Auckland Regional Holdings Submission on the National Infrastructure Unit's "Infrastructure: Facts and Issues" discussion paper

Auckland Regional Holdings (ARH) welcomes the current Government initiatives aimed at improving New Zealand's infrastructure and particularly the decision to develop a National Infrastructure Plan.

ARH is of the view, based on our recent comprehensive research into the New Zealand port sector and logistics supply chain, that while the port sector analysis contained in the National Infrastructure Unit's (NIU) draft discussion paper is largely accurate, it focuses on the current situation with limited consideration of the potential significant long-term risks and implications for New Zealand.

The following points relate to information contained in NIU's port sector analysis, and provide important information that we believe needs to be considered when determining future investment in New Zealand's port and supporting transport infrastructure.

Discussion points 1 to 5 below are based on extracts from the draft NIU discussion paper, with the requested question topics they relate to (e.g. Base Information, Missing Issues, etc.) indicated in square brackets.

Discussion points 6 to 9 provide additional feedback specifically related to the requested question topics, which were either not covered, or require additional feedback over and above the discussions contained in points 1 to 5.

1. Financial performance [Base information]:

Extract from the draft NIU discussion document (section 128):

> *"The previously mentioned report by Rockpoint concludes that, on average, the financial performance of the port sector is lower than that which commercially-motivated owners would demand. Some of the listed ports appear to operate quite successfully (at least within the normal range of companies subject to the vagaries of economic cycles and management performance). Others are failing to provide a return on investment and are struggling to survive."*

ARH comments:

All of New Zealand's container ports are earning inadequate returns which are unsustainable in the long-term. The true extent of the poor performance of New Zealand's container operations is masked by the diversified operations and limited disclosures by port companies.

A quick glance at Rockpoint's analysis (section 8.6) may indicate that the return on equity for New Zealand ports has, on average, from 1995 to 2007, been relatively satisfactory. However, upon closer analysis there is a clear industry-wide trend of decreasing returns over time (particularly in 2006 and 2007), reflecting the increasingly intense inter-regional price-based competition that exists within the New Zealand port sector.

This is driven by a number of factors that have weakened the bargaining power of New Zealand's 11 container ports, including:

- shipping line consolidation;
- close proximity of ports;
- the fixed cost nature of the industry which drives the need for volume; and
- low switching costs between ports for many of the shipping lines and their customers.

Additional analysis performed by ARH, indicates that the average return on equity for New Zealand ports has further decreased from 7.7% in 2007 to 5.1% in 2008[1]; well below an assumed average

[1] Quoted 2007 and 2008 average returns on equity relate to the year ending 30 June 2007 and 30 June 2008 respectively.

cost of equity of 10%[2], with a significant proportion of the return relating to revaluations and gains on sale. Of New Zealand's 11 container ports, ARH's analysis indicates that only three managed to earn a return on equity greater than 10% in 2007 and 2008, however, if net profit after tax (NPAT) attributable to revaluations and gains on sales are removed, the return on equity for these companies also fall below 10%. ARH's analysis is included in **Appendix 1**.

The diverse revenue streams of New Zealand's port companies (e.g. property rental, bulk, break-bulk, liquids and marine services, as well as container operations) and limited disclosure by port companies, masks the poor performance of New Zealand's container operations, which face lower operating profit margins and asset turnover than other operations. In addition, return metrics quoted based on book values (often used for annual financial reporting purposes) are typically significantly higher than returns based on a "fair value" estimate of equity value (i.e. share price or fair market value).

2. Larger ships [Missing issue / Aspiration]:

Extract from the draft NIU discussion document (section 135, 136):

> *"The last decade has featured a significant increase in the capacity of new vessels, driven by increasing trade volumes and the lower per-unit operating costs of larger vessels. The largest container ships now carry 11000 TEUs[34]. However, these vessels are being committed to the major trade routes and are unlikely to visit New Zealand in the foreseeable future. The largest vessels currently visiting New Zealand are around 4100 TEU capacity but some ports are preparing for 6100 TEU ships. There is debate about the costs of accommodating these ships. Several ports claim they already have this capability, or could be made compliant with readily achievable levels of investment. However, some commentators suggest that the costs could reach into the hundreds of millions and that duplication of this investment in competing ports would be wasteful from a total New Zealand perspective.*
>
> *The Chief Executive of Maersk New Zealand recently commented that the chances of larger ships visiting New Zealand in the near future are relatively small."*

ARH comments:

Although larger ships may not come to New Zealand in the immediate or near future, given the global trend towards larger ships that offer considerable cost savings to shipping lines and potentially their customers (i.e. exporters and importers), it is inevitable that they will eventually come. New Zealand needs to plan an optimal configuration for its port infrastructure and overall supply chain, and given the long lead times for implementation, this planning needs to commence as soon as possible. This will ensure that scarce public sector funds are invested efficiently and New Zealand is well prepared to accommodate larger ships. Given the significant infrastructure investment required to handle large ships, New Zealand needs to focus this at a small number of international hub ports. Otherwise there is a real risk that over time New Zealand's port infrastructure will not remain competitive with Australia's, resulting in increasing volumes of New Zealand containers being hubbed through Australia. This could have major ramifications for New Zealand's competitiveness in global markets.

Although the timing of the arrival of the next generation of larger container ships is uncertain, New Zealand should take guidance from Australia and start planning and preparing for their arrival. For example, Australia is developing a national ports and freight strategy and the Port of Melbourne is in active negotiations with relevant shipping lines to secure service utilising larger ships and is working to ensure it is prepared in an operational sense to receive them:

[2] The assumed 10% equity cost of capital is based on the value-weighted average cost of equity for the four listed New Zealand port companies (Lyttelton Port, Northland Port, Port of Tauranga and South Port) as at 30 June 2007 and 30 June 2008 of 11.25% and 10.0% respectively. This analysis relied on data sourced from PricewaterhouseCoopers' Cost of Capital Report's dated 30 June 2007 and 30 June 2008 and the market capitalisation for the four listed New Zealand port companies as listed on IRESS for these dates.

> *"The sooner larger generation container ships can be attracted to the port, the sooner the full benefits of the [channel deepening] project will flow through to cargo owners and consumers"*[3]

Australia's major container ports are undertaking considerable investment in port infrastructure, in response to significant growth in container volumes as well as the increasing size of ships. **Appendix 2** shows that the major Australian ports' scale and planned amount and speed of investment in port infrastructure is significantly greater than New Zealand's largest ports.

If this is disparity is not addressed, New Zealand's port infrastructure and shipping services may not be in a position to remain competitive with Australia in the future. New Zealand needs to respond to shipping industry requirements to handle larger ships and consolidate its fragmented volumes (which are costly for shipping lines to service) and infrastructure investment at a small number of hub ports. If it does not, over time New Zealand is at risk of becoming a spoke (rather than a hub) for the international shipping lines. There is anecdotal evidence that New Zealand's containers are already beginning to be hubbed through Australian ports. Ultimately, this would lengthen and reduce the reliability of New Zealand's supply chain and potentially reduce New Zealand's competitiveness in global markets, making New Zealand a less attractive place to do business.

It is therefore critical for New Zealand to plan and invest accordingly to ensure that it has major international hub port(s) in location(s) which are ready to enable importers and exporters to benefit from direct calling by larger ships in New Zealand.

- *"The nation's international competitiveness depends on its ability to connect directly with the large consumption markets in the US and Europe through Asia".*[4]

The move to larger ships is likely to result in significant cost savings for the shipping lines and New Zealand's importers and exporters.[5] However, since ports are by nature highly capital intensive it will place significant demands on New Zealand's port infrastructure. Substantial investment would be required in cranes and other container handling equipment, deeper channels and berths, greater storage areas, as well as adequate capacity, reliability and inter-connectedness between the various domestic transport modes, combined with greater efficiencies (i.e. lower cost and less waste) in the supply chain.

Due to the uncertainty around the future nature and shape of the port sector, "hub" port status is currently being contested between New Zealand's ports resulting in the potential for considerable unnecessary duplication and inefficient investment. It is important that scarce public sector funds are invested efficiently for the port sector to remain internationally competitive, particularly with Australia.

Appendix 3 contains ARH's assessment of the risk and implications of New Zealand cargo being hubbed through Australia.

3. Supply chain performance [Cross-sectoral]:

Extract from the draft NIU discussion document (section 131):

> *"No New Zealand port suffers the congestion problems faced by some ports in Australia, South-East Asia and elsewhere. Truck traffic congestion has occurred at the Port of Auckland, but the recently developed on-line traffic scheduling system and the new Wiri inland port should substantially alleviate this problem. Customer complaints about service, where they exist, are addressed out of the media spotlight. There is active solicitation of new shipping lines to service customer needs, with consequential benefits to New Zealand's exporters and importers from increased competition among international shipping"*

[3] Port Futures – New Priorities and Directions for Victoria's Port System", State of Victoria (2009)
[4] Nigel Jones, Fonterra General Manager of Supply Chain Strategy
[5] "The benefit to the wider New Zealand economy of being able to handle the larger ships is $2-3 billion per annum". Increasing the Productivity of New Zealand's Supply Chains; Nigel Jones, General Manager Supply Chain Strategy and Best Practice, Fonterra Co-Operative Group (March 2009) http://www.conferenz.co.nz/increasing-the-productivity-of-new-zealand-s-supply-chains-2.html

ARH comments:

The fact that New Zealand ports do not face significant congestion issues currently, does not mean that this will not be an issue in the future. To prudently plan for the future, port development needs to be viewed holistically with other areas of the supply chain.

Development of an efficient transport network requires a 'whole of supply chain approach' involving co-ordination between the various parties making decisions regarding infrastructure investment i.e. the Government, regional councils, port companies, etc. However, the current uncertainty around the future nature and shape of the New Zealand port sector makes this extremely difficult.

Port and transport infrastructure development are necessarily highly interdependent:

- Efficient supporting transport infrastructure is vital to the ability of ports to handle larger ships and increased future trade volumes;
- Likely developments in the port sector e.g. future location of major hub ports, cargo flows etc should therefore guide the Government's strategic decisions regarding investment in state highway and railway networks;
- The Government owns the vital inland freight infrastructure and shapes the direction of the transport sector though its policy and funding decisions, therefore the market is not the only factor that determines where ports develop and grow; and
- The risk of a non-coordinated approach to port and transport infrastructure development is either under- or over-investment in transport infrastructure servicing certain regions and ports.

The importance of adopting an integrated, multi-modal, 'whole of supply chain' approach to infrastructure network planning is demonstrated by the US West Coast ports situation in the 1990's where California upgraded its ports to handle larger (6,000-7,000 TEU) container vessels without improving the supporting transport infrastructure linking the ports to the hinterlands – this resulted in major bottlenecks.

There has been considerable commentary about the requirement and potential benefits to New Zealand of preparing itself for the arrival of 'big ships' with a carrying capacity of up to 7,000 TEUs. While the debate has tended to focus on capital expenditure required to upgrade port infrastructure and capacity, a bigger constraint may in fact be the transport links between the ports and their hinterlands. The New Zealand land transport system faces a number of significant challenges and has been identified by the World Economic Forum as a competitive disadvantage for New Zealand and a barrier to economic growth and productivity.

Furthermore, the lead times to upgrade rail infrastructure are likely to be longer than that to upgrade the ports[6]. Without the matching of port capacity and transport infrastructure, bottlenecks outside the port will eventually become bottlenecks within the port. This issue was recently raised by Fonterra (March 2009)[7] and in response, the Shippers Council is leading a project to determine the key bottlenecks in New Zealand's infrastructure preventing big ships calling and working efficiently.

A co-ordinated approach to port sector planning to identify major hub ports and a greater degree of collaboration within the port and wider transport and import/export sector is therefore required. For example, optimising the location, timing and phasing of both port and transport infrastructure investment) to provide improved returns on costly capital expenditure and ensure New Zealand is well prepared to handle large ships in the future.

[6] "$3bn annual savings seen in big ships", Business Day, 3 April 2009
[7] "Increasing the Productivity of New Zealand's Supply Chains" (March 2009); Nigel Jones, General Manager Supply Chain Strategy and Best Practice, Fonterra Co-Operative Group.

4. Future freight demands [Missing issue]:

Extract from the draft NIU discussion document (section 140):

> *"It would in theory be possible to look at past trends and future projections, and then form a view about the likely size and location of the future freight task. Such a view could then inform port planning. However, such analysis may not give a robust result. The speed and unpredictability of past commodity cycles suggests that long-term central planning is unlikely to be helpful. Twenty to thirty years ago few would have foreseen the current export volumes of dairy products, coal or wine. Conversely meat and wool volumes have declined substantially. Imports of CKD cars for assembly in NZ have been replaced by second-hand Japanese imports and Asian-manufactured goods have replaced many local products. Overall, globalisation has created a huge surge in freight volumes. It is difficult to predict whether these trends will continue or be replaced by new trends."*

ARH comments:

Even if the future is uncertain, New Zealand needs to prudently plan for future trade growth to ensure New Zealand remains an internationally competitive nation. An internationally competitive, efficient and sustainable port sector and supply chain is essential to the overall economic prosperity of the nation.

