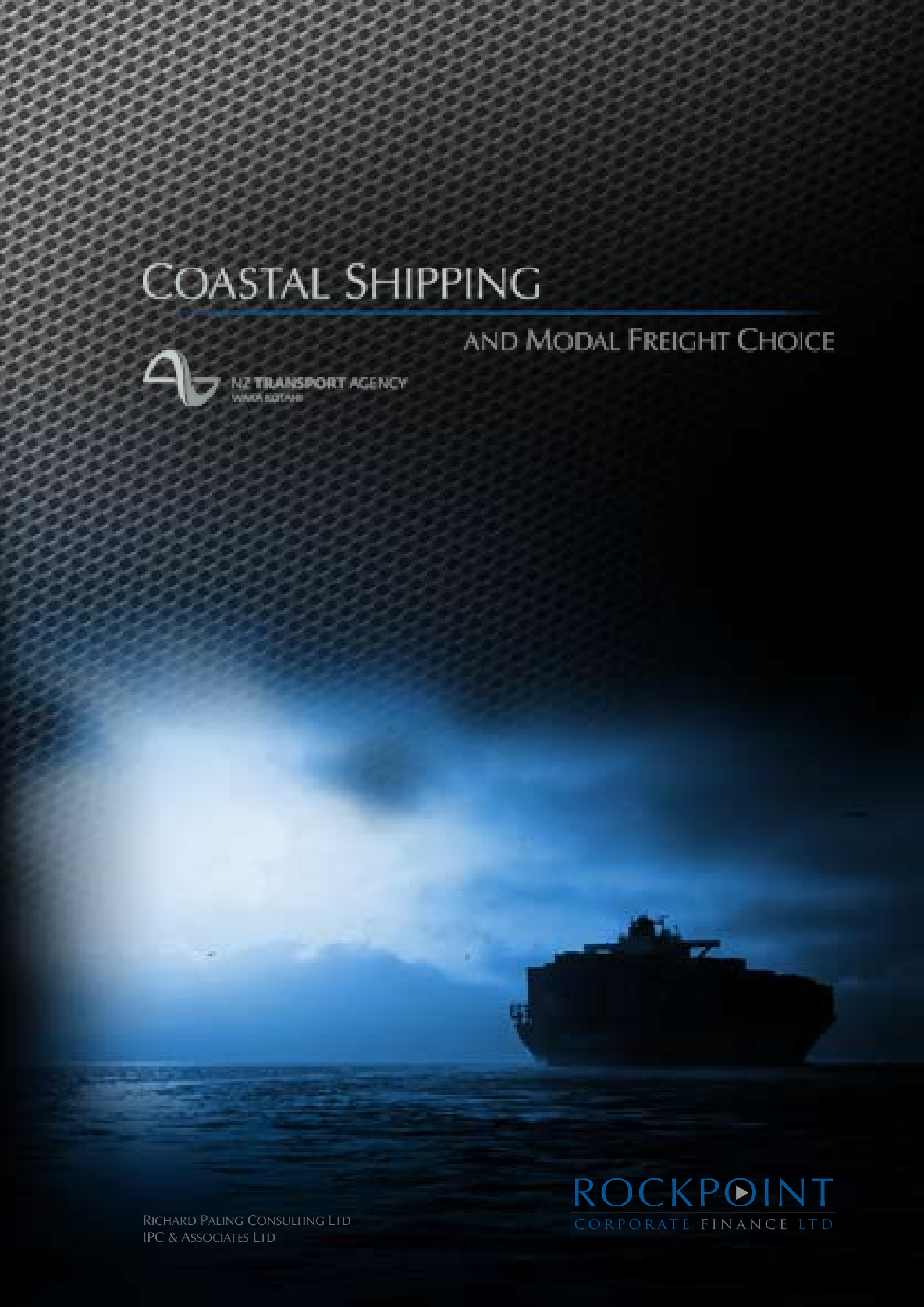
Coastal Shipping

and Modal Freight Choice

NZ Transport Agency
Waka Kotahi



Richard Paling Consulting Ltd
IPC & Associates Ltd

ROCKPOINT
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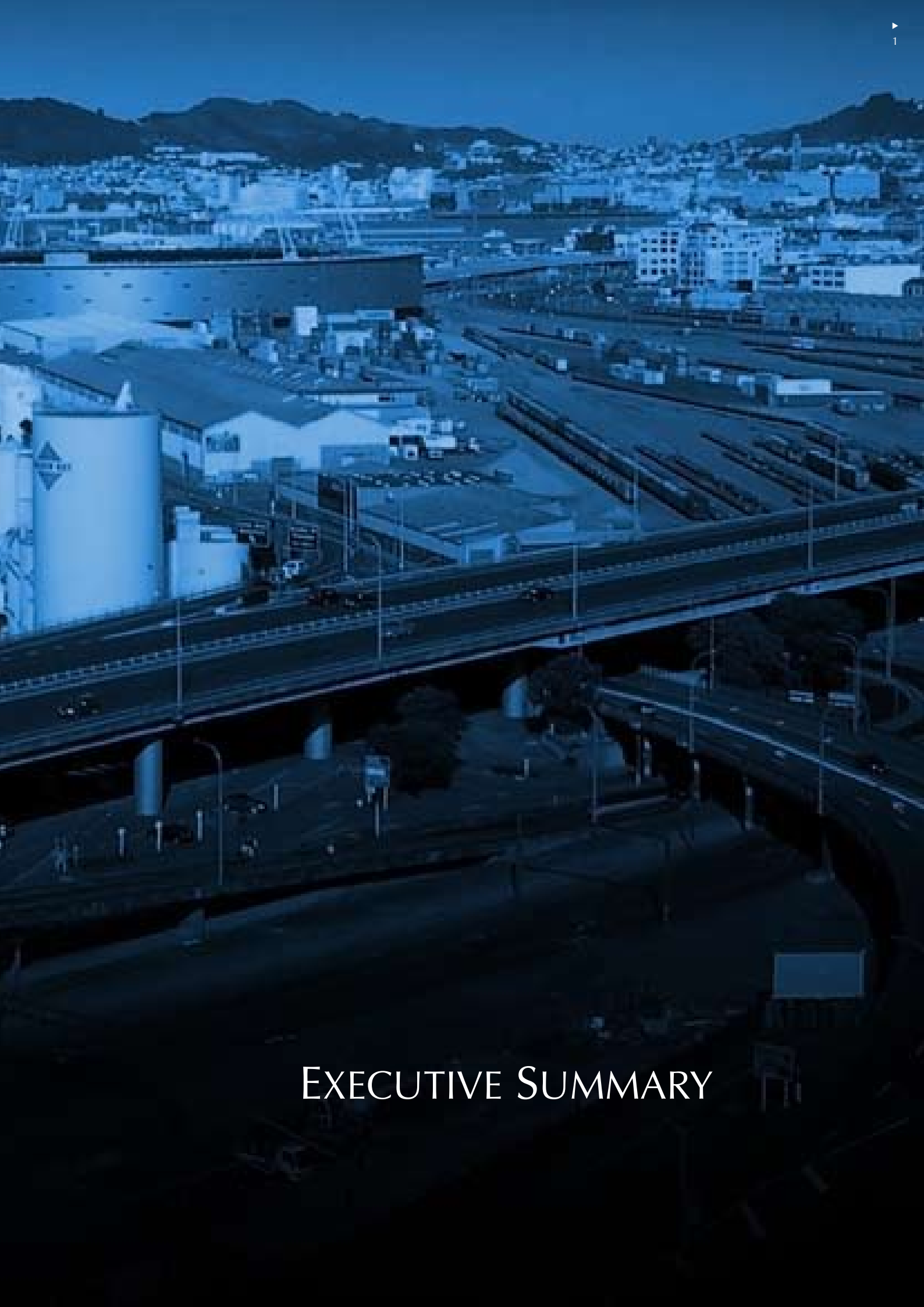


Executive Summary

1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

Coastal shipping accounts for 15% of all freight movements in New Zealand, with a greater market share in specialist bulk trades and inter-island services. As a mode, coastal shipping offers several advantages relative to road and rail in the market for general freight transportation. These include lower unit prices and reduced adverse externalities in the form of less congestion, fewer accidents and lower emissions. At present however, coastal shipping accounts for less than 3% of the general freight market and much of this is opportunistically provided by international ships operating on scheduled services, as opposed to dedicated domestic operators. This study presents a comprehensive overview of coastal shipping operations in New Zealand and assesses the prospect of increasing the proportion of freight travelling on coastal ships in relation to the competing modes of road and rail.

1.2 THE PROPOSAL

In May 2008, the Ministry of Transport launched "Sea Change", a strategic initiative with the goal of increasing the portion of national freight carried by the coastal shipping industry in New Zealand. The New Zealand Transport Agency ("NZTA") sought proposals from industry for the first round of funding in October 2008. Rockpoint Corporate Finance Ltd in collaboration with Richard Paling Consulting Ltd and IPC & Associates Ltd jointly submitted a proposal that constitutes the subject of this study. The proposal identified the need for a better understanding of the commercial drivers behind freight mode choice as a precursor to the development of policy aimed at the successful encouragement of coastal shipping.

1.2.1 Purpose

This study seeks to:

- Provide a comprehensive review of freight flows within New Zealand and assess opportunities to transfer portions of the freight effort from road and rail to coastal shipping;
- Assess the infrastructure systems supporting competing freight modes in New Zealand, and the operating features of each, including commercial performance, constraints and the investment required to accommodate forecast growth;
- Quantify the cost, time and service quality drivers for each transport mode;
- Understand the basis upon which shippers currently select their transport mode and factors which might influence future modal choice decisions; and
- Provide an enhanced policy basis to assess proposals for modal investment and change in the New Zealand transport sector.

1.2.2 Acknowledgements

The authors of the report would like to acknowledge the assistance received by a variety of parties in undertaking this study. Particularly we wish to express our gratitude to interview participants and respondents of our questionnaire. We appreciate the significant time and resources generously provided in the process of our research and trust that all involved find this report of benefit.

1.3 NATIONAL FREIGHT TASK

An understanding of the prospects for coastal shipping necessitated examination of the current national freight task. This study reviews key freight tasks as presented in the National Freight Demands Study ("NFDS") and updates selected data as required. A complete revision of the NFDS study data is outside the scope of this study.

For the purposes of our study, the New Zealand freight task as presented in the NFDS was compared with more recent data in relation to import and export trends, movements in a selection of key commodities, and the 2009 container movement study undertaken by Cubic Transport and Njord Shipping ("Cubic – Njord Study"). When compared to the NFDS base forecast period of 2006-07, some variation is observed in individual port totals, reflecting changes in shipping patterns and, changes in and natural volatility of, individual commodity flows. Import data shows a steadier trend than exports, albeit with a minor peak in 2005. Modest differences can be observed between the forecast flows in 2006-07 and 2007-08 reflecting changes in commodity trade and shipping patterns. Past mid 2008 significant declines occur in import volumes, particularly in the last two quarters, offsetting earlier growth. This has been confirmed by most international shipping lines and key import ports.

1.3.1 Container Traffic

The recent Cubic-Njord study provides a valuable insight into container traffic in New Zealand. The report, based on detailed trade information provided by the ports and shipping lines, records total container movements through ports as 1.70 million TEU for the 2008 calendar year. A reconciliation of recorded port volumes of 2.37 million TEU and the 1.70 million TEU unique container moves in the report (international and domestic) is presented as follows:

Assessment of Container Movements - 000TEU			
	Recorded	Unique	
Port Moves	2366		Containers handled, as reported by ports, being chargeable moves
less Import and Export	1542	1542	Import and export containers, of which some may be transhipped
Coastal Volumes	823		
less Domestic Containers	310	155	Domestic containers being 155,000, double counted
Balance (transhipments*)	513	256	Transhipments, being 256,000, double counted
Unique Container Movements		1698	international plus domestic
Unique Container Movements		1954	international plus domestic plus transhipment

*Assuming all this residual represents transshipments (that is, nil restows or other chargeable moves)

Note: these totals exclude all inter-island volumes between Wellington and Picton

1.3.2 Coastal Shipping Task

Coastal shipping of domestic cargo around New Zealand can usefully be divided into two main categories:

- **Bulk Commodities**: Such as cement and petroleum products moved on dedicated bulk carriers; and
- **General Cargo**: Mainly carried in containers or on RORO ships, using either the domestic coastal shipping services or utilising space on international ships.

In the NFDS, estimates were made of total freight movements, but in order to allocate these to modes, the calculated totals for rail and coastal shipping movements were deducted from the overall total to give an estimate of road transport. More detailed information is now available from a number of sources including ports, shipping companies, and in particular the Cubic-Njord Study. This provides a total tonnage carried figure for coastal shipping of 865,000 tonnes.

A comparison with the earlier estimates indicates that the NFDS possibly overestimates the total volumes of domestic general cargo transported by coastal shipping services, although the difference, at about 100,000 tonnes, is relatively small given the uncertainties with the data and the volatility of the market. Reflecting a number of conflicting trends, we have materially based our analysis of the overall freight task on the position observed for 2006-07 in the NFDS. Revised total general tonnage estimates for coastal volumes have been adopted for the purposes of this study.

1.4 INFRASTRUCTURE SYSTEMS

As part of our analysis, we examine the key infrastructure systems supporting the competing modes of road, rail and shipping. This base infrastructure is a primary determinate of transport offerings servicing the national freight task.

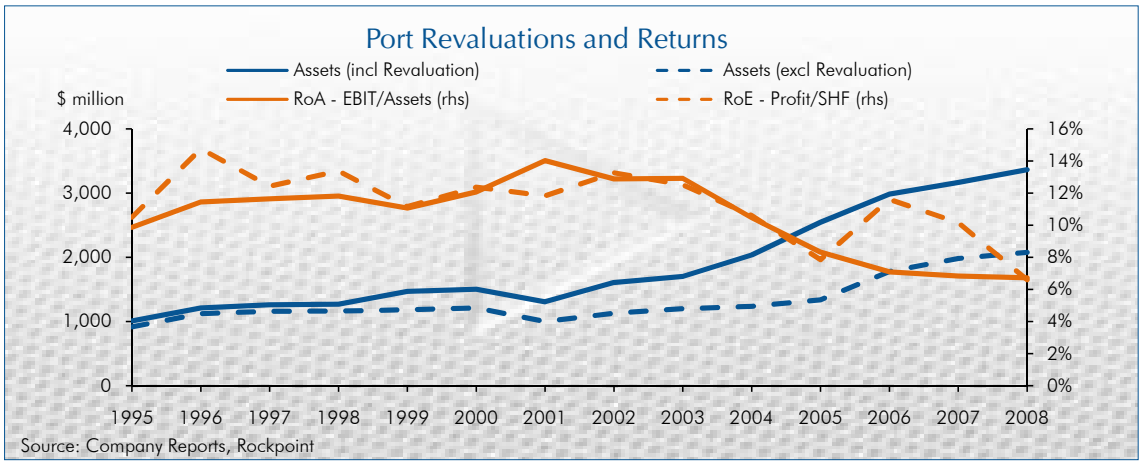
Infrastructure systems reviewed include:

- **Ports**: The key infrastructure system required to facilitate coastal shipping and related services by domestic and international operators;
- **Rail Network**: Enabling the provision of above-track rail operations; and
- **Road Network**: Both State Highways and Local Roads utilised by road transport operators.

1.4.1 Ports

New Zealand is currently serviced by 12 key ports in relatively close proximity to one another. Ports have achieved strong operational performance with significant growth observed in containerised volumes, now representing approximately 40% of total trade by weight compared to 13% in 1995. Port revenue has grown with trade throughput, although unit revenue has fallen since 1996. Similarly, port revenue margins (revenue / assets) have fallen steadily since 1998.

Port companies historically invest to meet perceived service capability requirements and have been further encouraged to invest by international shipping lines to meet peak demand requirements. In doing so, ports risk significant over-investment and may struggle to make commercial returns on their enlarged asset bases. Revaluations and capital expenditure post 2001 have had a material impact on reported asset bases and on shareholders' funds. Throughout this period, both return on assets and equity have been diluted by rising asset values.



The merits of commercially-driven port consolidation are widely recognised by industry and include trade rationalisation, capital optimisation and scale economies. To date no consolidation has been achieved, despite a number of initiatives, some of which are ongoing. Although the original intention of the Port Companies Act 1988 was to facilitate private ownership, all New Zealand ports remain majority council owned. Should consolidation occur, material flow on effects are anticipated in the concentration of investment to handle larger ships at fewer major ports. Such flow on effects could present significant freight aggregation opportunities for coastal shipping.

1.4.2 Rail Network

Rail network infrastructure facilitates the provision of above-track freight services. At its peak in 1953 the national rail network spanned 5,689 km, serving as the primary transport mode for both inter-regional freight and passengers. New Zealand's rail network today spans 3,898 route-kms (4,000 km including passing loops and double tracking), from Okaihau in the north

to Bluff in the south. The following figure presents rail volumes and an assessment of network capacity utilisation by line segment.

Rail Network Utilisation Freight Route	Freight Services Per Day	Line Capacity Utilised	Gross Tonnage	% North Bound	% South Bound
Auckland - Wellington - Christchurch	8	77%	2,870,231	43%	57%
Auckland - Tauranga	13	80%	3,588,084	61%	39%
Christchurch - Dunedin - Invergarcill	9	75%	1,840,299	56%	44%
				% East Bound	% West Bound
West Coast - Christchurch	11	51%	2,468,958	99%	1%
Hawkes Bay - Taranaki	13	60%	850,072	16%	84%
Other - Lines			3,839,191		

Underinvestment over the last 15 years has left sections of the rail network in a dilapidated state. According to KiwiRail in 2008, 200 km of the 4,000 km rail network was approaching the end of its predicted useful life and 33% of railway bridges were more than 80 years old. In examining the pattern of capital expenditure over the last 25 years we identify an extended period of deferred capital maintenance post privatisation. Recently significant capital expenditure has been committed to catch-up projects that alleviate network constraints. Following the transfer of ownership in September 2008, KiwiRail management recommended the Government commit an additional $1,041 million to upgrade projects over the next five years, combined with continued operating subsidies of $473 million for the same period, for a total of $1,514 million. The rail network will continue to require subsidisation on an ongoing basis to maintain operating standards and meet growing customer demands.

Rail operations are impacted by the age, design and condition of the country's rail infrastructure. New Zealand's rail system operates for the most part with an 18 tonne maximum axle load. This is light by world standards, which are typically 25 tonnes per axle load. Bridges, tunnel clearances and steep gradients in the network restrict the weight, height and speed of rail freight. While recent investment has targeted key areas of restriction, bridges remain a major network issue and, until addressed, track upgrades elsewhere are unable to be fully utilised.

The current network determines significantly what trade is contestable by rail. Where rail does not have an effective presence the opportunities for attracting incremental volumes are limited.

1.4.3 Road Network

Road infrastructure in New Zealand falls into two categories:

- State Highways; and
- Local Roads.

State Highways comprise a network of approximately 11,000 kilometres, 12% of the total road network in New Zealand, but account for approximately 50% of all vehicle kilometres travelled. Highways are owned and funded by the Government, through the NZTA. In 2008, NZTA's annual report valued New Zealand's State Highway infrastructure assets at $20,086 million. The 2008 / 09 annual budget for the State Highway network, allocates $1,345 million in funding as detailed in the recently released Government Policy Statement on Land Transport Funding 2009 / 10 – 2018 / 19 ("GPS"). In aggregate it is forecast that expenditure on maintaining and improving the State Highway network in New Zealand will be between $14,800 million and $18,900 million over the next ten years, with an average of $1,500 – $1,900 million per annum.

The Local Road Network in New Zealand comprises approximately 83,000 kilometres, which is 88% of New Zealand's total road network. It is owned and managed by individual Territorial Authorities and is part funded by Central Government at an average proportion of 50%, through the National Land Transport Programme. The 2008 / 09 annual budget for the Government's contribution to the Local Road Network was $684 million. In aggregate it is forecast that the Government's contribution to maintaining and improving the local road network will be between $6,865 million and $8,915 million over the next ten years, with an average of $687 – $892 million per annum. Funded under the Government's PAYGO policy it does not seek to generate a return on past investment in the road infrastructure.

The main capacity constraints on the New Zealand road network are associated with congestion in urban areas, particularly within Auckland, but also in the other urban centres of Wellington, Christchurch, Tauranga and Hamilton. Traffic speeds at peak periods are often very low affecting both passenger and heavy vehicle movements, with significant impact on the efficiency of the heavy vehicle fleet. Outside of urban areas, a number of other links have been identified by NZTA as suffering from congestion. In general these links are on approaches to the main urban areas although in some instances, they reflect specific bottlenecks in the State Highway network.

The GPS is the guiding document in which the Government outlines its priorities for transport. The current allocation of transport expenditure aims to stimulate productivity and economic growth and has a strong focus on further development of the road network. Over the next ten years it anticipates Government and Territorial Authority expenditure in aggregate of between $28,500 million and $36,700 million. There is however a noticeable reduction in the funding commitment for the development of alternative modes of transport, in particular coastal shipping.

1.5 Operational Characteristics - Shipping, Rail and Road Transport

An assessment of the operational characteristics of shipping, rail and road transport has been conducted as competing transport modes for domestic cargo.

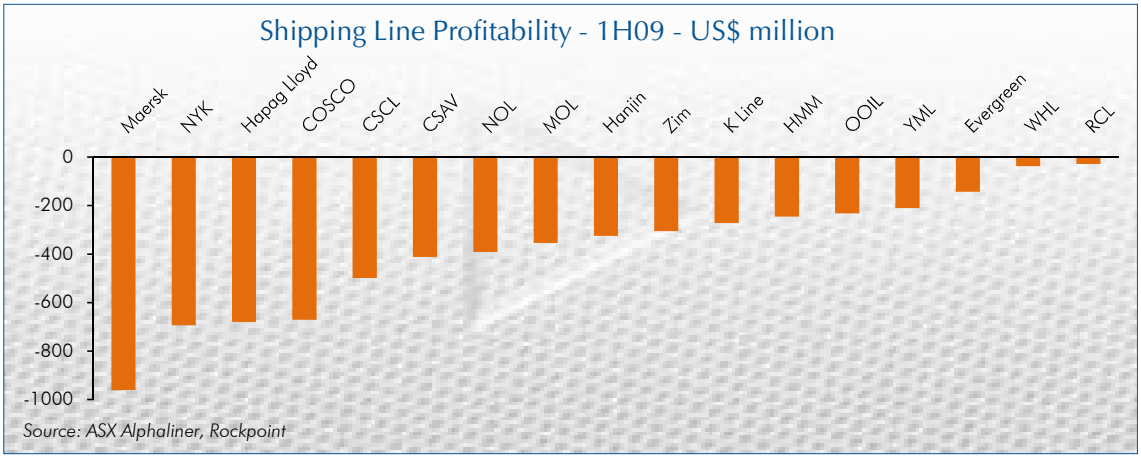
1.5.1 International Shipping

Internationally flagged commercial ships carry 99.5% (by weight) of New Zealand trade with the rest of the world. Collectively these ships make around 3,300 port calls in New Zealand each year, servicing a mix of container ships, general cargo (breakbulk) ships and bulk carriers.

Global shipping is dominated by intensely competitive private operators that are increasingly driving consolidation in the market. This drive to improve ship operating efficiency and gain market share emphasises the shipping industry's tendency to cyclically overbuild. Up until 2008, intense competition amongst shipping lines saw record commitments to new ship building. The overhang in ship orders will see the global containership fleet increase 45% from its current aggregate capacity of 12.7 million TEU to 18.4 million TEU by 2012. Utilisation of such capacity poses a significant challenge since the dramatic reversal of the global economy in mid 2008.

At the forefront of shipping industry developments is the increase in ship sizes. In 2005, ships exceeding 4000 TEU accounted for 17% of the world fleet or 43% of the available container slots on ships. By 2013, the ratios for ships greater than 4000 TEU will be 32% and 66% respectively. By 2030, these larger ships are forecast to account for 80% of container slots. This trend has the potential to significantly impact infrastructure requirements at ports and on key inland freight corridors. A move to a hub and feeder port system will also impact service frequency and in New Zealand could form a catalyst for port sector rationalisation.

Most shipping lines reported significant financial losses in the current financial year as a result of lower levels of global trade and a decline in container rates. The resultant efforts by shipping lines are focussed on operating costs including reconfiguring ship schedules, slow steaming to reduce fuel consumption and mothballing ships to remove capacity. While many shippers have welcomed the recent drop in international shipping rates, the market should be concerned about potentially long term adverse consequences on shipping companies and services.



The importance of the international shipping lines to New Zealand is evident in the domestic coastal freight task. Currently most import-export cargo transhipped within New Zealand is carried by international ships as part of scheduled services. The coastal transfer of domestic originated cargo is however not a core business for international shipping lines. Only 5 lines of the 13 interviewed actively service domestic origin and destination cargo in New Zealand. Their primary focus is on the maintenance of established blue water shipping schedules. Many operators felt the additional revenue offered by domestic cargo failed to compensate for the added logistical complexity and risk to ship timetables. For most operators, coastal volumes would be the first to be abandoned if ships were behind schedule.

New Zealand has historically been serviced by a high level of direct services and is currently served by 41 international scheduled services provided by 22 shipping lines. Scheduled shipping services are amended by shipping lines on an ongoing basis for a variety of reasons including alliances, freight patterns, competitive responses, unforeseen events and market factors (e.g. profitability). Amendments to scheduled services can have material flow-on impacts for affected ports, shippers and domestics shipping operators. Cumulatively, schedule changes, new alliances and withdrawals over the last year have reduced available container slots on combined international services by between 250,000 and 300,000 TEU.

1.5.2 Domestic Shipping

New Zealand's reliance on international shipping services for trade is substantial, but the country has also always possessed a domestic shipping industry. Currently New Zealand's commercial freight fleet is very small, with only 15 domestic commercial ships exceeding 45m.

