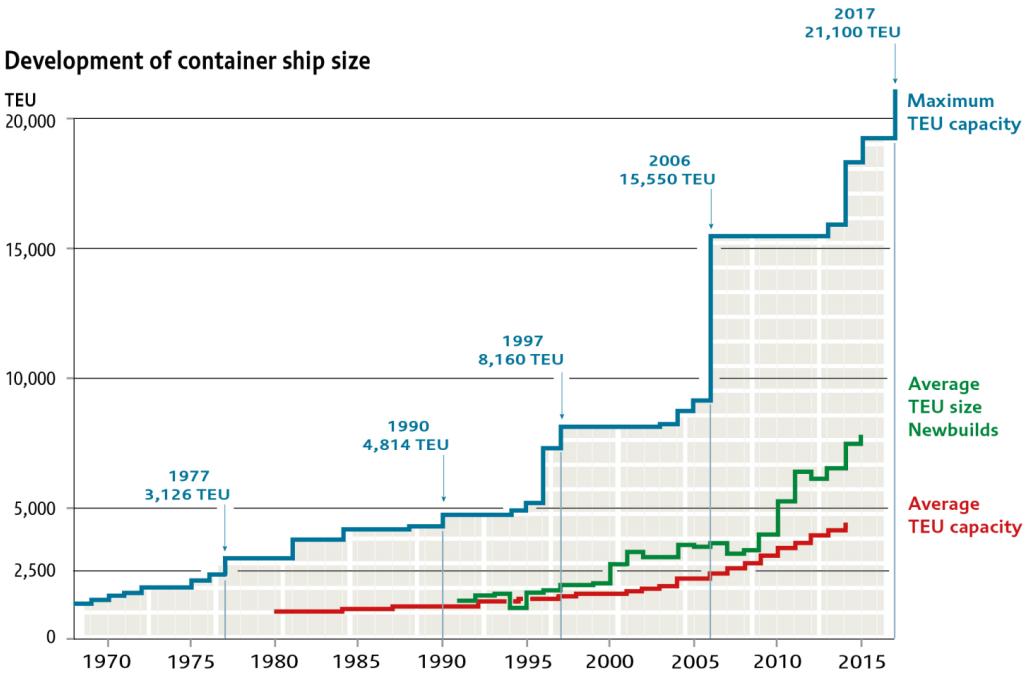
2.1. Ships are getting bigger globally

2.1.1. Ship size has been increasing since the first days of containerisation

Over the last 50 years, international trade has become increasingly containerised, meaning goods traded across borders are packed into containers.

In the search for transport cost savings, container ships themselves are getting bigger. This trend is accelerating. Between 2001 and 2008 the average size for new ships was 3,400 TEU; over 2009 to 2013 it increased to 5,800 TEU. In 2015 the average build was 8,000 TEU (OECD/ITF, 2015).

Figure 1 Increasing container ship sizes



Source: OECD/ITF, 2015

2.1.2. What are mega-ships/ULCVs?

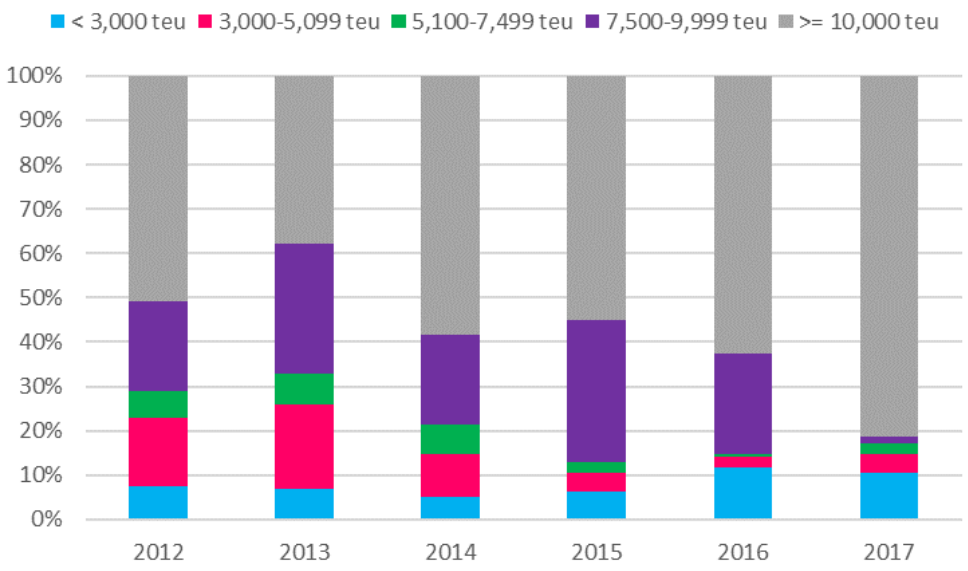
The term mega-ship is being used for the latest generation of container ships (OECD/ITF, 2015). They are also referred to as Ultra Large Container Vessels (ULCV). These ships have a capacity in the order of 21,000 TEU. There are already plans for the next generation of container ships which are expected to reach a capacity of 24,000 TEU (OECD/ITF, 2015).

2.2. Mega-ships are displacing smaller ships on other routes as a cascade effect

The current order book (the orders shipping lines place for new ships to be built) for container ships is skewed towards mega-ships. The higher proportion of mega-ship orders compared to other ship sizes triggers a cascade effect[2] on the structure of the global container fleet.

Figure 2 Order book is very skewed towards bigger ships

Anticipated deliveries



Source: MOT, 2016

Mega-ships are replacing the latest generation of big ships which must be moved to another route (mega-ships are introduced on the North Europe-Far East trade because it is relatively unconstrained, one of the longest by distance and with high trade volumes). They in turn displace the generation of ships before that and so on (OECD/ITF, 2015).

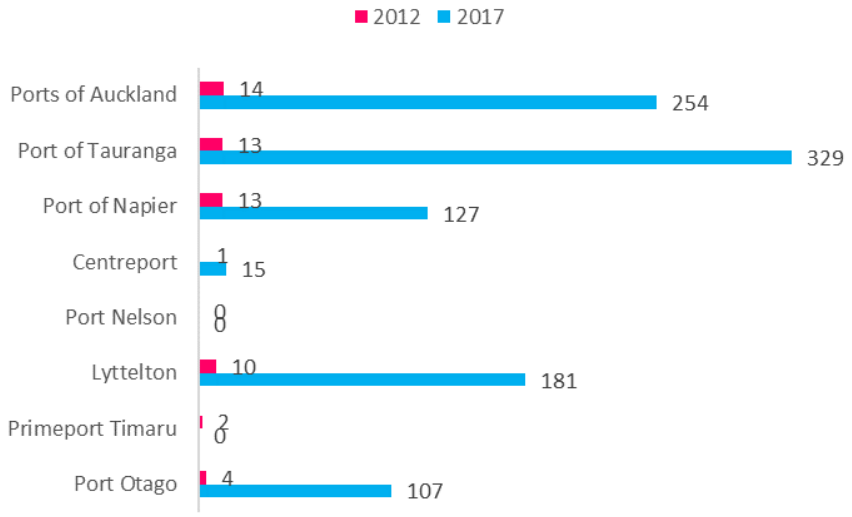
2.3. Ships visiting New Zealand are getting bigger as a result

The global container shipping cascade effect is contributing to an increase in the size of ships visiting New Zealand. Between 2012 and 2017, the number of port visits by ships with a capacity greater than 4,000 TEU has dramatically increased at New Zealand's largest international ports.

[2] The 'cascade effect' is the process by which older generations of big ships (still larger than ships visiting New Zealand currently) are potentially being "bumped" from their current routes towards New Zealand routes.

Figure 3 Bigger ships (over 4,000 TEU capable) are increasingly calling at most New Zealand ports

International port visits for ships 4,000 TEU capable and over; Counts visits to individual ports (so the totals are higher than the number of ships visiting New Zealand)

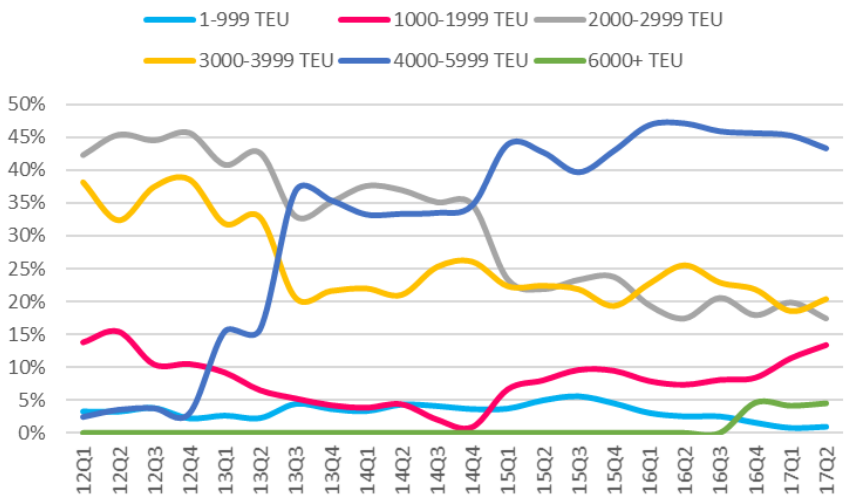


Source: MOT, 2017

Bigger ships in New Zealand have replaced 'medium' sized ships. Much of the transition towards larger ships in New Zealand occurred over 2013, this has slowed down since then.[3] Container exchanges by 4,000 to 6,000 TEU ships has remained more or less constant since 2015 (but at a much higher share than in 2012), but 6,000+ TEU ships are now beginning to make their way to New Zealand.

Figure 4 Bigger ships are replacing 'medium' sized ships

By international ship size; As a proportion of total TEU exchanges



Source: MOT, 2017

[3] This slowing down maybe exaggerated due to the 'line in the sand' thresholds for different ship size categories, but it does reflect the relative lumpiness of the introduction of bigger ships.

3. Overview of the bigger ship debate in New Zealand

The bigger ship debate has attracted lots of attention. Three key research pieces in New Zealand have had a major impact on the debate and provide a good summary of the competing views on the issue.

3.1. New Zealand Shippers' Council – 2010 and 2012 reports

The New Zealand Shippers' Council produced the first landmark report on the question of bigger ships in 2010, with an update in 2012 (which largely confirmed the conclusions reached in the 2010 report). Below we provide a summary of the findings and recommendations of these two reports.

3.1.1. New Zealand is at risk if ports do not invest to accommodate larger ships

NZSC's 2010 report made the case that if New Zealand's ports did not invest in becoming bigger ship capable, there was a risk that shipping services would become 'boutique', meaning that New Zealand would be serviced by relatively small and old vessels (by international standards). Furthermore, New Zealand's trade could be transhipped through Australian ports such as Melbourne, Sydney, or Brisbane, adding cost and potential delays (NZSC, 2010).

3.1.2. Bigger ships are an opportunity for New Zealand

The NZSC estimated that New Zealand could realise up to NZ$144 million per year of net supply chain benefits from 2015/16[4]. These benefits assumed two ports become 7,000 TEU ship capable. The benefits from the increase in ship size was tested against the counterfactual that trade would otherwise be transhipped through Australia (NZSC, 2010).

3.1.3. Recommends investment in four hub ports

Based on projected container volumes and the benefits from catering for bigger ships relative to the potential of transhipment through Australia, NZSC recommended that two ports (POT and Lyttelton Port) invest to become 7,000 TEU ship capable within five years, and that all four major container ports (POAL, POT, Lyttelton Port and Port Otago) eventually will have to become bigger ships capable (NZSC, 2010).

[4] The review or update of this estimate is out of scope.

3.2. New Zealand Productivity Commission – International Freight Transport Services Inquiry (2012)

3.2.1. At odds with the NZSC approach

In 2012 the New Zealand Productivity Commission (NZPC) released their findings from their International Freight Transport Services Inquiry (Freight Inquiry). The report acknowledged but also contested the NZSC's approach, conclusion and recommendations.

The NZPC's principal rebuttal was that higher costs to consumers are punished in competitive marketplace:

> *Shippers are unlikely to pay more for an inferior service, and shipping lines are unlikely to 'leave money on the table' by missing an opportunity for profit (NZPC, 2012).*
>
> *Competing shipping lines would have an incentive to reinstate a direct New Zealand-Singapore service and capture some of this revenue. Hubbing via Australia will only be viable should it provide a lower price or improved service quality than the status quo (NZPC, 2012).*

The report concluded:

> *The Commission cautions against using the 'Australian hubbing' scenario to justify investment in bigger ship readiness or central government planning of port infrastructure (NZPC, 2012).*

3.2.2. NZPC recommended a cautious and tailored approach

The NZPC acknowledged that bigger ships do raise questions around the coordination of investments to be made, particularly at ports.

But the report disagreed with the NZSC approach to defining the problem and estimating the risks associated with it. It recommended that the framework on which to base government decisions when confronted with the question of bigger ships must be more robust (NZPC, 2012).

It also noted that there is a role for the government to play as part of those coordination challenges but it must be wary of over-extending:

> *Governments can usefully promote this process by facilitating information sharing and discussion about different options, while ensuring that there is adequate coordination between different levels of government and between their own investment decisions when these cut across transport modes.*

But if the government adopts a strong leadership approach, it may well choose an inferior option, based on incomplete information (NZPC, 2012).

Because the question of bigger ships is complex, the strength of the approach and the robustness of the framework must be comprehensive enough to deal with the complexity if it is to help decision-makers understand the opportunities but also the trade-offs associated with bigger ships. The government can play a role, but it must understand the limitations of its role under uncertainty.

3.3. Ministry of Transport – Freight Futures Study (2014)

In 2014, Deloitte released a study commissioned by the MOT about the future of freight in New Zealand. Its focus was on the potential evolution of the port sector in New Zealand and how different scenarios of port hub-spoke system would impact the New Zealand economy (see Figure 27).

3.3.1. The study considered various future potential hub-spoke port scenarios

Ten possible scenarios were discussed. They differed by varying degrees of hub-port concentration and permutations of which ports would arise as hubs (while the others would become feeder ports).

3.3.2. Estimated benefits from bigger ships but also operational and capital costs

The study took a cost-benefit analysis (CBA) approach and looked at port capacity but also the required investments in road and rail depending on the port system (hub-spoke) configurations.

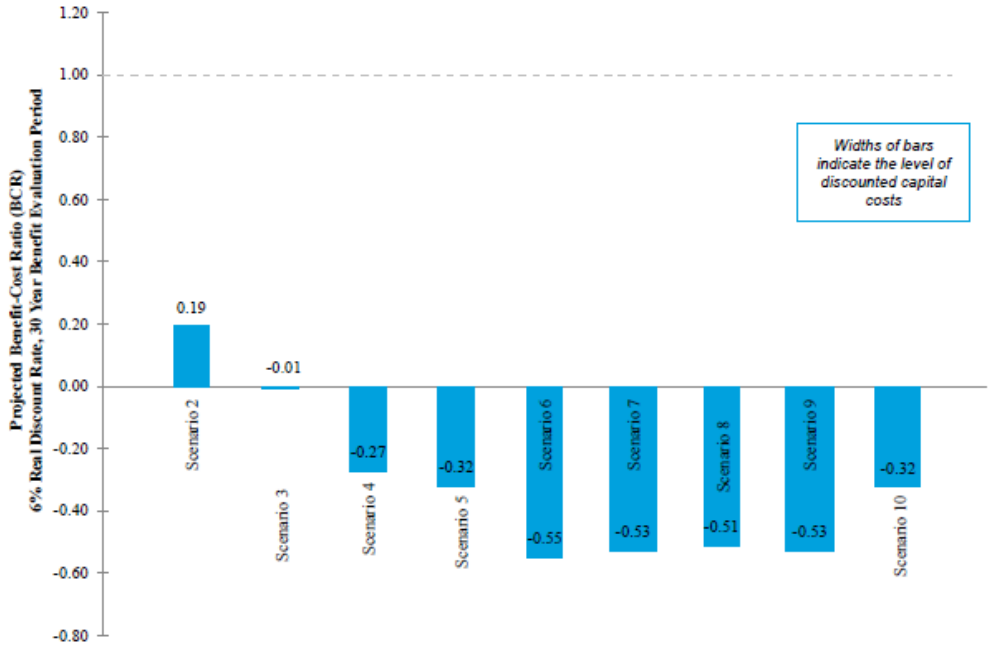
It considered both operational costs (lower freight rates with potential increase in transport within New Zealand to consolidate volumes to hub ports) and capital costs (infrastructure investments required to accommodate larger ships through ports, road and rail).