> *"New Zealand can't afford to find itself in the position where we don't have a sustainable, cost effective ocean freight network, supported by highly efficient domestic transport infrastructure."*[8]

Even though it is impossible to accurately predict the future, and particularly the type of goods traded, it is imperative that New Zealand prudently plans for future trade growth through careful scenario planning and analysis. As a remote trading nation, seaborne international trade is of critical importance to New Zealand:

- New Zealand is one of the most active trading nations, with import-export trade representing around 70% of GDP[9];
- New Zealand has a small domestic market and is geographically isolated from many of its trading partners, therefore it is heavily reliant on shipping; and
- Sea ports play a vital role in New Zealand's economic activity, being the principal conduit for global import and export trade, accounting for over 99% of international trade by weight and 83% by value[10].

New Zealand must continue to have sufficient infrastructure to support future growth in seaborne international trade.

As an example of future planning, Victoria has an integrated State development plan for Victoria's commercial trading ports "to ensure that there is sufficient capacity, with a prudent safety margin for planning purposes, to accommodate projected container volume growth until around 2020. Securing capacity in Victoria is also critical to ensuring that the Australian ports system as a whole is well placed to accommodate expected growth over this period."[11]

New Zealand needs to ensure that it undertakes prudent planning to ensure that port and transport infrastructure is in place to efficiently handle future trade growth and maintain New Zealand's international competitiveness.

Refer to **Appendix 4** for ARH's analysis of North Island container growth scenarios and New Zealand port capacity.

[8] "Fonterra move gives Tauranga port boost", New Zealand Herald, 8 September 2009
[9] Source: New Zealand Port Sector Report 2008, Rockpoint Corporate Finance Limited
[10] Source: NZ Statistics, Overseas Cargo - Year ended June 2009
[11] Source: "Port Futures, New Priorities and Directions for Victoria's Ports System", State of Victoria

5. Ports' role in regional development [Missing issue]:

Extract from the draft NIU discussion document (section 133):

> *"One explanation for continued local government ownership in the face of relatively low returns on investment is that LGs regard their ports as strategic assets owned to promote regional development. If so, below-market returns may reflect an implicit subsidy from rate payers to freight owners. A port could be considered as a direct subsidy or as a cost centre, similar to a tourism bureau that is not expected to cover its own costs but that provides value through the business it generates or facilitates elsewhere in the region."*

ARH comments:

Although ports are strategic assets which provide significant benefits to the regional and national economy, it is not sustainable for shareholders of port companies[12] to continue to receive inadequate returns. The current returns are insufficient to justify the high capital investment required in the future to maintain an internationally competitive port sector.

The New Zealand port industry is in a situation where normal market competitive forces are resulting in outcomes that are not efficient or in the best interests of New Zealand. The intense level of inter-regional price based competition has driven down ports' financial returns to unsustainable levels.

ARH analysis suggests that if the New Zealand port sector on average achieved its cost of capital, an additional $138 million per annum of post-tax profits would have been earned by the New Zealand port sector in 2008. Of this, local government owners' share would have been an additional $109 million per annum of earnings, which equates to approximately 23% of the 2008 total rates revenue of the relevant councils. A New Zealand average return on equity of approximately 10% (compared with a 2008 average of 5.1%) would have been achieved had New Zealand's average container handling prices been more in line with those achieved in Australia (New Zealand's average container handling price is estimated to be approximately 35% lower than Australia – refer to Figure 5 in **Appendix 2**).

New Zealand importers and exporters are not necessarily benefiting from low port costs as they need to meet contractual arrangements and have few available shipping line substitutes (i.e. limited pricing power). The inadequate returns have largely resulted in a net wealth transfer from the New Zealand owners of ports to international shipping lines (and potentially their major customers).

Ports are by nature highly capital intensive and require a significant amount of investment, however currently the New Zealand port sector is not earning returns that are sufficient to justify that level of investment. The current inadequate performance of New Zealand's port sector is not sustainable, and poses a significant threat to competitive future of the country.

As detailed above, an internationally competitive, efficient and sustainable port sector is essential to New Zealand's economic prosperity.

6. Regulation:

Port companies in New Zealand are governed by the Port Companies Act 1988 and the Port Companies Amendment Act 1990.

The principal objective of each port company, as governed by the Ports Companies Act, is "to operate as a successful business", regardless of ownership structure. Whilst New Zealand container ports may generally operate at competitive productivity levels and promote and improve the regional and national economy, the industry-wide failure of ports to earn an adequate financial return appears to be at odds with the objective of the Ports Companies Act and indicates that this is an issue that needs to be addressed.

[12] All New Zealand ports have majority local authority ownership.

7. Cross-sectoral issues:

As detailed in point 2, port and transport infrastructure development are necessarily highly interdependent. The draft NIU discussion document does not currently capture this.

New Zealand could take guidance from Australia which recognises the importance of ports being planned and operated in the context of the broader economy and freight logistics network:

> *"Victoria's commercial trading ports are key drivers of our economy and play a defining role in shaping the State and national freight networks. As well as being the major gateways to our overseas markets, they are also key freight hubs connected by road, rail and pipeline networks to freight origins and estimations locally, regionally and Australia wide. For these reasons, it is important that the ports be planned and operated to complement each other in the context of the broader economy and freight and logistics networks within which they have evolved and to which they contribute. Only by effectively coordinating the port system, recognizing the unique roles and strengths of the individual ports can the benefits of the ports to the Victorian economy and community be maximised."*[13]

8. Aspiration:

New Zealand needs to remain competitive with Australian ports to mitigate the potential risk of New Zealand containers being hubbed through Australia in the future. Therefore, New Zealand's major ports should aspire to match the Australian container ports' future performance and keep pace with planned infrastructure investment and technology. Refer to **Appendix 2** for benchmarking of New Zealand and Australia Port infrastructure.

9. Link to economic growth:

New Zealand's current approach of letting a natural port hierarchy develop is likely to involve an inefficient use of resources, including unnecessary duplication of investment and potentially stranded assets, and may not result in the best outcome for New Zealand. A national ports and freight strategy and/or action plan would assist with optimising the location, timing and phasing of investment. However, any framework is also likely to require a co-ordination between all industry stakeholders to establish the optimal configuration of the New Zealand port and freight transport sector to better ascertain that additional investments are a prudent use of scarce funds.

The Government, which has indicated that it sees infrastructure development as vital to New Zealand's growth and prosperity, can assist by supporting industry led initiatives and co-ordinating the recommendations of all industry stakeholders. Following the example set by Australia, the Government could take a lead role in the development and implementation of a national ports and freight strategy and/or action plan that will provide the guidance and confidence for future investment in port and transport infrastructure in order to facilitate the most optimal supply chain configuration for New Zealand, and, in doing so, make a significant contribution to its key objective of improving New Zealand's economic growth, productivity and international competitiveness.

[13] Source: "Port Futures, New Priorities and Directions for Victoria's Ports System", State of Victoria

Appendix 1: Financial performance of New Zealand container ports

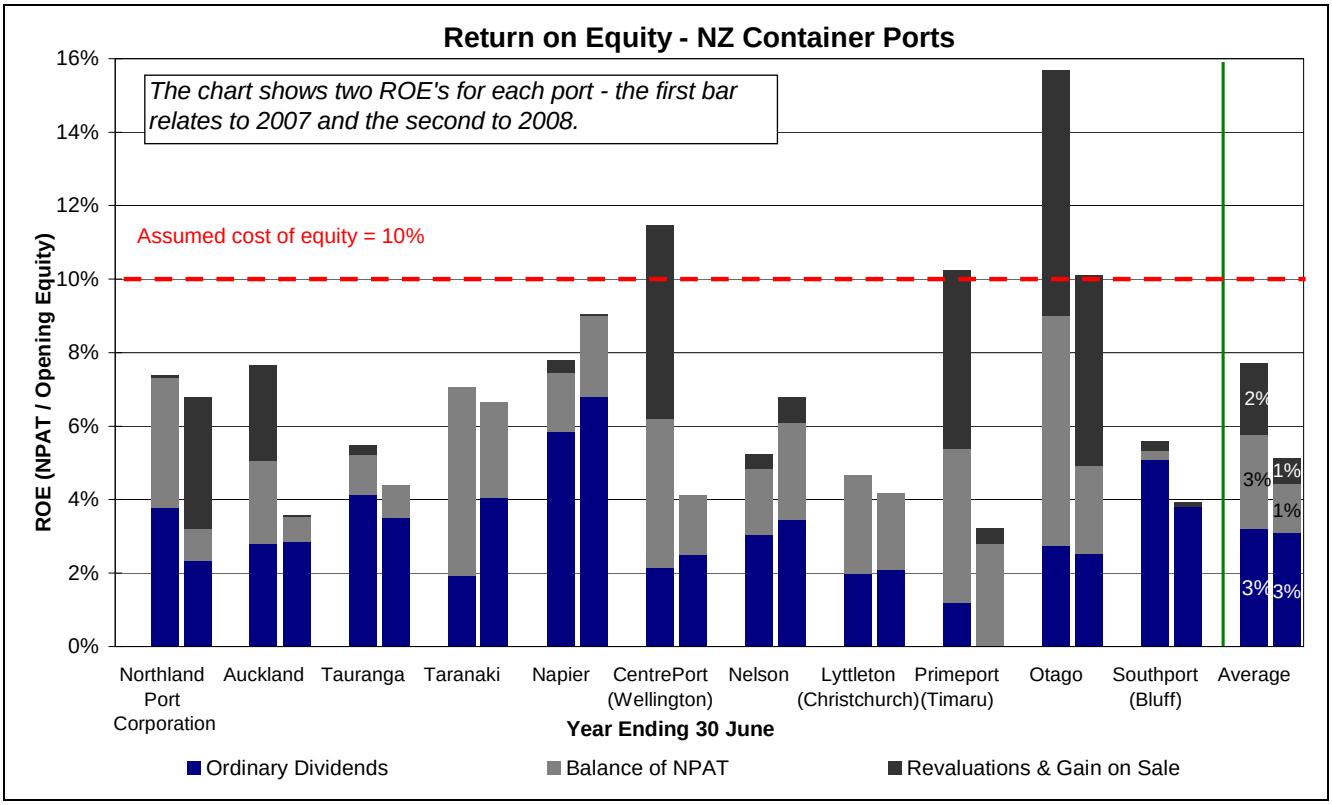
The information detailed below presents ARH's analysis of the 2007 and 2008 return on equity (ROE) for each of New Zealand's 11 container ports. For the purposes of this analysis, ROE is defined as Net Profit after Tax (NPAT) / opening equity value. Wherever possible, "market" equity values were used and in particular:

- For listed companies (i.e. Northland Port Corporation, Port of Tauranga, Lyttelton Port and SouthPort) the equity values were based on market capitalisations;

- The equity value for non-listed companies were:
  - In the first instance, the market value of equity as recorded in the shareholders' financial statements (i.e. Ports of Auckland, Otago, Nelson and Napier); and
  - In instances where the shareholders' equity investment in ports could not be readily identified (i.e. Ports of Timaru, Wellington and Taranaki), the book value of equity in the ports' balance sheet was used. As the book value of equity value in the ports' balance sheets is typically lower than the market value of equity recorded in the shareholders' accounts[14], the returns on these ports may be 'over-stated' relative to the other ports.

Because of the differing equity valuation approaches (in this analysis, as well as in the valuation methodologies employed by the various ports), this analysis should only be used to draw high level industry conclusions, rather than for detailed inter-port comparisons.

Figure 1: 2007 & 2008 return on equity - New Zealand container ports



Source: Ports and majority shareholder annual reports
Note:

(1) "Balance of NPAT" reflects NPAT not distributed to shareholders as ordinary dividends and having deducted revaluations and gain on sale items.

(2) The Port of Napier's financial year ends on 30 September. The financial year for all other ports ends on 30 June.

[14] For example, the 2008 closing equity value in Ports of Auckland's and Port Otago's accounts are 20% and 14% below that recorded in their shareholders accounts.

Key high-level conclusions include:

- The current ROE achieved by the New Zealand port sector is inadequate:
  - In 2008, the average ROE across New Zealand's container ports was 5.1% (see Figure 1). The average ROE in 2007 of 7.7% was also well below an assumed average cost of equity of around 10%[15].
  - It is likely that the returns on the ports' container operations would be even lower than the return on total equity.

- A significant proportion of the ROE relates to revaluations and gains on sale (i.e. 3% and 1% in 2007 and 2008 respectively) (see Figure 1). Removing this effect would reduce the average ROE to approximately half the assumed cost of equity of 10% (i.e. 6% and 4% in 2007 and 2008 respectively).

- Otago, Wellington and Timaru are the only ports that appear to have achieved an ROE above the assumed cost of equity of 10%. However, upon removal of NPAT attributable to revaluations and any gains on sale, these ROE's also fall below 10%.[16]

- The component of ROE paid out as ordinary dividends was approximately 3% on average in both 2007 and 2008 (see Figure 1).

- Had New Zealand's container ports achieved an ROE of 10% (across the entire business i.e. bulk, break-bulk and container operations) in 2008, total earnings would have increased by approximately $138 million (see Figure 2).