New Zealand crewed and operated ships carrying freight are categorised as either specialist bulk carriers, inter-island ferries or general freight ships. While the inter-island ferry fleet has expanded, the coastal fleet over recent years has diminished. New Zealand crewed ships also no longer operate in international waters.

Domestic operators currently include

- Specialist Bulk
  - Silver Fern Shipping (2 ships)
  - Golden Bay Cement (1 ship)

- Holcim (2 ships)
- Cook Strait Ferries (inter-island - Wellington to Picton)
  - KiwiRail (3 ships)
  - Strait Shipping (2 ships)
- Scheduled Services
  - Strait Shipping (1 ship)
  - Pacifica Shipping (2 ships)
- Tramp Coastal
  - Coastal Bulk Shipping (1 ship)
  - Black Robin Freighters (1 ship)

Excluding Wellington – Picton trade, coastal shipping carries approximately 4.2 million tonnes annually. This represents an estimated 1.9% of the national freight task, or 15% measured in tonne-km. The principal form of traffic is inter-island and in specialist bulk commodities such as petroleum and cement. More general cargo moves between the North and South Islands, primarily between Auckland and Christchurch.

Shipping is particularly suited to bulky, heavy products but there exist few growth opportunities for coastal shipping in this natural market segment. In the trade of containerised goods, coastal shipping offers a significant price advantage over road and rail, offering the lowest transit costs in cents / tonne-km. This strength however needs to be balanced against the cost of intermodal delivery, given most journeys require a road or rail leg. The largest impediment to growth in coastal shipping is delivery time and service frequency. Coastal shipping also involves greater complexity reflecting pickup, delivery and documentation requirements.

1.5.3 Rail

Rail is the closest competitor to coastal shipping in the movement of long haul bulk freight. In the last financial year, approximately 13.92 million tonnes of freight moved by rail, for a total of 4,013 million tonne-km. Of the national freight task, rail freight constitutes approximately 6% of total freight tonnes and 15% of total tonne-km. Rail's fortunes are tied substantially to the economic wellbeing of New Zealand's primary sector. Agricultural products (especially logs, wood, milk and dairy products) and coal constitute about 75% of current rail freight in tonnage terms. The average freight haul on rail is 283 km, compared to 118 km for road.

The provision of rail services is particularly constrained by the age of rolling stock and locomotives, legacy network infrastructure issues, and by reported customer care deficiencies in the movement of general freight for smaller customers. In the market for general containerised freight, rail is better suited to compete in the 'Stock Transfer' portion of the market, rather than fitting into a 'Just in Time' model. Rail struggles to meet tighter timelines given the limits of train schedules, the need for cargo aggregation and handling times to and from intermodal connections. For door to door freight delivery, rail relies on intermodal operators, necessitating the double handling of loads.

In the interviews conducted as part of this study, feedback confirmed the focus of rail on businesses with scale. Larger customers of rail were generally pleased with the level of service received, whilst smaller to mid-sized operators commented on the lack of customer care and unwillingness on the part of KiwiRail to tailor solutions to individual freight needs.

The 2008 New Zealand Transport Strategy set a target of increasing rail's freight market share to 25% by 2040, from current levels of 15% by tonne-km. To achieve this outcome rail requires more competitive capacity at critical transit times, improved speed, reliability, and connectivity with customers. As such, without significant investment in the network and rolling stock, it is unlikely rail will capture the additional market share targeted from road or coastal shipping.

1.5.4 Road Transport

Road is the dominant mode for freight and passenger transport in New Zealand. Road services 92% of the nation's total freight task in tonnes and 70% in tonne-km. It is forecast that road will remain the dominant mode of transport for the foreseeable future. Road services also provide an essential intermodal component for rail, international and coastal shipping movements.

The market for road transport is intensely competitive, evidenced by the low average profitability achieved by owner drivers and small truck fleet owners. Larger companies in the sector are increasingly positioning themselves as providers of comprehensive logistics services in an attempt to differentiate market offerings and capture greater value from established client relationships.

In New Zealand trucks weighing more than 3.5 tonnes number 115,200 or 3.6% of the total national vehicle fleet. Portions of the State Highway network suffer from congestion at current traffic volumes, with flow on implications for heavy transport, particularly in urban areas.

Developments in road transport include attempts to enhance truck capacity and efficiency. A number of initiatives are currently being considered by transport authorities, including increasing maximum vehicle weights from 44 tonnes to 53 tonnes. Results from trials and research indicate that productivity could increase by 10% to 20%, trip numbers could reduce by 16% and fuel use by 20% with the move to heavier vehicles. Many interviewees however indicated relaxation of weight restrictions would have limited impact on operations as their loads were typically constrained by volume rather than weight. Furthermore recent reports indicate significant portions of the road network, in particular bridges, would need to be upgraded to manage heavier trucks.

As a transport mode, road provides the maximum flexibility of capacity, handling loads from a single pallet up to 40' containers, and covering a multitude of routes as required. For shippers, road offers a considerable advantage through speed of delivery, with trucking companies able to deliver product to most parts of the country within 24 hours, and to all parts of the country within 36 hours. Moreover the reliability of road transport is unrivalled, a vehicle breakdown can be repaired within a few hours, or a replacement unit can be provided within a similar timeframe.

Alternate transport modes of rail and coastal shipping are better able to compete with road for longer distance movements where the speed of delivery is not paramount and cost advantages can outweigh quality of service disadvantages. If delivery requires an inter-island movement, this substantially impacts the total duration and cost of the service road is able to offer, and therefore improves the relative competitive positioning of coastal shipping.

1.6 INTERNATIONAL STUDIES OF COASTAL SHIPPING

In considering the factors that might enhance coastal shipping's share of the national domestic freight task, it is appropriate to consider relevant international experience.

Coastal shipping internationally struggled to maintain significant market share throughout the 20th century and lost freight to competing road and rail modes. The majority of freight handled by coastal shipping is currently in bulk products but the fastest growing segment for the mode is containerised cargo.

Coastal shipping services are receiving increasing focus worldwide as governments seek to mitigate the adverse impacts of a continued growth in the freight task on existing infrastructure and the negative effect of externalities, including congestion and pollution. The European Union ("EU") acknowledges that significant changes in modes can only be achieved through

the concentration of freight flows onto specific sea routes. This necessitates active partnerships between ports, shipping lines, land-based transport providers, freight consolidators and governing bodies, to ensure that the required inter-modal infrastructure is in place. EU studies recommend approaches to trucking companies to encourage them to think of shipping as a potential partner in their broader service offering, with full integration of the intermodal supply chain. The limited marketing of coastal shipping as a freight mode and consequent lack of awareness by shippers that coastal shipping can offer a quality service, limits shippers' perceptions. To overcome these market opinions in the EU, 19 countries have established promotional entities for shipping.

A key observation from Australian studies is the need to provide berth space for coastal shipping operators. Without greater funding to expand general cargo berths, coastal shipping companies will continue to cede berth space to international container lines. Greater regulatory support is actively being considered and implemented internationally. In Australia, two proposed measures include the introduction of a tonnage tax scheme and the reintroduction of accelerated depreciation regimes. Tonnage tax systems enjoy widespread support globally, in countries such as the UK, USA, Belgium, Germany, Greece, Norway and Denmark. Historically accelerated depreciation had notable success in attracting Australian domestic shipping investment. Cabotage systems are also in operation in a number of jurisdictions, however these systems have had little success in securing market share for domestic coastal shipping operators against cost effective overland transport. It is noted that proposed regulatory support in Australia is linked to initiatives addressing domestic skills shortages.

1.7 New Zealand Maritime Regulatory Framework

The principal legislation governing the shipping industry in New Zealand is the Maritime Transport Act 1994. The general provisions of the Act apply to all ships engaged in coastal shipping in New Zealand waters, however specific sections of the Act only apply to New Zealand registered ships.

Under the Immigration Act 1987, workers aboard international ships engaged in coastal shipping are temporarily exempt from requiring visas or work permits. The effect of this visa waiver is that they are not considered employees under the Employment Relations Act 2000 and are exempt from a range of associated legislation. Industry participants estimate that such legislation provides international shipping lines with a 15% – 20% cost advantage (excluding taxation effects) compared with domestic based coastal shipping providers.

New Zealand resident shipping operators are subject to local income tax on profits from their worldwide operations. Non New Zealand resident shipping operators in most cases receive tax relief on inbound and outbound shipping operations under New Zealand's double tax agreements. There are also grounds for non New Zealand resident employees of non New Zealand resident shipping operators to be exempt from paying income tax or ACC levies. In the domestic shipping context, this means that it is more expensive for New Zealand resident shipping operators to employ staff.

Maritime New Zealand ("MNZ") is the government agency responsible for oversight of the marine sector in New Zealand. The country is a signatory to more than 40 international maritime conventions, many of which impose significant obligations and costs onto ships operating around New Zealand. MNZ recognises that segments of current regulation are outdated or no longer appropriate to New Zealand conditions. Addressing a range of known issues could materially reduce operating costs for domestic coastal shipping operators in New Zealand.

1.8 MODAL CHOICE

As part of the study undertaken a number of interviews were conducted with industry participants to gain insights into their determinants of modal choice. Shippers ('cargo owners') rank "reliability" as the key criteria in modal selection. Others rate "product care" and "safety" highly. Shipper selections vary with the range of industry specific factors including product nature and supply chain characteristics. Findings support road's current market share of 70% of the freight task on a tonne kilometre basis. Whilst "cost" is ranked fifth, it is evident that companies are becoming much more price sensitive as the current economic downturn continues. Concern for environmental impacts is an emerging factor in modal choice.

Ranking of Criteria	
Reliability	4.75
Product Care	4.64
Safety	4.58
Timeliness	4.31
Cost	4.23

Pertinent issues preventing the selection of coastal shipping as a transport mode include timeliness, flexibility, warehousing, double handling costs and a general lack of awareness of the coastal shipping's service offering. Coastal shipping's cost competitiveness was noted by some shippers with expertise of the industry as an attraction for non time sensitive cargo.

Shippers express concern that different transport modes in New Zealand are not operating on a level playing field. Rail is perceived to enjoy a significant level of financial support from the Government enabling it to remain cost competitive, with historically negative implications for coastal shipping.

No clear consensus exists amongst the interviewed parties on how to best stimulate the development of coastal shipping, or even if attempting to do so is appropriate. Indicative feedback includes:

- The development of coastal shipping is best left to the market and to achieve substantial growth it has to better meet customer needs.
- A desire for greater certainty of rail's competitive position and for the Government, as shareholder, to clearly articulate its policies regarding funding and targeted commercial returns.
- A few parties suggest that coastal shipping should receive subsidies so as to compete on the same cost basis as road and rail. These parties feel road and rail transport providers are not required to pay the full cost of their respective infrastructure, nor the cost of externalities.
- Several parties recommend changes to the New Zealand port sector to stimulate the development of coastal shipping. This includes access to suitable general wharves and industry rationalisation to reduce current port over-capacity and pre-empt the anticipated reduction in port calls by international shipping lines.
- Intermodal connections at ports need improvement to significantly enhance the efficiency of all port traffic including coastal volumes.

A general consensus exists among shippers that the appropriate role of Government is in undertaking transport research and analysis, setting safety standards and policy, investing in infrastructure, and setting taxes, user charges and levies. There is strong opposition to the suggestion that Government attempt to dictate transport modes to users. The compelling consensus is that modal choice decisions are best left to the market. While a number of interviewees express a desire for the Government to be more active in the development of a broader vision for the transport sector, a number feel that the Government agencies involved do not possess the required level of industry and commercial knowledge to actively engage, particularly in relation to the shipping industry.

1.9 CONTESTABLE VOLUMES

Coastal shipping is restricted in its ability to serve portions of the freight market in New Zealand due to either the nature of the product being freighted or the geographical features of the movements. This study identifies a potentially contestable market for coastal shipping of 17 million tonnes, based on 2006-07 data. This represents about 8% of the overall freight task in tonnage terms and 20% of tonne-km. However the largest movements are located within either the North or South Islands. Of the major flows identified, only one segment was an inter-island flow, between Auckland and Canterbury.

Our analysis reveals that the share of coastal shipping is low for intra-island movements. It is only in longer inter-island movements, where the alternatives of rail or road also involve the use of Cook Strait ferries, that the market share for coastal shipping becomes significant. The key movement is between Auckland and Christchurch where coastal shipping is extensively used as part of the stock distribution process between manufacturing plants and distribution centres, and between distribution centres. In the market for freight between Auckland and Christchurch coastal shipping has an estimated 38% of the total volumes. These scheduled movements place less of an emphasis on journey times and reliability, and more on cost. Rail also enjoys a relatively high share for Auckland-Christchurch movements as it possesses characteristics similar to coastal shipping. The relatively high frequency of coastal shipping services between Auckland and Canterbury by both domestic and international shipping lines also provides greater capacity on this route.

In New Zealand an assessment of freight movements as a potential market for coastal shipping can be usefully divided into four main categories:

- **Short Distance Intra Regional Flows**: Distances effectively preclude the use of coastal shipping, except for some specialised commodities. These movements comprise about 75% of the freight task, as measured in tonnes in New Zealand.
- **Basic Products**: Basic products are typically low value and require the minimisation of transport costs. Where these are produced in locations with direct connections to rail or coastal shipping the use of these modes is prevalent. However many of the commodities within this group are initially produced at dispersed and remote locations where transport by road is the only realistic option. Moreover the need to minimise transport costs limits the scope for multimodal transport due to the associated costs of transfers between modes. Where products are destined for export markets, they also tend to be transported to the nearest export port, so limiting the scope for a coastal shipping leg.
- **Manufactured Products**: The movement of manufactured products encompasses items such as steel, paper, processed timber, bulk wine and beverages, some foodstuffs and chemicals. These tend to be dispatched to schedules which are not particularly time sensitive. Due to the relatively low value of the product, there are significant benefits in reducing transport costs. Where these products are transported between destinations some distance apart, coastal shipping has a role in their movement, as evidenced by current freight flows.
- **Retail Market Products**: Retail product freight can be further categorised as regular movements between manufacturers and distribution centres and between distribution centres. This freight also incorporates direct deliveries to wholesale, retail stores and stockists. Coastal shipping can realistically only serve movements between distribution centres and is therefore primarily confined to the movements between Auckland and Christchurch. Any increase in coastal shipping volumes would likely be captured from rail's current market share. Road's share in markets contestable with coastal shipping is predominantly made up of adhoc, urgent goods for which neither rail nor coastal shipping could provide an acceptable solution.

Excluding key bulk products the market for coastal shipping is limited primarily to the movement of semi-manufactured products (such as steel, chemicals and timber products) between appropriate locations, and the movement of retail products between major distribution centres

in Auckland and Christchurch. For both these volume groupings considerable competition is presented by rail and road. However the position of coastal shipping would change considerably should current patterns of international shipping services reconfigure and a greater need arises to provide transhipment cargo services between regional and hub ports.

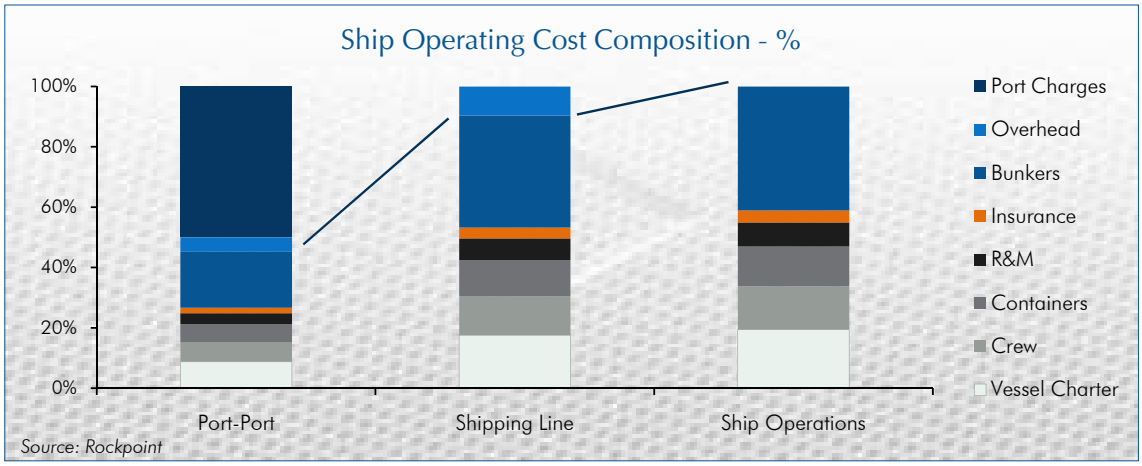
1.10 MODAL ECONOMICS

1.10.1 Domestic Shipping

As part of our analysis of the opportunities for domestic shipping, we have developed a financial model of a new coastal shipping operation servicing the container trade in New Zealand. The model is based on a single ship service, performing a four port weekly schedule serving Auckland, Tauranga, Lyttelton and Otago. A range of alternative scheduling and commercial scenarios were also evaluated.

The price charged to customers necessarily reflects the competitive positioning of coastal shipping for factors such as service frequency, speed of delivery and reliability. We have investigated current market pricing of representative city-to-city legs for each freight mode as the basis of assumed terminal-to-terminal revenues ($/TEU). No allowance was made for pickup and delivery charges from the port (container terminal). These were deemed additional costs to be incurred by the customer.

Key operating cost assumptions are based on international studies and feedback from shipping operators and experts. The categories considered included administration, ship costs (charter rate), bunker costs and port charges. The following figure presents the composition of coastal shipping operating costs in three different representations. We note port charges constitute a significant proportion of terminal to terminal costs, as indicated in the first column.



Based on our assumptions for a single ship, four port service utilising port container terminals, trade volume of approximately 23,000 TEU per annum is required for the business to breakeven on an operating cash flows basis. To also cover capital costs (that is, provide a full return on investment), the required breakeven volume increases to 28,000 TEU. In contrast, the use of general wharves as opposed to the container wharves results in corresponding breakeven volumes of 16,500 TEU and 20,000 TEU respectively. It is noted however that in considering these results, shipping lines and ports might discourage use of the general wharves for transhipment containers.

The addition of two extra ships to our base case service increases necessary breakeven volumes to approximately 80,000 TEU. At current coastal volumes of 195,000 TEU a new three ship service therefore constitutes 48% of the total market (a single ship service 14% of the total market) which equates to approximately 115% of volumes currently handled by domestic operators. While it is possible, given the increased frequency of service under the three ship service

scenario, that incremental volume may be captured from either rail or road, the introduction of such a service in the absence of assumed access to increased transhipment volumes, appears challenging. Structural change in terms of port call rationalisation by international shipping lines would represent a key opportunity for new volume for coastal shipping.

The analysis undertaken has been simplified to highlight key commercial features associated with domestic coastal shipping operations. It is important to note that the ability of a new coastal service offering to secure a base case breakeven volume will be dependent upon a range of variables including competitive responses from incumbent operators and competing modes, inherent service delivery constraints of a weekly service offering to shippers, freight task growth and the potential for structural industry change. The financial breakeven is also dependent on the level of port charges.

1.10.2 International Hub and Feeder

While a coastal shipping business case can be built around the carriage of domestic cargo (full containers) alone, this represents only 20% of the assessed coastal container market. The balance is carried by international ships on their scheduled services (of which 30% are empty containers).

A significant growth opportunity exists in the provision of feeder services for transhipment containers to reconfigured international shipping services.

For illustrative purposes we developed a simplified model of a single international service. We then tested a variety of international ship sizes and coastal feeder scenarios to assess the potential for slot cost efficiencies. For the purposes of this analysis we have assumed a schedule traversing Hong Kong, Auckland, Lyttelton, Nelson, Napier, Tauranga, back to Auckland and then returning to Hong Kong. The base case scenario involves a 2500 TEU ship visiting each scheduled port. The subsequent hubbing scenarios entail an Auckland port call by a larger vessel and a feeder service by a 1100 TEU coastal ship. The observed slot cost reductions are presented in the following figure:

Hub And Feeder	TEU per Trip		Costs $m p.a.		Slot Costs $/TEU p.a.		
Scenraio	International	Domestic	International	Domestic	International	Domestic	Overall
Base Scenario - 2500	3,970	1,200	210	18	1,018	288	849
Scenario 1 - 2500 + 1100	3,970	1,670	205	34	991	391	813
Scenario 2 - 4000 + 1100	5,070	1,670	238	34	904	391	777
Scenario 3 - 5500 + two 1100	6,970	3,340	314	68	867	391	712
Scenario 4 - 7000 + three 1100	9,570	5,010	411	102	825	391	676
Scenario 5 - Brisbane hub	3,970	1,200	111	128	538	2,044	888

It is noted that the optimisation of international scheduling and coastal shipping capacity has the potential to achieve further slot cost efficiencies.

A move to larger ships and hubbing will have flow on implications for New Zealand. While the benefits of larger containerships are apparent for slot cost economics, there are a number of wider logistical issues including port capacity, capability and regional logistics. Reflecting the scale of investment required by ports to meet the draught and associated infrastructure demands of larger vessels, any commitment made must be prudently secured by incremental revenues. Should New Zealand ports be unable to accommodate the larger ships required by shipping lines, the Australian ports, all recently upgraded, would surely be happy to act as a hub for New Zealand.

1.10.3 Infrastructure Systems

For illustrative purposes, we undertook a high level revenue analysis of the provision of infrastructure systems for the three modes assessed in this report, covering the rail network, the state highway road network and ports.

The objective of this analysis was to assess the implied commercial revenue requirement, assuming the application of rate of return targets consistent with that applied to the coastal shipping business case.

Based on the business case analysis framework applied to financial data for the 2008 year:

- Rail network returns represented approximately 6% of the calculated revenue requirement under the assumed framework;
- Charges and fees collected and allocated to State Highway network from all users, were approximately 40% the calculated revenue requirement under the assumed framework; and
- Current port charges provide on average 92% of the assessed revenue requirement under the assumed framework.

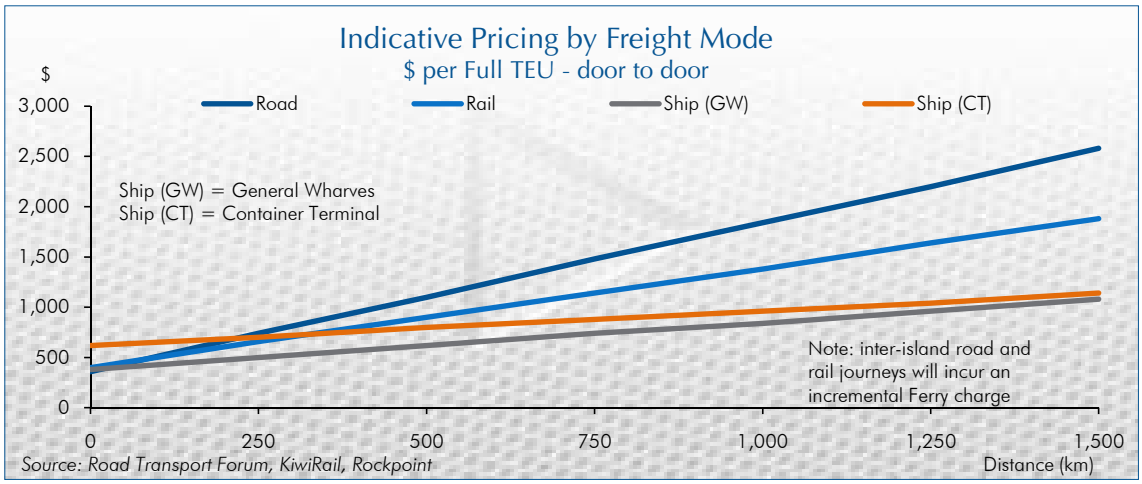
It is important to note in assessing these results that derived commercial returns are consistent with our coastal shipping analysis only. As such, no account has been taken of alternative approaches to financing (e.g. PAYGO), government policy, social objectives or any associated externalities (positive and negative).

1.11 MODAL PRICING

Pricing for freight services is set in a competitive market. While over time pricing will be guided by actual costs and target returns, large variations occur, both between and within modes.

Price determining factors include the nature of cargo, distance travelled, timeliness, third party service requirements and capacity utilisation. In addition each operator within a mode bids a price reflecting cost base differences, service offerings, price strategies and return expectations. Accordingly, there is no universal freight price schedule.

Utilising unit rates derived in our coastal shipping model in a comparison against assessed rail rates of 7 cents per tonne-km, and financial information in the Road Transport Forum study (2006) for road, we have derived estimated terminal-to-terminal delivery costs of a container movement, excluding pick-up and delivery.



In the current challenging economic climate, operators may be motivated to attract business simply to cover cash costs. A least-cost pricing sample obtained during the course of this study highlighted aggressive short run pricing by some road transport companies compared to more established practice.

1.12 EXTERNALITIES

The movement of freight by all modes imposes costs on external stakeholders although the extent of this varies from mode to mode. For each category of externality considered, the costs associated with road transport are substantially higher than for the same movement by rail or coastal shipping. An estimate of total externality costs for road in 2002 was $193 million, for an average of per 1.4 cents per tonne-km. For rail this was $9 million for an average of 0.2 cents per tonne-km and $2-3 million for coastal shipping, with an average of 0.1 cent per tonne-km. Average externality costs for road transport are therefore 6 times as high as those for rail and 12 times as high as those for coastal shipping.

1.13 CONCLUSIONS

The NFDS establishes the current baseline for the domestic freight task. As part of this study we have sought to review data which has become available since the NFDS was published. In general we concluded that the study continues to provide a reasonable basis for the estimation of scale, cargo breakdown and long run growth rate of the domestic freight task, despite observed short run variations. For coastal shipping volumes however, revised estimates were adopted.

International and domestic shipping lines servicing coastal trade (excluding Wellington - Picton ferries) carry 4.2 million tonnes annually, representing an estimated 1.9% of the national freight task, or 15% measured in tonne-km. This is principally represented by inter-island traffic and specialised bulk commodities. Shipping is particularly suited to bulky, heavy products although limited growth opportunities exist for coastal shipping's key cargo of petroleum and cement. Containerised volumes represent a growth opportunity for coastal shipping. Coastal shipping predominantly serves the inter-island general freight market as opposed to intra-island freight. The key segment of this trade is the Auckland to Christchurch container market, where coastal shipping commands an approximate 38% market share.