3.3.3. Concluded that bigger ships may not be welfare enhancing to New Zealand

The study concluded that as the ships get bigger, the costs outweigh the benefits. No alternative hub and spoke scenario passes the cost-benefit test (see Figure 5).

Figure 5 As ships get bigger, so do the costs to accommodate bigger ships at ports

Projected Benefit-Cost Ratio (incremental to Scenario 1)



Source: MOT, 2014

3.4. The debate is not limited to New Zealand

The OECD/ITF (2015) makes the same argument for ports and shippers globally (it focused specifically on mega-ships but the conclusions are still relevant for New Zealand as we consider the question of bigger ships) as the MOT study:

> *There are cost savings of mega-ships, but these are decreasing and might not even be realized. The transport costs due to larger ships could be substantial. There are size-related fixes to existing infrastructure, such as bridge height, river width/depth, quay wall strengthening, berth deepening, canals/locks and port equipment (crane height, outreach).*
>
> *Mega-ships also require expansion of infrastructure to cater to the higher peaks related to mega-ships; as a result, more physical yard and berth capacity is needed. A substantial share of the dredging, infrastructure and hinterland connection costs are costs to the public sector in many countries (OECD/ITF, 2015).*

4. Framing the issue of bigger ships for New Zealand

To understand how bigger ships will affect New Zealand's future, we must first very clearly frame the issue of bigger ships.

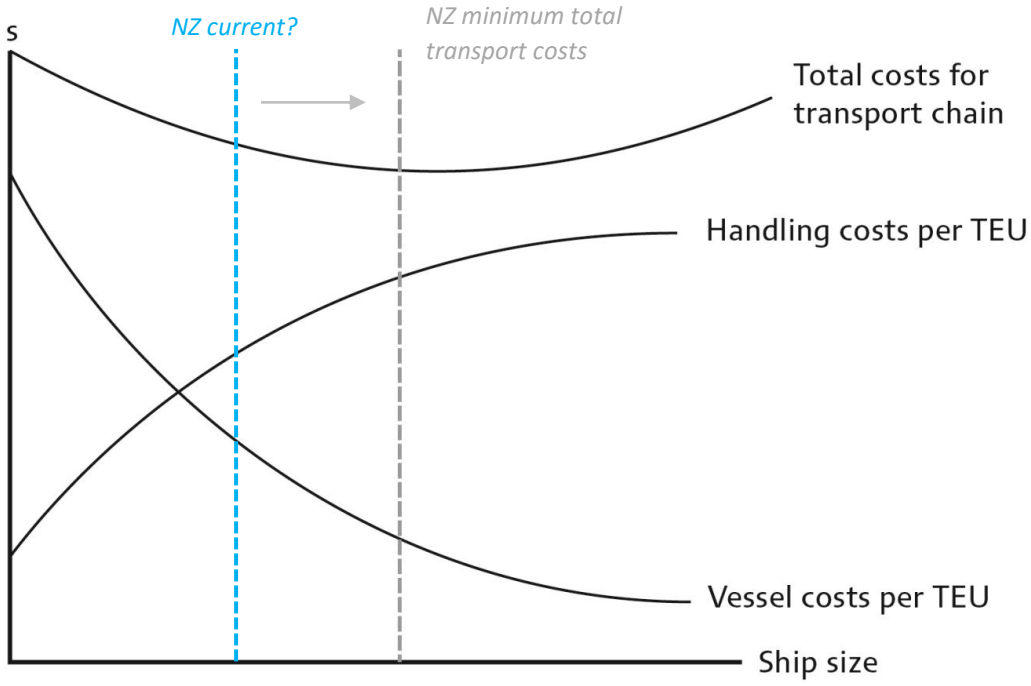
4.1. Framework: total transport costs rather than shipping transport cost alone

Our framework for this analysis is the total transport cost of moving containers across the supply chain, not just the shipping cost. The total transport cost is broken down into two parts:

3. **Handling costs** – the transport cost between the gate and the port (including the handling cost at the port)
4. **Vessel cost** – the shipping transport cost (OECD/ITF, 2015).

Figure 6 The trade-offs of bigger ships calling New Zealand

The shape of the curves are for illustrative purposes only and explain the trade-offs involved with bigger ships. They are not representative of the relative magnitude of handling and vessel costs per TEU.



Source: OECD/ITF, 2015

As ships get bigger, the shipping transport cost (or vessel cost) per container falls. There is however a decreasing marginal reduction to this cost meaning that the cost

reduction per container for future bigger ships visiting New Zealand (above 5,000 TEU) will be lower than for the previous increases in ship size (OECD/ITF, 2015).

Conversely the handling cost per TEU increases as ships get bigger for two reasons:

- **Operational costs** – the longer distance that the container must travel to the hub port to be loaded onto bigger ships (which may not apply in every situation)
- **Capital costs** – the infrastructure investments in road, rail, coastal shipping and at the ports themselves to cater for bigger ships (assuming that capital costs are recovered through pricing the use of the infrastructure which would increase the total handling costs on a per TEU basis).

  It is important to distinguish between capital costs at the ports and capital costs to provide road, rail and coastal shipping infrastructure. They do not necessarily move in the same direction.

4.1.1. Total transport cost is more than just the freight rate

Vessel cost

The overcapacity of bigger ships has led to slow steaming.[5] This means that the 'cheaper' headline freight rate per TEU of bigger ships is at least partially offset by the implicit cost of reducing the speed at which the ships travel.

Handling costs

Managing transit times will be crucial considerations for shippers and cargo owners.

Bigger ships could lead to a reduction in port call frequency (the number of port visits). This would be an important issue for New Zealand, due to the seasonal and perishable nature of many of our export products. There perhaps is an upper bound on how frequently large ships can visit before the frequency of port calls, even at hub ports, becomes too much of a risk.

To further manage transit times, existing land side congestion issues at ports will need to be addressed as bigger ships would lead to greater 'spikes' in containers exchanged. Finally, to the extent that bigger ships may lead to further supply chain integration it would provide savings to be shared across the supply chain.

Social costs (visual amenity, emissions, noise, injuries, fatalities, road congestion)

Social costs, particularly emissions, are an integral part of the total transport cost of a supply chain.

As ships get bigger and more fuel-efficient (a 6,500 TEU vessel emits 31% less carbon per TEU than a 2,600 TEU vessel), they contribute to the transition towards a lower emissions future (NZSC, 2010).

[5] Slow steaming is when ships are operated at slower speeds to reduce fuel and over capacity.

In this sense emissions from shipping move in the same direction as vessel costs when thinking about the shape of the curves in Figure 7. But emissions are only one part of social costs and shipping is only one part of the supply chain.

Social costs affect both handling and vessel costs.

4.1.2. Who pays for the capital handling cost?

How the capital investment component of handling costs is funded is an important problem associated with the question of bigger ships. If the investment cost is not recovered by pricing the use of the infrastructure, then the handling cost per TEU within the supply chain may not increase as ships get bigger.

The infrastructure is funded as subsidy. While ultimately New Zealand would benefit from lower vessel costs, taxpayers or cross subsidies within the supply chain would have funded the infrastructure to make this cost reduction possible.

To correctly apply the total transport cost framework, we must take a cost-benefit analysis approach which intends to maximise welfare for New Zealanders (as taxpayers) and not only shippers or ports (or international shipping lines).

Furthermore, there are competing interests between and within shipper, port and taxpayer groups. Not all New Zealand's regions will benefit equally (and some regional economies may be hurt).

The economy-wide distribution of the impacts may lead some regions to benefit and others to suffer. The export and import catchments closest to hub ports are likely to benefit the most.

4.2. Determining the shape of the curves for New Zealand is difficult

The shape of the curves Figure 6 are a function of complex drivers and vary by country based on their size, geography/topography, type of goods exported and imported, number of ports, the different shipping routes and many other factors.

For New Zealand, the big question is what does the "total costs for the transport chain" curve look like, and where are we now in relation to its lowest point, i.e. the lowest total transport cost per TEU, where the dotted line crosses the curve in Figure 6. In theory, while there could be a ship size that is ideal for New Zealand's trade, in practice it is too complex to determine.

4.3. Defining the problem

What exactly is the problem that we are trying to solve regarding the visits of bigger ships to New Zealand?

Defining the problem as the risk that New Zealand may not develop the capacity to accommodate larger ships is not sufficient. That is only a symptom of the underlying problem. The problem is not that the government must plan under uncertainty either – that is just a feature of the challenge, rather than the underlying issue.

The overarching question which needs to be answered is **how to best ensure that New Zealand's future freight system configuration accommodates larger ships in a way that minimises total transport costs.**

Hence, the problem definition for government is how to improve the quality of the regulatory environment and its provision of infrastructure in response to container ships increasing in size.

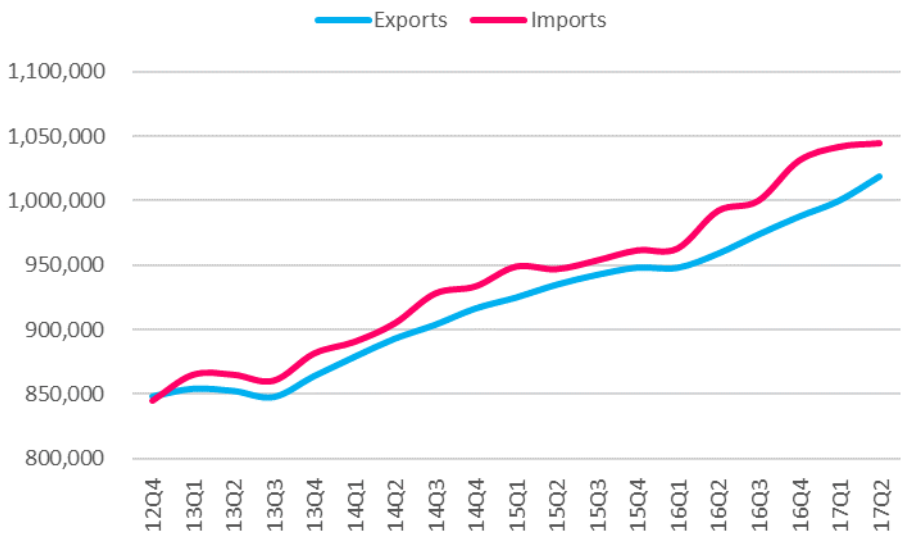
5. How has New Zealand adjusted to bigger ships since 2010?

5.1. New Zealand container trade volumes grew despite a slow global recovery

Despite the slow global recovery from the GFC, New Zealand's total export and import container volumes have both increased by about 200,000 TEU between 2012 and 2017.

Figure 7 Export and import volumes are growing at a relatively similar rate

TEU; Rolling 12 months; Quarterly



Source: MOT, 2017

The final origin and destination of exports and imports (respectively) in New Zealand are important to the bigger ships debate. Depending on which ports arise as hubs, it may increase costs for some shippers and not for others. The geographical location of the dairy industry relative to hub ports, for example, needs to be considered.

New Zealand's trade is increasingly with Asia, and China particularly. This concentration could provide potential opportunities for shipping lines to offer additional routes and ship capacity. The following provide an overview of the evolution of New Zealand's containerised trade since 2012:

- About half of containerised export volume growth has come from dairy exports, despite low prices over 2014 and 2015. Dairy, vegetables, fruits

and foodstuffs (processed) account for the lion's share of New Zealand containerised exports (see Figure 26 in Appendix B)

- China is the major importer of New Zealand's dairy exports, and its share of total container export volumes is increasing. It now matches the total Australian/Pacific volumes (see Figure 27).
- Containerised import growth is more balanced across commodities than for our exports (see Figure 28).
- The geographical origin of import growth has also been more balanced, with most of the increase coming from China, South East Asia and Europe (see Figure 29).

5.2. New Zealand ports are investing to cater for bigger ships

The ability of ports to handle larger vessels depends on several factors:

- Channel and berth pocket dimensions (depth, width, length)
- Size of quay cranes – larger cranes are required to reach wider beamed vessels
- Number of quay cranes – larger vessels will mean higher exchanges of containers per visit
- Number of container handlers required to support each quay crane
- Larger capacity container yards (MOT, 2014).

MOT (2014) summarised the current capacity of each port from the perspective of length and depth in 2014 (see Figure 8).

Figure 9 should not be taken as a representation of current port capacity. Its purpose is to summarise the capacity at different ports in 2014. We then subsequently discuss in Table 1 investments that have taken place since 2014 as well as future investment plans.

Figure 8 New Zealand port capacity to cater for bigger ships as of 2014 – some ports have invested since then which are summarised in Table 1

LOA (Length over all) – total length of the vessel

Port and Ship Class			Ports of Auckland	Port of Tauranga	Port of Napier	Port Taranaki	Centerport	Port Nelson	Lyttelton	PrimePort Timaru	Port Otago	South Port
Emma Maersk												
	TEU: 15,200	LOA(1)										
		Depth										
Gudrun Maersk												
	TEU: 9,500	LOA		✓								
		Depth										
Sovereign Maersk												
	TEU: 8,200	LOA	✓	✓								
		Depth										
Regina Maersk												
	TEU: 7,403	LOA	✓	✓							✓	
		Depth	✓						✓		✓	
NYK Altair												
	TEU: 4,953	LOA	✓	✓	✓						✓	
		Depth	✓	✓					✓		✓	
President Truman												
	TEU: 4,538	LOA	✓	✓	✓	✓			✓		✓	
		Depth	✓	✓		✓	✓		✓		✓	

Source: MOT, 2014

Table 1 summarises port developments since 2014 as well as planned investments.

Table 1 Recent investment developments by New Zealand ports for bigger ships

Port	Recent capacity development
Ports of Auckland	Ports of Auckland recently released its 30-year masterplan which includes berth extensions and channel dredging (POAL, 2017). Details on cost and channel depth not yet available but Ports of Auckland has consent to deepen its ship berths up to 14.5m (POAL, 2017). Ports of Auckland has also invested in three new cranes which can load and unload up to 19 containers deep (Prentice, 2017). POAL's long term investment includes automation of its terminal stacks which will increase its terminal capacity to around 1.7 million TEU (Prentice, 2017).
Port of Tauranga	Port of Tauranga is investing nearly $350 million to handle larger ships including by dredging its channel (Knowler, 2016). The first stage of the dredging is estimated at a cost of $40 to $50 million (POT, 2015). Port of Tauranga's channel is now 14.5m deep at low tide (POT, 2015). In late 2016, the Aotea Maersk with a capacity of more than 9,500 TEU began to call at Port of Tauranga (Knowler, 2016).
Napier Port	Port of Napier has plans for an up to $100m development including a new 350m wharf container terminal which would require some dredging around it. It is also seeking to dredge its channel from the existing consented depth of 12.8m to 14.5m (Port of Napier, n.d.) (Radio New Zealand, 2016). It is applying for a staged consent (six stages) to progressively meet demand for larger ships over time (Port of Napier, n.d.). Port of Napier also recently purchased cranes in 2014 (at a cost of $34 million) that could accommodate bigger ships (Underhill, 2014).
Centreport	CentrePort is seeking consent to dredge its channel to $14.5m so that it can handle 6,000 TEU ships at a cost between $37 and $44 million. The deepening of the channel is likely to be staged (Maxwell, 2016).
Port Nelson	Port Nelson is expecting fewer direct international visits and more feeder services but has retained international calls over time nonetheless. The cost of deepening the shipping channel at the time was considered prohibitive (estimated at $250 million) (Watson, 2010).
Lyttelton Port	MOT commented that of all the major ports, Lyttelton Port is the most constrained to take larger vessels (MOT, 2014). Following the Christchurch earthquake, the port developed a 30-year vision in which it will spend $1 billion on re-development. The plan includes extending the channel by 6.5 kilometres, doubling its current length as well as making it 20m wider and up to 6m deeper (New Zealand Coastal Society, 2016). The dredging cost is estimated to cost $80 million to $120 million, and will provide capacity for ships up to 8,000 TEU capable with 14.5m channel depth (New Zealand Coastal Society, 2016).
Port Otago	Port Otago has completed the first stage of its dredging (increasing the depth of the channel to 14m); the second phase is to allow the port to handle ships of 8,000 TEU (by dredging to 15m) (Knowler, 2016). The total dredging cost is estimated at $30 million (Mcneilly, 2015). Port Otago's investment also includes larger cranes, wharf strengthening, new warehousing and new tugs (Hartley, 2016).