- In 2008, a New Zealand average ROE of approximately 10% (compared with a 2008 average of 5.1%) would have been achieved had New Zealand's average container handling prices been more in line with those achieved in Australia. As noted in Appendix 2, there is an estimated NZ$140 difference between New Zealand and Australia's average container handling prices. Based on New Zealand's 2008 full import and export container volumes, this equates to approximately $134 million per annum of additional post-tax profits.

- It is important to note that other factors including over-investment (e.g. dredging and un-profitable expansion) and long-term pricing arrangements (i.e. decisions made by port companies) may in some instances have also contributed to the inadequate returns observed.

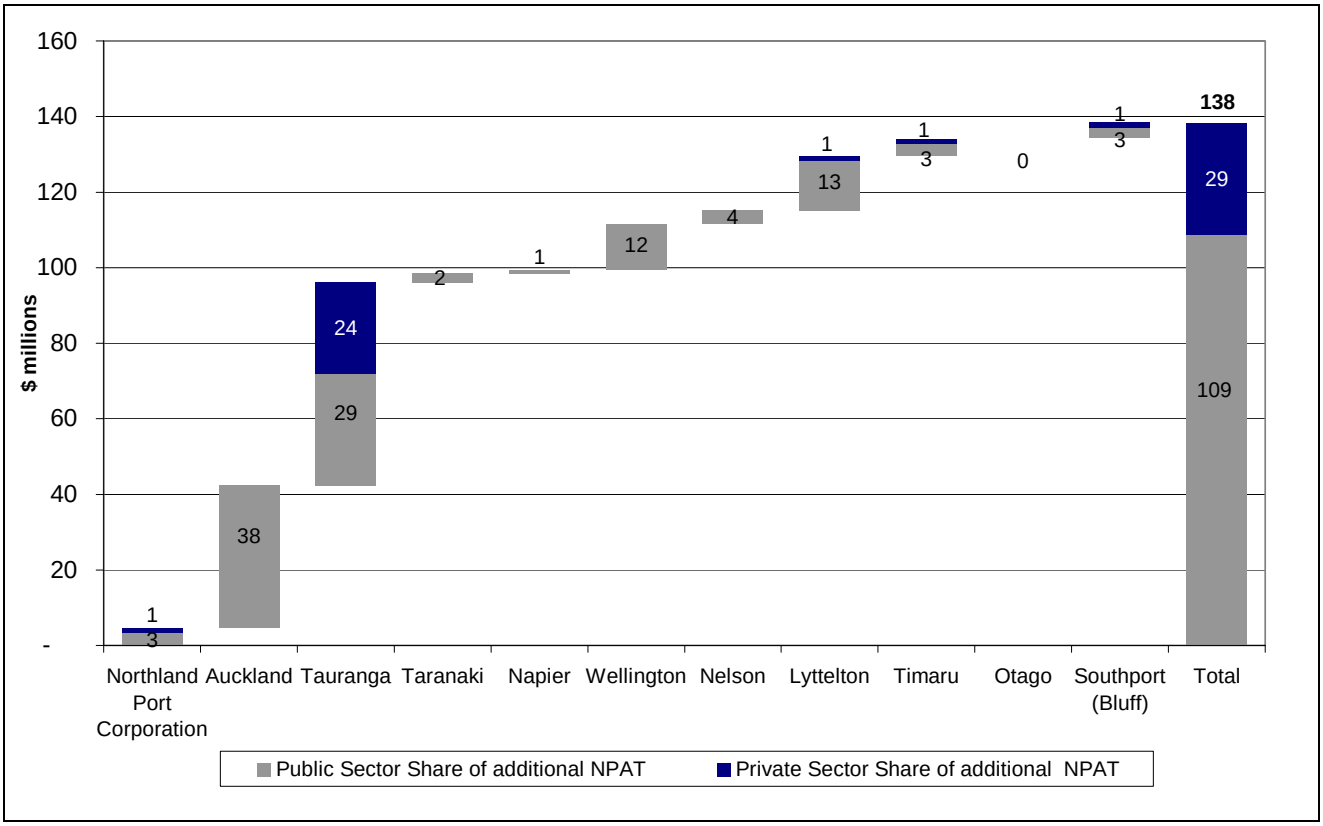
- Based on ownership proportions, $109 million of this additional $138 million of annual earnings would have accrued to their public owners (i.e. councils or their subsidiaries/holding organisations) with the remaining balance to private entities (see Figure 2):
  - A total of $109 million is considerable, particularly in the context of the rates income of the public shareholders. Our analysis in Figure 3 below suggests that this additional NPAT equates to approximately 23% of the 2008 total rates revenue of relevant councils (i.e. those with shareholdings directly or indirectly via subsidiaries/holding organisations).

[15] The assumed 10% cost of equity is based on the value-weighted average cost of equity for the four listed New Zealand port companies (Lyttelton Port, Northland Port Corporation, Port of Tauranga and South Port) as at 30 June 2007 and 30 June 2008 of 11.25% and 10.0% respectively. Data for this calculation was sourced from the PricewaterhouseCoopers Cost of Capital Reports dated 30 June 2007 and 30 June 2008, and the market capitalisation of the four listed New Zealand port companies as listed on IRESS as at these dates.

[16] Note (as previously mentioned) that Timaru's and Wellington's equity values are not necessarily true reflections of market value (i.e. based on port book value of equity)

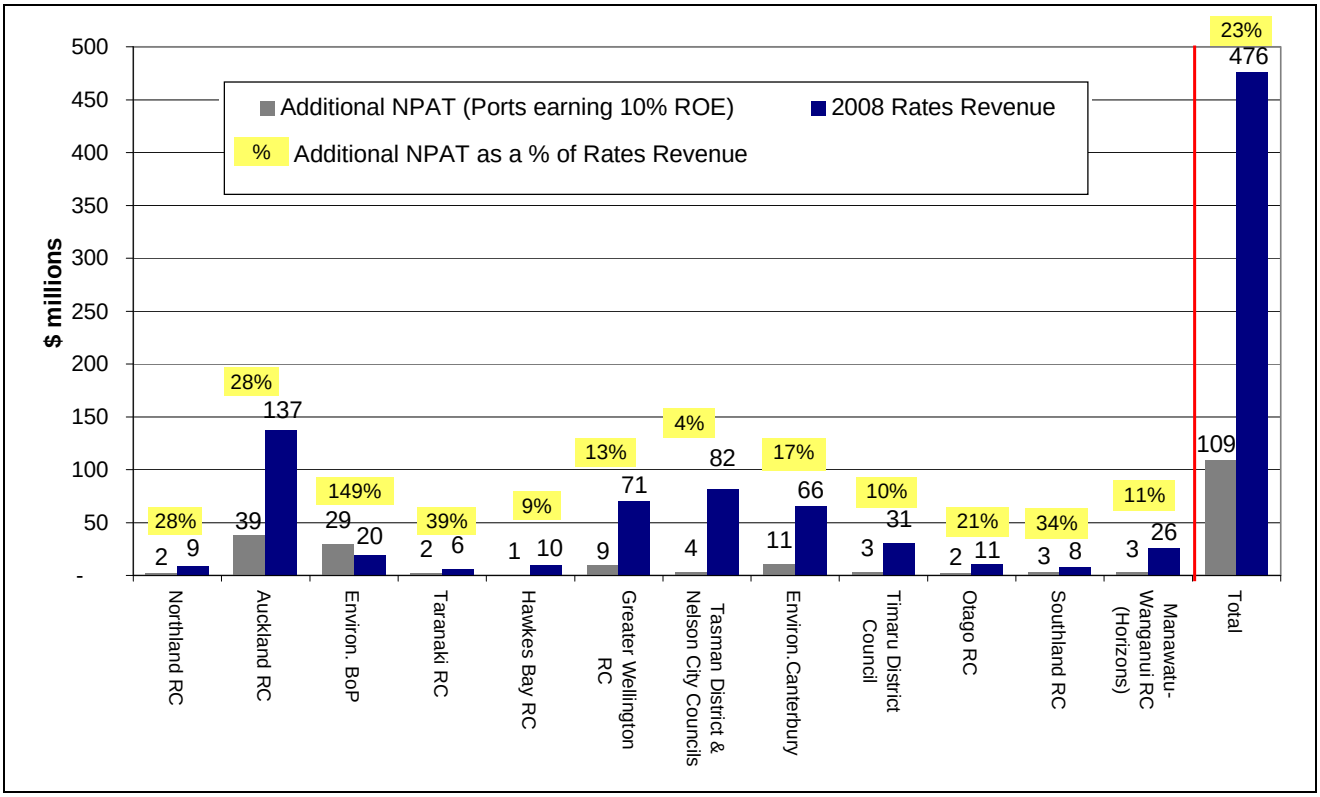
- Note that this analysis does not consider the dividend policies of the various ports and it is likely that only a portion of these additional earnings would actually be distributed to shareholders as dividends.

Figure 2: Additional 2008 NPAT if New Zealand container ports were achieving 10% ROE



Source: Ports and majority shareholder annual reports

Figure 3: 2008 Council rates and additional NPAT attributable to councils if New Zealand Container Ports were achieving 10% ROE



Source: Ports, council and majority shareholder annual reports

Notes:

(1) The councils presented have shareholdings directly (or indirectly via subsidiaries/holding companies etc) in one or more New Zealand container ports. While the majority of these are regional councils, there are several city/district councils with shareholdings in ports (i.e. Tasman, Nelson and Timaru). These differing council levels have implications for total rate revenue as presented in the figure above. As rates received by city or district councils are typically higher than those paid to the regional councils, the rates revenue in Tasman District and Nelson City Councils, as well as the Timaru District Council look relatively high when compared to the larger regional councils, such as Environment Canterbury and Otago Regional Council.

(2) As some councils have shareholdings (either directly or indirectly) in ports other than those in their region, the additional NPAT attributable to each of the councils presented above does not align exactly with the additional public ownership NPAT for the ports in their region. For example, the Manawatu-Wanganui Regional Council does not have a port in its region; however it does have shareholdings in the Ports of Napier and Wellington.

(3) The rates presented for the Timaru District Council are the budgeted rates for 2009. All other council rates relate to 2008 revenue.

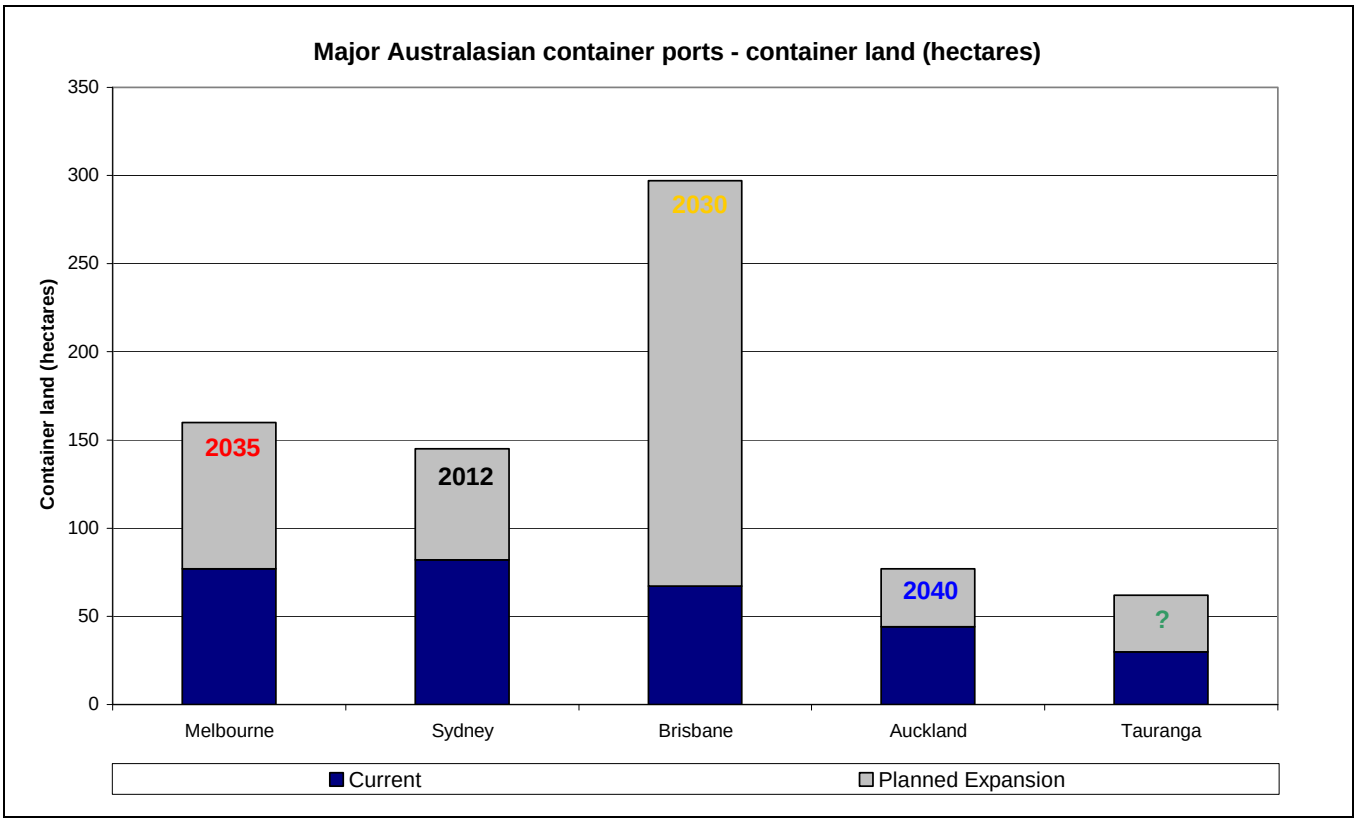
Appendix 2: Benchmarking of New Zealand and Australia Port infrastructure

The major Australian container ports are undertaking considerable investment in port infrastructure, backed by State and Federal Government funds, in response to significant growth in container volumes as well as the increasing size of ships. In addition to individual port development plans, the Australian Government has established an A$20 billion "Building Australia Fund" to support the development of critical economic infrastructure. This will include port infrastructure needs (including road and rail access) necessary to facilitate the predicted growth in container and bulk trades. In this year's budget, the Australian Government acknowledged the critical role that ports play as international gateways between businesses and global markets and committed A$389 million to improving their efficiency and capacity. Not only is Australia spending billions of dollars on infrastructure development, it is also exploring concepts such as a National Logistics City in Melbourne to further enhance its international competitiveness.