International and domestic lines have a very different business outlook and pricing basis for domestic cargos. For international lines, domestic origin cargo is secondary to blue water cargo movements and only some offer a domestic service. International lines typically command a greater proportion of intra-island movements, relative to domestic, reflecting multi-port schedules and the marginal pricing of these movements. Domestic lines in contrast derive their income solely from their coastal freight transport. As New Zealand resident companies, domestic operators incur additional cost burdens, being subject to New Zealand employment and taxation law, and maritime regulations.

Current economic conditions are severely affecting major international lines with substantial numbers of ships being left idle. A wide range of operational measures have been introduced to reduce costs, and the substantial overhang of ship capacity. This poses significant issues for New Zealand, as evident in the rationalisation of services and the withdrawal of 250,000 – 300,000 TEU slots from service in the last year. Internationally, shipping lines are becoming more focused on international transhipment ports which are likely to further reduce the number of direct services originating from New Zealand, with associated flow on impacts to shippers.

Our analysis suggests that of the total national freight task, contestable cargo volumes for coastal shipping are effectively limited. In market assessments undertaken of service offerings, coastal shipping received positive rankings for the provision of a low cost service, but frequency, flexibility and journey time were perceived as sources of weakness. Service reliability was also rated as an issue as international lines place less of a priority on the carriage of domestic freight and undertake frequent schedule changes.

Business case analysis indicates that a single ship coastal operation would need to attract approximately 28,000 TEU to breakeven, rising to 80,000 for a three ship service. In the

current market of approximately 195,000 TEU this is 14% of market share for the single ship service and 48% for the three ship service. A significant growth opportunity exists however in the provision of feeder services for the transhipment of containers to service international shipping lines. The volumes of containers offered by the transhipment market would be required to support a multi ship scenario.

Different cost structures exist for coastal shipping as compared with road and rail. For all road users, Government and Territorial Authorities do not attempt to generate a full economic return on the value of the road network. Rail is a recipient of significant financial support for network and operational requirements and also fails to generate a commercial return on infrastructure. Coastal shipping in contrast targets a commercial return on its operations (inclusive of capital costs) and is required to meet commercially established port charges. These represent approximately 50% of total operating costs, as compared to current infrastructure charges for road at 14% and rail at 9%.

Coastal shipping provides strong benefits in fuel efficiency and for environmental sustainability, particularly by way of reduced emissions. In the absence of the incorporation of externalities into modal pricing, coastal shipping does not currently receive any competitive pricing benefits from these attributes. However, the overall benefits of coastal shipping are somewhat reduced by the requirement for a road transport component in door-to-door deliveries.

Improved frequency of service would assist coastal shipping's relative competitive position. Longer transit times and less service flexibility compared to other modes however will still prevail, and there persists a general lack of appreciation by shippers of the quality of service coastal shipping can offer. Rail represents the most direct competition for coastal shipping. Should rail's pricing be amended to improve economic returns on capital invested, this would enhance the competitive positioning of coastal shipping.

The structural change in the market most likely to benefit coastal shipping is the rationalisation of New Zealand port calls by international shipping lines. Under a hubbing scenario, however, the majority of incremental consolidation traffic will be intra-island which presents road and rail as strongly positioned competitors relative to coastal shipping. If international shipping lines were to call on only one port in the North Island and one in the South Island there would also be a need to reposition empty containers from the import dominated North to the export oriented South. Coastal shipping would be well placed to meet this market need.

A desire was expressed by interviewees for the Government to be more active in the development a broader vision for the freight sector, however strong opposition was observed to the Government attempting to dictate transport modes to users, with 94% of respondents against this suggestion. A number of parties felt that Government agencies involved in the sector did not have the level of industry and commercial knowledge that active engagement required, particularly in relation to the shipping industry.

1.14 RECOMMENDATIONS

Key recommendations from the study:

Enhanced Data Capture

A working group be established to address mandatory comprehensive capture of key freight data (container, breakbulk and bulk flows) through New Zealand ports, on road and by rail. Conventions on data capture should be agreed, the data will ideally be derived from existing data collection undertaken by stakeholders and be useful to the wider market. All industry participants and government agencies be required to share this information. This database would be made publicly available, with appropriate analysis, to permit clear recognition and mapping of imports, exports, transhipments and domestic movements. The format and

procedures for this should be agreed by government agencies (Customs, Transport, Agriculture) in open consultation with industry participants (port companies, international and domestic shipping companies, transport companies, key shippers and industry groups).

Government Interaction and Policy Development

The Ministry of Transport forms a dedicated unit, with comprehensive and specialised knowledge, to provide leadership and to engage with the wider transport and Maritime Sector, including international and domestic shipping lines, ports and relevant service providers.

An Integrated Transport Strategy

The Government, as shareholder and provider of operating and capital grants, should clearly articulate its investment strategy for KiwiRail, including a breakdown of the commercial and national benefit drivers. This should also include whether as a State Owned Enterprise KiwiRail is expected to provide a return on all capital employed and if so what that target is.

Maritime New Zealand

Maritime New Zealand be supported in its efforts to develop appropriate and pragmatic regulations which govern New Zealand's maritime qualifications and operational requirements, and consider appropriate standards for mid size ships that solely operate around the New Zealand coast. This will enable a more competitive coastal shipping industry to develop under a system considered appropriate for domestic conditions.

Regional Transport Strategy

NZTA's requirements for Regional Land Transport Strategies be extended to require a formal analysis of the freight task that exists in and across each region and the likely growth of this over the next ten years. That the Regional Land Transport Strategies identify the major transport hubs in each region and in conjunction with surrounding regions formally consider the intermodal requirements for each such facility as part of their Regional Land Transport Plan for transport investment.

New Zealand Port Sector

Government, in a facilitation role, clearly articulates its policy views in relation to potential consolidation or coordination of port service capability from a national benefit standpoint, including how it could facilitate the evaluation of any such initiatives from a regulatory or infrastructure perspective.

Coastal Shipping Promotion

The Maritime Unit in the Ministry of Transport be charged with the establishment of a web based promotion service providing details of coastal services provided by domestic and international shipping lines in New Zealand, advice and links to service providers, supported by initiatives to simplify documentation. This would be coordinated with integrated data collection and sector engagement as recommended in Government Interaction and Policy Development above.

▸
Container Depot Auckland

Introduction

2. INTRODUCTION

2.1 STUDY SPONSOR

The New Zealand Transport Agency ("NZTA"), under the Domestic Sea Freight Development Fund, commissioned the study that forms the subject of this report.

2.2 PURPOSE OF STUDY

The study seeks to provide, on a nation-wide basis, a greater understanding of the freight market, with a key focus on the relative positioning and determinants of coastal shipping, to assist in the formulation of transport policy and related funding allocations.

2.3 BACKGROUND

In May 2008, the Ministry of Transport launched "Sea Change", a strategic initiative with the goal to encourage a revival of the coastal shipping industry in New Zealand. The strategy borrowed heavily from developments in Short Sea Shipping abroad as well as local industry research including the Shipping Federation's paper 'Roadways to Waterways'. As part of the implementation of 'Sea Change', the NZTA established the Domestic Sea Freight Development Fund in September 2008. With an allocation of $36 million over four years, the fund offered financial support for initiatives that would encourage freight to move from road and rail onto ships.

NZTA sought proposals from industry for the first round of $6 million in funding by 31st October 2008. Rockpoint Corporate Finance Ltd in collaboration with Richard Paling Consulting Ltd and IPC & Associates Ltd submitted a joint proposal for a study which is the subject of this report. The proposal identified a need to gain a greater understanding of coastal shipping and its drivers before informed decisions on policy and funding allocations could be made.

Since the formation of the National Government in November 2008, transport funding priorities have shifted. The Government Policy Statement dated May 2009, outlines a forecast expenditure of between $14,800 million and $18,900 million on the State Highway network until 2018/19 and the termination of the $36 million Domestic Sea Freight Fund. Of the $6 million earmarked for funding in the first round, only $2 million was allocated to sea freight development projects. Nevertheless this study sees value in resolving knowledge gaps in the sector by presenting insights into transport mode selection, and an examination of the business case for coastal shipping. Without a clear and balanced view of the commercial prospects of each transport mode, it is unlikely New Zealand will be able to formulate appropriate policy to encourage efficient and effective outcomes for the country.

2.4 METHODOLOGY

The methodology builds upon earlier work performed in the transport sector. The study reconciles the existing and disparate body of knowledge of New Zealand transport to provide a stocktake of existing freight flows (domestic and international, road, rail, ship), infrastructure systems (road, rail, port) and domestic transport service offerings. Analysis of the national freight task and three modes sets the basis upon which an examination of intermodal issues, commercial drivers, and the influence of relevant tax and regulatory legislation on freight mode preference and decision is undertaken. In forming conclusions and recommendations for consideration, the study considers externalities and identifies additional information requirements deemed necessary to provide a comprehensive view of the domestic freight market in New Zealand.

2.5 SCOPE OF WORK

The scope of work included:

- Appraisal of current freight flows in New Zealand, building upon the National Freight Demands Study ("NFDS") and incorporating updates to the freight task over the intervening period;
- Examination of the characteristics, capacities and constraints of each domestic infrastructure system (road, rail, port) and transport mode (truck, rail, ship), and their interactions;
- Analysis of the trends and factors driving the international shipping industry and the potential impact of these on the structure and scope of scheduled shipping services to New Zealand, including implications for the New Zealand freight task;
- Review of international coastal shipping experiences and initiatives;
- Overview of the maritime regulatory framework in New Zealand;
- Determination of the potential contestable volumes available to coastal shipping from an analysis of freight types and modal service offerings;
- Consideration of the factors which influence shipper modal selection including:
  - commercial drivers (price, choice, competition);
  - intermodal issues;
  - supply chain timeframe requirements;
  - service capacity, quality and reliability;
  - stakeholder preferences;
  - externalities (including congestion, safety and emissions); and
  - requirements for new infrastructure investment.
- Examination of modal economics and pricing across the three modes, including a business case assessment of an illustrative coastal shipping operation;
- Identification of relevant externalities and related issues;
- Formulation of conclusions and recommendations; and
- Presentation of findings.

2.6 OBJECTIVES

The study seeks to:

- Build upon the NFDS, providing a comprehensive review of freight flows within New Zealand and an assessment of the practical opportunities to transfer freight between road, rail and ship;
- Assess the commercial constraints on each mode and the requirement for further investment to accommodate growth, improve performance, and address external consequences (including congestion, safety and emissions);
- Quantify the cost, time and service quality drivers for each transport mode;
- Understand the basis upon which shippers currently make their transport mode decisions and the factors which might influence future modal choice decisions; and
- Provide a framework upon which public policy can be developed to encourage growth in the proportion of the freight task carried by coastal shipping, and assess future proposals for investment and change in the New Zealand transport sector.

2.7 REPORT STRUCTURE

This report comprises six key sections:

- **Freight Task**: Review of the National Freight Task (chapter 3);
- **Transport Modes and Infrastructure Systems**: Overview of the three transport modes: Shipping, Rail & Road and supporting infrastructure systems (chapters 4-10);
- **Regulatory Framework for Coastal Shipping**: International and Domestic (chapters 11-12);
- **Modal Choice**: Results of Interview Programme and Case Studies (chapters 13-14);
- **Modal Economics**: Analysis of Contestable Volumes, Modal Economics, Pricing and Externalities (chapters 15-19);

- **Conclusions and Recommendations**: (chapters 20 and 21); and
- **Appendices**: (chapters 22-26).

2.8 Assumptions and Exclusions

The following assumptions and exclusions provide a basis for the analysis:

- **New Zealand Coastal Shipping**: Coastal shipping in New Zealand incorporates all ships, including foreign flagged ships, employed in the carriage of domestic freight for a domestic destination, and includes the repositioning of empty containers. Transhipment freight moving between domestic ports before or after an international shipping leg also falls under this definition.
- **Geography**: North and South Island New Zealand trade is the study focus. Trade to the Chatham Islands, Stewart Island, and associated entities like the Cook Islands are excluded.
- **Freight Type**: The study ignores air freight and courier movements in light of the time critical nature of products using these services and its limited application to coastal shipping. In line with the study scope, analysis focuses principally on containerised freight movements.
- **Information Gaps**: Where gaps in statistical information and freight flows are identified, suitable approximations of similar companies / data have been used.
- **Economic Growth Forecasts**: Economic growth rate assumptions match those applied by the NFDS. Specifically the New Zealand economy is assumed to grow at an average annual rate of 2.0% per annum until 2031. This assumption is also in line with growth rates assumed by the Ministry of Transport ("MoT") in the forecast of overall freight demand and is between forecasts produced by the New Zealand Institute for Economic Research ("NZIER") and the Ministry of Economic Development ("MED").
- **Commerciality**: At the core of the commercial assessment of coastal shipping is an assumption that the mode must offer a reliable timely service with competitive pricing on an unaided basis.

2.9 Acknowledgements

Authors of the report would like to acknowledge the assistance received from a variety of parties in undertaking the study. Particularly we would like to express our gratitude to interview participants and respondents of our questionnaire. We appreciate the significant time and resources availed to us in the process of our research and trust that all involved find this report of benefit.

2.10 The Authors

2.10.1 Rockpoint Corporate Finance

Rockpoint Corporate Finance Ltd ("Rockpoint") is a Wellington based Corporate Advisory and Investment Banking firm servicing clients in New Zealand and Australia. Rockpoint's specialist sector expertise covers Ports, Transport, Infrastructure and Utilities, and Energy and Resources. Rockpoint executives have competencies encompassing industry research, financial analysis, financial structuring and operational experience. Earlier studies by Rockpoint include The New Zealand Port Sector Report 2008.

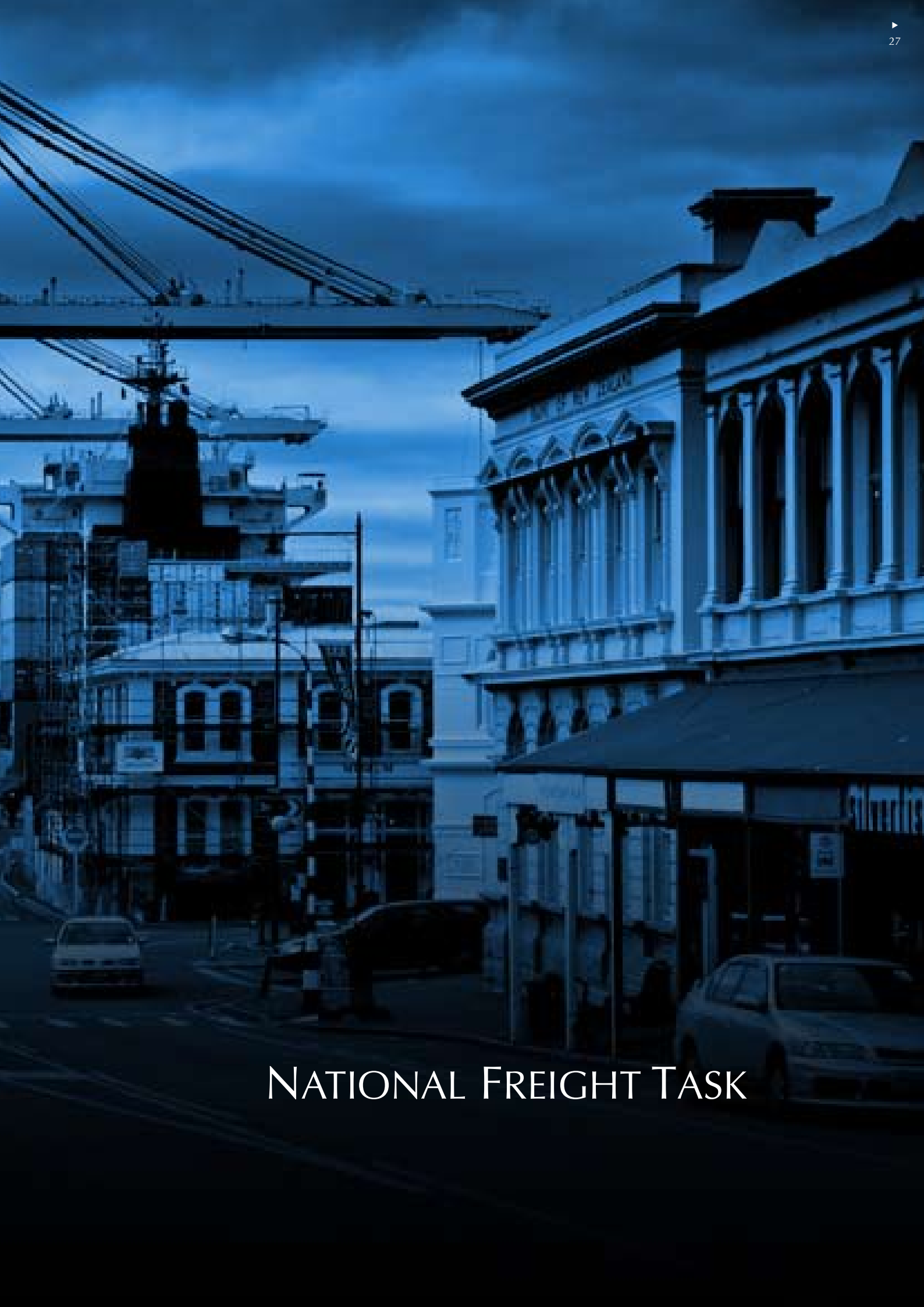
2.10.2 Richard Paling Consulting

Richard Paling Consulting Ltd ("RPC") is an independent transport planning and evaluation consultancy with New Zealand and international experience. RPC has provided services to a number of clients in New Zealand including Central Government, Regional Councils, Local Authorities and the Auckland Regional Transport Authority. Richard Paling was the lead consultant and primary author of the National Freight Demands Study (2008) undertaken for the MoT, MED, and Land Transport New Zealand.

2.10.3 IPC & Associates

IPC & Associates Limited ("IPC") was established by Peter Carr and specialises in transport project contracting and consultancy. IPC's extensive client base includes Central Government, Local Authorities, Ports, rail, shipping, stevedoring and cold store organisations in New Zealand, Australia and the Pacific Islands. IPC was an author of the National Freight Demands Study (2008), undertaken in conjunction with Richard Paling Consulting.


CAFE



National Freight Task

3 NATIONAL FREIGHT TASK

3.1 INTRODUCTION

In establishing the basis for an assessment of the current and future prospects of New Zealand coastal shipping, it is imperative to first acquire an overall understanding of the national freight task. Rockpoint Corporate Finance, Richard Paling Consulting and IPC & Associates are fortunate to be able to draw upon recent work performed in the transport sector. The National Freight Demands Study ("NFDS"), undertaken by a team led by Richard Paling Consulting and inclusive of IPC & Associates, provides a comprehensive database detailing the movement of freight by mode and commodity for 2006-07. The Rockpoint Port Sector Report, published in June 2008 presents recent trends in domestic and international shipping, and the New Zealand port sector.

This chapter presents an overview of the national freight task and in particular addresses updates to freight flows since the publication of the NFDS. While the scope of this report prohibits a comprehensive review of the freight sector in New Zealand, an attempt has been made to identify material changes and to confirm whether the data sets for 2006-07 still form a reliable basis for analysis and planning.

Through the interviews conducted, and from a review of recent data sources, we have attempted to identify the key trends impacting on the economy and the resultant impact on freight traffic flows. Specifically, the investigation undertaken covered the following key areas:

- International Trade Flows – utilising port statistics from Customs and Excise;
- Freight Trends – including information on commodities such as bulk petroleum products, cement, liquid milk, logs and timber products, grain, aggregates and coal. In total commodities represent over half the freight task in New Zealand;
- Domestic Container Supply – utilising information from the recently released Cubic-Njord study;
- Road Traffic – information on key roads and inter-island link (Wellington – Picton); and
- Coastal Shipping Data – a review of estimates of the coastal shipping task.

A key element driving the observed changes in freight flows is the current economic downturn and resultant volatility of economic activity. With the effects of this still unfolding and problems with timing delays in data collection, it is probably too early to conclude that current trade statistics represent the full extent of the recession. Our observations indicate a concentration of rapid changes in specific sectors which, although potentially material in the short term, is not unprecedented. A recovery of both domestic and international freight activity to previous levels is anticipated in due course.

3.2 NEW ZEALAND FREIGHT

The scale of the freight task in New Zealand is substantial and encapsulates a range of activities. As a remote island New Zealand is significantly dependent on international trade and the movement of freight affects almost all sectors of the economy. The national freight task encapsulates the linking of areas of production to ports and of domestic bound cargo to consumers. Primary industries still dominate the New Zealand economy, with agriculture, forestry and mining key export earners. Imports predominately comprise fuel, machinery and manufactures.

In aggregate the estimated New Zealand freight task for the financial year 2006 – 2007 totalled 225.8 million tonnes, or 26,800 million tonne-km. These amounts represent freight movements from domestic origin to domestic destination, including via ports. The respective modal shares for road, rail and coastal shipping in 2006-2007 on a tonne kilometre basis were 70%, 15% and 15%, as detailed in the following figure.

National Freight Task				
	Tonnes Lifted		Tonne-kms	
Mode	(millions)	% of total	(billions)	% of total
Road	207.8	92.0%	18.8	70.2%
Rail	13.7	6.1%	3.9	14.6%
Coastal Shipping	4.2	1.9%	4.0	14.9%
Air	0.1	0.0%	0.08	0.3%
Total	**225.8**	**100.0%**	**26.78**	**100.0%**

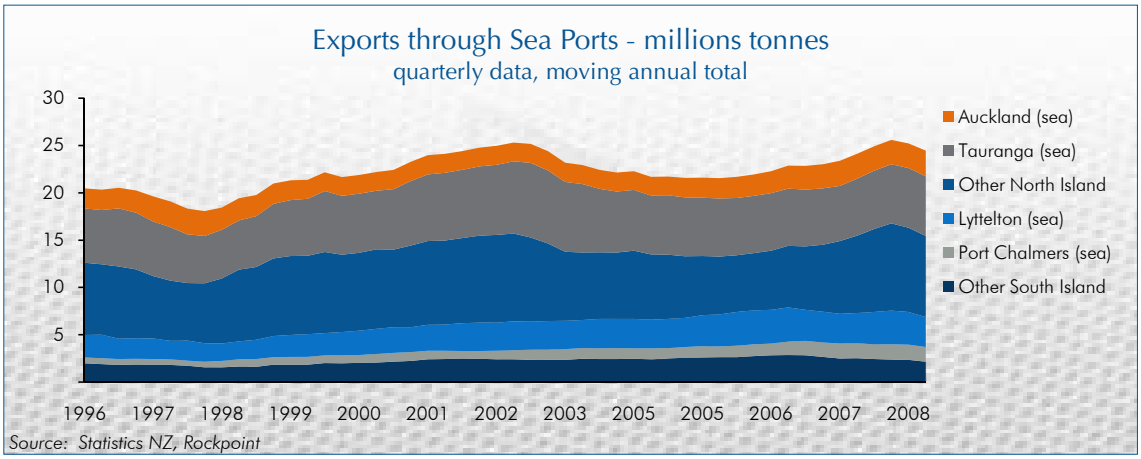
Source: NFDS updated

3.3 INTERNATIONAL TRADE

The key data source for international trade flows is the New Zealand Customs Service (as compiled and provided by the Department of Statistics) and provides volumes of international trade in tonnes through the New Zealand ports.

3.3.1 Export Volumes

The figure below presents export trends by port since 1996. The decline in exports between 2003 and 2006 is almost all attributable to falling log exports (the impact of a strong currency, principally affecting Tauranga) and falling oil exports (falling petroleum exports following the decline in the Maui field, affecting New Plymouth, and incidentally reversed in 2008). The decline since mid-2008, across most ports, is in response to the global economic climate.



Source: *Statistics NZ, Rockpoint*

The changing picture of trade flows since the NFDS report are presented by port in the following figure.

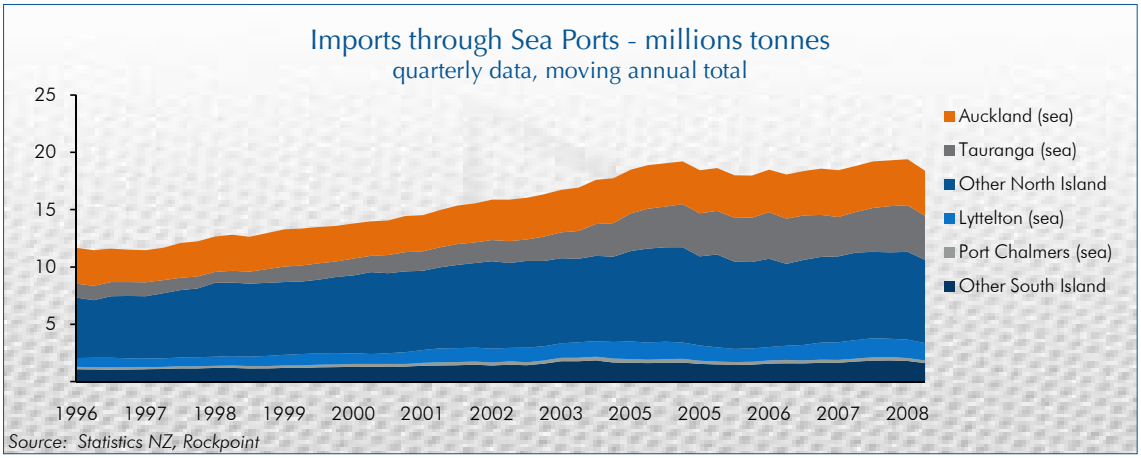
Export Volumes through NZ Ports - tonnes				
Port		2006-07	2007-08	Change %
Whangarei	MAP	1,156,500	1,230,150	6%
Auckland	AKL	2,508,282	2,561,227	2%
Tauranga	TRG	6,011,407	6,178,871	3%
Gisborne	GIS	589,041	678,017	15%
New Plymouth	NPL	1,374,866	3,281,052	139%
Napier	NPE	2,078,571	1,989,149	-4%
Wellington	WLG	818,259	764,283	-7%
Nelson	NSN	1,243,738	1,119,451	-10%
Picton	MLB	377,947	297,003	-21%
Westport	WST	49,990	0	-100%
Christchurch	LYT	3,273,358	3,422,638	5%
Timaru	TIU	517,266	404,300	-22%
Dunedin	POE	1,530,042	1,544,466	1%
Bluff	BLU	648,011	635,851	-2%
Various		682,200	815,800	20%
Total Sea Ports		**22,859,478**	**24,922,258**	**9%**
Airports		104,155	99,248	-5%
Parcel Post		40	29	-28%
Total Ports		**22,963,673**	**25,021,535**	**9%**

Source: Statistics NZ

Compared to the NFDS base period of 2006-07, exports exhibit some variation in the individual port totals. Changes in shipping patterns and the natural volatility in individual commodity flows impacted trade but with the exception of New Plymouth, the changes in export volumes between 2006-07 and 2007-08 are relatively small. Increases from New Plymouth reflect a substantial increase in crude oil exports but with little impact on inland or domestic freight flows, and excluding these, the change in total export volumes is again relatively small.