Source: Various (as cited in table)

These increases in capacity at potential hub ports for New Zealand are broadly in line with the NZSC's 2010 recommendations.

5.3. Port market structure changes spark debate over hub-spoke future

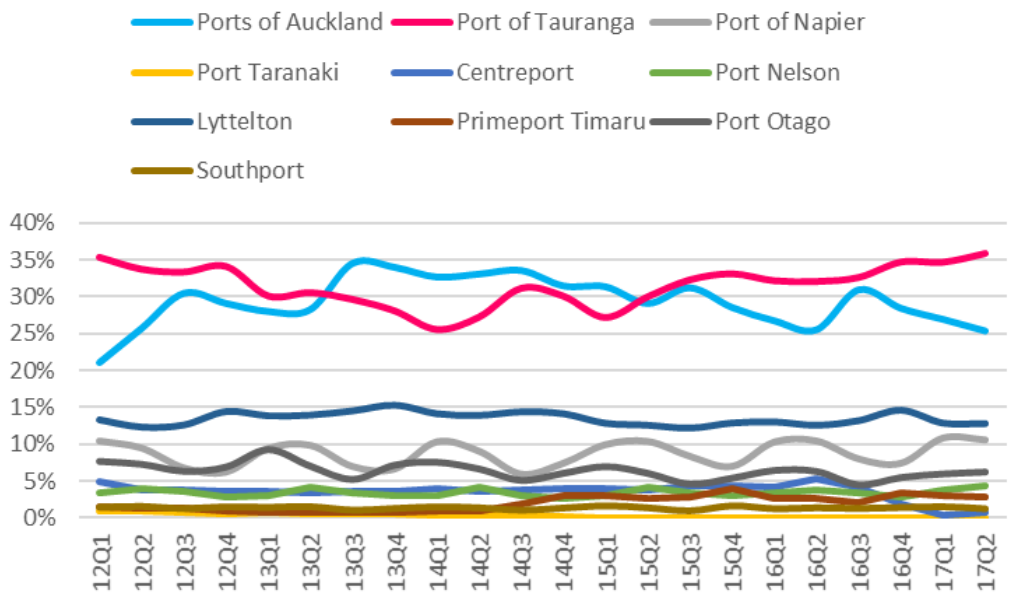
5.3.1. Changes to port market structure

The most significant changes to New Zealand's port structure over the last 5 years are taking place at Port of Tauranga. POT's container volume market share has been growing since 2014, and it is the only port exhibiting strong growth in container volume handled since 2014.

Other port market shares (in terms of containers handled) have remained relatively stable with total container volumes handled stable or slightly growing or falling.

Figure 9 NZ port sector market structure

Total TEU loads and discharges by port; Share of NZ total; Quarterly



Source: MOT, 2017

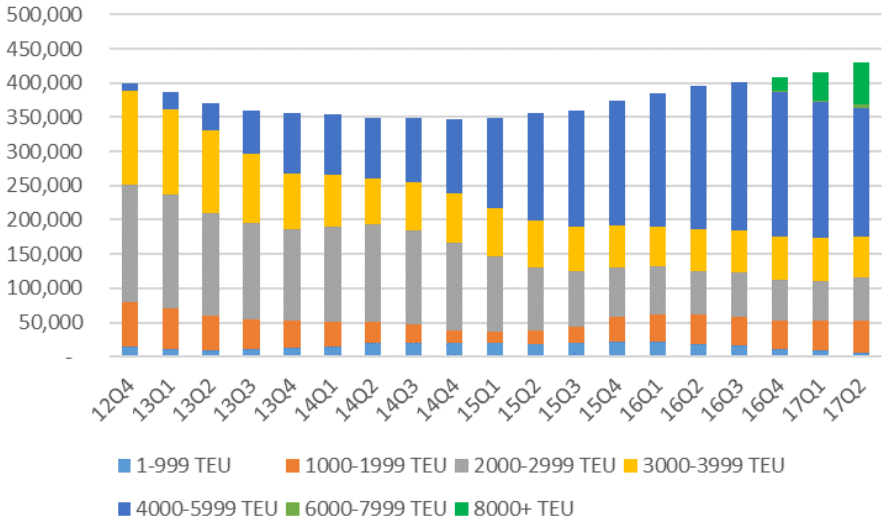
Total container handling at ports can be broken down into imports and exports.

In both cases, POT is gaining market share. It now handles import volumes comparable to that of POAL. The growth in export volumes has been even more concentrated towards POT than imports.

Activity at the Port of Napier is also increasing, but some of its most recent gains can be in part attributed to Centreport's shutdown. Primeport, while only handling small volumes, is also growing strongly. All other New Zealand ports, including POAL, have seen only relatively minor changes to their total volume of containers handled. All of POT's recent growth over the last year was accommodated by bigger ships (8,000+ TEU capable).

Figure 10 Almost all of the increase in containers handled by bigger ships over the last two years has taken place at POT

Port of Tauranga container load and discharges; Rolling 12-month; Export TEU by ship size



Source: MOT, 2017

5.3.2. Transhipment[6] volumes are on the rise after fluctuating since 2012

Total container handling at ports includes imports and exports but also transhipment and domestic shipping. Imports and exports are growing at relatively similar rates while domestic shipping is rising strongly.[7]

Transhipment volumes have been rising fast since the end of 2016. Alongside the various port investment plans across the country, this trend is sparking debate around the future structure the port sector and the role of different hub ports, particularly Port of Tauranga.

Since the end of 2016 export and import transhipment volumes have taken off after 5 years of fluctuations (transhipment volumes rose 40% in a year). Again, transhipment volumes (import transhipment loading and export transhipment discharges) are only growing at two hub ports, POAL but POT in particular (Figure 33 and Figure 34).

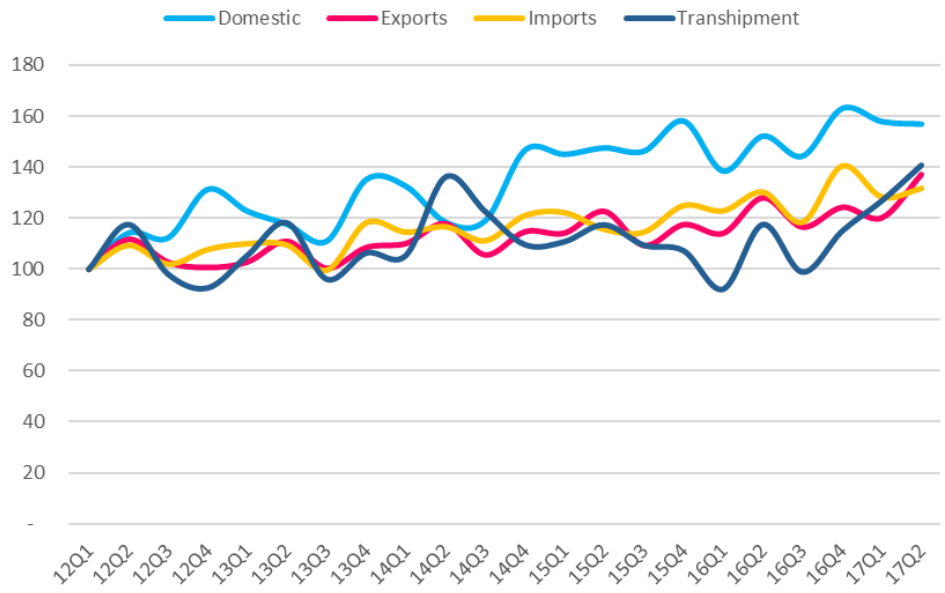
This trend is more visible for the share of exports transhipped across the entire port sector. Since the end of 2016, the share of total exports transhipped has stabilised and has been growing since the beginning of 2017.

6 The characterisation of cargo movements in FIGS (MOT, 2017) is designed to split shipping movements into international and coastal. For an export container that is transhipped, the container is loaded at a New Zealand port, is shipped to a second New Zealand port, discharged, and is then loaded for export without leaving the second port, and without the cargo changing (FIGS, 2017).

7 Domestic coastal shipping has grown strongly but only between three ports, POAL and POT (where containers are loaded) and Lyttelton Port (where the majority are destined). Domestic coastal shipping is only growing between hub ports.

Figure 11 Trends in TEU loads and discharges in New Zealand

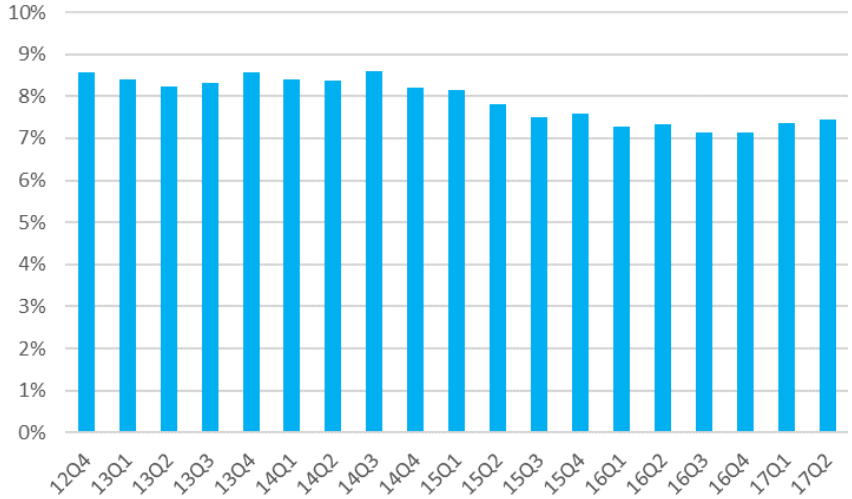
TEU loads and discharges; Index 2012 = 100; Transhipment includes re-exports



Source: MOT, 2017

Figure 12 Share of total exports transhipped has just started to rise

Percentage of exports that are transhipments



Source: MOT, 2017

5.3.3. Exploring changes in transhipment volumes across ports

Export transhipment[8]

New Zealand has two export 'hub' ports (where containerised transhipped exports are discharged), POAL and POT, with POT handling about three times POAL's export transhipment volume since the beginning of 2017. While POAL's volumes are not growing strongly for import and exports, its role as a hub for transhipment is also somewhat strengthening.

Port Otago, Primeport, Port of Napier and Port Nelson are increasingly sending exports to be transhipped through either POAL or POT (much of that change has taken place over the last year).

Import transhipment[9]

Import transhipment loadings are increasingly concentrated at two ports, POAL and POT. POT's import transhipment rose sharply over the last year, reaching volumes now comparable to that of POAL.

Import transhipment discharges are also increasingly concentrated at Lyttelton Port and Port Otago, the two hub port candidates for the South Island (imports to those two ports are being transhipped through North Island ports).

5.3.4. POT aside, road has traditionally accounted for most of the increase in container movements to and from ports

Between 2012 and 2015, most of the growth in container handling to and from ports was via road transport, which is more competitive for destinations under 150km (rule of thumb) trips.

Port of Tauranga is an exception to this trend with most of the growth in and out of the port being moved by rail (from about a third to half of exports between 2012 and 2016) (MOT, 2017).

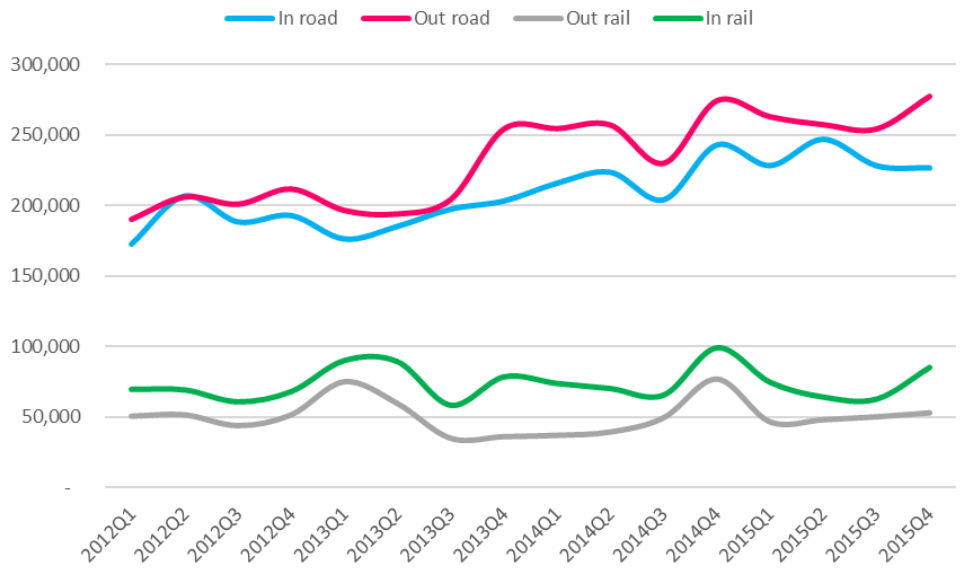
Because Port of Tauranga moves container by rail and most of the total container volume handled in New Zealand has been at Port of Tauranga, since 2016 the total container tonnage moved by rail is rising. The share of container tonnage to the total rail tonnage has increased from 41% in 2015 to nearly half in 2017 (MOT, 2017).

8 Figure 31.

9 Figure 32.

Figure 13 The increase in container handling across New Zealand's combined ports is being met primarily by road

Land transport mode to the ports (TEU)



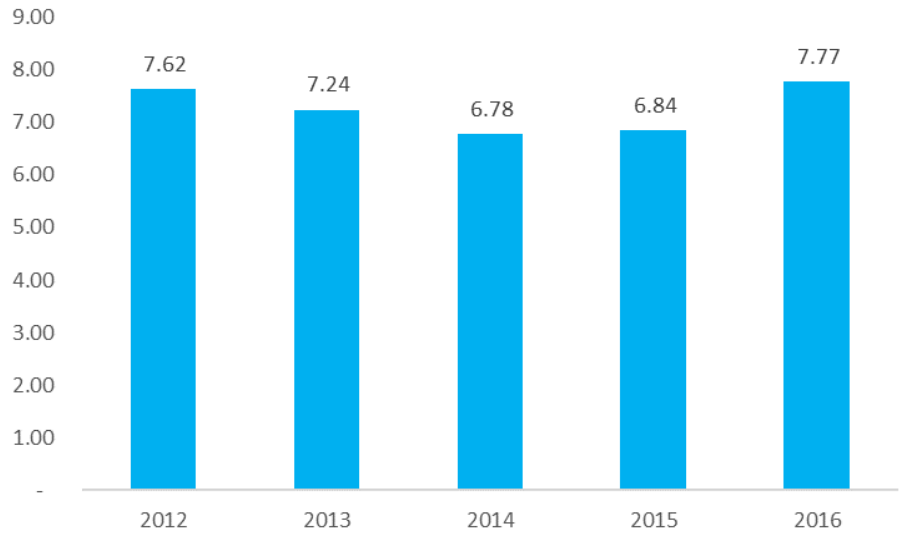
Source: MOT, 2017

5.3.5. The use of rail is increasing

POT and Port Otago have been increasing the proportion of containers moved in and out of their ports by rail (see Figure 33). Most of the increase in rail container movements has been between Auckland and the Bay of Plenty region (see Figure 36).