Set out in Figure 4 below is a comparison of current and future planned key physical port infrastructure (terminal area and berth length) between the major New Zealand and Australian container ports.

Currently the combined container terminal infrastructure of New Zealand's two largest container ports, Auckland and Tauranga, is broadly similar to the largest Australian container ports. Figure 4 shows that the current and future planned amount and speed of port infrastructure investment of the major Australian container ports is significantly greater than that of New Zealand's largest ports. However, as discussed in point 3, port capacity and development needs to be considered in the context of the whole supply chain, to ensure a match between port and transport capacity and requirements.

Figure 4: Australasian Port Infrastructure – Current and Planned Expansion



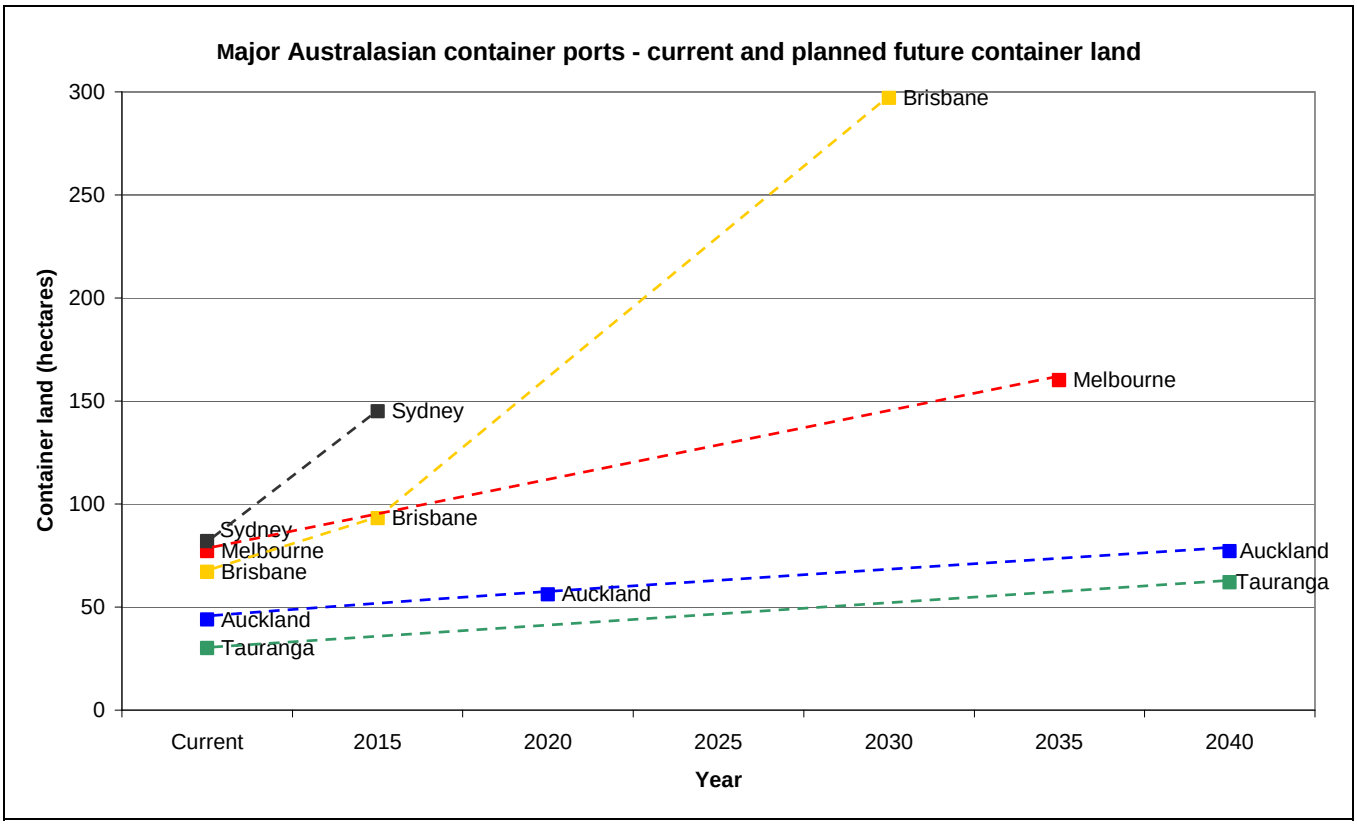
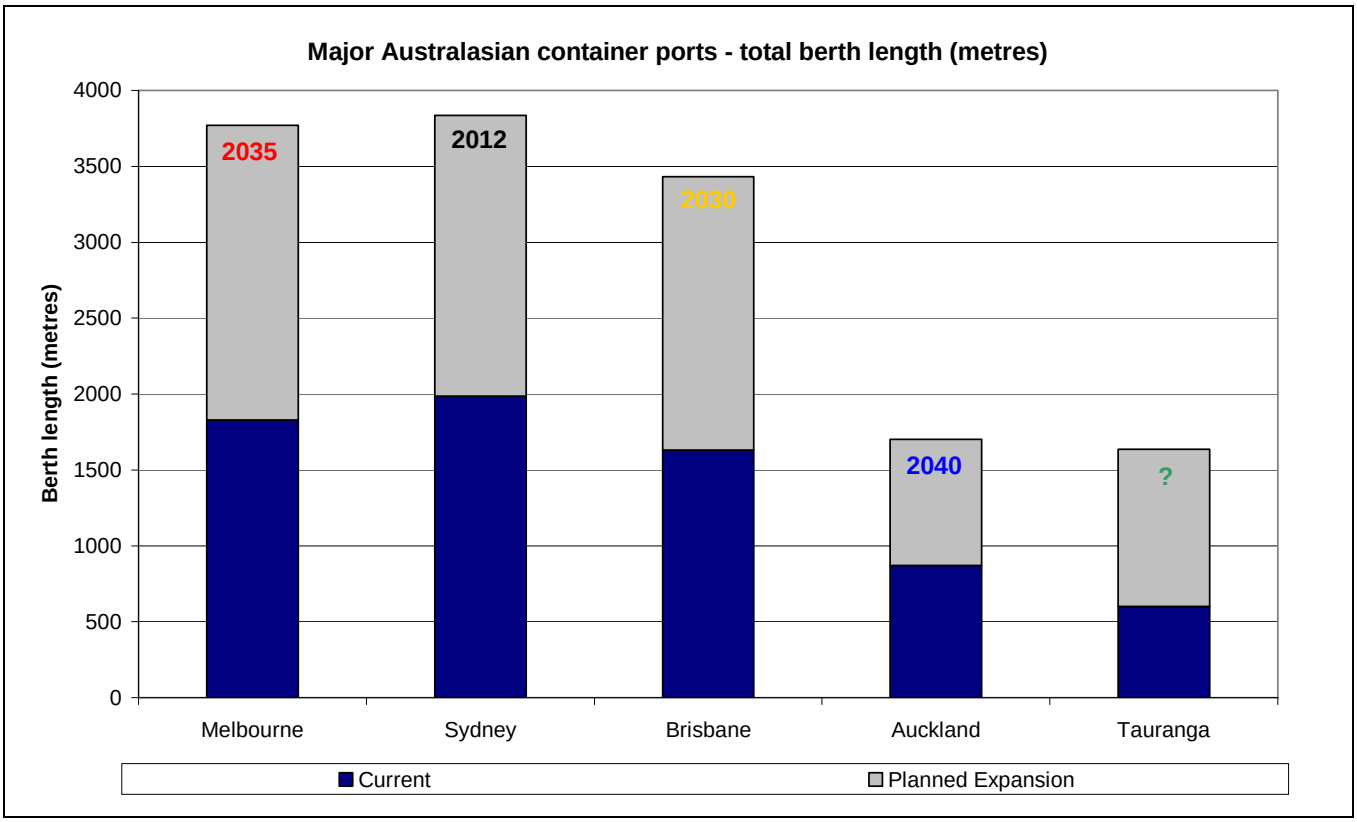
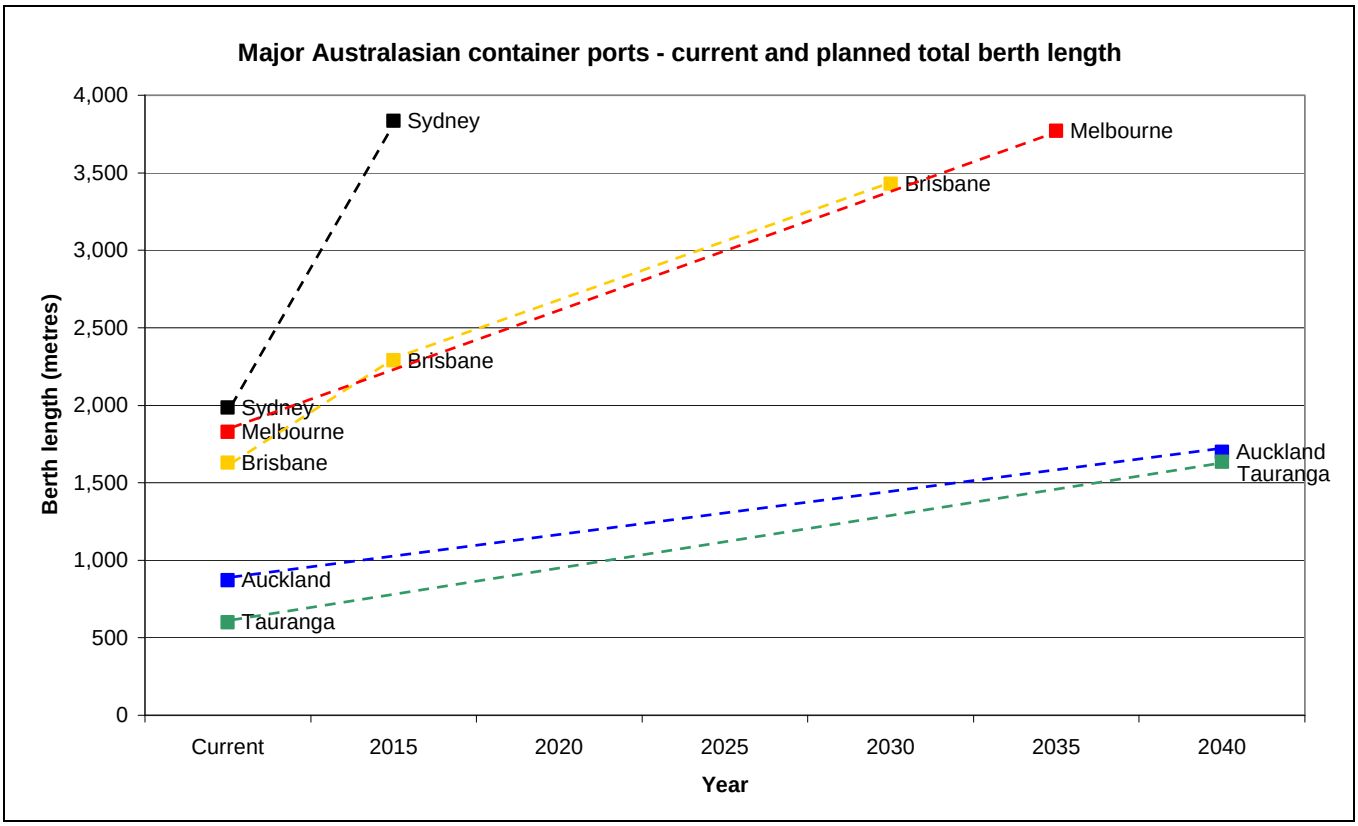


Figure 4 continued: Australasian Port Infrastructure – Current and Planned Expansion





Source: Estimates obtained from available public information.

Note: Container terminal areas are approximate only and can vary significantly depending on what is included e.g. rail yards, engineering, admin areas, empty container depots etc.