3.3.2 Import Volumes

Import data presents steady growth prior to 2005, with a flattening of trade until late 2008 when a broadly observed decline started after September 2008, as shown in the figure following.



Source: Statistics NZ, Rockpoint

Relative volume data for 2006/07 and 2007/08 is presented in the following table.

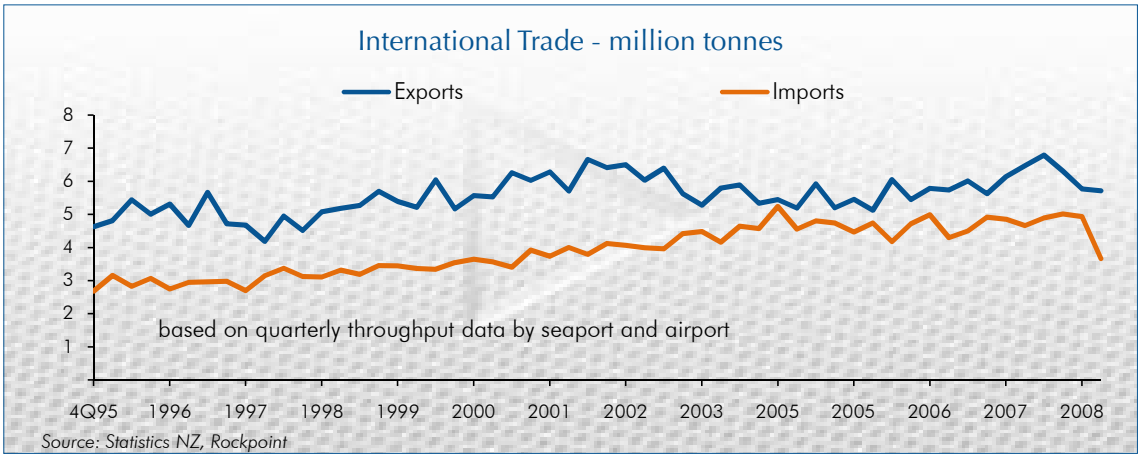
Import Volumes through NZ Ports - tonnes				
Port		2006-07	2007-08	Change %
Whangarei	MAP	5,242,347	5,365,603	2%
Auckland	AKL	3,875,889	4,053,695	5%
Tauranga	TRG	3,878,849	3,832,395	-1%
Gisborne	GIS	7,029	5,040	-28%
New Plymouth	NPL	488,718	556,351	14%
Napier	NPE	484,236	364,370	-25%
Wellington	WLG	1,217,135	1,243,235	2%
Nelson	NSN	124,274	156,335	26%
Picton	MLB	2,433	2,584	6%
Westport	WST	24,411	13,840	-43%
Christchurch	LYT	1,344,764	1,657,703	23%
Timaru	TIU	314,696	326,390	4%
Dunedin	POE	264,727	298,342	13%
Bluff	BLU	1,125,054	1,274,312	13%
Various			68,857	-
Total Sea Ports		**18,394,562**	**19,219,052**	**4%**
Total Airports		104,443	104,582	0%
Parcel Post		109	117	7%
Total Ports		**18,499,114**	**19,323,751**	**4%**

Source: Statistics NZ

Imports exhibit similar differences between 2006-07 and 2007-08, reflecting changes in commodity flows and shipping patterns. Overall fluctuations are relatively modest, with total import traffic increasing by about 4% over the period. Interviewees comment that currently import volumes are in decline and for some trades materially so. The indicated growth in 2007-08 is therefore likely to be reversed. This observation is further supported by analysis in the following section.

3.4 FREIGHT TRENDS

The impact of the economic downturn is apparent in New Zealand international trade data. By weight, we observe a 16% decline in exports from their peak in the quarter ending 30 June 2008, while imports have fallen 27% from their peak in the quarter ending 30 September 2008.



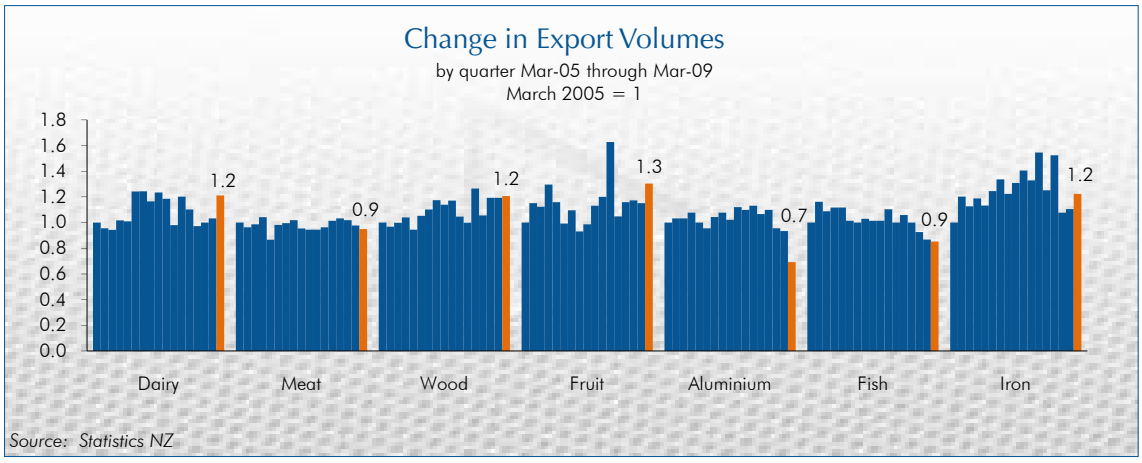
Source: Statistics NZ, Rockpoint

An illustration of the changes in commodity flows is set out in the following figure.

Export Volumes for Selected Products								
Period		Dairy 000 t	Meat 000 t	Wood 000 cum	Fruit 000 t	Aluminium 000 t	Fish 000 t	Iron 000 t
2005	Mar	401	217	1,978	145	91	68	143
	Jun	383	209	1,915	167	94	79	172
	Sep	378	214	1,977	163	94	74	161
	Dec	408	226	2,057	188	98	76	170
2006	Mar	405	188	1,870	168	91	76	162
	Jun	498	213	2,082	144	87	69	178
	Sep	499	216	2,181	159	95	68	191
	Dec	467	221	2,323	135	98	70	175
2007	Mar	495	207	2,252	143	93	69	187
	Jun	475	205	2,316	164	102	69	201
	Sep	393	205	2,071	174	100	75	190
	Dec	482	209	1,976	236	103	68	221
2008	Mar	442	220	2,504	152	97	72	179
	Jun	390	224	2,087	168	100	68	218
	Sep	401	221	2,358	170	87	63	154
	Dec	414	212	2,358	167	85	59	158
2009	Mar	486	206	2,387	189	63	58	175

Source: Statistics NZ

Recent statistics show a high level of volatility for many of New Zealand's key export commodities. This reflects seasonal patterns as well as the impact of weather and changing commodity prices on harvest volumes. Notably fish and shellfish exports have declined substantially over the last three quarters, with economic conditions affecting demand in export markets. Aluminium has declined substantially, with the downturn affecting volumes in addition to a failure of one of three potlines at the Tiwai Point Smelter. Recent logs and wood exports experienced an uplift with the declining NZ$ and renewed availability of bulk ships. Exports of dairy products reflect both supply and demand issues which has increased volatility. Relatively high exports were experienced in the March quarter with a lower currency, and increased demand from China in the post-melamine market. Exports of iron and steel have declined substantially from their peak at the end of 2007 however these again appear to be growing in the most recent figures reflecting an increased emphasis on exporting by the sector. Export trends are displayed graphically in the following figure.



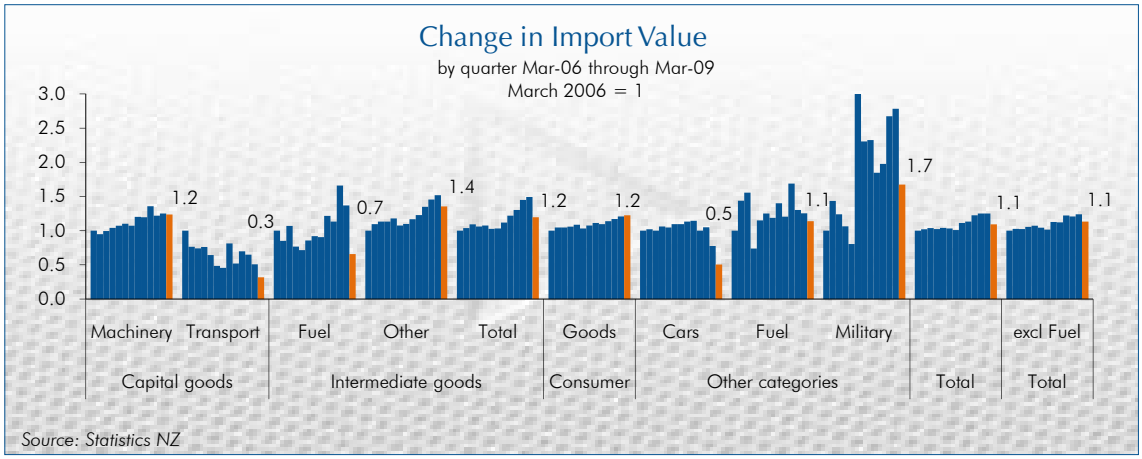
Source: Statistics NZ

Information on import quantities is only available by value which necessarily combines volume, price and exchange rate changes. The recent statistics for imports are set out and summarised graphically in the following two figures. The first figure reflects the actual prices paid in NZ$, as influenced by changes in the exchange rate as well as the volumes of goods. However, the subsequent figure depicts changes graphically in the form of an index. The final data point in the graphical data series corrects for changes in the trade-weighted index and possibly gives a better representation of the witnessed changes in volumes imported.

Import Values by Commodity - $ million

Period		Capital goods		Intermediate goods			Consumer	Other categories			Total	Total
		Machinery	Transport	Fuel	Other	Total	Goods	Cars	Fuel	Military		excl Fuel
2006	Mar	1,444	773	874	3,396	4,307	2,400	730	244	46	9,956	*8,837*
	Jun	1,370	592	744	3,720	4,469	2,516	745	351	66	10,173	*9,079*
	Sep	1,438	574	935	3,845	4,702	2,515	730	380	57	10,351	*9,036*
	Dec	1,503	589	672	3,852	4,575	2,541	774	180	49	10,183	*9,332*
2007	Mar	1,548	498	625	4,007	4,631	2,609	765	281	37	10,379	*9,474*
	Jun	1,592	376	749	3,653	4,423	2,480	800	305	209	10,274	*9,221*
	Sep	1,548	352	805	3,729	4,452	2,582	799	290	106	10,057	*8,962*
	Dec	1,737	629	792	3,965	4,814	2,675	828	342	107	11,088	*9,954*
2008	Mar	1,728	403	1,063	4,176	5,258	2,632	836	294	85	11,273	*9,916*
	Jun	1,960	540	990	4,582	5,613	2,732	731	412	91	12,196	*10,794*
	Sep	1,760	501	1,450	4,941	6,251	2,812	767	318	123	12,450	*10,682*
	Dec	1,807	394	1,197	5,162	6,436	2,899	566	306	128	12,470	*10,968*
2009	Mar	1,785	245	575	4,606	5,151	2,942	370	278	77	10,873	*10,021*

Source : Statistics NZ

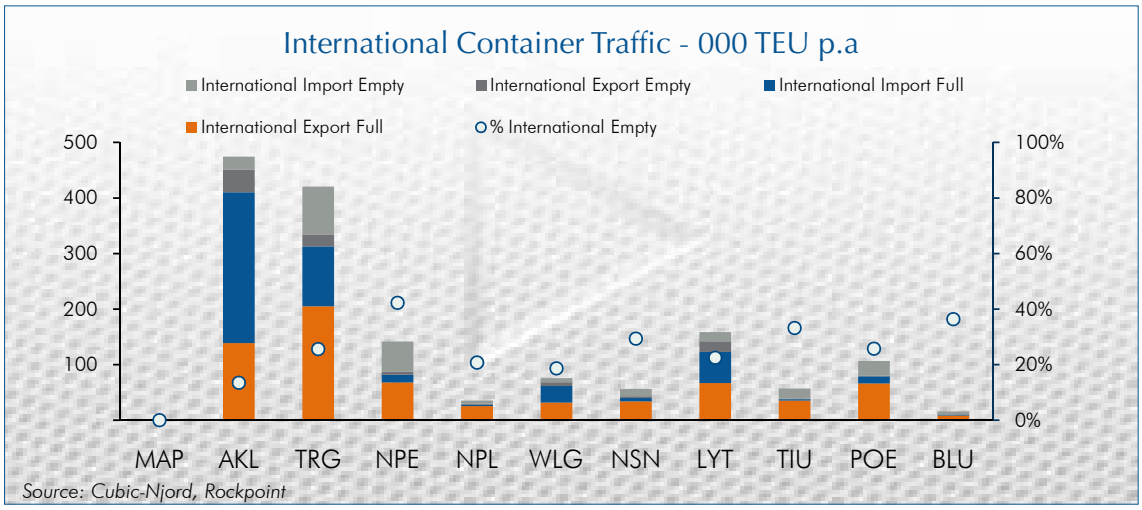


In general significant declines in import volumes, particularly in the last two quarters, offset earlier growth experienced until the middle of 2008. This trend is confirmed by commentary from international shipping lines and key import ports. Particularly sharp decreases in passenger cars and other transport equipment are witnessed, although imports of consumption goods in total appear to have avoided steep declines, despite anecdotal evidence to the contrary.

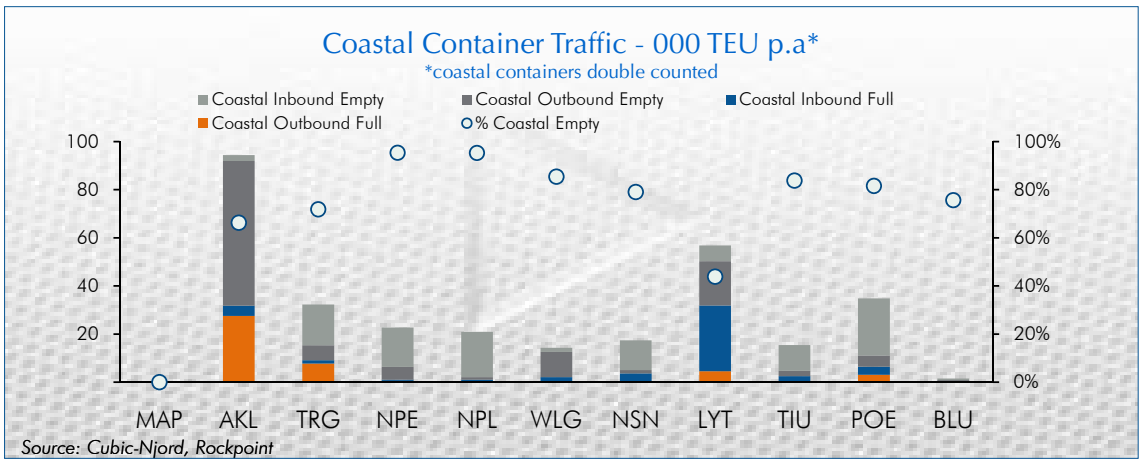
3.5 DOMESTIC CONTAINER SUPPLY

A recent container supply study by Cubic Transport and Njord Shipping ("Cubic-Njord") provides a valuable insight into container traffic in New Zealand. Container traffic is defined as international or coastal boxes, arriving (import) or departing (export), full or empty, and by container type (20' or 40', dry or reefer). While shippers and shipping lines seek to maintain desired container balances based on supply and demand, the flow of trade in New Zealand is inherently unbalanced. Key exports of primary products (dairy, meat, and fruit) are typically shipped in 40' reefers by export ports like Auckland, Tauranga and Otago. In contrast, imports

of consumer goods arrive in dry 20' and 40' containers primarily through Auckland and Lyttelton. Combined with natural seasonal patterns, these imbalances require substantial repositioning of empty containers. The following figure depicts international traffic in empty containers emphasising Auckland's role as an import port. Traffic in empty containers of typically between 20% and 40% of total flows is observed with movements weighted towards container imports into key export ports.



A similar analysis of coastal traffic shows a very heavy weighting (>70% of coastal flows) towards empty containers, which are clearly being repositioned to address import-export imbalances. Note in the following figure coastal containers are double counted – each by both source and destination port.



The Cubic-Njord report records total container movements through ports as 1.70 million TEU for the 2008 calendar year, based on detailed trade information provided by ports and shipping lines. The ports record in their public releases container volumes of 2.37 million for the year ending 30 June 2008. The difference in the two figures is accounted for by several factors:

- Different time periods;
- Ports record revenue-generating moves that include restows, moves instructed by shipping lines, and other actions, which do not all represent the unique receipt or dispatch of a container;
- Ports multiple-count transhipments, with the export or import of a single container generating revenue for the hub port for both the lift-off and lift-on, and a lift on / off for the feeder port; and
- A domestic container is counted by both the dispatching and receiving port.

The difference in recorded port volumes of 2.37 million TEU and the 1.70 million TEU unique containers moves measured by Cubic Njord is reconciled as follows:

Assessment of Container Movements - 000TEU	Recorded	Unique	
Port Moves	2366		Containers handled, as reported by ports, being chargeable moves
less Import and Export	1542	1542	Import and export containers, of which some may be transhipped
Coastal Volumes	823		
less Domestic Containers	310	155	Domestic containers being 155,000, double counted
Balance (transhipments*)	513	256	Transhipments, being 256,000, double counted
Unique Container Movements		1698	international plus domestic
Unique Container Movements		1954	international plus domestic plus transhipment

*Assuming all this residual represents transshipments (that is, nil restows or other chargeable moves)

Note: these totals exclude all inter-island volumes between Wellington and Picton

3.5.1 Summary Port Throughput

New Zealand Port Throughput - 000 TEU												NZ	
000TEU	MAP	AKL	TRG	NPE	NPL	WLG	NSN	LYT	TIU	POE	BLU	port	unique
Gross Ship Capacity	59	1437	1501	744	292	437	271	654	218	664	114	**6393**	
Containers Handled (port stats 2008)		841	582	154	60	92	78	251	80	209	20	**2366**	***2366***
less International Containers		475	421	142	35	76	56	159	57	107	16	1542	**1542**
less Domestic Containers (x2)		94	32	23	21	14	17	57	15	35	2	310	**155**
Transhipments (residual)		272	129	-11	3	1	4	35	8	68	3	513	**256**
Coastal Outbound Full		28	8	1				5		3		**45**	
Coastal Outbound Empty		60	6	5	1	10	1	18	2	5	1	**110**	
Coastal Out		88	14	6	1	11	2	23	3	8	1	**155**	
Coastal Inbound Full		4	1	1	1	2	3	27	2	3		**45**	
Coastal Inbound Empty		2	17	16	19	2	12	6	11	24	1	**110**	
Coastal In		7	18	17	20	4	16	34	13	27	1	**155**	
International Export Full		139	205	68	26	32	34	67	35	66	8	**680**	
International Export Empty		41	21	6	2	7	3	19	1	1		**102**	
Exports		180	226	74	28	39	38	86	36	68	8	**782**	
International Import Full		272	108	14	2	30	6	56	3	13	2	**504**	
International Import Empty		23	86	54	5	7	13	17	18	26	6	**255**	
Imports		295	194	68	8	37	19	72	20	39	7	**760**	
Coastal		94	32	23	21	14	17	57	15	35	2	**310**	**155**
International		475	421	142	35	76	56	159	57	107	16	**1542**	**1542**
Total		569	453	164	56	90	74	215	72	141	17	**1853**	**1698**
International - Imports/Total		62%	46%	48%	22%	49%	34%	46%	36%	37%	47%	**49%**	
Coastal - Imports/Total		7%	57%	75%	93%	26%	91%	60%	83%	78%	42%	**50%**	
% Transhipment		32%	22%	-7%	6%	2%	5%	14%	10%	32%	13%	**22%**	
% Available Capacity		59%	39%	21%	20%	21%	29%	38%	37%	31%	17%	**37%**	
% Available Capacity (Intl)		33%	28%	19%	12%	17%	21%	24%	26%	16%	14%	**24%**	
% Coastal Empty		66%	72%	95%	95%	85%	79%	44%	84%	82%	76%	**71%**	
% International Empty		14%	26%	42%	21%	19%	29%	23%	33%	26%	36%	**23%**	
% Empties Coastal		49%	18%	27%	73%	46%	45%	41%	41%	51%	17%	**38%**	

Source: Cubic-Njord "Domestic Container Supply Study", March 2009

Notes:

1. Gross Ship Capacity is derived from international and domestic scheduled services (as at April 2009), and represents the cumulative container slots on all ships visiting each port.
2. Containers Handled represents the total containers handled through the container terminals, as disclosed to Cubic-Njord by ports, and includes multiple counting of transhipment containers (year to December 2008).
3. Containers Handled excludes those handled across general wharves, principally by Pacifica and Strait Shipping (nominally for the 2008 calendar year).
4. Container Throughput (Cubic-Njord) represents unique transactions for each port.
5. NZ Total "unique" column (far right) represents the arithmetic sum of all individual ports, excepting:
   a. coastal volume totals are halved to avoid double counting; and
   b. transhipments are half of the difference between port totals and Cubic-Njord totals, again to avoid double counting.

6. The calculated Napier transhipment volume, shown negative, is clearly wrong, and reflects data inconsistencies (different periods, incomplete or inaccurate data).
7. Bluff did not disclose actual container throughput in its June 2008 year. We estimate 20,000 TEU given the weekly MSC service, and based on the Cubic-Njord estimates.

Key observations from the preceding table include:

- For international trade, Auckland is import weighted, while New Plymouth, Nelson, Timaru and Otago are export weighted;
- For coastal trade, Auckland is a heavy exporter with international imports and empty containers being redistributed south. Napier, New Plymouth, Nelson, Timaru and Otago are dominated by imports of empty containers;
- Based on the estimated ratio of transhipments, the emerging hub ports are Auckland (32%) and Otago (32%), and to lesser extent Tauranga (22%);
- Auckland throughput is the equivalent of 60% of all available container slots on scheduled shipping, followed by Tauranga, Lyttelton and Timaru;
- 71% of coastal boxes, and 23% of international boxes are empty containers;
- 38% of all empty container movements are coastal;
- The data does not provide for any seasonal patterns which, when considered, would likely show larger container imbalances; and
- Cubic-Njord estimates 45,000 TEU of domestic trade travels through the container terminals. An additional 41,000 TEU is estimated to travel across the general wharves (principally from Pacifica and Strait Shipping, and excluding the Wellington-Picton inter-island ferry flows).

NZ Coastal Container Movements - TEU	
Full domestic containers - container terminals (Cubic-Njord)	44000
Full domestic containers - general wharves (Rockpoint)	41000
Empty containers - container terminals (Cubic-Njord)	110000
Domestic Container Movements	195000
Transhipment containers - container terminals (Cubic-Njord)	255000
Total Coastal Container Movements	**450000**

To date, the cost of repositioning empty containers to meet the unbalanced needs of importers and exporters is incurred by international shipping lines. As the figures above indicate, this represents significant volume and it appears from recent announcements that some shipping lines may seek to start charging exporters for repositioning empties to meet acute seasonal imbalances. Historically, international shipping lines have repositioned empties and transhipped fulls on their own scheduled services. However, more recently domestic operators have assisted in this trade, for instance:

- Pacifica and Strait Shipping act as agents for international lines, both moving empty containers and transhipping full containers; and
- Cubic derive revenue from moving domestic cargo in empty containers otherwise being repositioned.