Figure 14 For the first time since 2012, the use of rail for container movement has increased

Million tonnes, Total weight of shipping containers moved by rail



Source: MOT, 2017

6. Looking forward – what trends will affect the future of bigger ships in New Zealand?

6.1. The global shipping industry is in a major state of disequilibrium

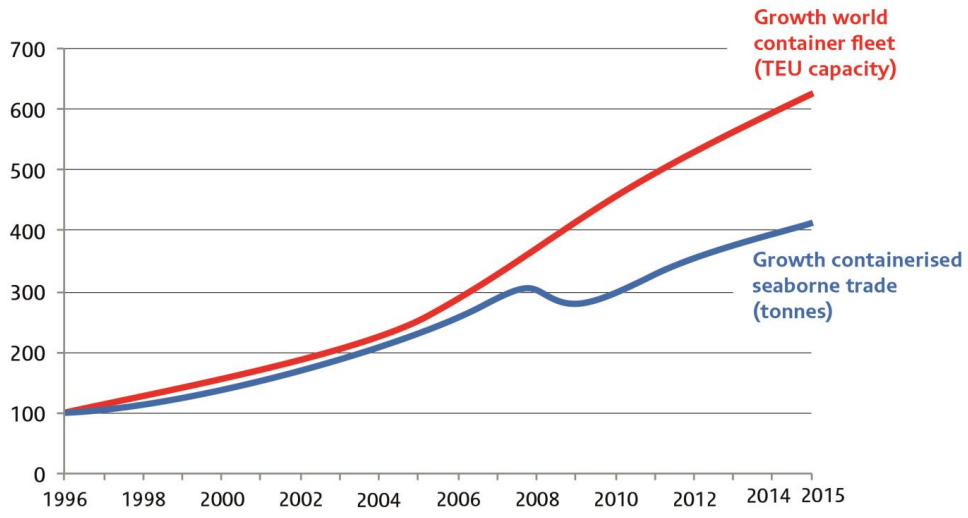
OECD/ITF puts it simply:

> *The development of the world container fleet over the last decade is completely disconnected from developments in global trade and actual demand (OECD/ITF, 2015).*

Up until the GFC in 2008, the supply of container ship capacity was closely related to demand for seaborne trade. Since the GFC, the growth in capacity through the building of bigger ships has clearly outpaced demand.

Figure 15 Disconnection between container ship size capacity and seaborne trade growth

Index 1996 = 100



Source: OECD/ITF, 2015

Most ports in the world have seen declines in throughput growth rates. Only some of the largest ports have been able to maintain growth rates (UNCTAD, 2016).

UNCTAD reports that in 2015, despite a growing gap between demand and supply since the GFC, bigger ships continue to be built:

Global container shipping demand slackened in 2015. The segment recorded its slowest growth rate since 2010 – 2 per cent, compared with 5 per cent in 2014. At the same time, sluggish demand was challenged by an accelerated massive global expansion in container supply capacity, estimated at 8 per cent in 2015 – its highest level since 2010 (UNCTAD,2016).

6.1.1. Why are lines building bigger ships?

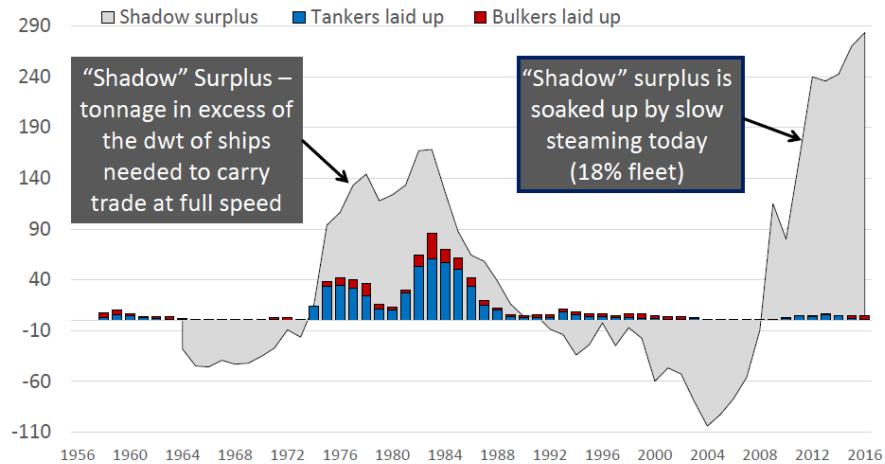
The shipping industry behaves in super cycles; it tends to overinvest in capacity during boom periods (Parry-Jones, 2017).[10] Shipping lines compete on price. The ability to build ever bigger ships has therefore led to what the OECD/ITF calls the 'herd' effect, a situation in which shipping lines must keep up with competing lines in the big ship race (OECD/ITF, 2015).

The last slump period of the cycle was between the mid-70s and the late 80s. In the early 90s, demand and supply were closer to equilibrium (also called the rebuilding phase). This was followed by the last boom period starting in the early 2000s, which the GFC ended. The shipping industry has been in the slump phase of the cycle ever since.

The difference between the current and last slump is that shipping lines are operating more of their vessels at slower speeds, a practice called slow steaming. The purpose of slow steaming is two-fold, to

- reduce fuel costs, as the ship engines consume less fuel at lower speeds
- absorb overcapacity, as a greater number of ships are needed for the same demand and hence this prevents ships being laid up (PECC, 2016). Clarkson estimates that 2.5 million TEU of capacity have been absorbed since the end of 2008 as a result of slow steaming (UNCTAD, 2016).

Figure 16 The shipping super cycle, capacity laid up and slow steaming



Source: Stopford, 2017

[10] This is due to the inelastic nature of aggregate demand for container shipping (it is relatively insensitive to price) (NZIER, 2010a).

This state of disequilibrium in the shipping industry is having knock-on impacts. This is called the 'cascade effect' and is the process by which older generations of big ships (still larger than ships visiting New Zealand currently) are potentially being "bumped" from their current routes towards New Zealand routes.

The current disequilibrium in the global shipping industry is putting pressure on ports (through the cascade effect) which compete for bigger ships themselves by investing in their capacity to cater for them. As the demand for and the supply of container shipping services will slowly converge, a new equilibrium will emerge with a new worldwide port hierarchy (PECC, 2016). The question of bigger ships can be boiled down to what port hierarchy will arise in New Zealand as we move towards this new equilibrium.

6.2. Freight rates have reached record lows

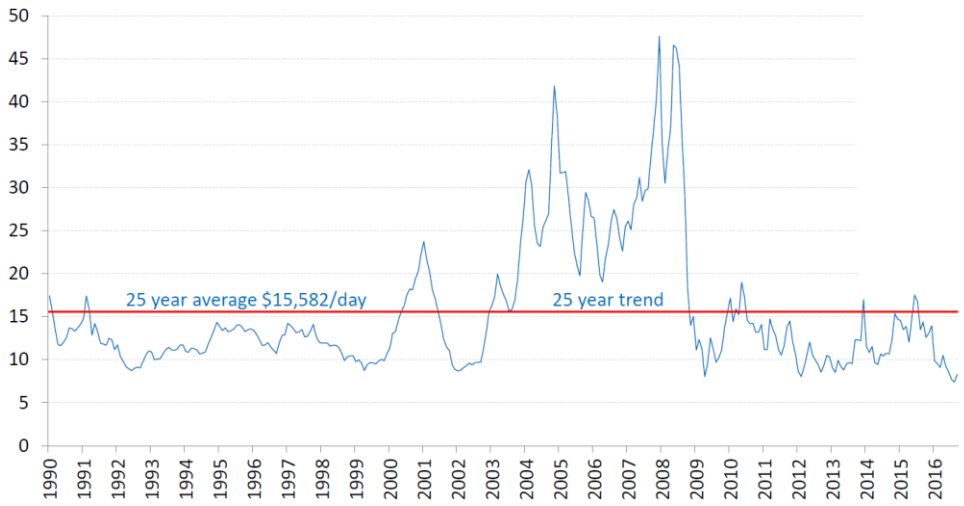
Freight rates for the container industry have been declining steadily. The worsening issue of overcapacity built up in 2015 is still being felt today.

UNCTAD reports that in 2015:

> *Average spot freight rates on all trade lanes dropped significantly. The Far East–Northern Europe trade route freight rates, for example, averaged as low as $629 per TEU in 2015, down by almost 46 per cent from the 2014 average and by 65 per cent, compared with rates in 2010* (UNCTAD, 2016).

The ClarkSea Index, the headline indicator of freight rates of all sea transport segments, shows the dramatic decline over the last decade.

Figure 17 The ClarkSea Index is at its lowest level in 20 years



Source: Stopford, 2016

Shipping lines have on a few occasions attempted general rate increases to address the supply-demand imbalance; they all failed (UNCTAD, 2016). This challenging environment for container shipping has forced shipping lines into alliances as well as

practices such as slow steaming to try and preserve profitability. That has not always been enough; Maersk, the world's largest container shipping company, reported a decline in net profit of 82 per cent in 2015 (UNCTAD, 2016).

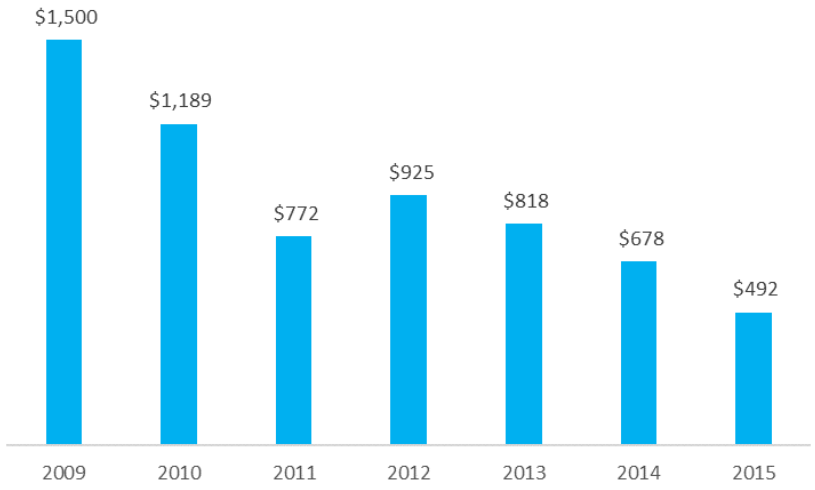
6.2.1. New Zealand's shipping costs have plummeted

Shipping costs are at historical lows for New Zealand; the cost per TEU is a third of what it was in 2009 on the Shanghai to Australia/New Zealand route (UNCTAD, 2016). This is great for New Zealand's competitiveness (although the trend is global), but it is important to distinguish two transport cost reductions as a result of bigger ships.

While some of the reduction in New Zealand's shipping costs may be attributable to the introduction of bigger ships to New Zealand, this is likely to explain only a small proportion. The lion's share of the freight rate reduction is more likely to have resulted from the global overcapacity built up by the container shipping industry's 'bigger ship race'.

Figure 18 New Zealand's shipping costs have plummeted

US$ per TEU; Shanghai–Australia/New Zealand (Melbourne) freight market



Source: UNCTAD, 2016

6.2.2. Oil prices are also subdued

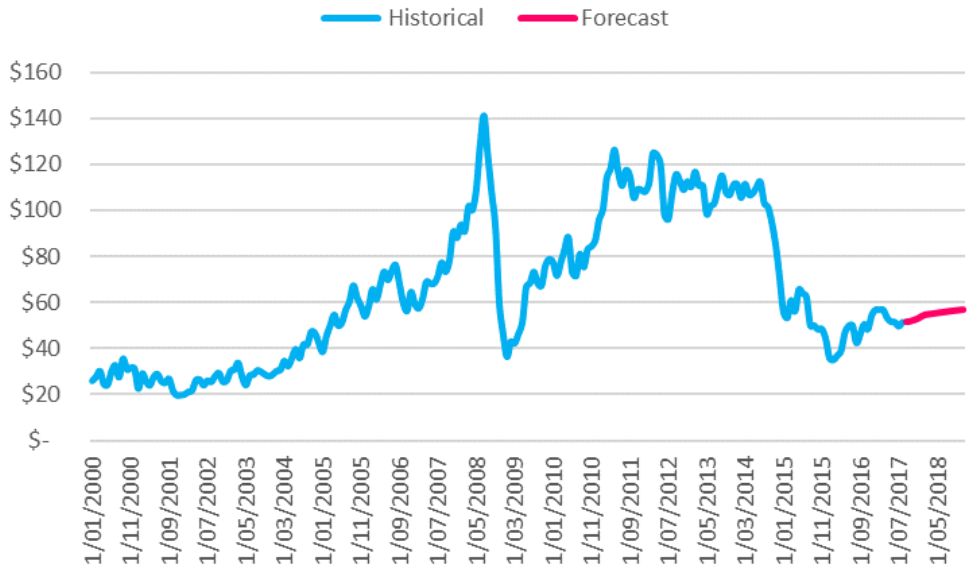
Oil prices are also subdued which contributes to lower freight rates in many ways. UNCTAD (2016) summarises how lower oil prices are contributing to oversupply in the container ship industry:

> *With low oil prices, there is less pressure for operators to apply slow steaming to save fuel, and if ships are faster, additional vessels are potentially released from service, increasing overcapacity. Another effect of low oil prices is that there is less incentive to scrap old, inefficient capacity* (UNCTAD, 2016).

Another impact of lower oil prices is that it allows ships to make a greater number of port calls on a particular route, which allows bigger ships to be viable on more routes than would otherwise be the case (such as New Zealand) (Lloyd's Loading List, 2016).

Figure 19 Oil prices have come down significantly since 2010/2012 and are not projected to increase substantially in the near term

Crude Oil-Brent; Monthly; FOB U$/BBL



Source: Barchart.com

6.3. Container ship scrappage is at an all-time high

Scrappage of retired container ships is driven by many factors. Steel prices are an important factor – as steel prices go up they provide a greater incentive to scrap ships.

The other important factor is the relationship between where there is demand for container shipping (on which route) and which ship size is most adequate to service that demand, i.e. where the ship can be cascaded to. Ships that can't be cascaded are more likely to be scrapped.

Container ship scrapping could hit a new record in 2017

Alphaliner asserts that container ship scrapping could hit a record 750,000 TEU in 2017 (Hand, 2017). Traditional Panamaxes (4,000 to 5,000 TEU) make up the majority of tonnage scrapped as their use is being significantly reduced from the widening of the Panama Canal. 2016 also saw another record for youngest ship ever scrapped, a 4,250 TEU ship built in 2009 (Hellenic Shipping News, 2017). Scrapping is also increasing for 3,000+ TEU while 6,000+ TEU ships are being scrapped for the first time (Clarkson Research, 2016).

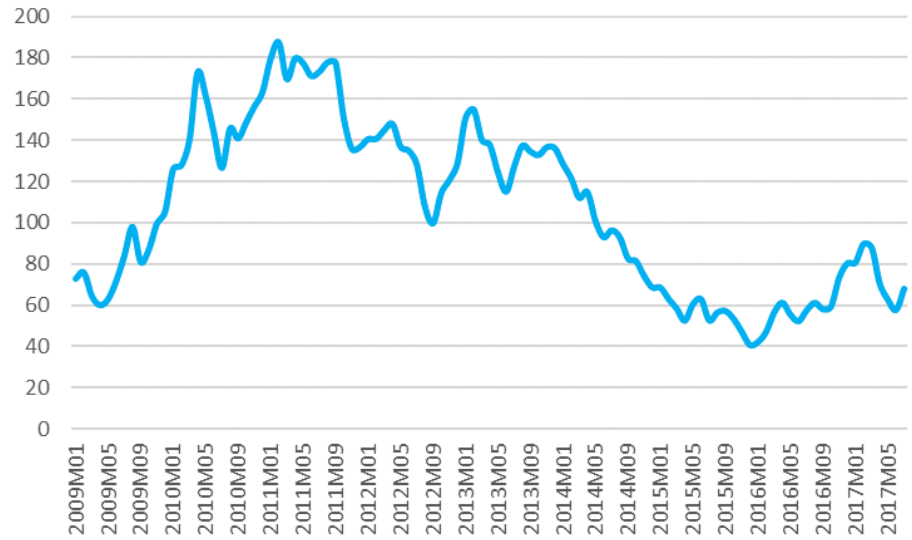
Steel prices

Steel prices are subdued due to oversupply from China. But ships are still being scrapped mostly because prices recovered somewhat over 2016 (Hellenic Shipping News, 2017).