The maximum size ship that is regularly servicing Australasian ports is understood to be approximately 4,500 TEU, with bigger ships in excess of 5,000 TEUs calling occasionally. However, both New Zealand and Australian ports are gearing up to cater for the next generation of ships in the range of 5,000-8,000 TEU within the next five or so years.

Table 1 below sets out the current and future planned channel and berth depths of the major Australasian ports as an indicator of their ability to cater for larger ships.

Table 1: Channel and berth depths

	Channel		Berth	
	Depth (CD)	**Max Draft (metres)**	**Depth (CD)**	**Max draft (metres)**
Melbourne	13.1	12.1 (14.0 by end of 2009)	13.1	12.1 (14.0 by end of 2009)
Sydney	15.0	13.7 (high tide)	15.2 (increasing to 16.5)	15.2
Brisbane	15.0	?	14.0	14.0
Auckland[17]	12.5	13.9 (high tide)	13.3 (15.5 by 2016[18])	12.5 (14.3 by 2016)
Tauranga	12.9	11.7 (low tide) 13.0 (high tide) Seeking resource consent to increase to 14.5.	14.5	13.0

Source: Port websites, port development plans and media announcements

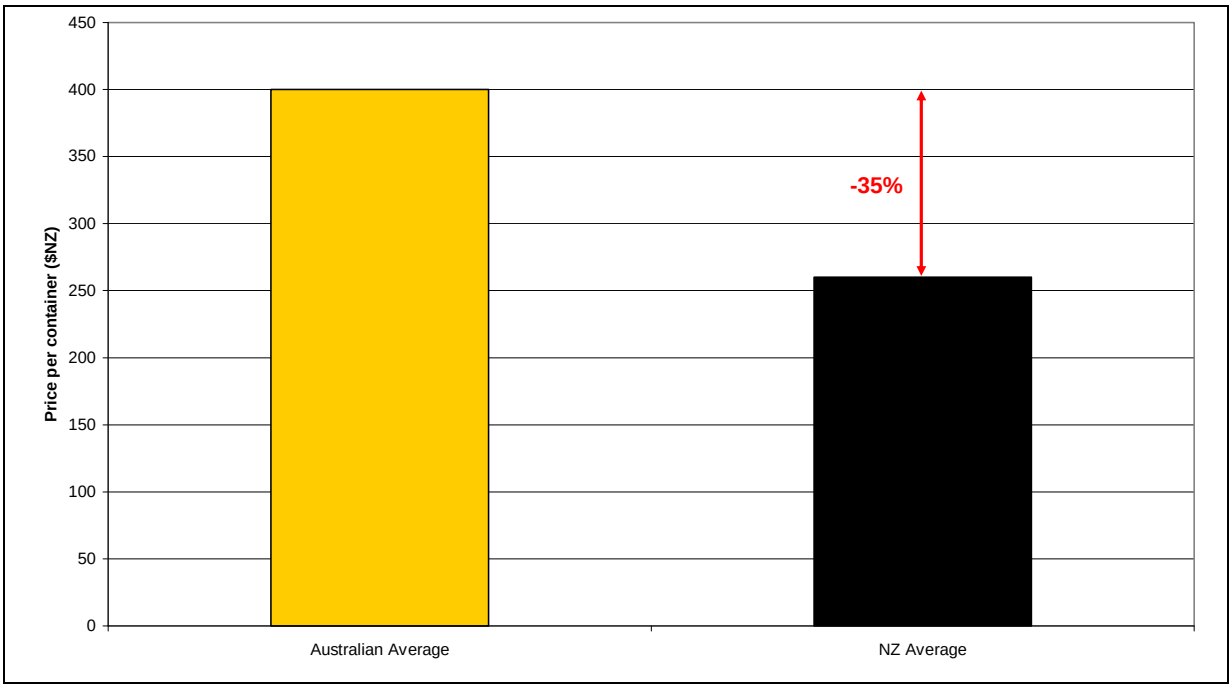
The five ports appear to be planning to cater for similar size ships (i.e. maximum draft). The Port of Melbourne is currently undertaking a significant channel deepening project at Port Philip Bay, which is due for completion by the end of 2009. However, a restriction in the turning basin will mean that ships are limited to approximately 300 metres in length.

[17] As per Ports of Auckland 2009 Port Development Plan
[18] Assuming Coast Permit Application for Fergusson Wharf Berth Deepening is approved

Pricing

New Zealand container handling prices are estimated to be approximately 35% lower than Australia as shown in Figure 5 below.

Figure 5: Average container handling prices ($NZ) – Australia vs. New Zealand



Source: BITRE Waterline 44 August 2008, ACCC Stevedoring Monitoring Report no.10 (October 2008)

The following assumptions have been employed in the above comparison:

- Australian prices are an average of import and export charges for ships in the 35,000 to 40,000 GT range and include stevedoring, cargo based charges for wharfage and other ancillary charges (but exclude harbour dues and berth fees for comparability with New Zealand);
- The New Zealand average container handling price of $260 is an indicative estimate only;
- The ratio of TEUs per container is assumed to be 1.42; and
- Australian dollars have been converted into New Zealand dollars at an exchange rate of 0.80.

The implications of this pricing analysis are that New Zealand ports could raise their container handling prices by a significant amount and still be competitive with Australian ports in terms of price.

It is interesting to note that Australian ports are increasing their port charges to enable continued funding of future port growth. Port of Brisbane announced on 24 August 2009 a 6% increase in wharfage (and harbour dues) effective from 1 December stating that *"despite not increasing our charges over the last 27 years, we have invested heavily in new infrastructure and facility upgrades in a climate of increasing costs….it is critical that we continue this funding for the future growth of the port…It is no longer viable to keep our charges unchanged in this environment; an increase, while not desirable, is simply unavoidable…In fact, we are the last capital city port to increase charges."*[19]

[19] "Port of Brisbane announces pricing adjustments from December 2009", www.portbris.com.au

Appendix 3: Risk and implications of New Zealand cargo being hubbed through Australia

Concern is often expressed that New Zealand could lose direct overseas shipping services to the ports of Sydney, Melbourne or Brisbane providing a trans-shipment service. This concern arises because small, fragmented container volumes in New Zealand are costly to service by shipping lines and result in increased transit times. Port rationalisation in New Zealand would reduce the risk of trans-shipment through Australia by consolidating volumes and investment in infrastructure at a small number of hub ports. It has been noted that:

- *"International shippers have made it clear they are determined to cut costs by servicing only super-ports. If New Zealand doesn't produce one of its own, the country's exports and imports will end up being "fed" through an Australian super-port, resulting in huge cost increases"* [20]*; and*

- *"The nation's international competitiveness depends on its ability to connect directly with the large consumption markets in the US and Europe through Asia".*[21]

This concern is heightened further by the current global contraction in trade volumes which has had the following impacts:

- A significant fall in import volumes into New Zealand;
- Direct European trade lanes are not profitable for shipping lines due to low volumes and overcapacity, low freight rates, and imbalanced container flows (imports vs. exports);
- Southbound Asian trade is suffering;
- Minor trade lanes are becoming marginal; and
- Globally, shipping lines are being forced into more vessel sharing agreements, which has a flow on effect for the smaller regions such as Australasia. The only way for shipping lines to mitigate further losses is to reduce unit costs through larger ship deployment and further carrier consolidation to tighten up capacity and increase demand.

The advantage for shipping lines of trans-shipment of New Zealand cargo through Australia would be a significant reduction in the number of Australasian port calls. Large scale trans-shipment of New Zealand cargo through Australian ports would have serious ramifications for New Zealand however, especially given New Zealand's reliance on shipping and international trade. Likely impacts include:

- Longer, more costly supply chain to get New Zealand goods to market:

    - For example, instead of exports being railed to a New Zealand hub port to be consolidated then shipped directly to their final destination, goods would be trucked to the nearest port, loaded onto a feeder ship to an Australian hub port to be consolidated with other New Zealand cargo, and then re-loaded onto a ship to its final destination;

    - This would result in increased handling costs - Fonterra in its recent decision to consolidate its New Zealand port use stated that "the big cost influences are all about avoiding trans-shipping costs" and "each time a container is handled it costs hundreds and hundreds of dollars";

    - Transit times would be increased by a minimum of four days compared to a direct service; and

[20] "Rivalry between ports could cost NZ dearly", Northern Advocate, 29 August 2008.
[21] Nigel Jones, Fonterra General Manager of Supply Chain Strategy

  - A recent study of 126 economies calculates the loss from export delays at around 1% of trade for each extra day. For perishable agricultural products, the cost is nearly 3% of the volume of trade for each day of delay[22].

- Less reliable supply chain competing for space with Australian companies;

- Increased transit times for New Zealand's perishable exports (however extremely perishable export products e.g. fresh seafood are usually transported by air rather than sea);

- Reduced competitiveness in global markets resulting from increased handling and delays;

- Space-constrained, more expensive direct services;

- More expensive consumer goods; and

- Sub-optimal utilisation of sunk investments by New Zealand ports in dredging, plant and equipment etc, and Government investment in supporting landside infrastructure.

When assessing the risks of this occurring, factors that could help to mitigate against this include:

- End destination import ports such as Auckland typically have a significant influence over vessel scheduling decisions as high value import containers are a significant contributor of freight revenue for shipping lines, and importers wish to release capital tied up in inventory as quickly as possible. However, the significant fall in New Zealand import volumes and freight rates in recent times increases the risk of some of the smaller lines reconsidering involvement in the New Zealand trade.

- New Zealand's reefer (temperature controlled) export cargo is very valuable to shipping lines due to the high margins earned relative to dry containers as evidenced by the relatively large number of shipping lines servicing the small, fragmented and highly seasonal container volumes outside of the Ports of Auckland and Tauranga. However, the reefer equipment imbalance is very costly due to the cost of re-positioning empty containers.

- It may be difficult to provide a cost-efficient and high enough frequency trans-shipment service to New Zealand to ensure competitive transit times compared with a direct calling vessel. Therefore, if certain shipping companies decided to trans-ship New Zealand volumes through Australia, new or other shipping lines may take the opportunity to fill the vacuum by offering direct services.

  - For example in the airline industry the trend towards hub and spoke networks created the opportunity for low-cost point to point services to enter the market.

- The importance to New Zealand exporters of having access to regular direct shipping services to key consumption markets is demonstrated by Fonterra's recent decision to consolidate its port use:

  - "Fonterra wanted to improve its service to global customers and reduce costs by moving containerised product away from indirect (feeder) services to direct exporting for the large European, Middle East and North American markets through Asia"[23]

[22] Djankov, Freund and Pham, forthcoming, OECD Economic Surveys: New Zealand, Volume 2009/4, April 2009, p90
[23] "Tauranga wins in Fonterra export move" New Zealand Herald, 15 August 2009

- Large scale trans-shipment through Brisbane is highly unlikely as:

    - Sydney and Melbourne importers are unlikely to tolerate vessels being delayed in Brisbane to discharge import cargo destined for New Zealand; and
    - Brisbane ships more export containers, hence it is often the last port of call in Australia. Sydney, followed by Melbourne, are usually the first ports of call in order to release space and provide goods to importers to enable the servicing of around 70%[24] of the Australian market overnight.

However, the following factors mean that there remains a real risk of trans-shipment through Australia occurring:

- There may be some potential for certain services to be trans-shipped through Melbourne or Sydney. This is a real risk for New Zealand as given the fixed cost nature of the industry, ports are always looking for opportunities to increase their throughput. In some instances, ports will even provide subsidised feeder services to ensure that cargo is routed via that port.

- The Port of Melbourne is in active negotiations with relevant shipping lines to secure service utilising larger vessels and is working to ensure it is prepared in an operational sense to receive them.

    - "The sooner larger generation container ships can be attracted to the port, the sooner the full benefits of the [channel deepening] project will flow through to cargo owners and consumers"[25]

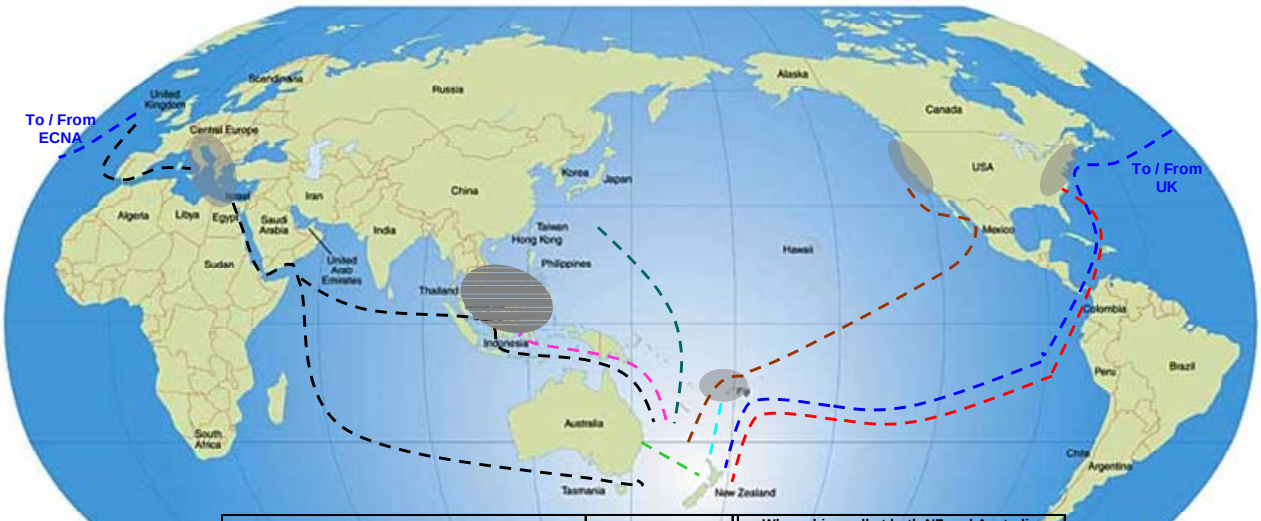
- There is anecdotal evidence of trans-shipment of New Zealand containers through Australia already beginning to occur.