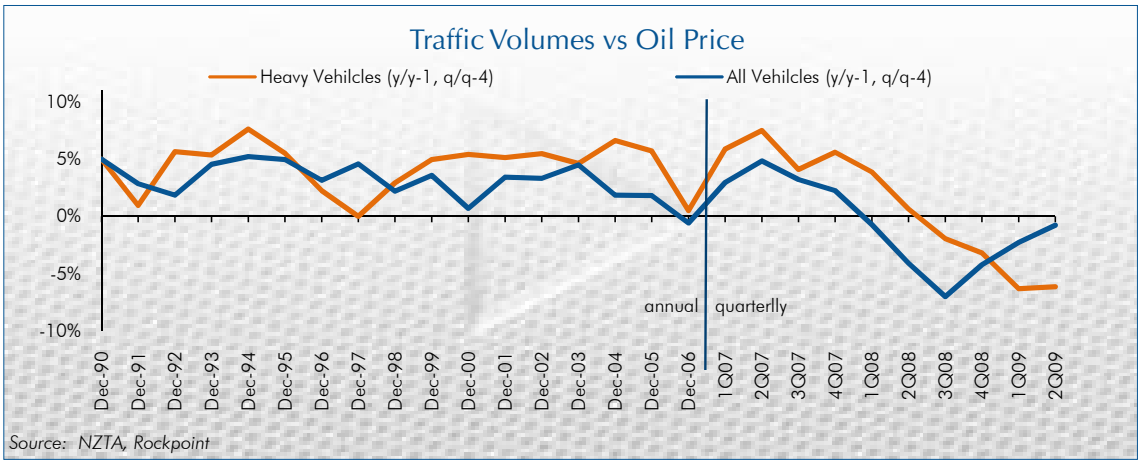
3.6 Supplementary Data

3.6.1 Road traffic flows

The task of assembling trade and freight data is complex and accordingly the release of this data is often delayed and incomplete. There are however several indirect means of monitoring freight flows. The Government collects revenues from road users in the form of Road User Charges ("RUC"), Fuel Excise Duties ("FED") and Motor Vehicle Registration and Licensing Fees ("MVR"), all of which demonstrate a steady increase in freight activity in recent years. However, no measure can be relied upon as a direct quantification of freight flows as:

- RUC, FED, and MVR rates are periodically changed (increased);
- Not all vehicles for which RUC, FED, and MVR are collected are freight vehicles; and
- The fuel efficiency of the trucking fleet has improved over time.

Perhaps a more direct measure of the freight task is road traffic information collected by NZTA (Transit NZ) monthly and published within the following month. Road traffic information also provides data for heavy vehicles (>3.5 tonnes), separate from total traffic. While heavy vehicles cover many different categories of vehicle, freight trucks represent the vast majority. The figure below presents the annual percentage change in traffic (year/year-1, and month/month-12), displaying an accelerated rate of change since late 2007, partly in response to rising fuel prices. Whereas the category "All Vehicles" records a recovery since mid-2008, there is no similar recovery for heavy vehicles.



3.6.2 Changes in Production of Basic Commodities

Basic commodities constitute a significant portion of the overall freight task. Information available on the production of basic commodities is set out in the figure below. This distinguishes between changes occurring in the North and South Islands separately.

Basic Commodity Production - million tonnes		2006-07	2007-08	Change
Milk Production				
	North Island	10.6	9.8	-7%
	South Island	5.0	5.4	8%
	Total	15.6	15.2	-3%
Exotic Forests Harvesting (million cum)				
	North Island	14.2	14.6	3%
	South Island	5.0	4.6	-7%
	Total	19.1	19.2	0%
Grain Production				
	North Island	0.2	0.3	23%
	South Island	0.6	0.7	6%
	Total	0.9	1.0	11%
Production of Aggregates				
	North Island	28.4	29.1	2%
	South Island	11.9	11.2	-6%
	Total	40.3	40.3	0%
Coal Production				
	North Island	2.3	2.2	-5%
	South Island	3.5	2.6	-26%
	Total	5.8	4.8	-17%

Source : Statistics NZ

From the amounts presented above it is difficult to determine any general trends. The trading environment for these commodities will have been affected by the recent economic slowdown and so the major effects will not be represented in the data set.

3.7 REVIEWING THE ESTIMATES OF THE COASTAL SHIPPING TASK

In the NFDS, comprehensive estimates were made of total freight movements. In order to derive the trade flows for different modes, the totals for rail and coastal shipping were deducted from overall totals to give an estimate for road transport.

Rail data was derived from detailed information from Toll Tranzlink, and therefore are regarded as comprehensive and reliable. Coastal shipping movements were estimated based on a number of disparate sources and as a result this information is deemed less reliable. Due to the focus of this study on coastal shipping, the opportunity was taken to review the existing data available on coastal shipping in more detail and where possible collect additional data.

Coastal shipping of domestic cargo around New Zealand can usefully be divided into two main categories:

- **Bulk commodities**: cement and petroleum products moved on dedicated bulk carriers; and
- **General cargo**: goods predominately carried in containers or on Roll-On-Roll-Off ("RORO") ships, using either the domestic coastal shipping services provided by the likes of Pacifica Shipping and Strait Shipping or space on international ships transiting between New Zealand ports as part of a longer distance international journey.

Estimates of general cargo traffic moved by coastal shipping, as derived from the NFDS, are set out in the following figure. These are in terms of tonnes, rather than TEUs.

Coastal Cargo (NFDS) - 000 tonnes p.a.

From\To		Nth	Akl	Wai	BOP	Gis	Hby	Tar	Man	Wgn	T-M	WC	Can	Otg	Sth	NZ
Northland	Nth															
Auckland	Akl						3				17		365	78	1	464
Waikato	Wai															
Bay of Plenty	BOP		3				1			4	2		124	35		169
Gisborne	Gis															
Hawkes Bay	Hby		3		5						3		1			12
Taranaki	Tar															
Manawatu	Man															
Wellington	Wgn				1						7		83			91
Tasman/Marlb	T-M		63				15			12						90
West Coast	WC															
Canterbury	Can		70		2					40	19					130
Otago	Otg		3													3
Southland	Sth				23											23
NZ Total	NZ		140		32		19			56	48		572	113	1	982

Source : National Freight Demands Study (NFDS)

The information on the carriage of coastal shipping's core cargos of cement and petroleum is reasonably reliable and is assessed independently of all other cargo. Information on the movement of general cargo is less consistent and comprehensive. Attention therefore focuses on this portion of trade to attempt to provide a more accurate estimate of the domestic coastal shipping position and the way in which it contributes to the overall movement of general cargo.

3.7.1 Updating the Coastal Shipping Figures in the NFDS Data

For the purposes of this study, the following definitions of shipping traffic have been applied:

- **Coastal cargo**: The movement of general domestic cargo between domestic origins and destinations, being either:
  - carried by domestic shipping operators; or
  - carried by international lines.
- **Transhipment cargo**: International cargo with either a domestic source or domestic destination which is carried between New Zealand ports on a ship different to that used on the international leg; and
- **Import / Export cargo**: International cargo directly loaded onto / unloaded from the ship employed on the international leg. That ship may also make calls at other New Zealand ports.

While information in the NFDS is primarily coastal cargo as defined above, the sources of information available do not always allow this type of traffic to be readily distinguished.

Since the NFDS more detailed information is now available from a number of sources and has been used to update the figures set out in Section 3.7. These sources include data from the ports, shipping companies, and in particular analysis from the Cubic-Njord study. The Cubic-Njord analysis is based on detailed data collection covering container movements at almost all ports in New Zealand. This relies predominantly on container handling statistics which exclude transhipments, restows and other port movements in reaching the estimates of the total volumes of containers moved for domestic coastal shipping.

It should be noted that the available information covers a number of different periods. As a result issues exist in combining data sources, particularly given the recent changes in freight patterns and the domestic coastal shipping schedules of Strait Shipping and Pacifica. In the absence of more up-to-date information an estimate must be made of how traffic patterns might have responded to the changes in services.

Furthermore, coastal shipping services use different facilities within each port including container terminals using the port's quay or mobile cranes, linkspan wharves for RORO or general wharves using the ship's cranes. Information on cargo shipped may thus be recorded differently by each port, and by each wharf. This is a particular issue for the West Coast services operated by Pacifica whose geared ship use port's general wharves. As a result, cargo movements are not recorded in standard container recording systems by these ports, and are absent from the Cubic-Njord totals. Similar issues relate to Strait Shipping because a portion of its cargo is RORO. The Cubic-Njord Report focuses purely on the movement of containers, excluding flows across general wharves.

Where it has been possible to check Cubic-Njord data against alternative figures, a reasonably good match is observed. Given the comprehensive nature of the approach adopted by the Cubic-Njord study, we have accepted it as a reliable base, with the addition of data on a number of the excluded services operated by domestic coastal shipping operators. To produce the more comprehensive estimates required, we have assumed that the traffic identified for the domestic shipping operators in the NFDS is largely additional to that recorded in the Cubic-Njord Study. The freight carried by these additional services would comprise a mixture of containers and RORO units and we have therefore estimated the volumes in terms of tonnages transported.

The additional complication of the time period conflicts for this traffic are noted (NFDS year to June 2008, Cubic-Njord year to December 2008, this study year-to-June 2009), but in the absence of any identified clear trends, the annual tonnes have been summed without adjustment.

The resultant volumes and comparative differences with NFDS estimates are set out in the following two figures.

Revised Estimates of Coastal Cargo - 000 tonnes p.a.

From\To		Nth	Akl	Wai	BOP	Gis	Hby	Tar	Man	Wgn	T-M	WC	Can	Otg	Sth	NZ
Northland	Nth															
Auckland	Akl				1		0			1	45		329	26		401
Waikato	Wai															
Bay of Plenty	BOP		4							0			69	5		77
Gisborne	Gis															
Hawkes Bay	Hby		2		0					0			1	1		5
Taranaki	Tar		0		0								3	0	0	3
Manawatu	Man															
Wellington	Wgn		0		0		0	0			108		51	0		159
Tasman	T-M		47		0			0		17				0		64
West Coast	WC															
Canterbury	Can		57		9		2	7		31	13		0	1		119
Otago	Otg		6		3		3			12			7			31
Southland	Sth				0		0			3				0		4
NZ Total	NZ		116		14		5	7		64	166		460	33	0	865

Source : National Freight Demands Study (NFDS), updated

Accordingly, the changes are summarised in the following table.

Changes from Earlier NFDS Estimates - 000 tonnes p.a.

From\To		Nth	Akl	Wai	BOP	Gis	Hby	Tar	Man	Wgn	T-M	WC	Can	Otg	Sth	NZ
Northland	Nth															
Auckland	Akl				0		-2			1	27		-36	-52	-1	-63
Waikato	Wai															
Bay of Plenty	BOP		1				-1			-4	-2		-55	-31		-91
Gisborne	Gis															
Hawkes Bay	Hby		0		-5					0	-3		-1	1		-7
Taranaki	Tar		0		0								3	0	0	3
Manawatu	Man															
Wellington	Wgn		0		-1		0	0			100		-32	0		68
Tasman	T-M		-16		0		-15	0		5				0		-26
West Coast	WC															
Canterbury	Can		-12		7		2	7		-9	-5		0	1		-11
Otago	Otg		3		3		3			12			7			28
Southland	Sth				-23		0			3				0		-19
Total	NZ		-24		-18		-14	7		9	117		-113	-80	-1	-118

Source : National Freight Demands Study (NFDS), updated

A comparison with earlier estimates indicates that NFDS data possibly overestimates total volumes of domestic general cargo transported by coastal shipping. However, these differences at about 0.1 million tonnes are relatively small given the uncertainties with the data collected and the volatility of the market. In general, the main differences are witnessed in the movements between Auckland and Bay of Plenty, and Canterbury and Otago which are lower in the revised figures. The movements between Wellington and Nelson are slightly higher.

Additional information on the level of transhipment traffic along the New Zealand coast exists, although this is for the most part collected by a range of different ports using varying methods, and does not always permit a distinction between transhipment and other forms of traffic. Consequently, the construction of a comprehensive table of the coastal movement of transhipment cargo is not possible. However, in the case of Auckland, information is available

and transhipment traffic is approximately 50% greater than pure domestic coastal traffic. For domestic coastal shipping, only about 7% of movements recorded by Ports of Auckland are to or from the North Island, whereas for transhipment traffic these movements account for about 69% of the total. From the limited information available it appears this depiction is indicative. Most domestic coastal traffic is inter-island, where the typical distances travelled are greater and road and rail also require a sea leg. For transhipment traffic, most of the movements are intra-island, filling gaps in international shipping schedules which typically make North Island and South Island calls but may not serve all the smaller regional ports in each island.

3.8 Key Observations / Conclusions

The following presents key observations and conclusions from our review of the national freight task:

- **Trends in the National Freight Task**: Since the position observed in 2006-07 and reported on in the NFDS, the national freight task of New Zealand has witnessed a number of conflicting pressures, including:
  - A period of atypically strong economic growth from 2004 to mid 2008, followed by a subsequent economic downturn;
  - Climatic factors including drought conditions in parts of the country in 2007-08 which temporarily depressed yields of agricultural products, particularly milk from the Waikato and Taranaki;
  - Changes in fuel prices, which rose strongly until mid-2008 and then declined, with impacts on general and heavy vehicle traffic patterns;
  - Changes in international shipping costs, ranging from fluctuations in ship charter rates, crewing and bunker costs, affecting the availability and price of all ships; and
  - More general volatility in shipping patterns, resulting in a number of changes in port calls, however it is difficult to establish the overall impact.
- **National Freight Demands Study Basis for Analysis**: Given the conflicting trends in the freight task, we have materially based our analysis on the 2006-07 position observed and reported in the NFDS. This provides a comprehensive and consistent set of information which is available in the public domain. While the immediate forecast period is expected to generate results below the long term average, over the 30 year forecast period a return to the long term trend is anticipated. Where appropriate, any findings in this report have been reviewed qualitatively in light of trends identified from other sources including the interview programme.
- **Updated Coastal Shipping Data**: Current analysis indicates that the NFDS has possibly overestimated the total volume of domestic general cargo transported by coastal shipping services. Revised estimates have been adopted for the purposes of this study.
- **Data Collection**: The undertaking of this study highlights the value in collecting, collating and disseminating comprehensive statistics on freight flows in New Zealand as a matter of course. The provision of consistent quality data would reduce uncertainty and permit the formation of well-informed policy on a timely basis.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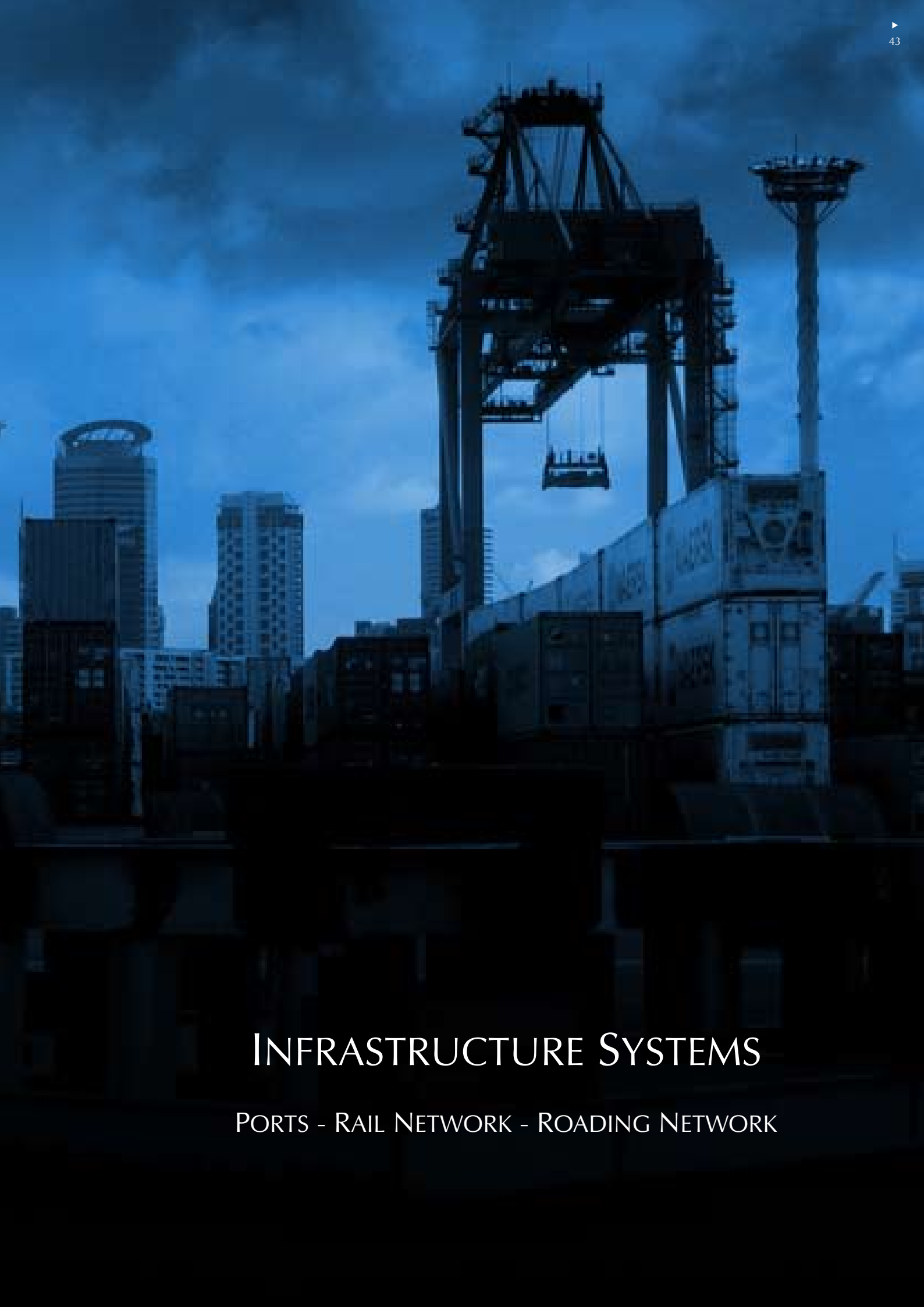


Infrastructure Systems

Ports - Rail Network - Roading Network

4 INFRASTRUCTURE SYSTEM - PORTS

4.1 INTRODUCTION

Ports provide the land-sea interface and are the key infrastructure required to facilitate shipping by domestic and international operators.

This chapter presents an overview of New Zealand's ports in the context that they form an important infrastructure system for the provision of shipping services.

The consideration of ports is limited to those currently catering for ships carrying general freight, and excludes port facilities which serve:

- Outer Islands: Chatham Islands, Stewart Islands, Waiheke Island and all others;
- Tourism, fishing and recreation ports: such as Akaroa, Milford Sound, Oamaru, Opua, Tarakohe and Whakatane; and
- Specialist facilities: such as ironsand exports from Taharoa, or oil products to Point Howard, Wellington.

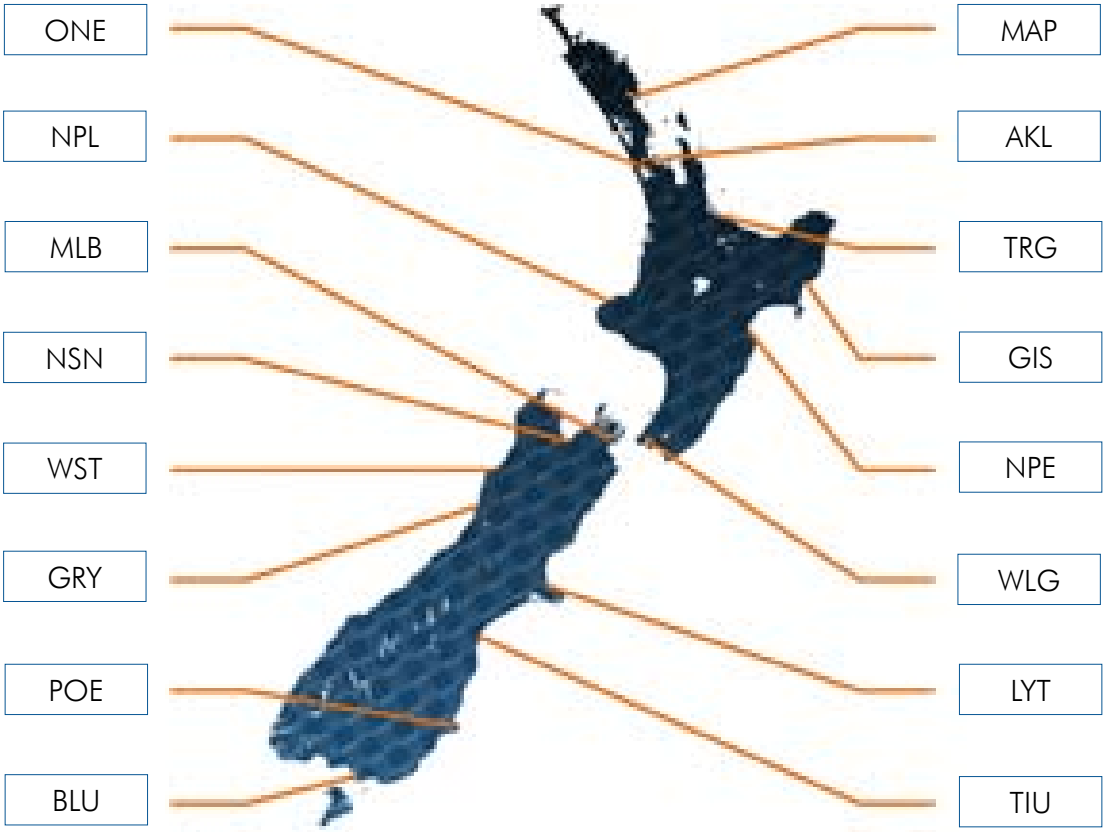
4.2 PORT NETWORK

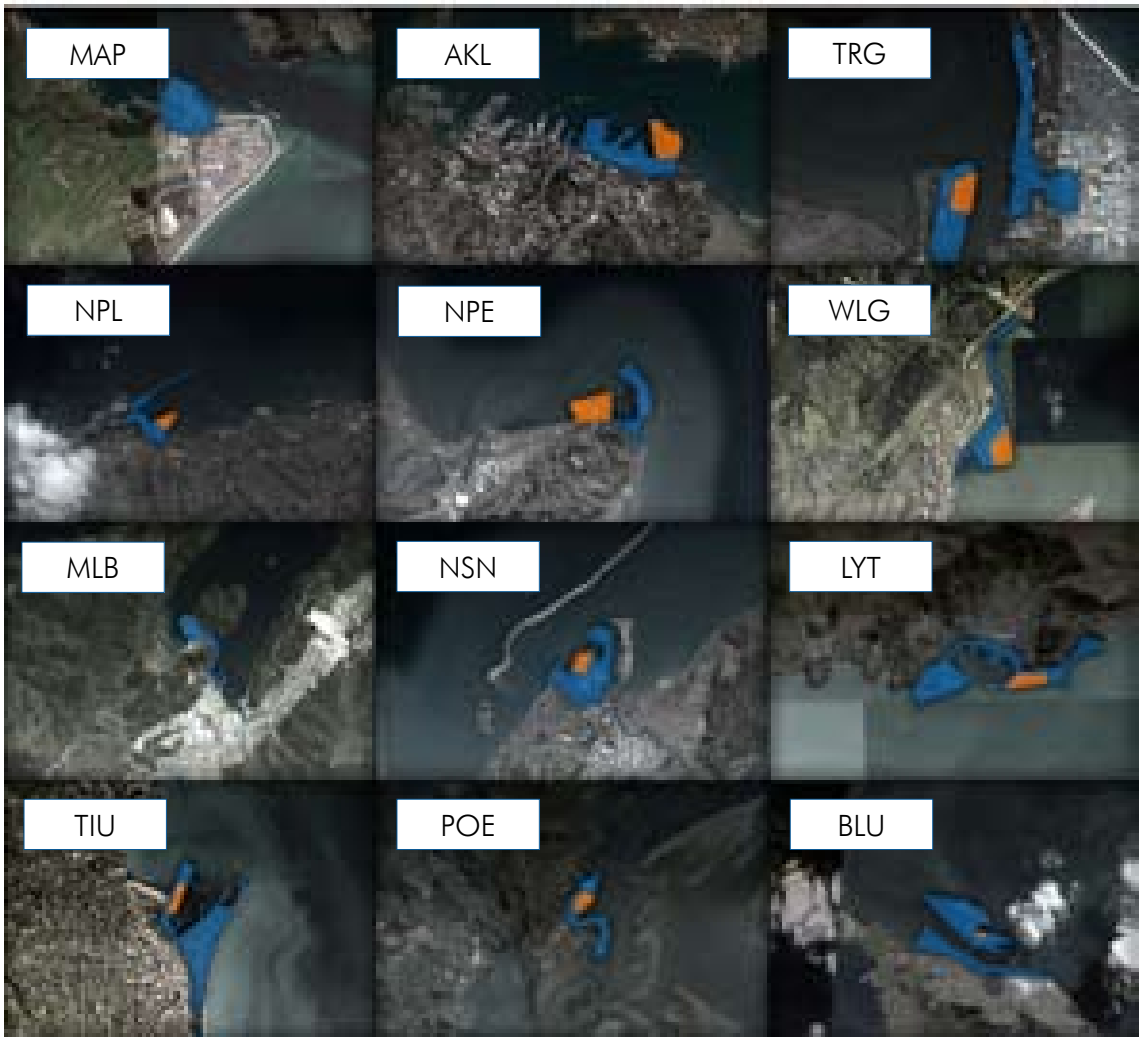
The history of the port sector in New Zealand has been one of rapid change, adaptation and consolidation. From over 150 ports in the mid-19th century, the country now only has 12 ports handling international trade.

Historically ports in New Zealand were run by local Harbour Boards. In 1988 these were superseded with the introduction of the Port Companies Act ("the Act"), creating corporatised ports. These developments proved pivotal to the evolution of the New Zealand port sector addressing:

- Profit focus: Section 5 of the Act states "The principal objective of every port company shall be to operate as a successful business". Port profitability has since risen impressively, from $69 million in 1995 to a peak of $225 million in 2006, and falling to $142 million in 2008 primarily on the decline in profitability of Ports of Auckland; and
- Ownership: Port ownership was vested in various local government authorities.

The figure opposite presents selected port locations and associated infrastructure footprints for both general and containerised trade facilitation. The ports identified play a key role in commercial trade (international and coastal shipping) but to varying degrees. Core container ports with dedicated wharves and gantry cranes include Auckland (AKL), Tauranga (TRG), Lyttelton (LYT) and Otago (POE). CentrePort (WLG) also employs gantry cranes while Napier (NPE), New Plymouth (NPL), Nelson (NSN), Timaru (TIU) and SouthPort (BLU) offer container terminals with mobile habour cranes. Non-container ports that play a role in coastal shipping include Northport (MAP) and Onehunga (ONE), and Westport (WST) for the cement trade. All other ports have the capacity to handle general cargo as well as containers using either ship cranes on a geared ship or mobile container cranes. For our analysis ports have been broadly categorised by the nature of their core cargo, as consistent with Rockpoint's Port Sector report.