Steel production is a key part of China's rebalancing challenge towards a consumption-driven economy. It recently attempted to reduce steel production but prices rose over much of 2016, prompting new investments into steel production (prompting the most recent price fall). China's balancing act will continue to impact global steel prices going forward and hence the scrapping of container ships.

Figure 20 Steel prices have recovered as China cuts production but still remain subdued

Nominal US dollars; Iron ore



Source: World Bank

Scrappage contributes to reducing or increasing the cascade effect on New Zealand depending on which vessel classes are being scrapped.

6.4. Global economic outlook is positive but the recovery is expected to be prolonged

The IMF is generally positive about the state of the world economy in the near future:

> *The pickup in global growth anticipated in the April World Economic Outlook remains on track, with global output projected to grow by 3.5 percent in 2017 and 3.6 percent in 2018.*
>
> *The unchanged global growth projections mask somewhat different contributions at the country level. U.S. growth projections are lower than in April, primarily reflecting the assumption that fiscal policy will be less expansionary going forward than previously anticipated.*

> *Growth has been revised up for Japan and especially the euro area, where positive surprises to activity in late 2016 and early 2017 point to solid momentum.*
>
> *China's growth projections have also been revised up, reflecting a strong first quarter of 2017 and expectations of continued fiscal support* (IMF, 2017).

6.4.1. Supply and demand in the container shipping industry are converging

While a positive global economic outlook is good news, most of the normalisation has come from the supply side with a sharp reduction in container ship capacity building since 2016 (Clarkson Research, 2017b).

Clarkson Research finds that growth in container ship capacity dramatically slowed in 2016 with deliveries falling to 0.9m TEU (from 1.7m in 2015) (Clarkson Research, 2017a). The total ordered capacity dropped to a record low of 0.2m TEU in 2016 (Clarkson Research, 2017a).

Subsequently, Clarkson Research is for the first time seeing signs of improvements:

> *Sector fundamentals did appear a little more positive in 2016. Demand conditions improved, with global volumes expanding by an estimated 3% in the full year to 181m TEU…*
>
> *Improved volumes, demolition and the re-alignment of liner networks, helped improve charter rates and indeed feeder containerships rates have moved above trend for the first time since 2011* (Clarkson Research, 2017a).

Another shipping consultancy Drewry in their latest Shipping Outlook suggests that the market has finally reached a turning point as a result of supply side normalisation (Drewry, 2017 and Robertson, 2017). Drewry forecasts global freight rates to increase by 12% in 2017 with profitability and returns emerging over the next 12-18 months (Drewry, 2017 and Robertson, 2017).

6.5. Panama Canal widening's contribution to the cascade effect could be exaggerated

6.5.1. The Panama Canal was widened in 2016

The Panama Canal (the Canal) was widened in 2016 to accommodate newer generations of ships. Prior to that, only container ships up to 5,000 TEU capable could use the Canal (PECC, 2016). The new 'locks' of the Canal can now accommodate up to 13,000 TEU capable container ships (New Panamax) (PECC, 2016).

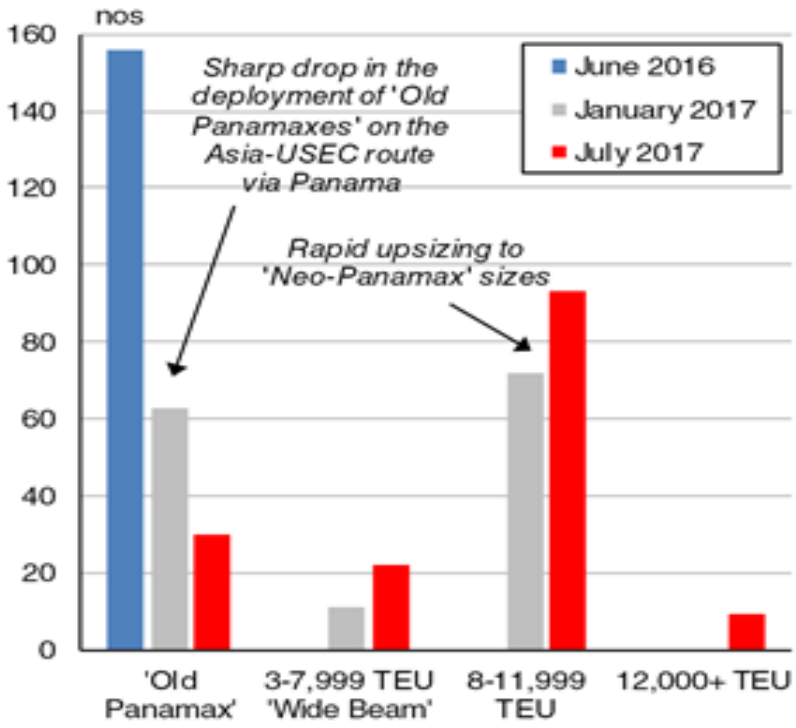
The most important impact of the Canal widening is on the US East Coast's (USEC) container shipping activity. The Boston Consulting Group estimates that 10% of container traffic from East Asia could shift from US Pacific ports to Atlantic Coast ports by 2020 (PECC, 2016).

6.5.2. Potentially releasing 'Old Panamax' vessels as a cascade effect

The cascade effect originating from the release of mega-ships might be stronger because of the widening of the Canal. If the Canal hadn't been widened, Panamax size ships (between 4,000 and 5,000 TEU) would still be crucial to Asia-USEC trade. Now they have lost some relevance (though not entirely so, as explained in the following section) (Clarkson Research, 2017c).

Clarkson Research reports that, over 2016, an increasing number of old Panamax vessels were either idle or scrapped because of the widening of the Canal (Clarkson Research, 2017c). Shipping lines using the widened Canal are jumping the 8,000 TEU and under class straight to 8,000-12,000 TEU class of ships, suggesting that the cascade effect could affect not just old Panamax vessels but newer generations of vessels as well (Clarkson Research, 2017c).

Figure 21 Change in ship sizes on the USEC route as a result of the Panama Canal expansion



Source: Clarkson Research, 2017c

6.5.3. Old Panamax vessels are still useful

The main reason is that despite the new capacity the Canal, old Panamax vessels are likely to remain competitive and still be used for USEC trade. This is partly because of the widened Canal in and of itself, the price for old Panamax vessels and freight rates on this particular route have fallen significantly as a result of the opening of the new locks on the Canal (Lloyd's Loading List, 2016).

Secondly there are infrastructure bottlenecks on the USEC. For example, the Bayonne Bridge that restricts access to the port of New York/New Jersey is being raised. The project is due for completion around mid-2019 (Drewry, 2016).

For these reasons, Drewry explains that:

> *Based on the current projections shippers won't see any significant difference in the Asia-USEC via Panama trade after July [2016]. The average size ship will increase by around 25% to 5,900 TEU, but that figure is still well short of the 13,000-14,000 TEU upper-limits the expanded Panama Canal will be able to accept* (Drewry, 2016).

6.6. Alliances are still growing, leading to further consolidation

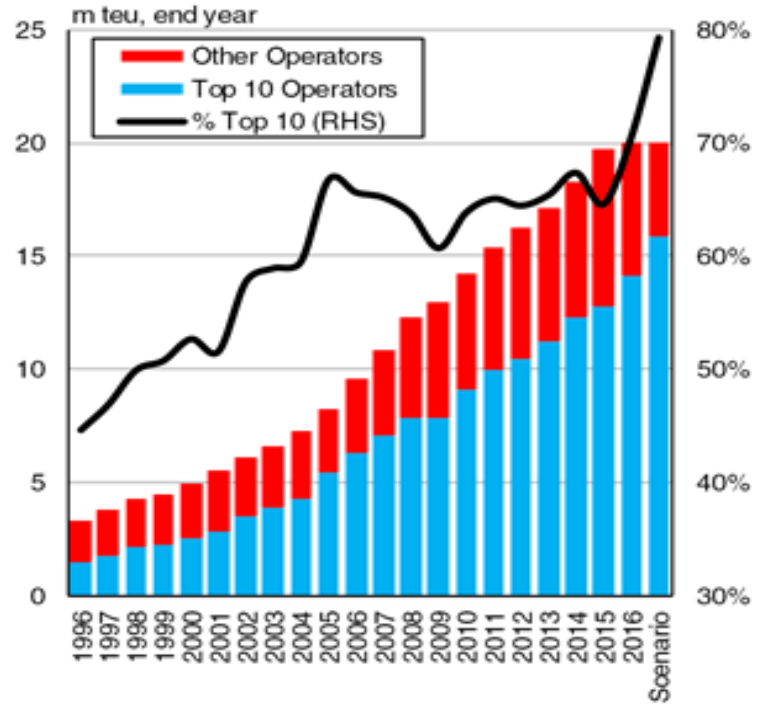
In response to depressed freight rates, shipping lines have consolidated into alliances. UNCTAD summarises the alliances taking place in the container ship industry:

> *In this respect, the beginning of 2015 saw the consolidation of the five leading carriers into two new alliances (East–West): the 2M alliance (Maersk and the Mediterranean Shipping Company) and the Ocean Three alliance (CMA CGM, China Shipping Container Lines and the United Arab Shipping Company) (BRS Group, 2016). In early 2016, the Hyundai Merchant Marine, a major shipping line of the Republic of Korea, entered negotiations to join the 2M alliance (UNCTAD, 2016).*

Three major Japanese operators have declared their intention to merge and start operations in 2018 (Clarkson Research, 2017). Clarkson Research expects Hapag-Lloyd to complete its merger with UASC, while Maersk Line's planned acquisition of Hamburg-Sud is awaiting approval (Clarkson Research, 2017).

As a result of the alliances, the container ship business is now one of the most consolidated in the seaborne trade segment. Clarkson Research expects this trend to continue. By the end of 2017 it expects the top ten shipping lines' share by TEU would reach 79% market share, nearly twice what it was 20 years ago (Clarkson Research, 2017).

Figure 22 Increasing concentration in the container shipping industry



Source: Clarkson Research, 2017

6.7. The impact of the 'cascade effect' on New Zealand

6.7.1. There are limits to how much ships can cascade

OECD/ITF explain that most of the cost savings of bigger ships are realised at sea because it is there where the fuel cost savings take place. A container ship of any given size would be built on the assumption that it will be deployed on a certain route. The estimated saving is therefore not constant across routes (with different times at sea) as the ship is cascaded:

> *As a result, there might be diseconomies related to cascading effects. […] It could well be that each round of cascading effects erodes to some extent the cost savings that were realised with the previous round of upsizing of container ships (OECD/ITF, 2015).*

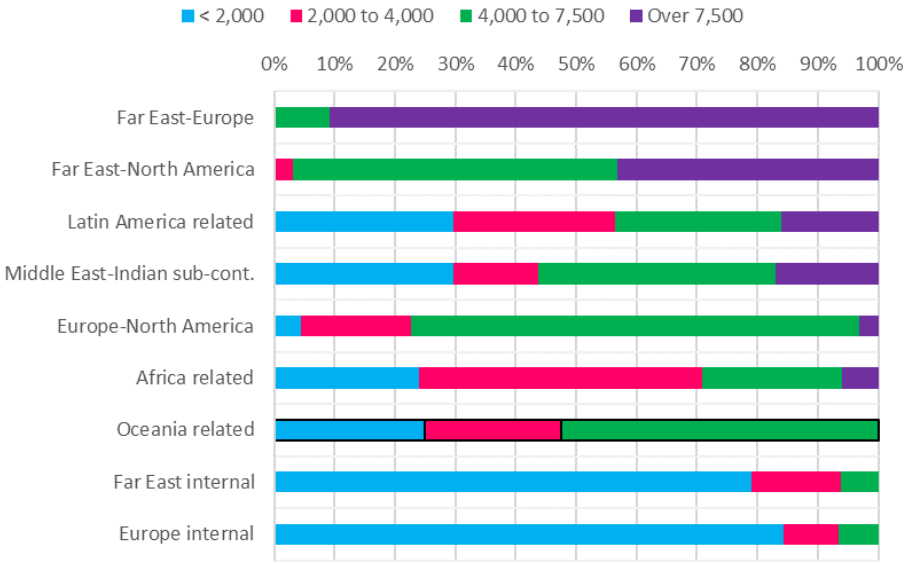
6.7.2. Is New Zealand at the 'back of the queue' of the cascade effect?

The current fleet structures by shipping route suggest that New Zealand (Oceania) is towards the 'back of the queue' of the cascade effect. Other routes can be changed to

include New Zealand however, as was recently the case for POT which now receives the Aotea Maersk (9,500 TEU) on its way to South America.

Figure 23 Are Oceania ports one of the last routes that the cascade effects would impact?

By TEU



Source: MOT, 2016

OECD/ITF (2015) modelled cascade effect scenarios out to 2020 for different routes. There isn't enough detail to understand the specific impact on New Zealand, but the North-South route is expected to see an increase in average ship size from about 4,000 to 4,500 TEU suggesting that the cascade effect is expected to be relatively limited (noting though that there is a wide distribution of ship sizes on the North-South route).

The 'strength' of the cascade effect in OECD/ITF's simulation depends largely on the introduction of the next of generation of mega-ships, averaging 24,000 TEU over the next decade. If ships this size are being ordered as the global economy recovers, the cascade effect on New Zealand would suggest that bigger ships will be visiting sooner rather than later. Hence intuitively, the strength of the global economy could speed the cascade effect but there are other factors at play (such as scrappage).

Interestingly, many commentators have suggested that the next generation of mega-ships might be the biggest ships that will be built as beyond that, the economies of scale become too small to justify building even bigger ships (over 24,000 TEU) (Alphaliner, 2015). That does not mean however that the cascade effect will stop. Bigger ships may be introduced to a greater number of routes around the world.

7. Key themes from interviews

This section summarises the themes from our interviews of major shippers, ports and shipping lines.

7.1. Low freight rates force shipping lines to cut costs but they remain unsustainable

Low freight rates have been beneficial for New Zealand shippers but a challenge for shipping lines. Shipping lines need to find areas where they can cut costs and remain profitable, such as being more fuel efficient.

Over the longer term however, shipping lines cannot cut costs indefinitely and they believe rates will need to normalise closer to their historical average. The expectation is for rates to recover over the medium term.

7.2. Container ships will increase in size

There is consensus that the cascade effect will continue and that container ships calling New Zealand will get bigger. The widening of the Panama Canal, some believe, will bring forward the cascade of bigger ships. The next 'step' in the size of ships is believed to be in the 5,000 to 6,000 TEU range. Interviewees could not say when this step change will occur exactly.

7.3. Which ports would invest?

The hottest debated issue is by far potential overinvestment at ports. There is a near unanimous opinion that port ownership by local government is driving some ports to propose dredging and other investments for which the commercial return is felt to be less than satisfactory in a competitive environment.

7.4. Government action can distort market signals

Interviewees pointed out to two key distortions:

- Local government port ownership and transparency
- Rail infrastructure investment and pricing (and to a lesser extent the same for road).

While those interviewed generally felt these risks currently distort the market, they were not major risks to New Zealand's overall competitiveness. Neither provide a substantial increase in market power for different actors in the competitive landscape.

They may however generate unsustainable supply chains which may put some investments at risk over the longer term as ships get bigger and the freight system evolves accordingly.

7.5. The shippers-ports-shipping lines competitive environment is sound overall

Interviewees unanimously described their competitive environment as generally sound (either from a shippers, ports or shipping lines perspective). But there is a distinction to be made between domestic and international competitive environments. Given the current shipping environment, there are concerns that the consolidation of shipping lines will increase their market power.

Most interviewees did not considered it a major risk in the medium term. The common view is that overcapacity is likely to remain an issue for years to come while vessel sharing agreements and mergers still provide the opportunity for shipping lines to compete amongst themselves.

7.6. Bigger ships create uncertainty that the supply chain is adjusting to

Bigger ships are a source of uncertainty which shippers, ports and shipping lines are trying to manage. A directive or hands-on approach by government to deal with the risk bigger ships create was generally thought not to be a useful approach. Relying on competitive pressures and clear market signals was much more preferred.