- Shipping routes – Figure 6 below shows the routes of the major New Zealand shipping services.

    - For the vast majority of services, the first port of call in New Zealand is either Auckland or Tauranga;
    - When ships call at both Australia and New Zealand, on average they call on three New Zealand (maximum of six) ports and in Australia they call on an average of two (maximum of four);
    - New Zealand is closer than Australia to North America therefore ships call at New Zealand ports first on the North America and Europe via Panama routes.

[24] Victoria University Melbourne, "A National Logistics City: Securing Australia's Global Competitiveness" (2007).
[25] Port Futures – New Priorities and Directions for Victoria's Port System", State of Victoria (2009)

Figure 6: New Zealand Shipping Routes



Route	# of Shipping Companies Operating the Route	When ships call at both NZ and Australia, Number of Stops:					
		NZ Average	AU Average	NZ Max	AU Max	NZ Min	AU Min
UK/Europe via Suez [1]	4	2.3	4.0	3.0	4.0	2.0	4.0
UK/Europe via Panama [2] [3]	3	2.3	2.7	3.0	3.0	2.0	2.0
East Coast of North America via Panama [3]	4	4.0	2.0	6.0	2.0	3.0	2.0
West Coast of North America [3]	4	2.3	2.7	3.0	3.0	2.0	2.0
Southern Asia	7	3.9	1.4	5.0	4.0	2.0	1.0
Northern Asia	8	3.0	1.0	3.0	1.0	3.0	1.0
Tasman	5	3.5	2.1	5.0	3.0	2.0	2.0
Pacific Islands [4]	7						
Weighted Average		***3.2***	***2.2***	***4.3***	***3.0***	***2.2***	***2.0***

Notes:
(1) Routes back towards Europe through Southern Asia (or vice versa)
(2) Some ship routes will stop at the East Cost of North America, whilst others bypass them heading directly towards the Panama Canel
(3) Some ship routes will stop in the Pacific Islands, whilst others bypass them heading direct to NZ/Australia
(4) Mainly calling on Auckland only

Source: Derived from information contained within 'New Zealand Port Sector Report 2008' (Rockpoint)

Some services are more at risk than others. The likelihood of trans-shipment of New Zealand volumes through Australia for each of the major trade routes is analysed in Table 2 below.

Table 2: Likelihood of trans-shipment of New Zealand volumes through Australia

NZ Service Route	General Route	Approx. % of NZ export trade [(1)]	Likelihood of T/S through Australia	Comments
Asia				
North Asia (Japan, China, Hong Kong, Korea, Taiwan, Vietnam, Philippines)	▪ North Asia ▪ **NZ** (some services via Brisbane or Pacific Islands) ▪ North Asia	21%	Not likely	• Transit time of around 10 days from North Asia for both NZ and Australia. • Trans-shipment through Australia would increase transit time to NZ by at least 4 days compared to direct service. • Increasing dependence on imports from Asia - NZ importers would always choose shipping lines that offered a direct service. • Currently the only Australian stopover is Brisbane which is not a likely Australian trans-shipment port.
South Asia Singapore, Malaysia, Indonesia, Thailand)	▪ South Asia ▪ **Australia** (mainly Brisbane) or Pacific Islands ▪ **NZ** ▪ South Asia (some services return via Brisbane)	14%	Possible but not likely	• Increasing dependence on imports from Asia - NZ importers would always choose shipping lines that offered a direct service. • Currently the only Australian stopover on most routes is Brisbane which is not a likely Australian trans-shipment port. • 4 shipping lines offer direct services between Singapore and NZ.
America				
North America East Coast (ECNA), West Coast (WCNA)	▪ North America (ECNA via Panama) ▪ **NZ** ▪ **Australia** ▪ **NZ** ▪ North America (some services return via Pacific Islands)	13%	Not likely	• NZ is closer to North America than Australia therefore ships call at NZ ports first on their way to Australia, and again on the way back. • The US is NZ's second biggest export market after Australia[26]. The NZ Government is working towards a free trade agreement with the US. This may eventually increase volumes further. This increases the chance of maintaining a direct NZ call.

[26] In terms of export value - NZ Statistics.

Table 2 continued: Likelihood of trans-shipment of New Zealand volumes through Australia

NZ Service Route	General Route	Approx. % of NZ export trade (1)	Likelihood of T/S through Australia	Comments
Europe				
Europe via Suez	▪ Europe ▪ Middle East ▪ **Australia** ▪ **NZ** ▪ **Australia** ▪ South Asia ▪ Middle East ▪ Europe	17%	Some potential	• Europe direct trade lanes currently not profitable • Some potential for trans-shipment through Australia given proximity to the Middle East relative to NZ. • Development of NZ upper North Island hub port will strengthen NZ's position to maintain direct call.
Europe (Panama Direct)	▪ Europe ▪ ECNA ▪ Panama ▪ Pacific Islands ▪ **Australia** ▪ **NZ** ▪ Panama ▪ ECNA ▪ Europe	2%	Some potential	• Some potential for trans-shipment through Australia given services go via Brisbane, Sydney and Melbourne before calling at NZ ports.
Europe via Panama	▪ Europe ▪ ECNA ▪ Panama ▪ **NZ** ▪ **Australia** ▪ **NZ** ▪ Panama ▪ ECNA ▪ Europe	1%	Not likely	• NZ is closer to North America than Australia therefore ships call at NZ ports first on their way to Australia, and again on the way back

Note (1): Ports of Auckland estimate as at May 2009, excludes Trans-Tasman and Pacific Island trades within these services, which account for around 32% of New Zealand's total trade volumes.

The Europe via Suez service, which accounts for approximately 17% (refer Table 2 above) of the New Zealand container trade, appears the most at risk of trans-shipment of New Zealand volumes through Australia given Australia's proximity to the Middle East relative to New Zealand and also the fact that Europe direct trade lanes are currently not profitable. However, given the close proximity of Australia to New Zealand and the trend towards larger ships and reduced port calls, other services will become increasingly at risk if New Zealand does not prepare to cater for the next generation of ships over the next few years by consolidating volumes over a small number of hub ports and investing in the necessary port and transport infrastructure.

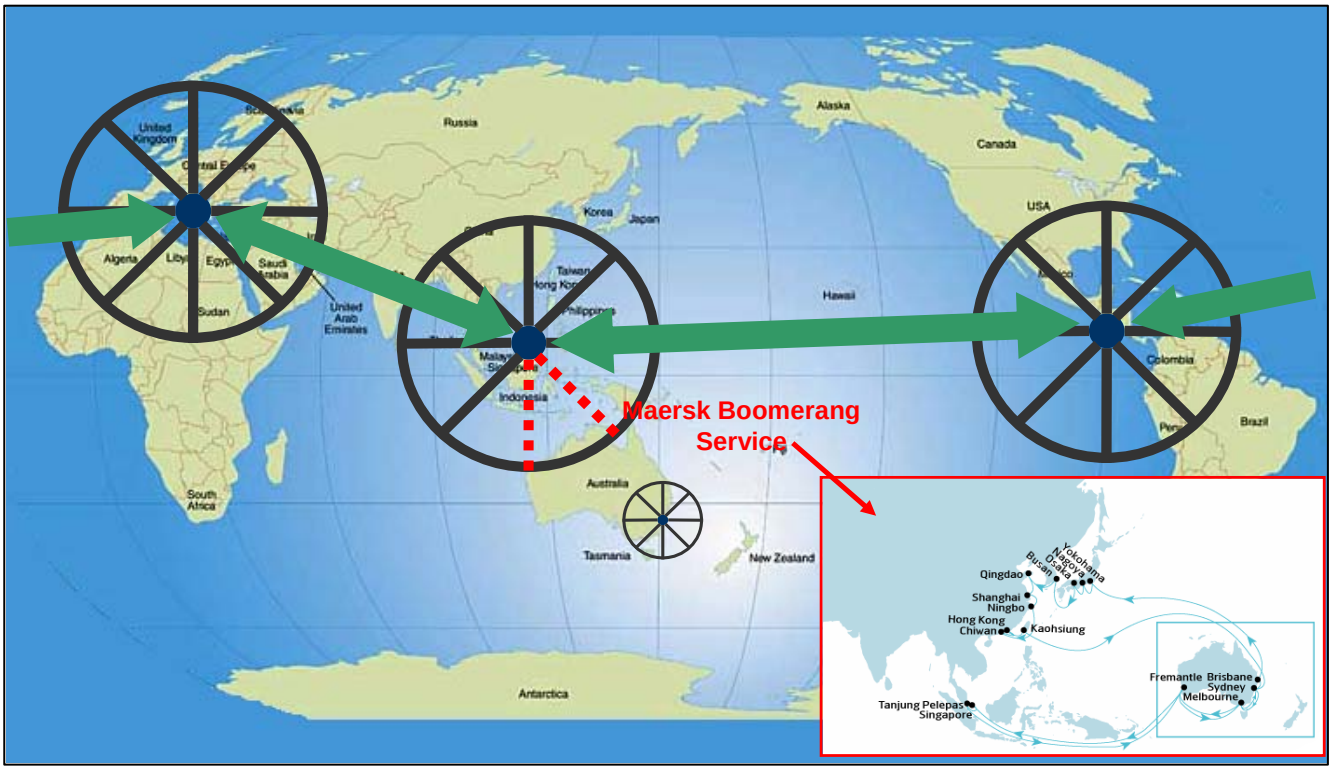
For example, in September 2008, Maersk established a weekly "Boomerang" service between Asia and Australia (see Figure 7) which is operated by a fleet of around ten 4,500 TEU ships (likely to be upgraded to 6,000-6,500 TEU ships over time). This service could potentially cover the import and export drivers for both Australia and New Zealand if Maersk's New Zealand containers were to be trans-shipped through Melbourne and Sydney. It is also interesting to note that Mediterranean Shipping Company S.A (MSC) are a partner line on this service and are currently one of the main shipping lines trans-shipping volume to/from New Zealand through Australia (predominantly via Sydney).

As illustrated in Figure 7 below, the three major international shipping hubs are Europe, Asia and America. Cargo moving from Europe/Middle East tends to be trans-shipped through the same Asian ports as New Zealand's Asia trade is being shipping to/from, therefore there is potential for up to 50% of New Zealand's trade to be threatened (i.e. both the Europe and Asia trades).

This is likely to be an upper bound estimate as it assumes the lowest cost structure based on large vessels and efficient and cost effective port handling though the east Australian ports. It may in fact be difficult to provide a cost-efficient and high enough frequency trans-shipment service to New Zealand to ensure competitive transit times compared with a direct calling vessel, especially given New Zealand's increasing dependence on imports from Asia.

However, it is important to note that this analysis assumes today's conditions, and future unknown industry changes could make the risk even greater. The fact that this very real risk exists and has major ramifications for New Zealand's international competitiveness means that it is vitally important for New Zealand to optimise its port and transport infrastructure to ensure that it has major international hub port(s) in location(s) which are ready to enable importers and exporters to benefit from direct calling by larger ships in the future.

Figure 7: Major international shipping hubs and Maersk Boomerang service



Appendix 4: Container port capacity

New Zealand upper North Island container capacity

Some commentators have suggested that in order to cater for the trend towards larger ships and fewer port calls, New Zealand should have a maximum of two hub ports, one in the North Island and one in the South Island. However, this presumes that a single port has the future capacity to handle the entire North Island container trade over the long-term. The implications of this for New Zealand's overall port and transport infrastructure and supply chain also need to be carefully considered.

The upper North Island accounts for over 80% of North Island container volumes and around 60% of total New Zealand container volumes. If there was to be only one hub port in the North Island it makes sense for it to be located in the upper North Island, either at Auckland or Tauranga, to be close to the largest import and export markets.

However, as shown in the analysis in this section, depending on future trade growth, both Auckland and Tauranga (plus further expansion at these ports) will be required in order to provide sufficient capacity. In the future, Northport could also be utilised to provide further capacity given that is the closest alternative port to Auckland (approximately 150 kilometres away), and is a natural deepwater port.

The capacity of Auckland and Tauranga to cope with future growth in North Island container volumes, assuming that all containers from other North Island container ports (Wellington, Napier, Taranaki) can be railed or coastal shipped to the hub port(s) in the upper North Island, is examined below. Note that the alternative to hubbing all North Island containers through Auckland and Tauranga is continued direct services to some or all of the other North Island ports. However, this increases the risk of New Zealand volumes being hubbed through Australia (refer to Appendix 3 for further details).