Port Operating Area

Container Operations

New Zealand Port Nomenclature			Container	Port Type
Port	Location / City, Region	Code *	Terminal	(Rockpoint)
NorthPort#	Marsden Point, Whangarei, Northland	MAP	×	Bulk
Ports of Auckland	Waitemata Harbour, Auckland	AKL	✓	International
Ports of Auckland	Onehunga (Manukau Harbour), Auckland	ONE	×	Coastal
Port of Tauranga	Sulphur Point, Mt Maunganui, Bay of Plenty	TRG	✓	International
Eastland Port	Gisborne, Poverty Bay	GIS	×	Bulk
Port Taranaki	New Plymouth, Taranaki	NPL	✓	Bulk
Port of Napier	Napier, Hawkes Bay	NPE	✓	Regional
CentrePort (Wellington)	Wellington	WLG	✓	Regional
Port Marlborough	Picton, Marlborough	MLB	×	Bulk
Port Nelson	Nelson, Tasman	NSN	✓	Regional
Port of Westport	Westport, West Coast	WST	×	Coastal
Port of Greymouth	Greymouth, West Coast	GRY	×	
Lyttelton Port of Christchurch	Lyttelton, Canterbury	LYT	✓	International
PrimePort Timaru	Timaru, South Canterbury	TIU	✓	Regional
Port Otago	Port Chalmers, Dunedin, Otago	POE	✓	International
SouthPort	Bluff, Invercargill, Southland	BLU	✓	Bulk

Source: Annual Reports, Rockpoint

** Port Codes based on international convention (eg NZAKL shown as AKL)*

 # NorthPort comprises Marsden Point (petroleum), NorthPort (timber products) and Portland (cement)

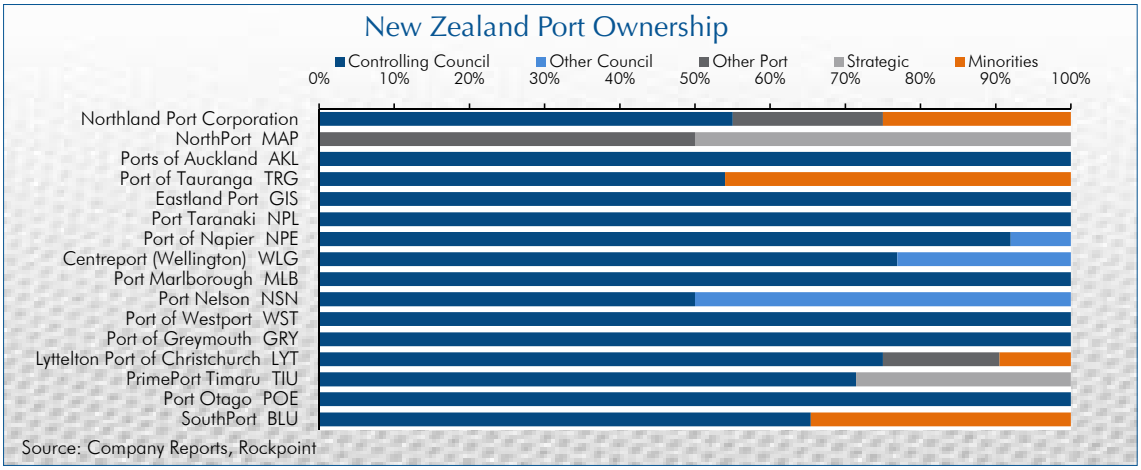
4.3 OWNERSHIP

While the original intention of the Port Companies Act (1988) was to facilitate private ownership, every New Zealand port remains majority owned by a council. Of the 15 ports presented in the following figure, seven are wholly owned by a single council, and a further three are wholly-owned by two councils. Ports themselves have also aquired stakes in other ports, for instance:

- Port Otago (POE) holds a 15.5% stake in NZX-listed Lyttelton Port of Christchurch (LYT).
- Port of Tauranga (TRG) and Northland Port Corporation were 50:50 investors in the greenfield general wharf development at Marsden Point (MAP), branded Northport.
- The four ports with minority investors are all NZX-listed.

Notably, no council with a controlling interest has reduced its stake in the last decade and some have crept higher including Ports of Auckland (AKL) to 100%, and LYT to 75.1%.

Note in the case of Northland, the oil jetty serving the Marsden Point refinery is a separate facility from Northport, and is owned by the New Zealand Refining Company. Golden Bay's nearby cement wharf at Portland is also independent. For convenience in this report all are collectively referred to as Northport (MAP). The ownership of Northland Port Corporation, which is not a port company, is shown to link the Northland Regional Council's controlling (55%) shareholding to the corporation's 50% stake in Northport (MAP).



Source: Company Reports, Rockpoint

Several ports and industry commentators have recently raised the benefits of, and need for, port consolidation. Despite several attempts at sector rationalisation no restructuring has occured to date.

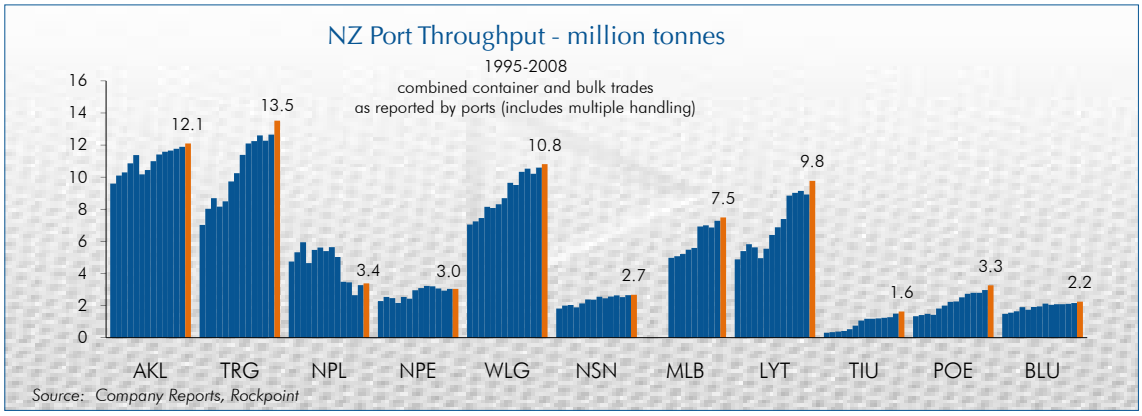
Recent major consolidation initiatives involving port companies include:

- The failed merger of Auckland and Tauranga;
- The failed attempt by Christchurch City Holdings Limited ("CCHL") to privatise Lyttelton and to then introduce global port operator, Hutchison Port Holdings;
- The acquisition of a blocking stake by Otago to frustrate CCHL's privatisation ambitions;
- Ongoing discussions regarding a Lyttelton-Otago merger; and
- The rise and demise of a new coal trade in a joint Port of Greymouth-Port Taranaki initiative.

The merits of further commercially-driven port consolidation are widely recognised, notably by the ports themselves. These include trade rationalisation, capital optimisation and the development of scale economies. Should consolidation occur, material flow-on effects are anticipated in the patterns and volume of freight transport requirements. Such flow-on effects could present significant freight aggregation opportunities for coastal shipping, subject to a matching investment in infrastructure.

4.4 NETWORK INTENSITY / ACTIVITY

New Zealand's 11 principal ports handle a combined 70 million tonnes of cargo annually, with a compound growth rate of 2.9% per annum since 2000. Over this period international export volumes have grown 0.3% per year compound, although the share of total port throughput has fallen from 42% to 36%. Imports have risen by 5% per year compound, rising from 26% to 30%. Weakening exports and the stronger growth in imports were driven, at least in part, by the rising New Zealand dollar. This position has reversed markedly since mid-2008 as shown in the figure overleaf.

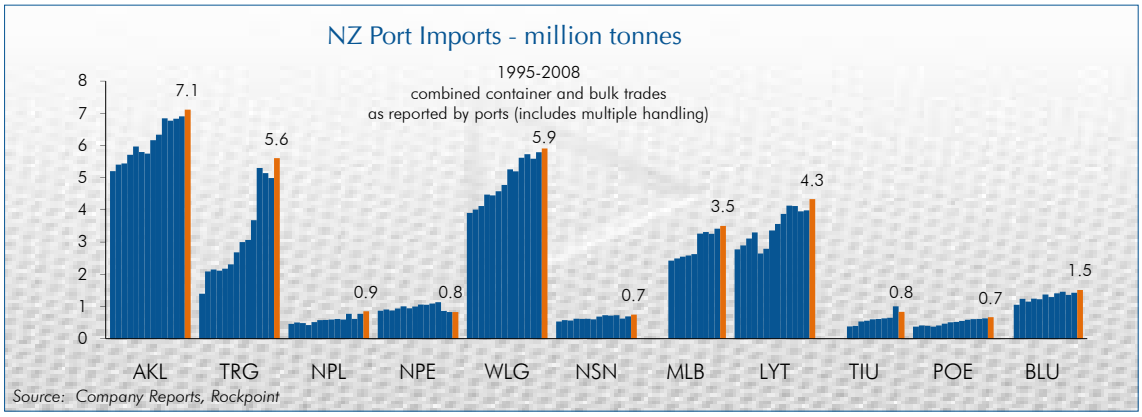


Several ports have a specialist capability in a key bulk commodity trade, examples include:

- Northport - MAP: oil, logs and timber products;
- Tauranga - TRG: coal and logs;
- New Plymouth - NPL: oil and product exports;
- Wellington - WLG and Marlborough - MLB: inter-island ferry traffic;
- Lyttelton - LYT: coal; and
- Southport - BLU: aluminium.

4.4.1 NZ Imports – by port

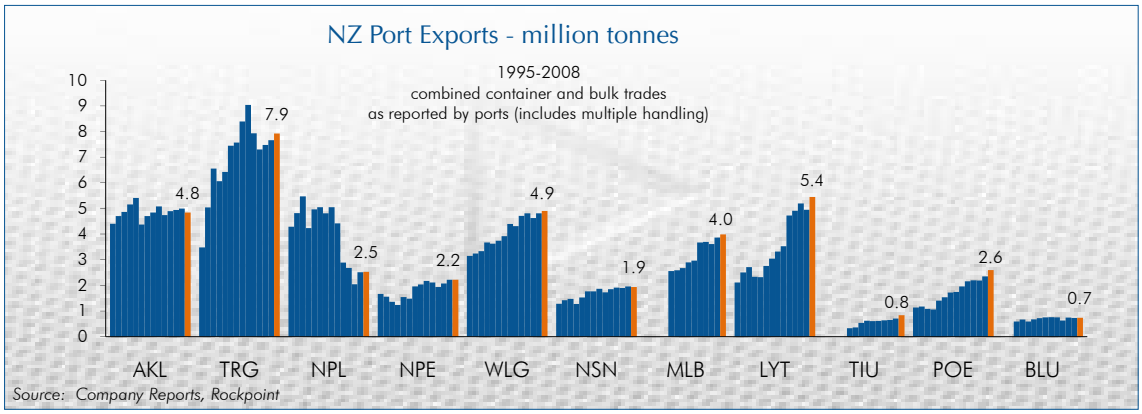
The following chart presents reported import trade by selected ports.



A substantial part of Tauranga's increase in imports is coal. Other ports handle a variety of bulk imports (fertiliser, cement, vehicles) and general cargo (machinery, merchandise and consumption goods). Auckland and Tauranga are the principal beneficiaries of increased flows of consumption goods. Wellington and Marlborough volumes are boosted by inter-island ferry trade.

4.4.2 NZ Exports – by port

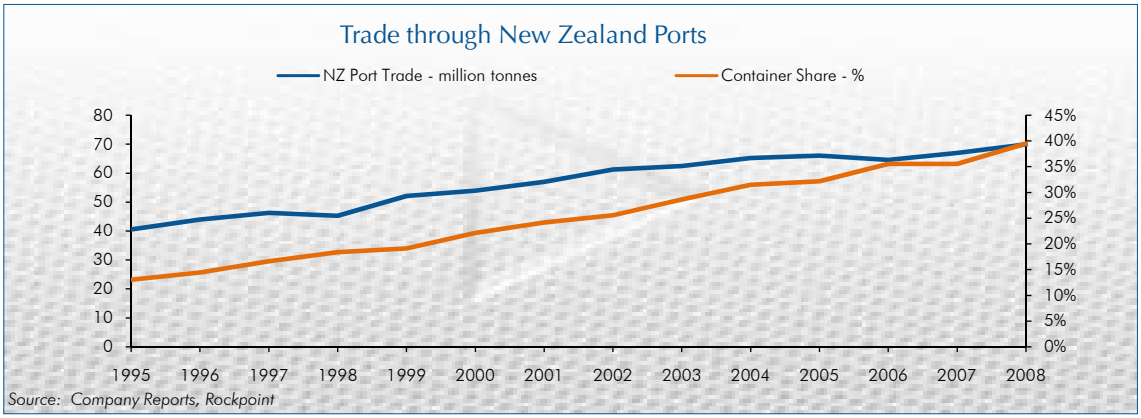
The following chart presents reported export trade by selected ports.



Lyttelton has benefited from growing coal exports, while agricultural exports have boosted Timaru and Otago volumes. New Plymouth has experienced a sharp decline in oil exports with the fall in Maui field production, while trade in most other ports experienced steady volumes.

4.5 OPERATIONAL PERFORMANCE

While not large by world standards, New Zealand ports have achieved strong operational performance. Since 1995, the ports have successfully catered for 4.1% compound annual trade growth, and a 10.6% compound annual growth in the container trade. Notably, over this period, containers as a percentage of total trade have risen from 13% to 40%.



Source: Company Reports, Rockpoint

4.6 CAPACITY AND CONSTRAINTS

4.6.1 Facilities

Ports have been able to accommodate the historic growth in trade volumes through investment and improved operational practices. Most ports are land constrained, with those close to the CBD in cities under particular pressure from competing uses. The following figure summarises selected facilities at key ports.

Port Facilities	MAP	AKL	TRG	NPL	NPE	WLG	NSN	MLB	LYT	TIU	POE	BLU
Port Operating Land (ha)	33	68	168	23.2	60	70	45	10	90	93	25	40
Container Land (ha)		42	90	7	19	11	9		8	5	15	3
Draught (m)	13.0	12.5	11.7	11.2	11.8	10.7	9.8	15.3	13	11.5	12.5	10.2
Wharf Length - overall (km)	0.57	4.10	2.06	1.63	1.59	4.67	1.17	0.62	3.29	1.55	2.76	1.92
Wharf Length - container (km)		0.84	0.60	0.42	0.38	0.59	0.48		0.42	0.46	0.60	0.43
% trade containers		73%	50%	21%	46%	11%	36%		36%	64%	84%	3%
Quay Cranes		8	5			3			3		3	
Mobile Cranes				2	4		2			3		1
Forklifts/Stackers	6			9	6		12		8	14		
Straddles		42	18			10			16			
Reefer Slots	8	1329	1347	432	1066	800	400		724	750	1350	105
Tugs	4	5	3	3	2	3	2	2	2	1	3	2
Pilot Launches	1	2	2	2	1	2	1	1	1	1	2	1
Rail Connection	no	yes	yes	yes	yes	yes	no	yes	yes	no	yes	yes

Source: Company Reports, Rockpoint

The configuration of some wharves is not optimal for a major growth in containers. The container trade requires large blocks of land behind long wharf faces, to provide an efficient exchange in the removal, storage, and dispatch of containers. Older wharves often lack space and are unable to bear axle loadings of modern straddle carriers or forklifts.

4.6.2 Capacity

In their current configuration, ports appear to have additional container trade capacity. Based on stated port throughputs and applying typical crane rates, we calculate average berth occupancies for ports, as displayed in the figure overleaf. Most ports offer multiple berths for container ships although these may not be occupied evenly across a week, giving rise to peak congestion problems. Furthermore, our calculation is likely to under-estimate berth occupancy, given ships might be delayed, or cranes non-operational while ships are berthed. However we conclude overall that ports possess spare container trade capacity.

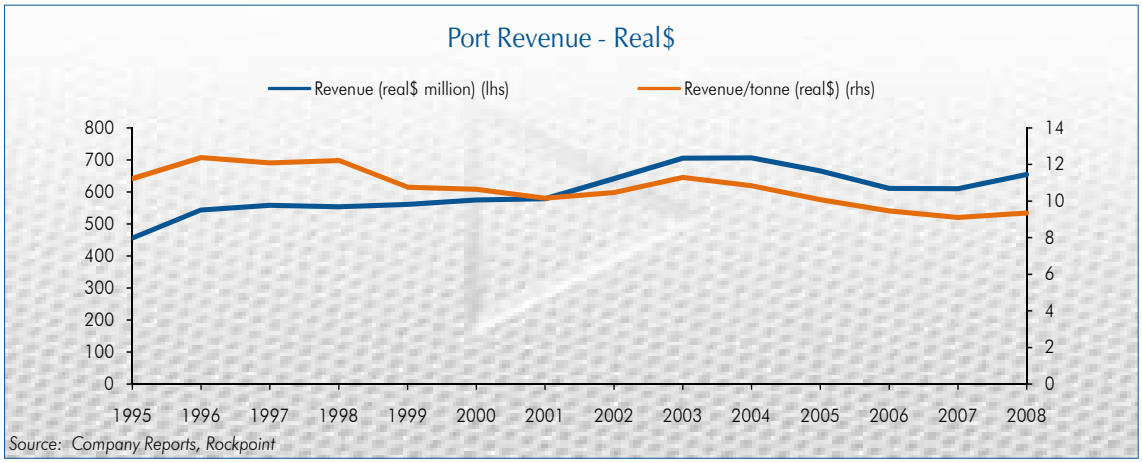
Port Crane Capacity	MAP	AKL	TRG	NPE	NPL	WLG	NSN	LYT	TIU	POE	BLU
Containers handled (000/year)		841	582	154	60	92	78	251	80	209	20
Cranes (bold = quay)		**8**	**5**	4	2	**3**	2	**3**	3	**3**	1
Crane Rate		25	25	15	15	25	15	25	15	25	15
% hours utilised		48%	53%	29%	23%	14%	30%	38%	20%	32%	15%

Source: Company Reports, Rockpoint

Berth occupancy is only one measure of port capacity. Storage area, number of straddles and forklifts, and road and rail connections also serve to define throughput limitations.

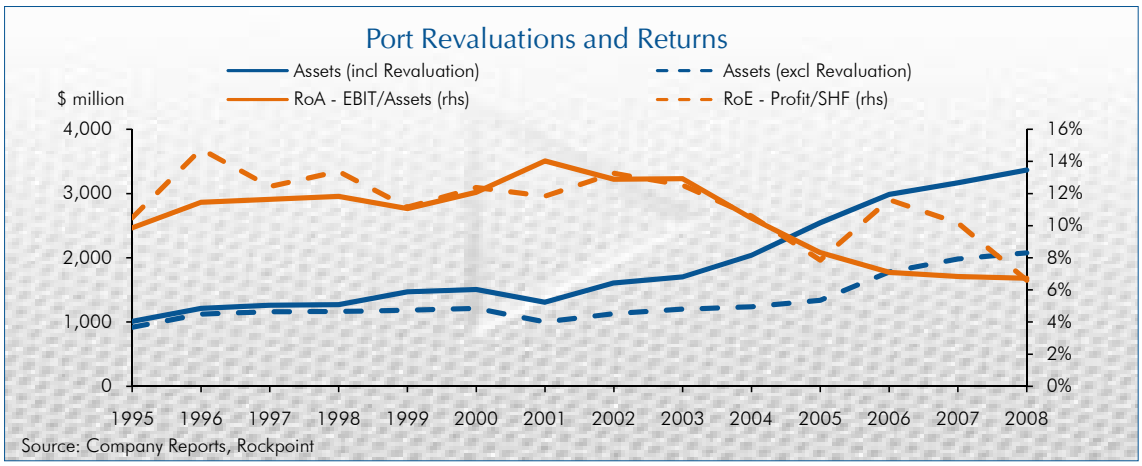
4.7 FINANCIAL PERFORMANCE

Port revenue has grown with trade over time, although unit revenues (real$/tonne) have fallen.



New accounting standards under GAAP and IFRS permit companies to revalue historical assets. The asset base of port companies has subsequently accelerated with asset revaluations and rising capital expenditure post 2001. Revaluation reserves have risen from $92 million (or 3% of total assets) in 1995 to $1,288 million (48% of total assets) in 2008.

Shareholder funds (excluding revaluations) have only slightly risen from $563 million in 1995 to $858 million in 2008. Throughout this period, return measures in ROA (Return on Assets) and ROE (Return on Equity) have steadily declined.



While aggregate assessments are necessarily simplistic, our analysis suggests ports achieve earnings slightly below their target rates of return.

International shipping lines encourage ports to invest in capacity to handle larger ships and transfer cargo at greater rates. This appears to result in greater peaks of activity when ships are in port and longer lulls between ship calls. In addition, it is apparent that ports undertaking capital expansion risk over-investing. We note the following trends:

- Asset value (real$)/tonne has risen from $30/tonne in 1995 to $50/tonne in 2008;
- Capital expenditure per incremental tonne has risen from ~$10/tonne in 1995 to ~$70/tonne in 2008; and
- Most ports have, with minimal incremental capital expenditure, the capacity to handle materially greater volume.

4.8 KEY OBSERVATIONS / CONCLUSIONS

The following presents key observations and conclusions from our review of port infrastructure:

- Positioning:
  - Ports are the land-sea interface and are an integral component of the transport infrastructure system utilised by international and domestic shipping.
  - New Zealand is currently serviced by 12 key ports. The distances between neighbouring ports are typically small.
- Volumes Handled:
  - In 2008 New Zealand ports handled over 60 million tonnes of traffic including international traffic, transhipment traffic and coastal movements.
  - New Zealand ports as a whole have achieved strong operational performance with significant growth observed in containerised volumes. Containerised volumes now represent approximately 40% of total trade compared to 13% in 1995.
- Ownership: Despite the original intention of the Port Companies Act (1988) to facilitate private ownership, all New Zealand ports remain majority owned by Councils. The trend in recent years has been for Councils to increase their ownership stakes in ports.
- Financial Performance:
  - Port revenue has grown with trade throughput, but unit revenue (real$/tonne) has fallen since 1996. Similarly, port revenue margins (revenue/assets) have fallen steadily since 1998.
  - Rising capital expenditure is observed post 2001, contributing significantly to the pre-revaluation cost of port asset bases.
  - Revaluations further materially impact on the value of asset bases and reported increases in shareholders funds. Throughout this period, returns as measured in ROA and ROE have been steadily diluted.
  - Port companies, which have been encouraged by shipping lines to invest to meet peak demand requirements, risk significant over-investment, and are struggling to make commercial returns on their enlarged asset bases.
- Coastal Shipping: Ports favour coastal container traffic utilising existing container terminal facilities, as opposed to general container wharves. Port costs represent a significant proportion of coastal operator costs.
- Consolidation: The merits of further commercially-driven port consolidation are widely recognised and include trade rationalisation, capital optimisation and scale economies. However, recent initiatives in this regard have either failed or are ongoing. Should consolidation initiatives ultimately be successful, material flow on effects are anticipated in the patterns and volume of freight transported. Such flow on effects could present significant freight aggregation opportunities for suitable transport modes such as coastal ships.

5 INFRASTRUCTURE SYSTEM - RAIL

5.1 INTRODUCTION

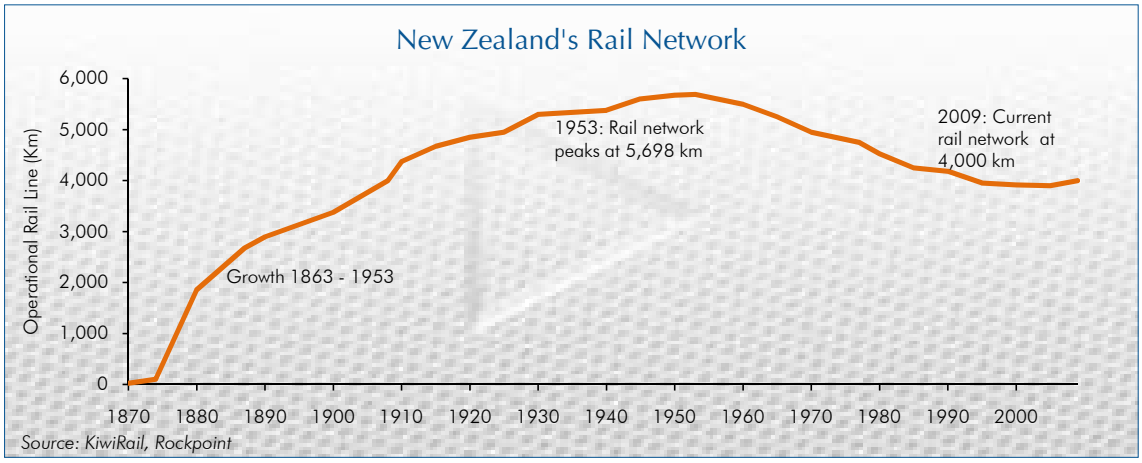
This chapter presents the key features of New Zealand's rail infrastructure as a basis for a subsequent discussion of the provision of rail freight services. Rail is a key competitor for coastal shipping especially in the transport of general freight over longer distances. Rail's particular competitive characteristics determine the mode's potential service offering and therefore warrant further examination.

5.2 RAIL NETWORK

At its zenith in 1953, the national rail network spanned 5,689 km, covering the length and breadth of the country and serving as the primary transport mode for both inter-regional freight and passengers.

Throughout the late 20th century, a gradual easing of road distance restrictions for freight, in combination with expansion of the road network and deregulation of the transport industry lead to increased competition from road transport and a decline in rail trade.

The growth and decline of the rail network is presented in the following figure.



New Zealand's rail network today spans 3,898 route-km (4,000 km including passing loops and double tracking), from Okaihau in the north to Bluff in the south. The network can be broken into several main trunk lines, and a number of secondary branch lines.