The OECD/ITF makes similar recommendations in tackling the question of ULCVs:

> *More balanced decision-making would be needed, with clearer alignment of incentives to public interests, policy support to enhance supply chain productivity, more regional collaboration and the creation of an appropriate forum for a discussion between liner companies and all other relevant transport actors* (OECD/ITF, 2015).

Bigger ships provide an incentive for innovation. Shippers, ports and shipping lines are developing relationships to leverage the disruption from bigger ships in their favour.

How each supply chain participant will strike a balance between coordination and competition across the supply chain, both horizontally and vertically, is an important part of how New Zealand's freight system will evolve in response to bigger ships.

From a whole of system perspective, our main concern is whether competition is sound (particularly for shippers and cargo owners) to ensure it evolves in a way that minimises total transport costs over the longer term.

7.7. The main risk from distortions is unsustainable supply chains

Interviewees' foremost concern is the formation of unsustainable supply chains as a result of container ships getting bigger in New Zealand. Supply chains propped up by market distortions may not be commercially viable if that distortion was removed.

Bigger ships are not a risk in and of themselves as long as market signals are not distorted. Existing distortions may be incentivising investments at ports that would

further entrench some supply chains into relying on distortions to be commercially viable. This is not sustainable in the longer term, particularly as ships are getting bigger and putting pressure on supply chains to reorganise.

The long-term risk is that of stranded assets at two levels, at the port and for shippers and cargo owners. If investment takes place at ports without the container volumes to justify it, the shareholders of the port (local government and therefore by implication local ratepayers) are bearing of the risk of a potentially poor return on investment.

Unsustainable supply chains also create risks for shipper/cargo owners. Investments by shippers/cargo owners are made with the expectation of exporting through a port and hence on a transport cost from the gate to the final consumer. If investment at ports take place based on a market distortion, it is uncertain if the port in question will be called by larger ships if the container volumes don't justify it for shipping lines. This creates uncertainty for shippers/cargo owners' transport costs as they may have to bear the cost of the sunk investments but without the savings from bigger ships.

Our view and that of interviewees is that maintaining sound competition without distortions is New Zealand's key insurance to benefiting from bigger ships.

7.8. Two different visions for New Zealand's port system

Two different visions for the future of New Zealand's port system came through the interviews:

- Hub-spoke model – under this model two ports would accommodate larger ships (6,000 TEU and over). Other ports would retain international calls but would also provide feeder services to the two main hub ports
- String service model – under this model, bigger ship could call along several ports on the East Coast. The size of bigger ships under a string service are expected to be in the order of 6,000 TEU.

There can be variations between the two models, as transhipments and feeder services would take place under a string service model. They are not mutually exclusive and to some extent will coexist. The debate is a matter of degree between the two visions rather than a strict one or the other. There is insufficient information to test the relative costs and benefits of those two visions in detail at this stage.

7.9. MOT's Freight Futures Study was not well received

Several interviewees did not think that MOT's Freight Futures Study helped to inform the bigger ship debate. The study was criticised for its lack of stakeholder engagement to test the approach and assumptions made in the report. As a result, the findings are disputed. The conclusion that moving towards a hub-spoke system would not be welfare enhancing to New Zealand and would reduce competitiveness is debated.

We recommend that clearer analysis on the potential future benefits and costs of bigger ships is undertaken. What might be useful is to understand the commercial

viability of different hub-spoke or string service systems, rather than simply assuming a series of future hub-spoke scenarios.

The research question to answer is: if competition is assumed to be sound going forward, what are the likely supply chain structures that could arise while minimising total transport cost?

7.10. Congestion, transit times as well as payment are practical challenges

There are significant practical challenges to bigger ships. Port of Napier's submission to the NZPC's Freight Inquiry provides a good summary of those challenges:

> *On an entirely pragmatic level, the logistical challenges for (hub) ports are considerable. Although not insurmountable, we cannot lightly dismiss the effect of New Zealand's unique pattern of trade – ie, the import/export imbalance and geographic location of cargo (remote from many larger ports), its strong seasonal bias, reefer capacity needs, cool chain integrity concerns with longer inland transport transits, and the increased opportunity for spoilage or delays (NZPC, 2012).*

One often overlooked significant logistics challenge is the need for reefer containers for chilled products. Bigger ships, while creating logistical challenges, provide important reefer capacity. The introduction by Hamburg Sud of a 7,500 TEU service into POT on a seasonal basis this year provided greater capacity, particularly reefer, in the peak perishable export season which is critical for projected kiwifruit, apple crops and possibly dairy and meat growth.

Congestion at ports as result of bigger ships' higher exchanges are real risks for supply chains. Solutions to congestion issues at hub ports will be required to maintain seamlessness through the supply chain.

7.11. Social licenses to operate

Ports first and foremost but other actors in the supply chain as well are concerned with social pressures (particularly on noise and visual disruptions) on their activities. Debates around social licenses to operate for port, road and rail are far from trivial and genuinely affect the structure of supply chains.

POAL is a good example of a port intersecting at many different interests (container and vehicle import trades, iwi, sailing, noise and visual) which has sparked a debate about the optimal location of the Ports of Auckland. POT enjoys somewhat fewer pressures but may not be immune to future social interests.

A more common discussion across all New Zealand ports is around dredging for container ships. Dredging has some environmental impacts and these are debated before consents are granted. Land use planning further up the supply chain can also come under pressure, particularly regarding noise complaints and regulation on trucks and rail. Growing export and import container volumes and the arrival of bigger ships could catalyse those debates.

8. Implications for industry and government

8.1. Does the conclusion that bigger ships will drive lower freight rates still hold true?

Bigger ships do offer the benefit of lower vessel costs. But the magnitude of benefits and where they accrue across the supply chain are both dependent on many factors. Currently those factors suggest that the vessel cost savings are significantly lower than expected in 2010/2012.

8.1.1. Freight rates are already at historic lows

Shipping costs are at historical lows for New Zealand. This means that bigger ships may not provide the magnitude of savings today compared to what they would have been seven years ago (as estimated by NZSC's 2010 report).

In a low oil price environment and where most of the savings from bigger ships are from fuel efficiency, the savings from bigger ships are also minimised.

8.1.2. But bigger ships could protect against increases in freight rates

As previously mentioned, shipping lines consider that current freight rates are unsustainable over the long term and they will have to go back up. As ships calling into New Zealand get bigger, it would protect shippers against these future increases to some extent (because of bigger ships' lower vessel costs).

8.1.3. Shipping lines may not entirely pass savings on to shippers

The cost savings from bigger ships are not necessarily passed on to shippers. How the savings from bigger ships are captured across the supply chain depends on the competition between shipping lines for cargo.

As shipping lines recover from years of losses, it is likely that even as freight rates recover over the next few years, shipping lines will be reluctant to pass the savings on to shippers, having borrowed to build mega-ships.

New Zealand's greatest insurance policy for benefiting from a bigger ship future is maintaining competition for its cargo across shipping lines. As ships get bigger, shipping lines need high utilisation of their ships (bigger ships are commercially viable only at high utilisation rates). Vessel sharing agreements through alliances would remain valuable to shipping lines even as demand for container shipping increases.

In the current global shipping industry environment, shipping lines have few incentives to fully pass on the savings from bigger ships.

The consensus on the approved alliances and vessel sharing agreements is that they are not a clear threat to competition between shipping lines (NZSC, 2014). There are still pressures on shipping to compete on price. How much competition will force shipping lines to pass on the cost savings to New Zealand shippers will depend on the future strengthening of the global economy, the demand for shipping from New Zealand and how many ports develop as a hub in New Zealand.

8.1.4. Savings from bigger ships are not linear with ship size

As ships get bigger the amount of saving reduces for the same increase in capacity- there are reducing returns to scale. Shippers' benefits tend to reduce for a given increase in TEU capacity as ships get bigger.

8.1.5. Slow steaming is an implicit cost and could slow progress towards freight rate normalisation

While not applicable to all New Zealand rotations, slow steaming is an implicit cost on some shippers (longer time to market). Slow steaming has helped to 'hide' excess capacity but the flipside is that the time to freight rate normalisation can be prolonged.

8.1.6. Lower vessel costs go hand in hand with higher handling costs

Our framework for this analysis is the total transport cost of moving containers across the supply chain, not just the shipping cost. As ships get bigger the shipping transport cost (or vessel cost) per container falls but the handling cost generally rises.

The change in total transport cost (the one most relevant to shippers) depends on a much more complex set of circumstances than just the benefit of lower international shipping costs.

8.1.7. Savings from supply chain efficiencies

It is likely that bigger ships will lead to greater supply chain integration. The incentive to better coordinate different stages of the supply chain to make bigger ships work in New Zealand may provide cost savings and enhance competitiveness.

8.2. What is the impact if multiple ports invest in dredging to compete for bigger ships?

Whether multiple ports investing in dredging to compete for bigger ships will benefit shippers on not will depend on the port. Ultimately supply chains ought to form where they are commercially viable and ideally free of distortions.

- Potentially beneficial – It offers greater choice which increases competition for their cargo but also safeguards them from potential increases in handling costs of transhipping their cargo to a hub port before it is sent (or imported) overseas.
- Potentially harmful – Shippers/cargo owners find themselves paying for sunk investments without benefiting from bigger ships. The question of whether four to six ports investing in dredging to accommodate 5,000+ TEU ships (all the way to 8,000 TEU for some ports) can be justified with enough container volumes must be resolved for these benefits to be realistic.

As stated above the topic of overinvestment at ports is hotly debated and the arguments made by different ports to justify investments are contested. We do not any views on the merits of any strategy undertaken by ports in this report.

8.3. Are bigger ships a good or a bad thing for shippers?

There are no reason why bigger ships could not be introduced in a way that benefits New Zealand if competition remains sound across the supply chain. There are trade-offs involved with bigger ships which competition at different levels of the supply can ensure that total transport costs are minimised.

The more important question is, assuming sound competition, what are the likely supply chain structures that could arise to minimise total transport costs?

The most important question that shippers should be asking themselves is not whether big ships will be accommodated in New Zealand but how (i.e. how many hub ports or big ship string services will arise?) and therefore what does that mean for handling (operational and capital) costs and who is going to pick up these costs?

To better comprehend the potential impact of bigger ships, industry players need to understand the commercial viability of different hub-spoke or string services systems rather than assume a series of future hub-spoke scenarios (as per the MOT Freight Futures Study).

8.4. Are there new implications that need to be considered?

8.4.1. Bigger ships, rather than creating new issues, increase the necessity to address old ones

The discussion about bigger ships and their impacts tends to begin at the port because that is where the physical constraints lie – ships cannot call into New Zealand if channels are not deep enough and the cranes are not wide enough.

However, the core of the bigger ships issue is not the ability of ports to invest but the quality of the freight transport sector's competitive and regulatory environment. Bigger ships create pressures on port (as well as rail and road) infrastructure which magnifies long-standing regulatory issues rather than generate new ones.

What is important is how can New Zealand shippers, ports and shipping lines work together to make bigger ships work and how the government can support this change without overextending its role.

The question of interest from a NZ Inc perspective is to think about which supply chain configuration will accommodate larger ships while minimising total transport costs. As we have defined transport costs, this configuration would ensure that New Zealand's welfare is maximised (as it includes the capital recovery cost).

8.4.2. Current trends suggest greater competitive pressures on ports over time

Bigger ships are likely to exert greater pressure on ports to compete for cargo.

There are two reasons for this. The first is the ability to cater for bigger ships, the second relates to how ports and shippers will compete and collaborate amongst themselves to leverage bigger ships (in order for ports to maintain or increase their market power).

As discussed earlier in the report, many ports have signalled their willingness to invest in expanding their capability. They are competing for bigger ships to call at their port and making sure they remain relevant.

At the same time, some shippers are wary of regional ports increasingly becoming feeder ports. Depending on their product and whether it is perishable or not, shippers might prefer direct calls. This will put pressure on regional ports to match the offering of any hub port service.

Hub ports themselves need greater certainty of an increase in throughput to put together convincing businesses cases to invest in being bigger ship capable. Shippers can use that to their advantage (the shipper would probably need to be within two port catchments to exert meaningful power).

Hence the cascading of bigger ships both from a hub port or feeder port perspective, which has raised competitive pressures on the shipping lines themselves, is by implication likely to also raise competitive pressures on ports as a second-round effect.

8.4.3. The global focus on reducing emissions will have new implications

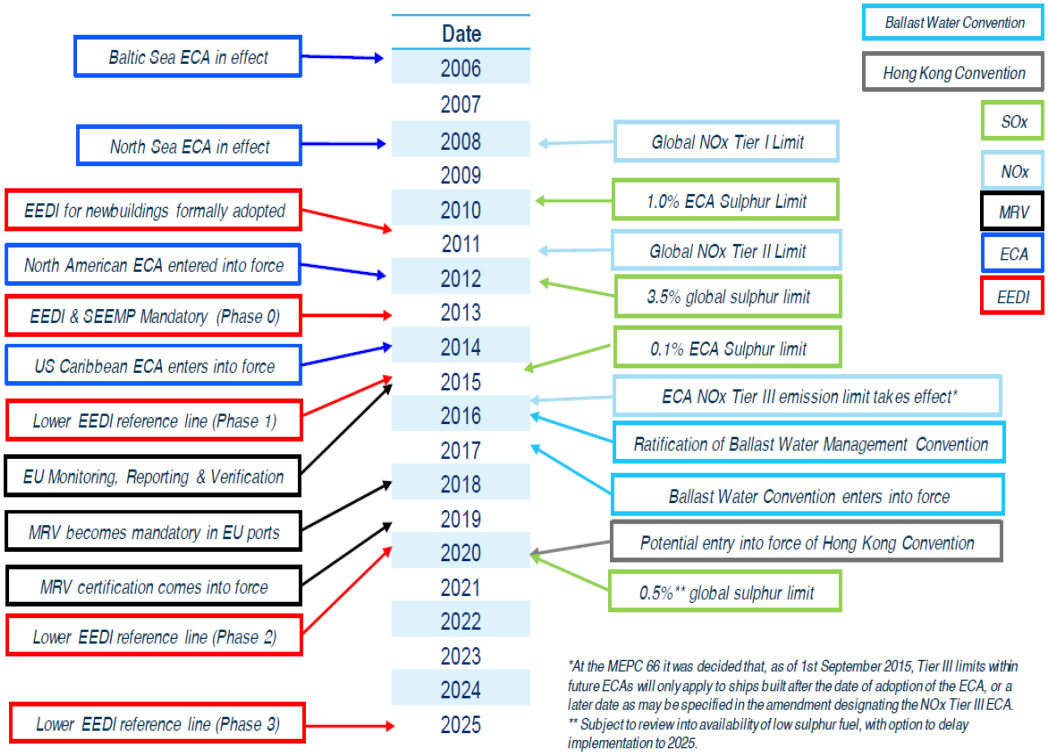
Last but certainly not least is the increasing global focus on reducing emissions and its impact not only on shipping but all actors in the supply chain.

The impetus for shipping lines, ports and shippers towards greater sustainability genuinely enters decision-making.

The following figure summarises the timeline of environmental regulation for shipping from 2006 out to 2025. A number of regulations are yet to be enforced but have already been agreed to. The most important is the requirement to use low-sulphur fuels or gas by 2020 i.e. the 0.5% global sulphur limit in the figure above. International Shipping News estimates the cost of the policy in a full compliance scenario at up to US$60 billion annually from 2020 (NZSC, 2017).

As mentioned above, bigger ships have lower emissions on a per TEU basis. This is an important benefit that is attractive to shipping lines as well as shippers.

Figure 24 Environmental regulation timeline for shipping



Source: Gordon, 2016

8.5. The policy implications of bigger ships

8.5.1. Labour-NZ First-Green international freight policies

At this stage, we can only rely on the incoming government's election campaign manifestos to gauge what policies relevant to the bigger ship debate are being considered. The four key policies relevant to bigger ships are:

- **Port strategy** – As part of a national freight strategy, develop a national ports strategy with a particular focus on the Upper North Island (NZ Labour Party, 2017)
- **Sea-change strategy** – Refresh and move to implement the 'Sea Change' strategy to revitalise Coastal shipping (NZ Labour Party, 2017)
- **Rail** – Investment in regional rail (NZ Labour Party & NZ First, 2017)
- **Relocating Ports of Auckland** – Commission a feasibility study on moving the Ports of Auckland, including giving serious consideration to Northport (NZ Labour Party & NZ First, 2017).