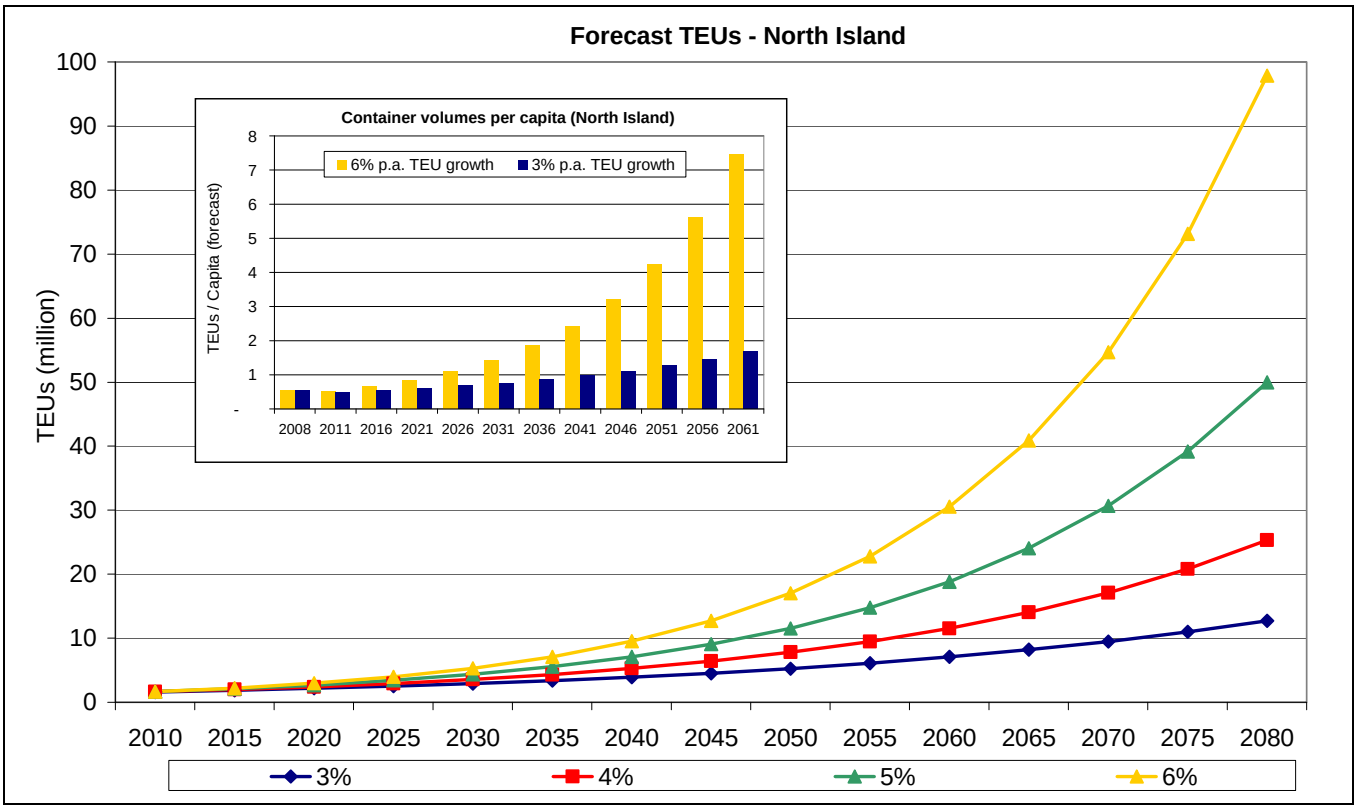
Forecasting long-term growth in North Island container volumes is necessary in order to assess the likely future port and transport infrastructure requirements. The North Island container growth scenarios are set out in Figure 5 below. These are based on the following assumptions:

- A 10% reduction in container volumes in 2009 compared to 2008 levels, due to the global economic downturn; and
- Growth from 2010 onwards under four scenarios; 3% p.a., 4% p.a., 5% p.a. and 6% p.a. These growth scenarios are based on ARH's analysis of historical and projected future North Island container growth scenarios.

The graph below demonstrates that long-term forecasts are very sensitive to the assumed growth rate and that over the very long-term, 6% p.a. in particular appears optimistic, especially given New Zealand's population is forecast to grow at a much slower rate and the opportunities for greater containerisation rates of cargo are likely to reduce.

However, it is important to consider the potential impact on container demand of achieving the Government's goal of closing the income gap between New Zealand and Australia by 2025. This is likely to require growth in productivity of between 3% and 5% per annum (vs. 1% per annum achieved over the last 10 years) depending on Australia's rate of growth.

Figure 8: North Island container volume growth scenarios



Future North Island container capacity is analysed below, taking into account current port infrastructure and port development and expansion plans as well as likely future productivity improvements. Figure 9 and Figure 10 below demonstrate that:

- Only under world class productivity levels (which are significantly higher than the productivity levels achieved by New Zealand ports currently) could Auckland and Tauranga's planned future port capacity be sufficient to meet projected North Island container demand in 2040, assuming 5%-6% p.a. compounding growth;

- North Island container volume growth of up to 4% p.a. until 2040 could potentially be accommodated by Auckland and Tauranga (in aggregate) assuming all available container land is utilised, all planned reclamation takes place, and the ports invest in new terminal stacking operations (which would approximately double the capacity per hectare of the container terminals);

- Berth length appears likely to be the greater constraining factor, rather than land capacity; and

- In the future, other ports e.g. Northport are likely to be required to provide additional capacity for significant trade growth over the long-term, if New Zealand is to avoid an infrastructure deficit in ports.

When drawing conclusions from the analysis below, it is important to note that:

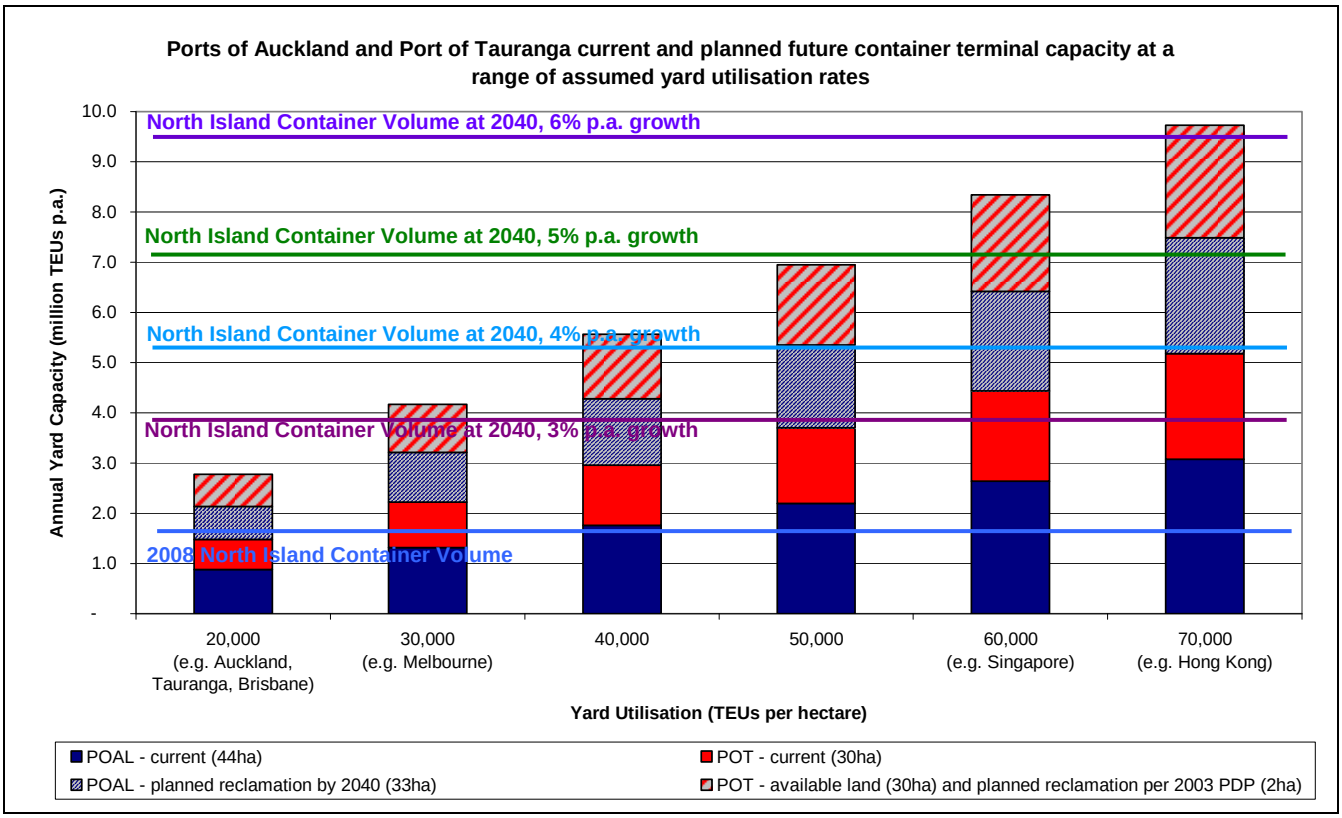
- The extent of future productivity improvements is extremely difficult to forecast, as is demonstrated by the need for port expansion at Ports of Auckland being extended much further out from the date envisaged in the 1989 Port Development Plan, as technology has provided greater efficiencies than anticipated [27];

- If the proportion of South Island volumes trans-shipped through North Island hub ports increases in the future, this will further increase North Island port capacity requirements;

- Given the uncertainty in demand growth and productivity improvements, the sequence of development would be better optimised if Auckland and Tauranga's container operations were combined. For example, all existing container land would be utilised first before undertaking reclamation or purchasing additional land; and

- This analysis does not take into account transport infrastructure capacity and requirements.

Figure 9: Dedicated container terminal capacity - Auckland and Tauranga



Source: Ports of Auckland and Ports of Tauranga websites and public domain port development plans

Note the following in relation to Figure 9 above:

- Container terminal areas are indicative only because the figures can vary considerably depending on what is included /excluded e.g. rail yard, empty container depots, admin areas etc.

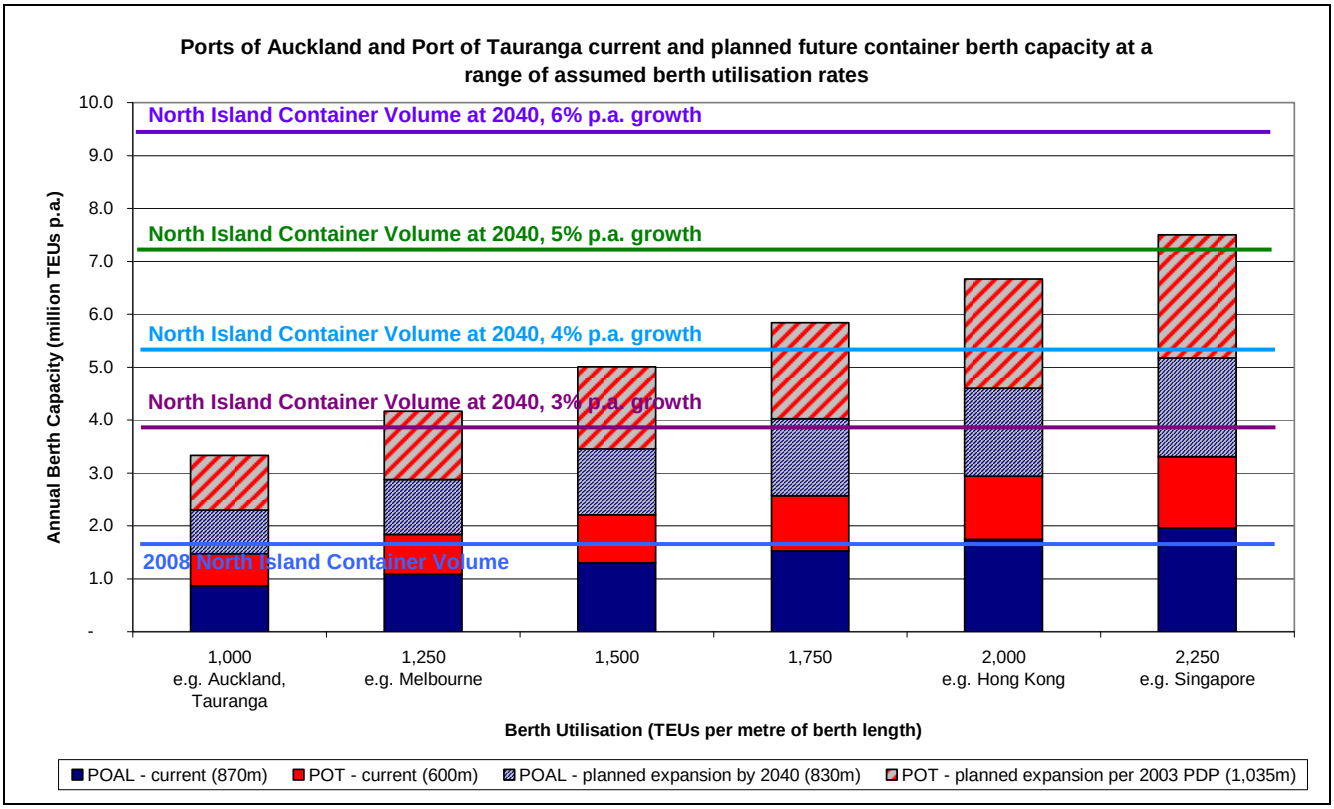
[27] Ports of Auckland's 1989 Port Development Plan envisaged redevelopment of the eastern port by way of reclamation being required in stages from 1992 and a new second port being required in 2010. However, as a consequence of continuing productivity and efficiency improvements, the timing of port redevelopment has been extended much further out than was contemplated – reclamation was delayed until 2008 (first stage) and Ports of Auckland considers that a new port may not be required in the foreseeable future.