With an emphasis on freight movements we distinguish five key rail trade routes in New Zealand. These classifications do not directly correspond to the line categorisation used by KiwiRail but instead describe the significant freight corridors for rail:

- Auckland via Wellington to Christchurch on "the Main Trunk Line";
- Auckland via Hamilton to Tauranga on "the East Coast Main Trunk Line";
- Napier via Palmerston North to New Plymouth on " the Lower North Island Link Line";
- West Coast to Christchurch on "the Midland Line"; and
- Invercargill via Dunedin to Christchurch on "the Main South Line".

In the figure adjacent we present the national rail network with a representation of lines closed since development.

New Zealand Rail Network

5.3 OWNERSHIP

From a mix of public and private provincial beginnings, the railway network combined under central government ownership in 1876. Significant investment from consecutive governments led to the expansion of rail to a national network with enhanced capacity. By the 1980's however, rail had become a considerable financial burden on the New Zealand Government. In 1993 the rail network and operations were sold to a private consortium, under the name Tranz Rail.

Despite initial successes, private owners similarly found the cost of running and maintaining the rail network prohibitive. In the early 2000s, growing financial challenges faced Tranz Rail which led to talks with the Government to find a means of maintaining a financially viable national rail service.

In 2002 Tranz Rail sold the Auckland network to the Crown. The following year, the two parties discussed a wider solution that would have involved the Government taking a stake in Tranz Rail. Before any decision was made, Toll Holdings, an Australian company, offered to buy Tranz Rail on the basis that it could operate the company (excluding the network) at existing levels without Government support.

In 2003 the Government and Toll Holdings reached an agreement and the Government bought back the rail network for $1. This investment was vested in the New Zealand Railways Corporation, the body which had held the Crown's interest in railway land since 1990. 'OnTrack' became the entity's trading name.

Despite the ability of Toll Holdings to generate profits from operations it became clear that the rail network was in need of significant capital expenditure to maintain service levels. On 1 July 2008 the Government signed an agreement to purchase Toll New Zealand's rail and ferry businesses and regain control over the entire network. From the transfer on 1 October 2008 the New Zealand Railways Corporation under the trading name 'KiwiRail Group' became the single entity responsible for all rail and ferry services and rail infrastructure.

Currently KiwiRail ascribes a value of $11,800 million to the New Zealand rail network and $602 million to the value of rolling stock and inter-island ferries.

5.4 NETWORK INTENSITY / ACTIVITY

As with other freight modes, 2007 has been identified as a base year for rail operations. Total volumes have dropped significantly in 2008-2009 (anecdotally between 15-20%) with the current economic turmoil but these results are seen as an outlier from the general freight trend.

New Zealand
Rail Network Intensity

The following figure exhibits the rail freight matrix as presented in the National Freight Demands Study. The matrix was developed from data supplied by Toll Tranzlink in 2007.

Movements by Rail 2006-2007 - 000 tonnes p.a.

From\To		Nth	Akl	Wai	BOP	Gis	Hby	Tar	Man	Wgn	T-M	WC	Can	Otg	Sth	NZ
Northland	Nth	77	122		23			1					1		1	226
Auckland	Akl	16	46	39	666		9	16	125	94	18	2	368	36	12	1447
Waikato	Wai	3	1185	148	915		1	12	6	1	1		13	2	3	2290
Bay	BOP	3	817	864	1362		1	5	3	8			20	1	1	3086
Gisborne	Gis						13						1			15
Hawkes Bay	Hby		20		9	23	152	26	49	23	1		50	1	1	356
Taranaki	Tar		36	1	47		7	279	11	11			8	5	1	406
Manawatu	Man		59	6	18		55	617	42	199	2		28	1	1	1028
Wellington	Wgn		24		9		12	6	52	58	3		13	2	1	181
Tas/ Marlb	T-M		46	1	4		12	2	8	5	24		48	26	7	182
West	WC		2	1	2							69	2415	17	1	2507
Canterbury	Can		173	19	33		20	12	69	33	22	5	355	237	84	1063
Otago	Otg		43	10	11		2	3	2	6	1	1	83	57	64	284
Southland	Sth		10	5	6		2	1	2	2	1		148	413	76	668
Total	NZ	99	2584	1095	3106	24	287	981	368	442	73	78	3551	800	251	13741

Source : National Freight Demands Study (NFDS), updated

The rail matrix reveals the most utilised portions of the network.

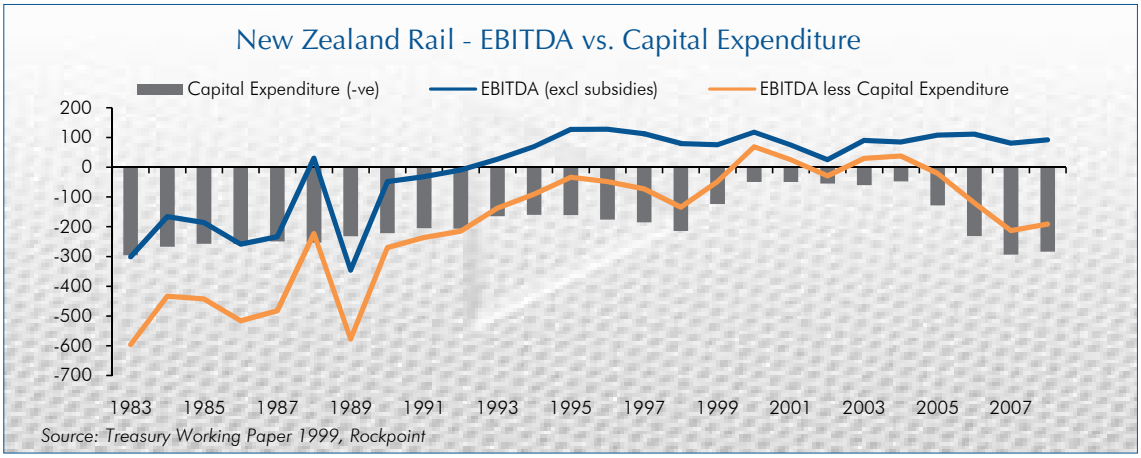
- The rail corridor from Auckland to Waikato experiences the heaviest traffic at 3.9 million tonnes per annum (2006-2007). The section carries trades from both the Main Trunk Line and East Coast Main Trunk Line, which intersect at Hamilton and travel to Auckland.
- The Waikato – Bay of Plenty, Waikato – Manawatu and West Coast – Canterbury sections of the network are also heavily utilised as displayed on the intensity map adjacent.

The least utilised lines on the map include:

- Hawkes Bay – Gisborne (at 39,000 tonnes per annum);
- Okahukura – Stratford; and
- Masterton – Woodville.

5.5 CAPACITY AND CONSTRAINTS - RAIL NETWORK

Underinvestment over the last 15 years has left sections of the rail network in a dilapidated state. According to KiwiRail in 2008, 200 km of the 4,000 km rail network was approaching the end of its predicted life and 33% of railway bridges were more than 80 years old. In examining the pattern of capital expenditure over the last 25 years we identify an extended period of deferred capital maintenance post privatisation in 1993. Curtailing infrastructure investment represents a rational response to the excesses of the past and an attempt to restore profitability. However, part of the rationale for re-nationalisation of rail's operating business asserted by the Labour Government, was that if Ontrack was to be required to commit increasing amounts of catch-up capital expenditure the Government should own the entire rail business. In September 2008, post the transfer of ownership, KiwiRail management recommended the Government commit an additional $1,041 million to upgrade projects over the next five years. Combined with continued operating subsidies of $473 million for the same period, this amounts to a total of $1,514 million of projected capital expenditure.



As recent experience demonstrates, a rail network can remain operational in periods of minimal infrastructure spending provided greater restrictions are imposed on above track operations.

Physical network constraints, both by design and as a result of deterioration, can be broadly separated into five categories: line capacity, clearances, speed restrictions, track length and load capacity.

For any line or route, service capacity is determined by the physical characteristics of the underlying track, combined with the rolling stock plying that route and the features of the trade being serviced. Key physical track constraints include:

- Maximum axle loads;
- Double or single tracked;
- Maximum line speeds;
- Passing loops;
- Signalling; and
- The length of maintenance windows.

5.5.1 Load Capacity / Maximum Axle Loads

New Zealand's rail network operates for the most part with an 18 tonne maximum axle load. This is light by world standards, which are typically 25 tonnes per axle load. Locomotive weights in New Zealand are thus limited to 108 tonnes for six axle engines, and have constrained pulling power relative to most international locomotives. Bridges are the key points of weakness in the network limiting load weights. In 2008, 30 were subject to speed restrictions because of their age or condition. Ontrack upgrades over the last couple of years have focused on the replacement of timber piers close to the end of their useful life and increasing maximum axle load capacities on bridges to either 22.5 tonnes or 25 tonnes. If bridge restrictions were completely removed from the network it would be possible to operate 22.5 tonne axle loads on current tracks and ballast. The qualification is this would merely require a greater level of maintenance than with current loads.

5.5.2 Double vs Single Tracked

Double tracked sections of the rail network provide the greatest capacity. Outside metropolitan Auckland and Wellington, the rail network is currently only double-tracked between Hamilton and Papakura (90 km), and Heathcote and Islington in Christchurch (18 km). (Note: in the case of the Hamilton - Papakura line there are two sections of single track line totalling 13 km).

Capacity on the single track section of the network is limited by the number, length and distance between passing loops. In high intensity sections of the network, such as the Tauranga – Hamilton and Midland Line, investment in passing loops has enabled greater track utilisation

and freight volumes. Completion of the 900 metre Hamilton – Tauranga crossing loop extensions and the addition of two new passing loops has effectively doubled capacity on the line.

5.5.3 Speed Restrictions

Temporary speed restrictions are the primary means by which maintenance risk issues are mitigated. Track, sleepers, signalling equipment, formations and structures all deteriorate over time. As sections of the national network age, they increase risks to above track rail operations. Derailments, collisions, and structural damage are all real risks in sections of network in a state of disrepair. This necessitates speed restrictions and extends the service time for freight. Steep track gradients and tight turning curves also require speed restrictions. Despite periods of realignment during the 1930s, 1950s and 1980s, much of the current rail network is still in its original configuration. Without significant works in grade and curve easement this will continue to restrict the speed of rail's service offering.

5.5.4 Clearances

Clearances describe the maximum height and width spans of the above-track rail network. Tunnel ceilings and bridge heights are the key clearance constraints, and many of these are still in their original formation. New Zealand's rail network is primarily restricted by height rather than width. Ontrack has recently completed works on tunnels in the Manawatu Gorge and on the Kai Iwi Deviation at Wanganui. Both initiatives were necessary for the movement of 9' 6'' high cube boxes on the Lower North Island link from Hawkes Bay to Taranaki. Upgrades of a couple of Northland tunnels have also recently been completed at a cost of $10 million. As container dimensions have increased in recent times, clearances have become an important issue for rail operations.

5.5.5 Track Length

The reach of the rail network is an obvious limiting factor for KiwiRail's business. Current track span is a significant determinant of what trade is contestable by rail. The presence of rail sidings at key customer facilities, such as Mainfreight and Toll Tranzlink, permits greater efficiencies and improves the competitive position of rail relative to road or shipping. Where rail does not have rail sidings, the opportunities for attracting volumes from road are remote. As an example, the absence of a rail link to NorthPort in Marsden Point excludes rail from potentially lucrative trade. Similarly rail is excluded from trade to the city of Nelson.

5.6 CAPACITY AND CONSTRAINTS - NETWORK SEGMENTS

Rail Network Utilisation Freight Route	Freight Services Per Day	Line Capacity Utilised	Gross Tonnage	% North Bound	% South Bound
Auckland - Wellington - Christchurch	8	77%	2,870,231	43%	57%
Auckland - Tauranga	13	80%	3,588,084	61%	39%
Christchurch - Dunedin - Invergarcill	9	75%	1,840,299	56%	44%
				% East Bound	% West Bound
West Coast - Christchurch	11	51%	2,468,958	99%	1%
Hawkes Bay - Taranaki	13	60%	850,072	16%	84%
Other - Lines			3,839,191		

Source: KiwiRail, Rockpoint

5.6.1 The East Coast Main Trunk Line

As the most heavily plied route on the network, the line from Auckland to Hamilton and Hamilton to Tauranga has been the focus of much capacity enhancing capital investment over recent years. KiwiRail currently states the line is running at 80% of capacity with 61% of total

freight travelling north bound from Tauranga and 39% of freight travelling south bound from Auckland. With the completion of two additional passing loops and the introduction of new container wagons, the major constraint on the route remains the network's base axle load capacity. This is gradually being addressed with the upgrade of the line from Auckland to Hamilton to carry 20 tonne axle loads.

5.6.2 Main Trunk Line

Much capacity exists on the Main Trunk Line with an abundance of passing loops. KiwiRail state that the line is currently running at 77% of capacity with a balanced mix of south bound at 57% of total freight vs. north bound freight at 43% of total freight. Reliability of service however is more problematic. Some sections of track are in a better condition than others, with several weak points prone to rock slips and damage, particularly near Marlborough. Steeper track gradients and the interchange with the inter-island ferry also limit service timelines. Trains from Auckland typically take 36 hours to get to Christchurch (yard to yard). Problems also occur with the arrival of the freight train from Auckland at 7am as this prevents the delivery of freight in the early morning.

5.6.3 Lower North Island Line

The rail line linking Hawkes Bay with Manawatu and Taranaki varies in its usage. During peak dairy season all available milk wagons are fully deployed on the route but in the off season they have minimal utilisation. KiwiRail states average total capacity is approximately 60%, of total freight traffic 84% is west bound and 16% east bound. Much construction has been completed over the last year to remove key constraints limiting the transportation of high cube containers for the dairy industry on the line. Anecdotal evidence suggests that traffic flows have increased in response to this. The restrictive Kai Iwi tunnel has been removed from the line with the completion of a deviation in 2008 and three tunnels at the eastern end of the Manawatu Gorge have been 'daylighted' to permit larger box traffic.

5.6.4 Midland Line (West Coast to Christchurch)

Although total capacity usage on the Midland line is currently at 51%, 99% of total traffic travels from West to East, and the line therefore operates close to capacity for East bound trade. Track constraints centre around the Otira Tunnel, where the venting of CO_2 exhaust gases and heat hinders engine efficiency and speed. Limited oxygen in the tunnel restricts diesel engine power and adds service time as purging gas from the tunnel limits when the next train can pass through. Steeper grades on the route at Reefton, Cass and near Springfield likewise affect train speed and line capacity. In 2008 Ontrack prioritised the upgrade of signalling equipment between Rolleston and Arthur's Pass on the Midland Line with the intention to improve service, reliability and efficiency. In May 2008 work also started on the replacement of the 122 year old single lane road-rail bridge across the Arahura river near Hokitika. In future, additional passing loops and the electrification of the Otira tunnel are seen as key to enhancing capacity. It is believed by KiwiRail that these and similar relatively small scale improvements will be sufficient to cope with the expected increase in coal traffic.

5.6.5 The Main South Line (Christchurch to Invercargill)

The freight mix on the Main South Line from Christchurch to Dunedin and Invercargill is relatively balanced. 56% of total freight on the line is north bound traffic, a large portion of which is bulk freight, 44% of freight is south bound, predominantly consisting of general goods. KiwiRail states the line currently runs at 75% of capacity. Options for additional freight volumes on the line exist. The movement of liquid milk into Clandeboye or Edendale is currently being developed and Fonterra has purchased the old Fisher and Paykel site in Mosgiel which is likely to become a key aggregation point for the dairy trade. Options are also under investigation for rail to take a greater portion of the contestable finished product from the Clandeboye factory. A key constraint on the Main South Line is the steep gradients south of Oamaru. These limit train weights to 1,100 tonnes.

5.7 MARGINAL LINES AND LINE CLOSURES

In the rail network, each individual line has different profit characteristics associated with the nature of trade plying the line and the costs of providing respective services and infrastructure. However, network effects complicate the analysis of single lines and can blur the determination of the cost-benefits of individual routes in isolation.

From a commercial stand point a number of branch lines on the national rail network clearly fail to earn an appropriate return on invested capital. The Okahukura - Stratford line linking Taranaki to the Main Trunk Line is one such marginal segment. The line has been maintained to a lesser standard than the rest of the network, with significant tunnel clearance, speed and weight restrictions. It is prone to slips and floods, with formation and drainage problems in a number of tunnels. The rationale for maintaining the Okahukura - Stratford line despite its limited usage, is that it provides an alternative route (albeit much longer and slower) if major disruptions occur on the Main Trunk Line between Okahukura and Marton. Recent discussion has focused on the potential of turning the line into a cycle way.

The Napier - Gisborne line is another section of the network experiencing little usage. The line is a long, winding route, prone to slips, wash-outs and floods. There is a significant back log of maintenance and renewal work from earlier storms built up over many years. Significant expenditure is also required to improve bridge capacity and to upgrade the line to carry high cube containers. Currently KiwiRail offers one service a week on the Napier – Gisborne line and this runs at a loss. Community benefits are espoused as a reason for keeping the line open but without greater tonnage this would necessitate a significant government subsidy.

The Treasury review of rail operations for the incoming Government in late 2008 noted that without subsidies, the full 4000km of track would be not unsupportable given current revenue, and if KiwiRail could not find additional customers, it will need to downsize operations. Options proposed to improve the commercial return on rail included closing or mothballing the least economic lines, slowing down track rehabilitation, scaling back the modernisation of the locomotive fleet and deferring or scaling back recommended upgrades, track extensions and other improvements. On a purely commercial basis previous owner Toll indicated it would restrict activities to around 2300 kilometres of track. Treasury agrees with this assessment and recognises that any public subsidy of rail beyond this level of activity is only justified where there are clear public benefits that are not included in the commercial price (e.g. via reduction in congestion or emissions). Capital developments assessments are advised to be conducted on an individual business case basis with the recommendation that if the economic and externality benefits did not exceed the cost of investment, the development should not proceed. In a subsequent review of rail the Ministry of Finance noted that the stronger commercial focus for KiwiRail will to some extent require a cultural shift and reorientation for its board and management. The Ministry of Transport is to lead rail policy development and funding in the future.

5.8 KEY OBSERVATIONS / CONCLUSIONS

The following presents key observations and conclusions from our review of rail infrastructure:

- **Rail Network**: Rail is a significant contributor to the overall freight task in New Zealand carrying about 15% of the total national freight task measured in tonne-km terms on 4,000 km of track.
- **Line Closures**: New Zealand has a history of closing uneconomic branch lines. The length of the national rail network has fallen from 5,689 km in 1953 to 4,000 km today.
- **Competition**: Since the removal of distance restrictions, road transport has emerged as a key competitor to rail. Rail currently carries 15% of the national freight task in tonne-km, whereas road carries 70%.

- **Government Ownership**: The government purchased the rail and ferry operations from Toll NZ in July 2008, restoring the entire rail business to public ownership under the KiwiRail Group.
- **Network Intensity**: The most utilised sections of the rail network include the Main East Coast Line from Auckland to Tauranga, the Midland Line from the West Coast to Christchurch, and the Main Trunk Line from Marton to Auckland. Segments of the rail network with the least activity include lines from Napier to Gisborne, Okahukura to Stratford and Masterton to Woodville.
- **Capacity and Constraints**: Rail service capacity is limited by the age, design and condition of the country's rail infrastructure. Recent maintenance programmes have appropriately targeted key network constraints.
- **Impact of Network Constraints**: Constraints of the network impact rail service offerings through:
  - Speed restrictions / Frequency implications;
  - Load capacity / Maximum axle loads: New Zealand's rail network operates for the most part with an 18 tonne maximum axle load;
  - Reliability associated maintenance requirements; and
  - Inability to carry key container box formats (e.g. high cube).
- **Capital Expenditure**: Deferred capital expenditure since the 1990's has left the rail network in a dilapidated state, and necessitated greater restrictions on rail operations. Bridges, tunnel clearances and steep gradients in the network restrict the weight, height and speed of rail freight. Rail will continue to require sizeable capital investment on an ongoing basis to maintain operating standards and meet growing customer demands.

6 INFRASTRUCTURE SYSTEM - ROAD

6.1 INTRODUCTION

In this section we present key features of the New Zealand road infrastructure system as a basis for discussion of the provision of road related freight services later in this report.

Road infrastructure in New Zealand falls into two categories:

- State Highways; and
- Local Roads.

6.2 ROAD NETWORK - STATE HIGHWAYS

State Highways comprise the key arterial routes between major cities in New Zealand and provide access to important transport hubs such as ports and airports. In total State Highways provide an 11,000 km network, which is 11.6% of the road network in New Zealand, but handle nearly 50% of all vehicle kilometres travelled. Highways are owned and funded by the Government, through the NZTA. As a basis for the management and prioritisation of expenditure the NZTA's National State Highway Strategy breaks down the network as follows:

- **National State Highways**: Connect places of national significance, the major cities and key transport hubs and typically carry over 400 heavy commercial movements per day;
- **Regional State Highways**: Connect locations of regional significance and typically carry between 100 – 400 heavy commercial movements per day; and
- **Sub-Regional State Highways**: Connect districts of significance and serve as feeder routes for the main State Highway network.

6.2.1 State Highway Development

In 2008, NZTA's annual report valued New Zealand's State Highway infrastructure assets at $20,086 million. The 2008/09 annual budget for the State Highway network allocated $1,345 million in funding as detailed in the recently released Government Policy Statement on Land Transport Funding 2009/10 – 2018/19 ("GPS"), comprised as follows:

- New & improved infrastructure $864 million
- Renewal of State Highways $202 million
- Maintenance & operation of State Highways $279 million
- Total Road Funding 2008/09 $1,345 million

The GPS also provides expected ranges for expenditure in each of these activity classes for the following ten years as detailed in the following figure. The projection provides NZTA with flexibility in responding to funding requests and managing overall expenditure under the National Land Transport Programme.

GPS Land Transport - Funding Outlook - $ millions

Activity Class		2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
New & improved infrastructure for State Highways	Low	800	825	850	875	900	950	950	975	1,000	1,025	9,150
	High	1,150	1,150	1,150	1,150	1,175	1,200	1,275	1,300	1,325	1,350	12,225
Renewal of State Highways	Low	190	190	200	210	220	240	250	260	280	290	2,330
	High	230	230	240	250	260	280	290	300	320	330	2,730
Maintenance & operation of State Highways	Low	270	280	280	300	320	330	350	370	390	410	3,300
	High	335	345	345	365	385	395	415	435	455	475	3,950
Total for State Highways	Low	1,260	1,295	1,330	1,385	1,440	1,520	1,550	1,605	1,670	1,725	14,780
	High	1,715	1,725	1,735	1,765	1,820	1,875	1,980	2,035	2,100	2,155	18,905

New Zealand Road Network

In aggregate it is forecast that total expenditure on maintaining and improving the State Highway network in New Zealand will be between $14,800 million and $18,900 million over the next ten years, with an average of $1,500 – $1,900 million per year.

Several of these appropriations were confirmed in the recently released 2009/10 budget. The amounts budgeted for the forthcoming year include:

- New & Improved Infrastructure $5 million
- New Infrastructure & Renewal of State Highways $930 million
- Accelerated State Highway Construction $74 million
- Maintenance & Operation of State Highways $287 million
- Total State Highway Appropriations $1,296 million

There is also a multi-year appropriation for the purchase of new and improved infrastructure as specified in the National Land Transport Programme. This commenced 1 July 2006 with a total appropriation of $862 million. It has a remaining appropriation of $494 million to be utilised before 30 June 2011.

6.3 ROAD NETWORK - LOCAL ROADS

The Local Road network in New Zealand comprises approximately 83,000 kilometres, which is 89% of New Zealand's total road network. It is owned and managed by individual Territorial Authorities and is part funded by Central Government at an average proportion of 50% (approx), via the National Land Transport Programme.

The Surface Transport Cost and Charges ("STCC") report presents a Local Roads valuation on a Depreciated Replacement Cost basis of $25,360 million, as at June 2002.

6.3.1 Local Road Development

The 2008/09 annual budget for the Local Road network as stated in the GPS, was $684 million and comprised as follows:

- New & Improved Infrastructure for Local Roads $231 million
- Renewal of Local Roads $216 million
- Maintenance & Operation of Local Roads $237 million
- Total Local Road Appropriations (GPS) $684 million

The average overall contribution from Central Government towards the cost of Local Roads via Funding Assistance Rate ("FAR") is 50%. The FAR for construction and maintenance is a minimum of 57% and 43% respectively, with the balance funded by the relevant Territorial Authority. This entails total funding of approximately $1,400 million. The GPS also provides ranges for expected expenditure in each of these Activity Classes for a forecast ten year period.

GPS Land Transport - Funding Assistance Rate (FAR) - $ millions

Activity Class		2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total
New & improved infrastructure for Local Roads	Low	150	150	150	175	175	175	200	200	200	200	1,775
	High	250	250	250	275	275	275	300	300	300	300	2,775
Renewal of Local Roads	Low	200	210	220	230	240	250	270	280	300	310	2,510
	High	240	250	260	270	280	290	310	320	340	350	2,910
Maintenance & operation of Local Roads	Low	200	210	220	230	250	260	280	290	310	330	2,580
	High	265	275	285	295	315	325	345	355	375	395	3,230
Total for Local Roads	Low	550	570	590	635	665	685	750	770	810	840	6,865
	High	755	775	795	840	870	890	955	975	1,015	1,045	8,915

In aggregate it is forecast that the Government contribution to maintaining and improving the Local Road network in New Zealand is expected to be between $6,865 million and $8,915 million over the next ten years, with an average of $687 – $892 million per year.

Several of these appropriations for the 2009/10 financial year have been confirmed in the recently released budget. The amounts budgeted for the forthcoming year include:

▸ New & Improved Infrastructure for Local Roads	$196 million
▸ Renewal of Local Roads	$222 million
▸ Maintenance & Operation of Local Roads	$245 million
▸ Total Local Road Funding	$663 million

6.4 POLICY AND FUNDING

In this section we present Government policy objectives and sources of funding for road infrastructure development.