The devil is in the detail

It is difficult to comment on the incoming government's proposed policies because the devil is in the detail. But we can use the findings from this study and apply it to what we know about the policies so far.

Our main observation is that the four policies considered by the incoming government have significant overlaps and require very strong alignment to deliver the greatest gains to New Zealand.

Port strategy

A strategy could take many forms along the NZPC's scale from Market driven through Information sharing and Leadership to the more interventionist Directive (NZPC, 2012).

What we can say at this stage is that a Directive approach is not likely to be beneficial given the complexity and the uncertainty of the impact of bigger ships on New Zealand's supply chains.

Furthermore, we suggest the port strategy takes a similar approach to the Productivity Commission's International Freight Inquiry and considers the supply chain as a whole, from the gate to the port, and not in isolation from the wider freight environment.

Sea-change strategy

The original Sea-change strategy was released in May 2008 towards the end of the Clark government. The National government did not pursue the Sea-change strategy. The incoming government wants to refresh and implement it.

We acknowledge that the strategy will be refreshed so we can only speak to the overall objective as it seems unchanged: to revitalise coastal shipping. The target of the 'first' The Sea-change strategy target was for domestic sea freight to be carrying at least 30%

of inter-regional domestic freight in tonne-kilometres by 2040 (MOT, 2008). MOT (2014) estimated the share at 14% in 2012, down from 15% in 2006.

This target has three important features to point out:

- All cargo not just containers – the target is for bulk and containerised cargo, petroleum, limestone, cement and fertiliser make up 80% of the coastal shipping task by tonnes which are mostly 'bulk' products i.e. non-containerised (MOT, 2014)
- domestic sea freight – international ships compete with domestic ships; international ships are today handling more than two thirds of the coastal domestic containerised freight task in TEU
- inter-regional domestic freight – the focus of the policy is on domestic freight, not on exports and imports.

The impact of bigger container ships on domestic freight wasn't investigated in detail in this research. Ships are getting bigger due to containerised import and export growth, not due to the domestic freight task.

Aside from the specificity of the target, the Sea-change strategy in its current form is vague in places and the refresh should address this gap. Specifically, the refreshed strategy should provide a clearer link between the problem definition and the target.

For example, the strategy argues that there are synergies between bigger ships, a hub-spoke model and domestic sea freight increasing its market share of inter-regional domestic freight. The logic behind those synergies should be made clearer in any refresh, particularly around the competition between international and domestic ships. This will help stakeholders better understand whether policy changes will be implemented successfully.

The strategy is also predicated on a movement towards a hub-spoke model but there is no clear explanation of what that means. If the refreshed strategy is also to predicate a hub-spoke model, it will need to be clearer on the specific port structure that is implied and how that it will intersect with the accompanying port strategy.

Rail investment

There has been no announcement on this policy on rail, other than an indication that investments should take place in the regions. It is therefore not possible to comment on the specifics.

The only proposal at this stage is to investigate a rail line to Marsden Point and Northport as well as upgrading the North Auckland Line to take pressure off the roads in Northland (NZ Labour Party, 2017).

But we can, in line with the Sea-change strategy, start to highlight key considerations for rail in the context of bigger ships coming to New Zealand. The most important is that the combination of the Sea-change strategy and the prospect of rail investment must mean that coastal shipping and rail will both compete for cargo not only with road freight but also between themselves.

We suggest that the refresh of the Sea-change strategy and business cases for rail investments will need to provide clarity on how the three transport mode shares are expected to evolve for the considered policies to be successful and achieve the lowest

total transport cost across the supply chain (which includes capital recovery costs and social costs such as emissions).

Relocating Ports of Auckland

It is out of scope for this report to review the costs, benefits and trade-offs of relocating the Ports of Auckland, whether to Northport or somewhere else. But the feasibility study will have to consider how the relocation will intersect with the port and Sea-change strategies as well as investments in rail in addition to assessing the costs and benefits of the relocation itself.

8.5.2. The NZPC's recommendations are still relevant today

The policies that would foster sound competition do not change with the size of ships.

It is not obvious that new policy recommendations related to maintaining the competitiveness of the environment are needed other than those raised in the past but not yet or partially acted on.

The NZPC's International Freight Inquiry recommendations were generally well received by industry. They made several specific recommendations which are directly relevant to the issues covered in this report and summarised in Appendix C.

Progress on those recommendations has been varied but the general view across the industry is that the issues these recommendations deal with have yet to be fully addressed (regardless if they thought those recommended policies were the best way to address them).

8.5.3. Rather than new policies, some refining of the NZPC existing policies could be useful

Consider how the costs and benefits of proposed investments in ports, coastal shipping, road and rail align to minimise total transport costs

One of the differences between the hub-spoke and string service vision is, to a degree, where investments should take place. The former is at a smaller number of ports and potentially somewhat more behind the border (road and rail towards hub ports) than the latter.

While central government 'oversees' road and rail infrastructure, local government has major ownership stakes in ports. R8.2 and R9.2 could be considered in tandem to reconcile national and local interests acting at different levels of the supply chain. There might be trade-offs to be made in investments at ports relative to behind the border infrastructure (road and rail) as well as coastal shipping.

While the mechanism to bring those moving parts together would be a complex one, ensuring that the assessment of road, rail and coastal shipping policies consider the port investments trade-offs would be a step towards maximising the national benefits from bigger ships.

Research on supply chains that would deliver minimum total transport costs

The most important question to answer for government in the context of bigger ships, assuming sound competition, what are the likely supply chain structures that would minimise total transport costs?

Further research is required to answer this question which would potentially provide a better indication of the shape of the curves in Figure 7.

This research goes at the core of where the debate currently lies: What are the possible scenarios in which bigger ships are introduced to New Zealand while retaining minimum total transport cost across the supply chain?

This work would provide insights into potential future states of the freight system, from the gate to the port, and improve the understanding of the risks and opportunities of different investments for cargo owners, ports and shipping lines. Such research would require a robust understanding of competitive behaviour across the supply chain.

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Appendix B Supporting information

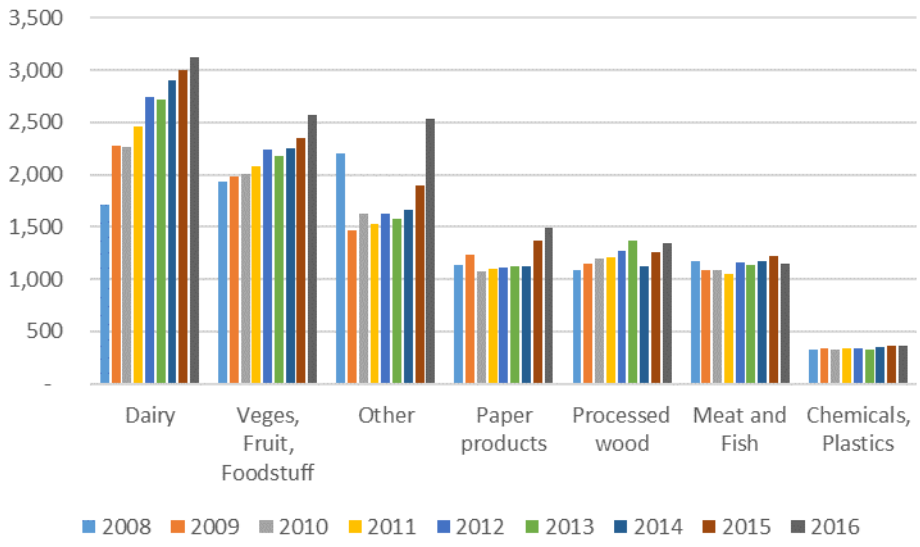
Figure 25 MOT's hub-spoke scenarios

		Status quo	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9	Scenario 10
Ports	Hub	Status quo All 10 container ports provide international services	Auckland Tauranga, Napier Lyttelton Otago	Auckland Tauranga, Lyttelton Otago	Auckland Tauranga, Lyttelton	Auckland Tauranga, Otago	Auckland Lyttelton	Tauranga, Lyttelton	Auckland Otago	Tauranga, Otago	Tauranga
	Feeder		All other ports are feeder ports	All other ports are feeder ports	All other ports are feeder ports	All other ports are feeder ports	All other ports are feeder ports	All other ports are feeder ports	All other ports are feeder ports	All other ports are feeder ports	All other ports are feeder ports
Vessel size (TEU) by trade	Asia	4,500	4,500	6,000 7,000 from 2017	6,000 7,000 from 2017	6,000 7,000 from 2017	6,000 8,000 from 2017	6,000 8,000 from 2017	6,000 8,000 from 2017	6,000 8,000 from 2017	6,000 8,000 from 2017
	North America	2,700	2,700	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037
	Europe	2,700	2,700	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037	2,700 incr to 6,000 by 2037
	Trans-Tasman	2,500	2,500	2,500 incr to 2,700 in 2021	2,500 incr to 2,700 in 2021	2,500 incr to 2,700 in 2021	2,500 incr to 2,700 in 2021	2,500 incr to 2,700 in 2021	2,500 incr to 2,700 in 2021	2,500 incr to 2,700 in 2021	2,500 incr to 2,700 in 2021

Source: MOT, 2014

Figure 26 About half of containerised export growth has come from dairy

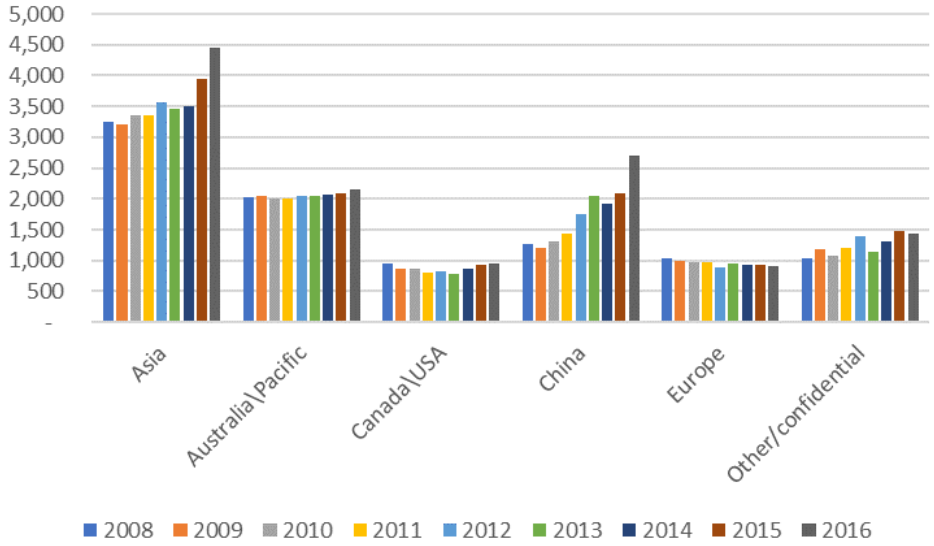
Containerised sea exports; Thousands; Tonnes



Source: MOT, 2017

Figure 27 Growth in New Zealand container exports has been almost entirely to Asia

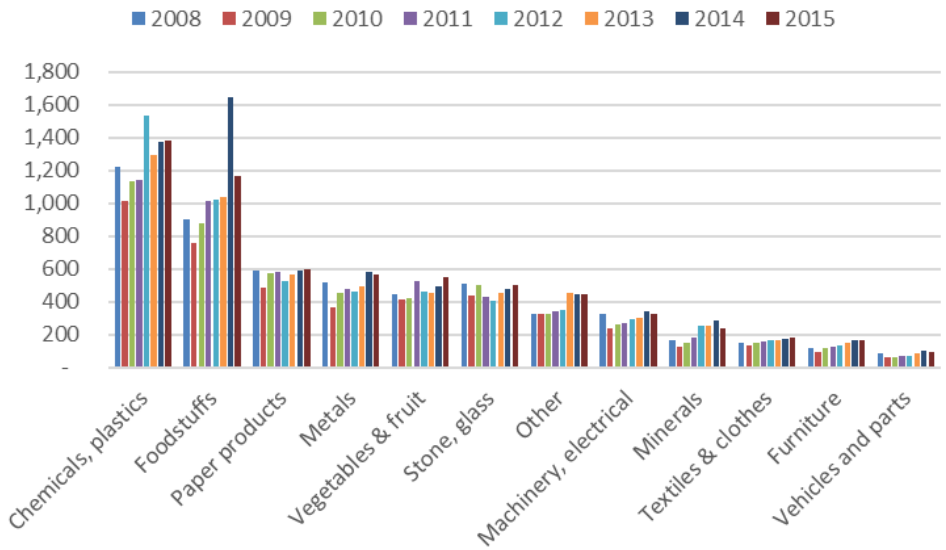
Containerised sea exports; Thousands; Tonnes



Source: MOT, 2017

Figure 28 Container import growth has mostly come from chemicals, plastic and foodstuffs

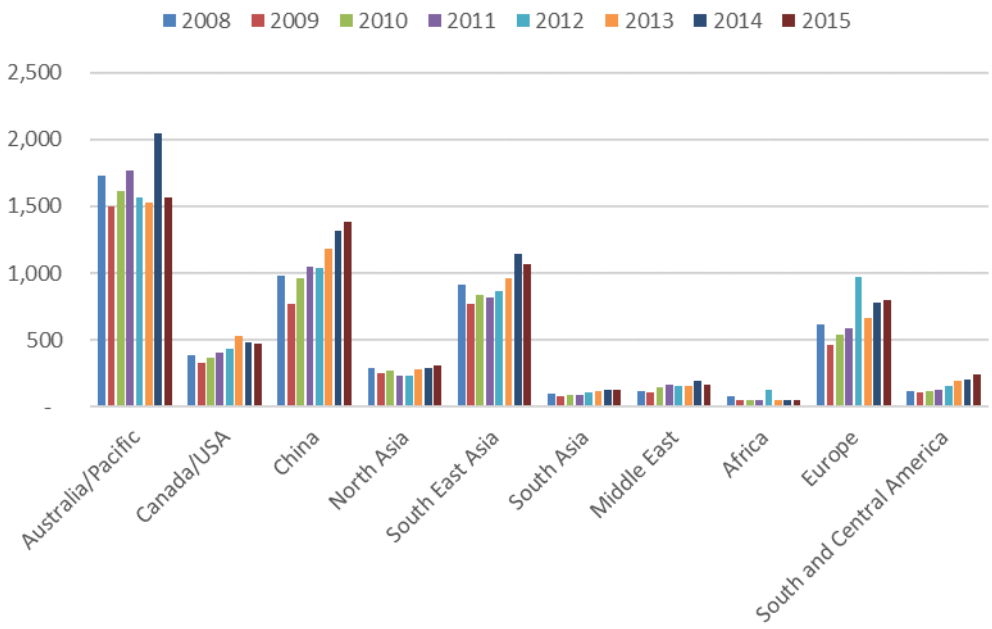
Containerised sea imports; Thousands; Tonnes