- Yard utilisation depends on a number of factors including container dwell times, choice of handling system / stacking density and proportion of trans-shipment[28] containers (counted twice in the throughput statistic):

  - Hong Kong is a large trans-shipment hub and stacks containers up to 12 high.
  - Singapore is the world's busiest trans-shipment hub which handles around 25% of the world's total container trans-shipment throughput, and 6% of global container throughput.
  - Port of Melbourne's 2006-2035 Port Development Plan states that "by 2035, the port's international container terminals will be operating at a terminal productivity of up to 45,000 TEU per hectare".
  - Patrick Terminals designed yard utilisation for its terminal operations in Melbourne and Sydney is around 30,000 TEU per hectare.
  - New terminal stacking operations using automated stacking cranes (ASCs) could approximately double the capacity per hectare of Auckland and Tauranga's container terminals (approximately 20,000 TEU per hectare based on 2008 volumes) by enabling increased stack heights (up to six full containers) and a more efficient yard layout.

- The use of inland ports can provide further significant increases in terminal capacity by reducing dwell time at the container terminals.

Figure 10: Dedicated container berth capacity - Auckland and Tauranga



Source: Ports of Auckland and Ports of Tauranga websites and public domain port development plans

Note: The planned additional 830 metres of berth length at Auckland will not necessarily be entirely dedicated to containers i.e. it may also be used for vehicles

[28] Movement of cargo from one vehicle or means of transportation to another for further shipment

Note the following in relation to Figure 10 above:

- Berth capacity increases with ship size.
- Singapore port can currently handle up to 11,000 TEU ships compared to the maximum vessel size of 4,100 TEU currently calling at New Zealand ports.
- Patrick Terminals designed berth utilisation for its terminal operations in Melbourne and Sydney is around 1,250 TEU per metre[29].
- Port of Melbourne's 2006-2035 Port Development Plan states that "productivity at Swanson Dock berths is forecast to increase….to almost 1,500 TEU/m by 2017. This is comparable with rates currently being achieved at the world's most efficient container terminals with similar vessels and exchanges. By 2035, the port's international container terminals will be operating at a berth productivity of up to 2,000 TEU/m."
- The combined current berth length of Auckland and Tauranga is 1,470 metres, with planned expansions increasing this to 3,335 metres (6.7 million TEU p.a. assuming berth utilisation rates of 2,000 TEU per metre are achieved). The analysis suggests that it is likely another North Island port will be required in time, in order to meet long-term growth in container volumes.
- It is expected that berth productivity will improve more than land productivity over time with larger ships, faster cranes, quad lifting, increasing use of 40 foot containers etc. However, despite significant improvements in berth utilisation rates over time, berth capacity is likely to be the greatest constraining factor over the long-term given that inland ports can be used to increase terminal capacity by reducing container dwell time, whereas additional berth length involves expensive reclamation requiring resource consent.

New Zealand South Island container capacity

A similar capacity analysis has also been performed for the South Island.

Figure 11 and Figure 12 below contain preliminary analysis of the ability of the two largest South Island ports, Lyttelton and Otago, to provide the required future South Island container capacity under a range of growth scenarios.

Key points to note are:

- Lyttelton and Otago have not published publicly available port development plans therefore the container port areas and berth lengths in the analysis below are based on current port infrastructure as well as Port Otago's recent application for resource consent to extend one of its berths;
- It is understood that both Lyttelton and Otago ports are land constrained therefore significant additional container terminal land would require expensive reclamation;
- South Island container volumes are expected to grow at a slower rate than North Island volumes given that Auckland's share of the national population is expected to increase in the future[30];

[29] Patrick container terminals designed capacity / berth length: Port Botany (1,238 TEU/m), Melbourne (1,356TEU/m).

- Based on 2008 TEU volumes, Lyttelton's yard utilisation rate is around 30,000 TEU per hectare while Otago's is only around 14,000 (indicating excess capacity is available). Berth utilisation rates for Lyttelton and Otago are around 600 and 400 TEU per metre respectively;

- Total South Island container volumes in 2008 were 628,692 TEU (27% of the national total);

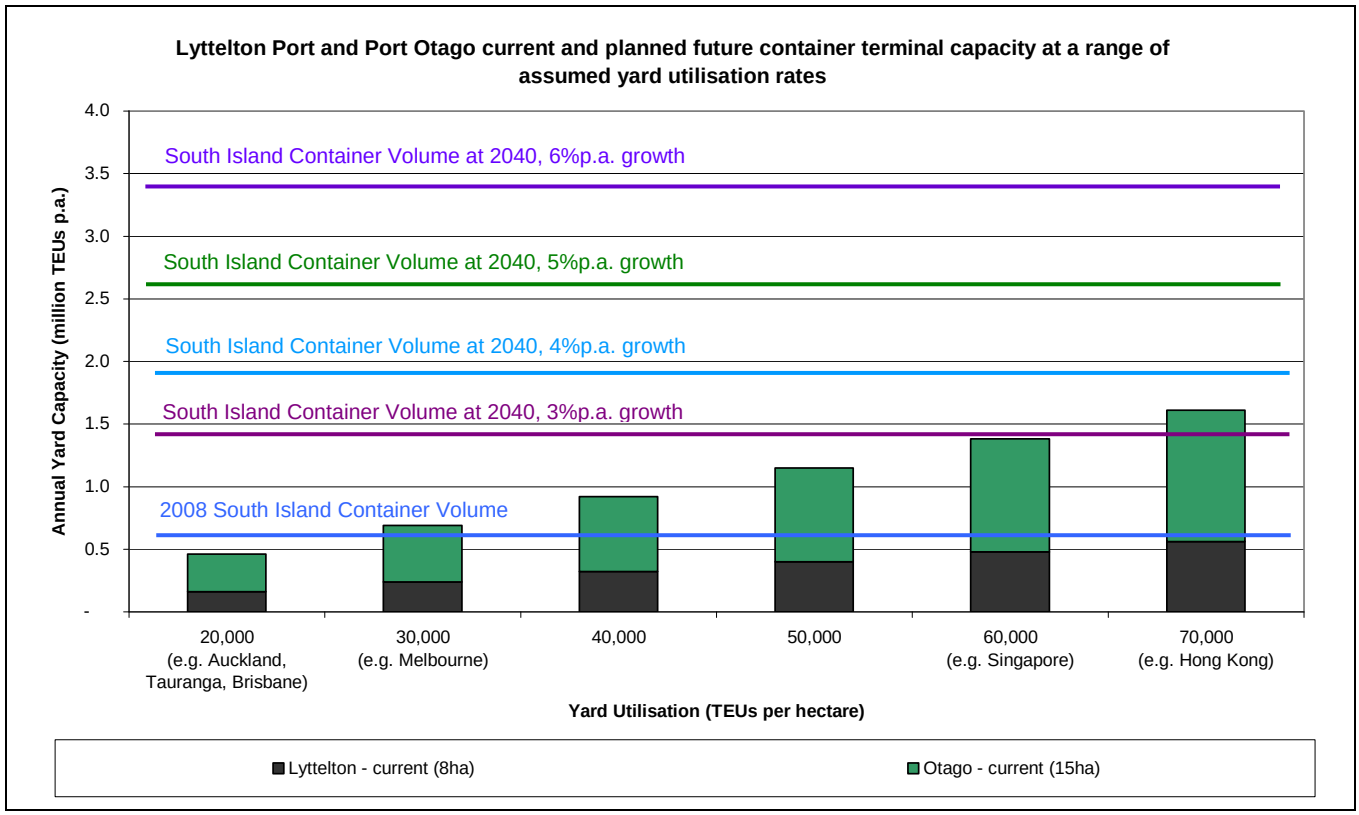
- The analysis below indicates that in contrast to the North Island situation, container terminal area (rather than berth length) appears likely to be the future capacity constraining factor.

- As mentioned above, inland ports can be used to reduce dwell time on the container terminals (however this involves costly double handling of containers); and

- Based on current port infrastructure and publicly available information on planned berth expansion at Otago, and in the absence of significant reclamation, it appears that even assuming current world class utilisation rates are achieved by 2040, both Lyttelton and Otago ports will be needed in order to cater for the South Island's future capacity requirements.

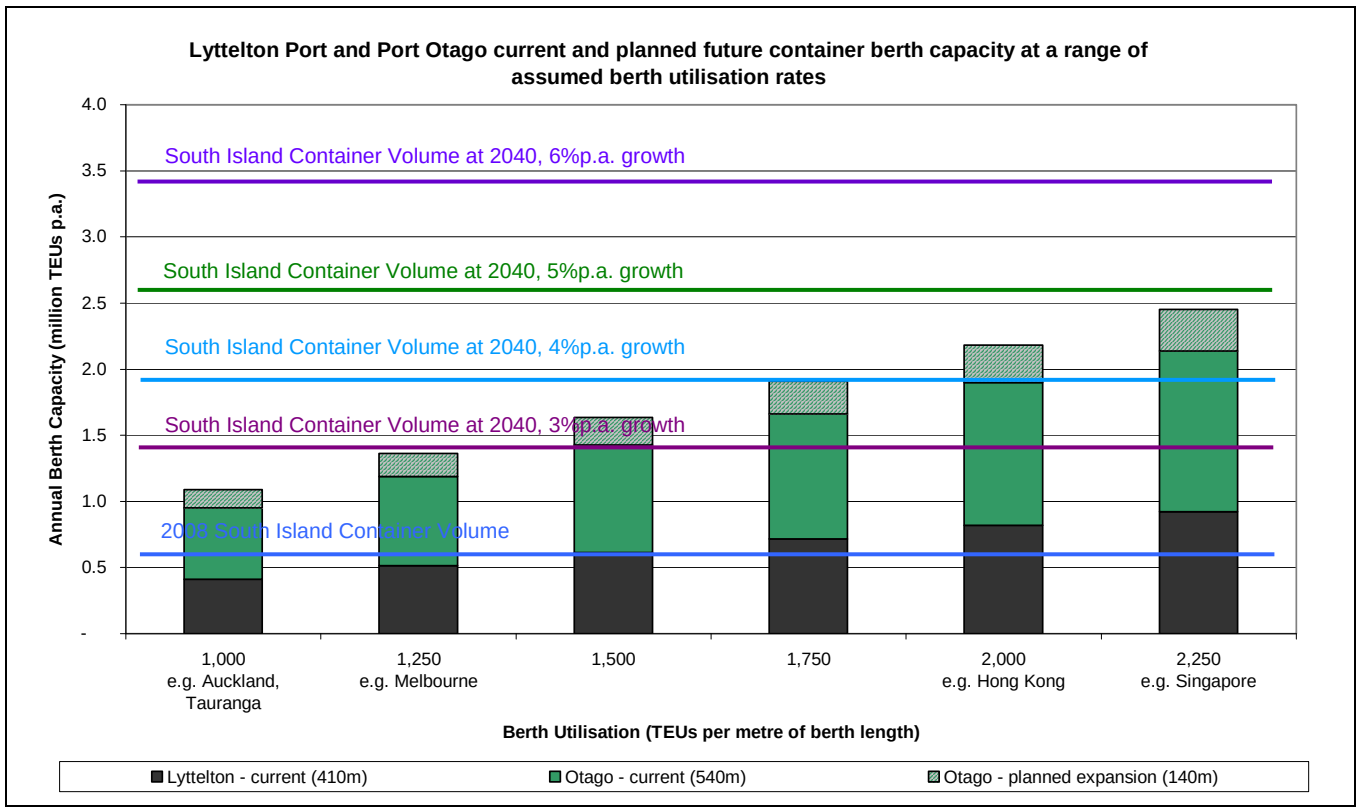
[30] The Auckland Regional Growth Forum predicted that by 2050, Auckland's population would reach 2 million. This means that by 2050, Auckland would represent 41% of the nation's population and 77% of the nation's growth between 2005 and 2050. This compares with approximately 33% of NZ's current population and 51% of growth between 2001 and 2006.

Figure 11: Dedicated container terminal capacity – Lyttelton and Otago



Source: Lyttelton Port and Port Otago websites

Figure 12: Dedicated container berth capacity – Lyttelton and Otago



Source: Lyttelton Port and Port Otago websites, Port Otago application for resource consent (September 2008)