Source: MOT, 2016

Figure 29 Growth in imports has been broader geographically than exports

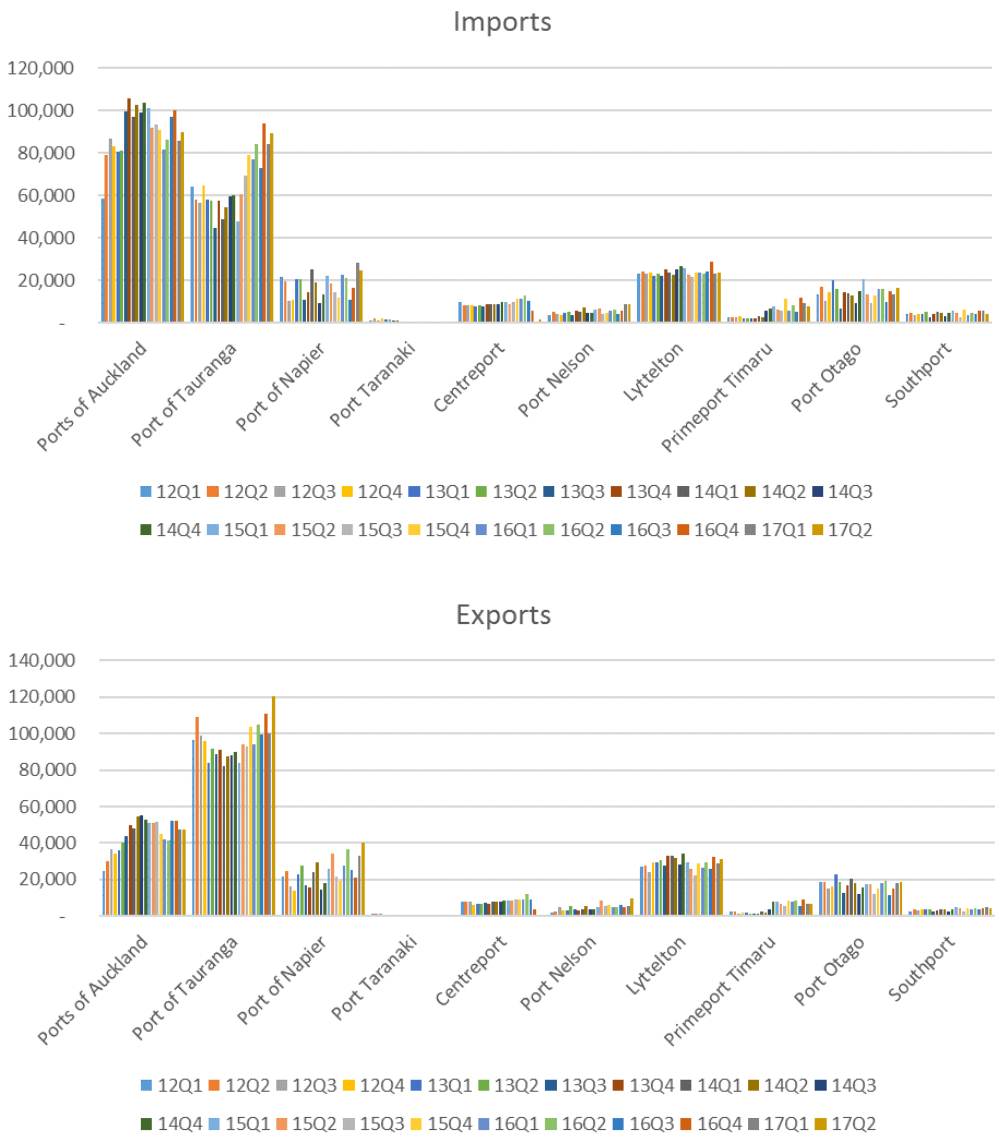
Containerised sea imports; Thousands; Tonnes



Source: MOT, 2016

Figure 30 Imports' and exports' container handling at New Zealand ports

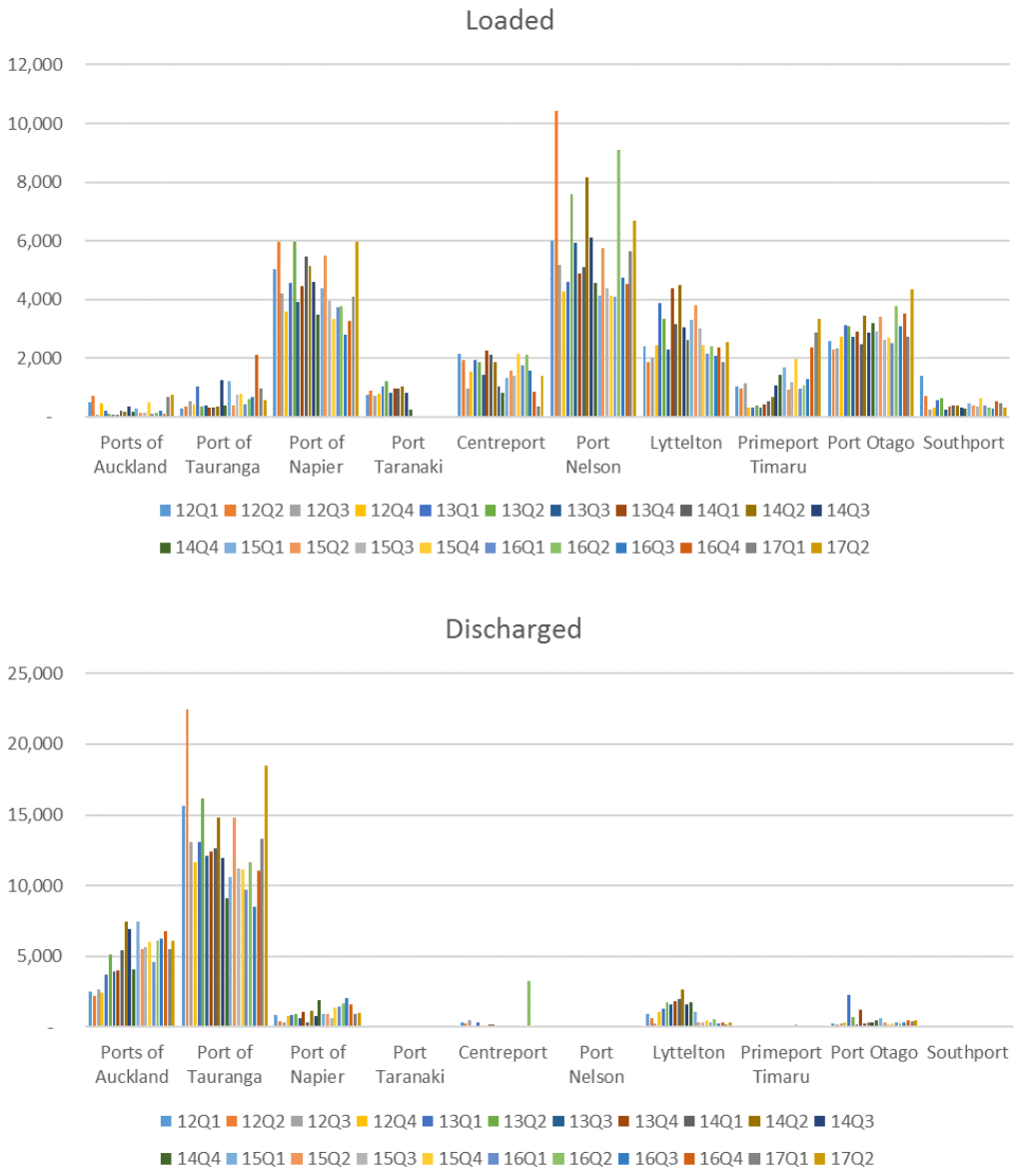
In TEU



Source: MOT, 2017

Figure 31 Exports: transhipment loading and discharges

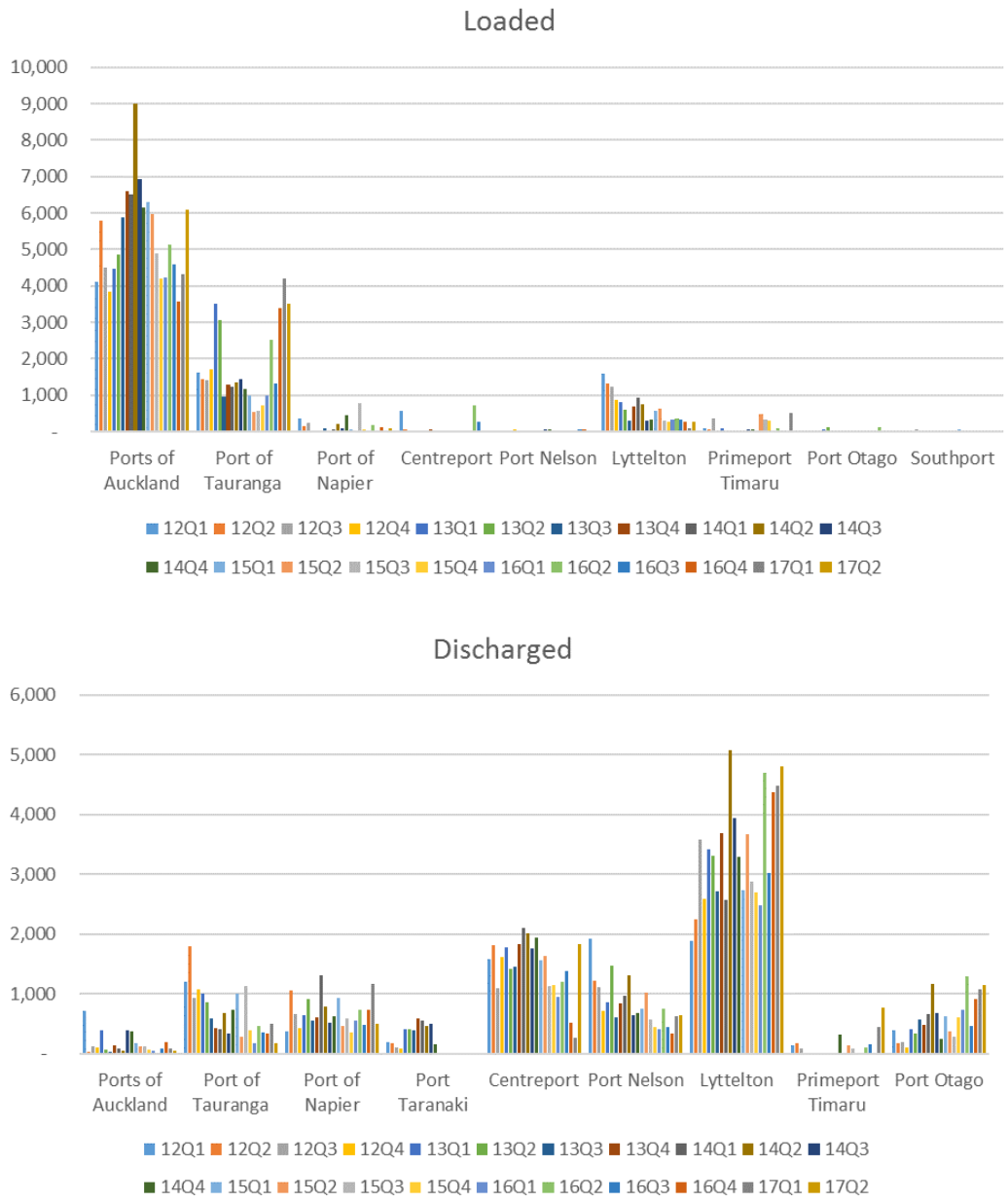
TEU for export transhipment; excludes re-exports



Source: MOT, 2017

Figure 32 Imports: transhipment loading and discharges

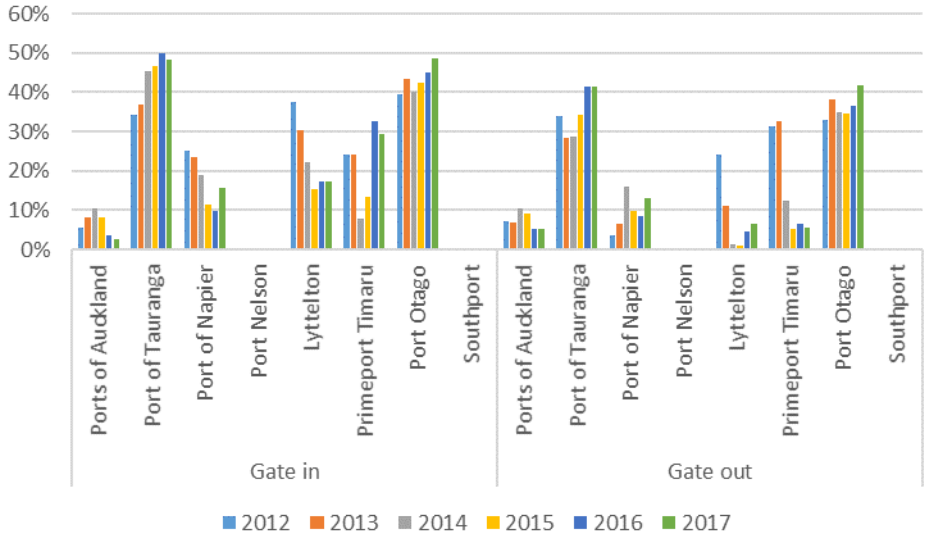
TEU for import transhipment



Source: MOT, 2017

Figure 33 POT and Port Otago are increasingly using rail to move containers in and out

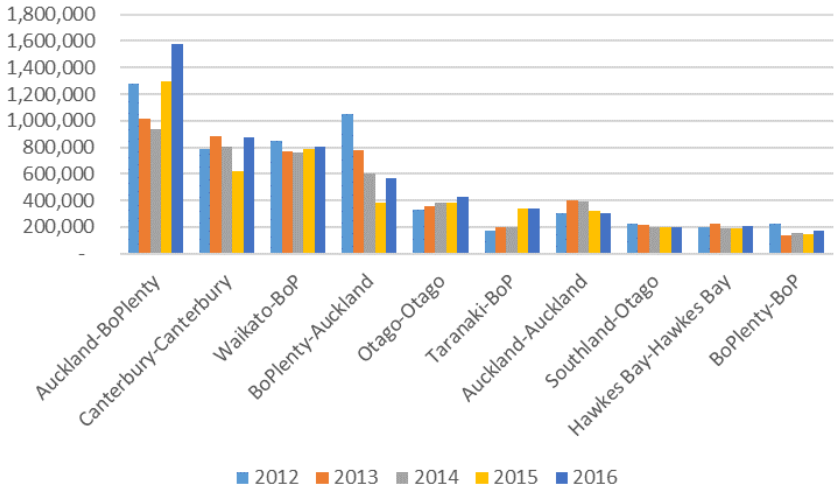
Rail share of land movements in and out of the container terminals



Source: MOT, 2017

Figure 34 Shipping containers moved from Auckland to Bay of Plenty and within Otago account for all the growth in the use of rail for container movement

In tonnes



Source: MOT, 2017

Appendix C Most relevant NZPC recommendations to bigger ships

R8.2 *The Minister for the Environment should commence development of a National Policy Statement for transport infrastructure. This would provide guidance for local authorities when considering competing national and local priorities.*

R9.2 *The government should:*

- *coordinate its assessments of road and rail projects in order to allocate capital where it can add most value; and*
- *seek ways to improve the transparency of decision making around road and rail infrastructure projects, including the publication of cost-benefit analyses.*

R10.3 *Port companies should regularly publish economic value-added analyses for their operations, including disaggregated data for significant business segments. This would improve reporting and transparency, and help to ensure the efficient use of capital in the freight transport system.*

R10.4 *To support benchmark competition between port companies, the Ministry of Transport should regularly publish an independent assessment of comparative financial performance for port owners and policy makers to consider.*

R10.5 *Government should use the s.7 provisions in the State-Owned Enterprises Act (providing for SOEs to receive direct payments for non-commercial activities) with KiwiRail to transparently identify expectations around public goods and the costs incurred in their delivery (NZPC, 2012).*

R10.6 *Councils should be clear about the objectives they wish to pursue through port ownership. Having decided those objectives, they should choose the minimum level of council ownership that offers the required control rights. Increased private capital participation offers improved incentives for port efficiency, and the dynamic efficiency of the freight system in general.*

R10.7 *Councils should consider landlord port models in which land ownership is separated from terminal operations. This may be an efficient mechanism for maintaining control over port land use while benefiting from the efficiency improvements resulting from increased private involvement in port operations (NZPC, 2012).*

Appendix D List of interviewees

D.1 Shippers/Cargo owners

- Chris Foord – Fonterra
- Jameel Afiz – Open Country Dairy
- Joanne Wilson – Silver Fern Farms
- Michael Knowles – Zespri

D.2 Ports

- Alistair Kirk – Ports of Auckland
- Garth Cowie – Napier Port
- Mark Cairns – Port of Tauranga
- Martin Byrne – Port Nelson

D.3 Shipping lines

- Gerard Morrison – Maersk
- Noel Coom – ANL
- Simon Edwards – Hamburg Süd

D.4 Others

- Alan Mcdonald – Employers and Manufacturers
- Geoff Lewis – Productivity Commission
- Nic Kay – Manfreight
- Stephen Selwood – Infrastructure New Zealand