6.4.1 Government Policy

The Government Policy Statement on Land Transport Funding 2009/10 – 2018/19 ("GPS") released in May 2009 presents the views on transport funding of the National Government. In the foreword to this document the Minister states:

"The Government's priority for its investment in land transport is to increase economic productivity and growth in New Zealand. Quality land transport infrastructure and services are an essential part of a robust economy. They enable people and businesses to access employment and markets throughout the country and link them to international markets through the nation's ports and airports. Investing in high quality infrastructure projects that support the efficient movement of freight and people is critical.

The GPS is the main guiding document by which the Government can ensure that the land transport funding system focuses on the priority of generating economic growth and productivity. The GPS aligns investment in the land transport sector more closely with this priority. Further, the GPS closely reflects the modal choices that are realistically available to New Zealanders. Approximately 70% of all freight in New Zealand goes by road, and 84% of people go to work by car, truck or motorbike, so we need good roads to move freight and people. The government supports some mode shift over time, especially in our major cities of Wellington, Auckland and Christchurch, but considers that this should not be accelerated to the point where the outcomes are economically inefficient."

The GPS also lists seven "Roads of National Significance" which are a key focus of national road development and are considered important in achieving targeted economic growth and productivity.

Roads of National Significance

- Puhoi to Wellsford – State Highway 1;
- Completion of the Auckland Western Ring Route – State Highway 20/16/18;
- Auckland Victoria Park bottleneck – State Highway 1;
- Waikato Expressway – State Highway 1;
- Tauranga Eastern Corridor – State Highway 2;
- Wellington Northern Corridor (Levin to Wellington) – State Highway 1; and
- Christchurch motorway projects.

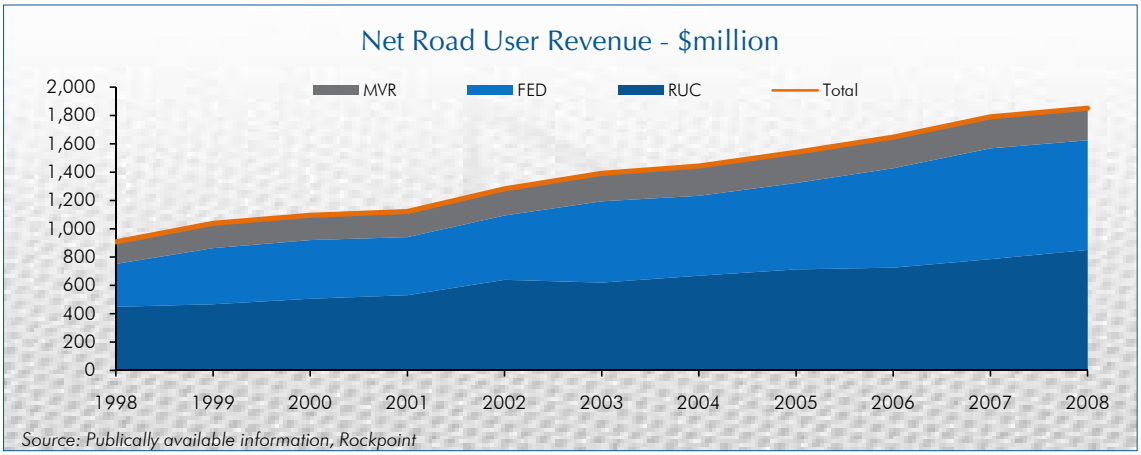
6.4.2 Alternative To Roading ("ATR")

In the recent May 2009 GPS there is a noticeable reduction in the funding commitment for the development of alternative modes of transport, in particular coastal shipping. As announced the Domestic Sea Freight Development Fund which had an appropriation of $36 million over

four years, has been reduced to a forecast funding of $6 million in 2008/09 and an aggregate of $4 million in the following three years. We note that there is no specific appropriation for these amounts in the 2009/10 budget.

6.4.3 Sources of Funding

The State Highway network in New Zealand is predominantly funded by an array of user charges. Fuel Excise Duty, ("FED"), Road User Charges ("RUC") and Motor Vehicle Registration and Licensing Fees ("MVR") are collected by Government and committed to the National Land Transport Fund for transport purposes only. Termed PAYGO, the collection of funding is administered by NZTA and allocated in accordance with the current National Land Transport Programme. Each National Land Transport Programme covers expenditure for road maintenance and capital improvements for three years, formulated in conjunction with the ten year GPS, the 30 year Regional Land Transport Strategy and Regional Land Transport Programme devised by each regional authority.



In addition to these dedicated sources of funding, Central Government is able to contribute to land transport initiatives from general taxpayer funds or borrowings in the form of Crown appropriations. There is potential for specific projects to be undertaken as public-private partnerships, although New Zealand has no experience of this to date. Tolling projects are another form of funding, of which there are currently two in New Zealand; local road Route K in Tauranga, and the Northern Gateway Toll Road between Orewa and Puhoi on State Highway 1.

The financial contribution from territorial authorities to local roads comes from rates, development contributions and borrowings.

6.4.4 PAYGO

The PAYGO policy is the basis upon which the government funds the State Highways and contributes to Local Roads. It should be noted that the Government's current PAYGO policy does not seek to ensure that there is a commercial return on the value of the underlying infrastructure assets. Rather it accepts that past investment in the roading infrastructure is a sunk cost which provides improvement to the general efficiency and level of economic activity in New Zealand.

6.5 NETWORK INTENSITY

The following map presents the intensity of heavy transport usage on the State Highway network in New Zealand. We have taken this data from telemetry sites operated by NZTA's Traffic Surveys. This highlights the concentration of freight movements in the Auckland and Waikato regions, as reflective of population distribution, concentration of manufacturing activity and the importance of the Ports of Auckland, Port of Tauranga and Auckland International Airport as major transport hubs. It also highlights the importance of State Highway 1 for its full length.

New Zealand
Road Network Intensity

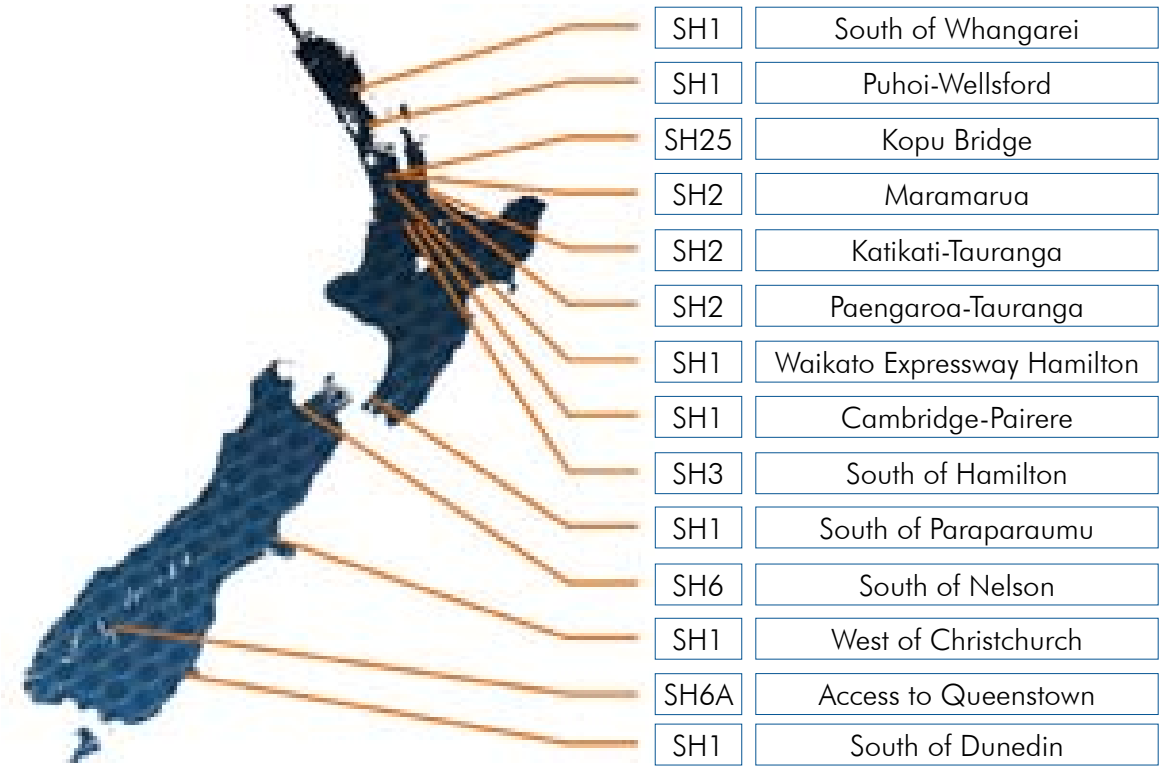
6.6 CAPACITIES AND CONSTRAINTS

The principal capacity constraints in the New Zealand road network are associated with congestion. These occur particularly in the main urban areas of Auckland, but also in the other urban centres of Wellington, Christchurch, Tauranga and Hamilton. Traffic speeds in the peak periods are often very low affecting both light and heavy vehicle movements and with significant impact on the efficiency of the heavy vehicle fleet. The impact of congestion is discussed more specifically in Section 10.

While to the extent possible the operators of heavy vehicles aim to avoid driving in congested conditions, the needs of customers, in manufacturing and retail, often necessitate deliveries or pickups at the ends of the working day, requiring the movements of heavy vehicles at peak times.

Outside of the urban areas, NZTA identify a number of other links in the National State Highway Strategy that suffer from congestion. These are listed in the figure below.

Areas of Congestion on the State Highway Network



State Highway	Area of Congestion
SH1	South of Whangarei
SH1	Puhoi-Wellsford
SH25	Kopu Bridge
SH2	Maramarua
SH2	Katikati-Tauranga
SH2	Paengaroa-Tauranga
SH1	Waikato Expressway Hamilton
SH1	Cambridge-Pairere
SH3	South of Hamilton
SH1	South of Paraparaumu
SH6	South of Nelson
SH1	West of Christchurch
SH6A	Access to Queenstown
SH1	South of Dunedin

In general congested links are on the approaches to the main urban areas, although in some instances, they reflect specific bottlenecks in the highway network such as the Kopu Bridge. Many of the links identified are also associated with tourist traffic such as Puhoi-Wellsford, South of Whangarei, Maramarua and access to Queenstown.

To an extent the proposals under the Roads of National Significance will address the more serious congestion issues. The expansion and upgrade of the motorway network in Auckland is a key priority including links on the Western Ring Route in Auckland and on the replacement and widening of the Newmarket Viaduct. The Kopu Bridge is also scheduled for replacement with work starting in 2009.

The issues of congestion across the urban areas are probably more difficult to resolve, given the limited opportunities for the provision of additional highway capacity. While traffic management measures such as ramp signalling, ATMS, and managed lanes may provide

incremental capacity, more radical measures may be needed if congestion levels are to be significantly reduced. In general these would need to encourage passenger vehicle traffic to divert to other modes or travel at other times. For freight vehicles the opportunity to change mode, or the time of travel within the urban areas, in practice may be very limited as this is guided by the needs of customers.

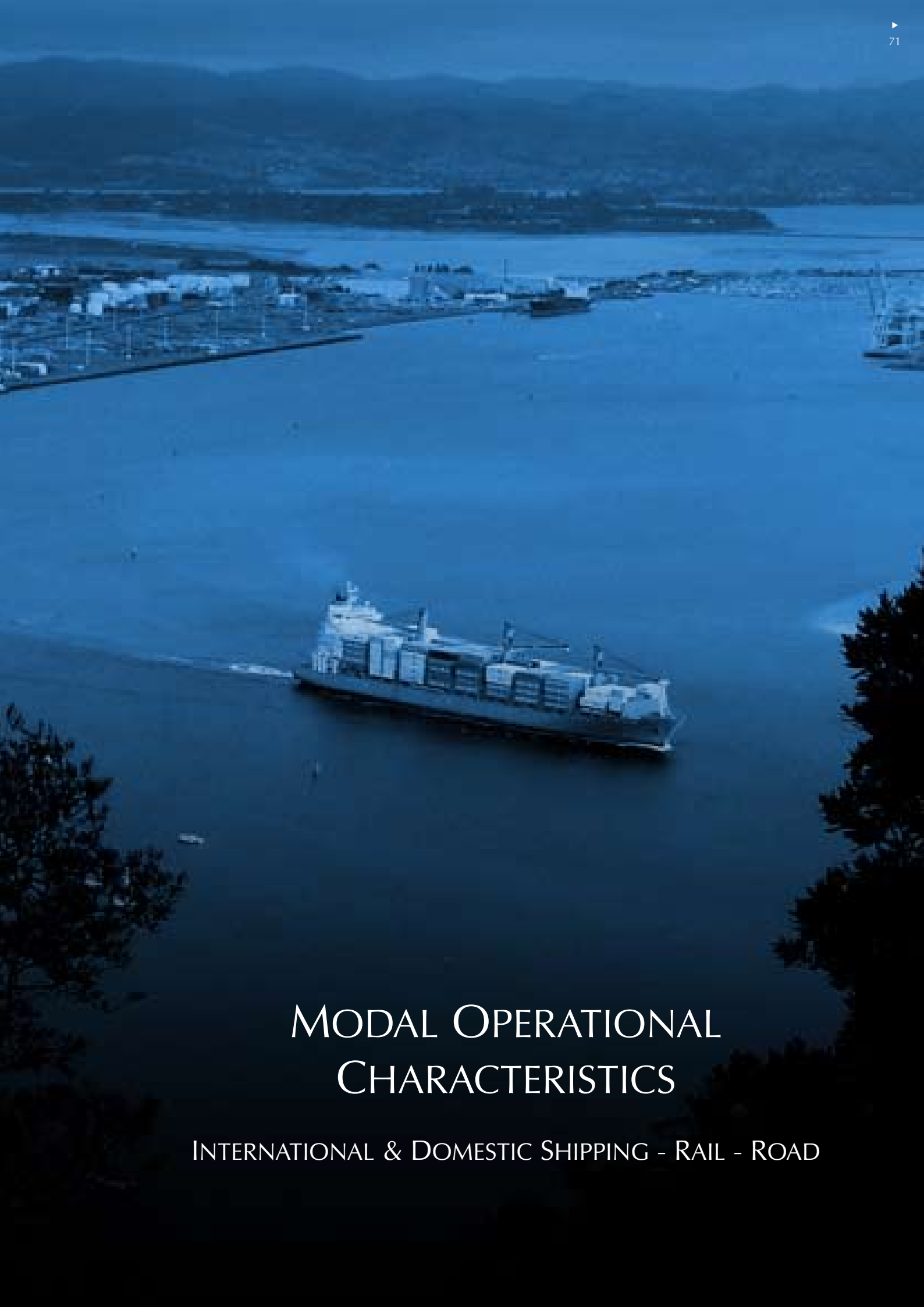
Regional Authorities are increasingly aware of the impact of freight movements on road networks in their region and some are investigating how this should be best managed and whether there are mechanisms for alleviating the impact of growth in heavy transport movements. All major urban areas are actively considering how to reduce the numbers of vehicles, both passenger and freight, on roads in their cities. Some Regional Councils incorporate a strategic focus on modal connections to major transport hubs in their land transport plans. This may include investment to increase the portion of freight delivered by rail in order to reduce the number of truck movements.

Should significant changes occur to scheduled international shipping services in New Zealand, road connections and service capability will be an essential component of the freight aggregation and distribution task. These changes are not currently reflected in the development and expenditure forecasts for State Highways.

6.7 KEY OBSERVATIONS / CONCLUSIONS

The following presents key observations and conclusions from our review of road infrastructure:

- **Road Network**: State Highways comprise a network of approximately 11,000 km, which is 11.6% of the road network in New Zealand, but handle nearly 50% of all vehicle kilometres travelled. The Local Road network in New Zealand comprises approximately 83,000 kilometres.
- **Ownership**: State Highways are owned and funded by the Government, through the NZTA. The Local Road network is owned and managed by individual Territorial Authorities. Both the Central Government and the Local Authorities fund the Local Road network.
- **Network Valuation**: NZTA's 2008 Annual Report valued New Zealand's State Highway infrastructure assets at $20,086 million. The value of Local Roads is estimated in the STCC report at $25,360 million as at June 2002 on a Depreciated Replacement Cost basis.
- **Road Expenditure**: The current National Government identifies road as the mode that makes the most immediate contribution to improving productivity and increasing economic growth. It has increased the aggregate funding commitment to the improvement and development of State Highways and Local Roads. Furthermore, the Government has designated seven projects as Roads of National Significance, enabling faster RMA approvals and the priority of development funding.
- **Capital Investment**: Notwithstanding an increase in funding, the scale of proposed road development still presents challenges. The Western Ring Road and the proposed second Auckland harbour crossing have budgets of approximately $1,400 million and $4,100 million respectively. These two projects alone comprise more than five times the total expenditure for State Highway renewal and development for 2009/10.
- **Network Intensity**: Network intensity is strongly correlated with population and industry activity. Accordingly, New Zealand road usage is strongly concentrated around Auckland, and the other major urban centres of Hamilton, Tauranga, Wellington, Christchurch and Dunedin. The greatest portion of the freight task handled by road is on the central triangle between Auckland, Hamilton and Tauranga, as well as on State Highway 1 running the length of the country. Within urban centres, freight transport is strongly focused on servicing major transport hubs, such as ports and airports, and concentrations of manufacturing and distribution activity.



Modal Operational Characteristics

International & Domestic Shipping - Rail - Road

7 OPERATIONAL CHARACTERISTICS - INTERNATIONAL SHIPPING

7.1 INTRODUCTION

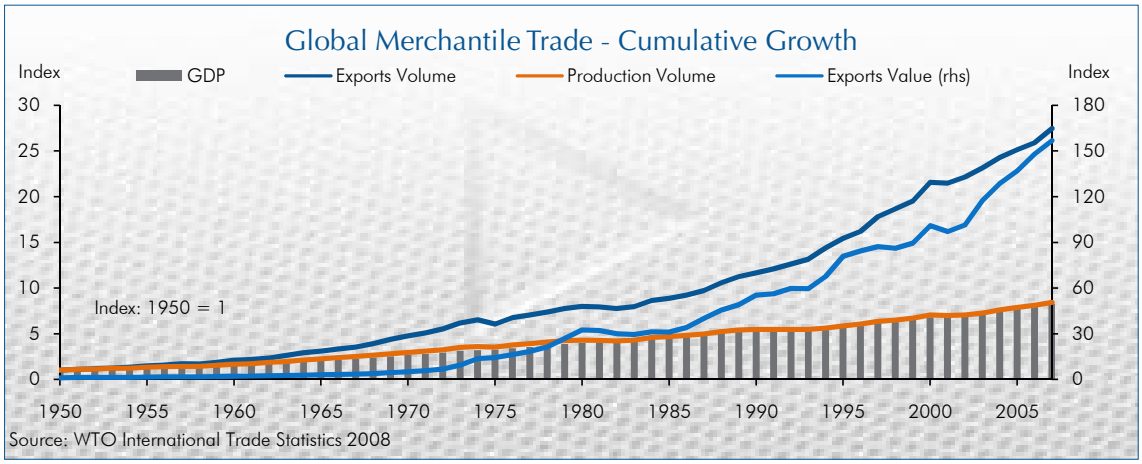
New Zealand, as a geographically remote trading nation, is reliant on long trade routes to exchange goods with other nations. Internationally flagged commercial ships carry 99.5% (by weight) of New Zealand trade with the rest of the world. Collectively these ships make around 3,300 port calls each year, and represent a mix of container ships, general cargo (breakbulk) ships and bulk carriers.

In this section we present the features of international container shipping operations as key links to and customers for coastal shipping.

7.2 OPERATING ENVIRONMENT

7.2.1 Scale of Activities

Globally, cross-border trade has risen at a rate materially faster than economic growth and production (output). As the global standard of living rises and countries increasingly specialise their production and broaden their consumption, the need for cross border trade increases. This trade in physical goods generates the freight task to be met by transport operators, predominantly shipping lines.



Where the opportunity exists shipping presents the lowest cost option for long haul, high volume freight movements. For short haul movements however shipping is less effective than other modes except in specific circumstances like the Europe inland waterway network. Globally, 55% of all cross-border trade occurs within geographic regions, such as North America, Europe and Asia. These tend to be relatively shorter hauls, often without access to sea and waterways, and accordingly are managed by rail and road transport. Almost all inter-regional freight movements are undertaken by ships.

Intra- and Inter-Regional Trade - US$billion								
\ Destination Origin \	North America	Latin America	Europe	CIS[#]	Africa	Middle East	Asia	World
North America	**951**	131	329	12	27	50	352	1,854
Latin America	151	**122**	106	6	14	9	80	499
Europe	459	80	**4,244**	189	148	153	434	5,772
CIS [#]	24	6	288	**103**	7	16	60	510
Africa	92	15	168	1	**41**	11	81	424
Middle East	84	4	108	5	28	**93**	397	760
Asia	756	92	715	80	91	150	**1,890**	3,800
World	2,517	451	5,956	397	355	483	3,294	**13,619**

Source: WTO Trade Statistics 2008

Note: [#] Commonwealth of Independent States - includes 12 of the 15 former Soviet Republics

7.2.2 Shipping Capacity

Global shipping is dominated by private (non-government) operators and has always been intensely competitive. Barriers to entry in the shipping industry are relatively low and niche operators are quick to exploit opportunities. As the global shipping task has burgeoned, competition between large operators has intensified, driven by their cost advantages, principally through economies of scale.

The growth of major shipping lines such as Maersk, CMA CGM, COSCO and Hapag Lloyd have in part been achieved through consolidation, mergers and takeovers. However, the growing demands of freight also provided an opportunity for all shipping lines to grow organically. Market giant Maersk controls 15% of the global containerised market, followed by MSC at 11% and CMA CGM at 7.5%. The share held by the top ten continues to inch higher and now exceeds 60%.

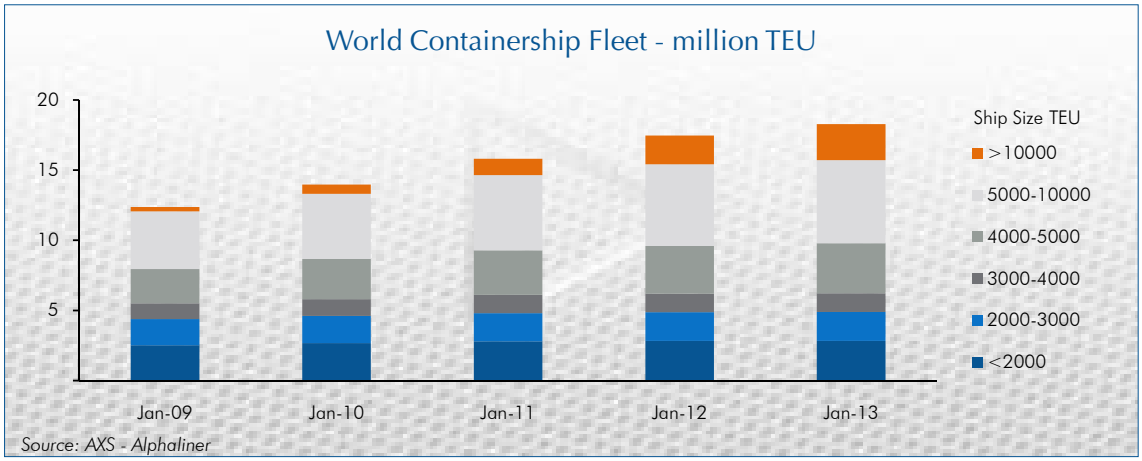
The growth of the world fleet permits a progressive improvement in fleet capability. New technologies include improved ship design (larger ships), greater cargo capacity in each class, faster hulls (reduced resistance) and improved engine efficiency.

While such fleet improvements occur as a matter of course, the imperative was driven by some dramatic externalities:

- Demand for new capacity – across all sectors of the shipping industry, global demand for new capacity has built from the early 1990's, reaching its peak in 2008. The greatest pressure was evident for bulk ships, where the demand from emerging economies for raw commodities (iron ore and base metals, coal, oil) absorbed all capacity. Some New Zealand bulk trades, such as logs, had been partially displaced into containers recently. Similarly, strong demand from western countries for consumer goods, placed pressure on containership capacity; and
- High fuel prices – historically bunkers represent half of ship operating costs. As the crude oil price rose steadily since 1998, the pressure to pass on costs to shippers increased. By mid-2008, when the crude oil price surged past US$140/bbl, bunkers accounted for over 70% of ship operating costs, and necessitated strong responses from ship operators to shed costs.

The drive to improve ship operating efficiency and gain market share emphasises the shipping industry's tendency to cyclically overbuild. Up until 2008 intense competition amongst shipping lines saw record commitments to shipbuilders, with delivery of new ships being more than four years from commitment date. Long delays in commissioning new capacity contribute to shipping's "boom/bust" cycles. The last major surge in shipbuilding, in the decade leading to 1975, was followed by a slump lasting past 1990.

The even greater surge in ship building leading to 2008 may have equally long-reaching consequences. Since mid-2008 the world has witnessed a dramatic reversal of the global economic environment, with global GDP growth of >3.5%/yr reversing to a notably chilly <-3.0%. Facing plunging profitability, and with large portions of the global ship fleet now idle, shipping lines remain burdened by their past commitments to new ship building. This overhang of ship building orderbooks will see the global containership fleet increase from its current aggregate capacity of 12.7 million TEU to 18.4 million TEU by 2013. With overcapacity already apparent, the outlook remains challenging for shipping lines.



7.2.3 Construction Costs

The forces of supply and demand apply equally to ships as they do to other tradable commodities. The strong demand for capacity until 2008 placed a price premium on existing ships and the orderbook, with prices rising more than the rising steel price, and ship scrapping falling to record lows. However, unlike physical supply, prices respond quickly to changes in supply and demand, with the ship brokers recording a dramatic fall in ship values across most markets.

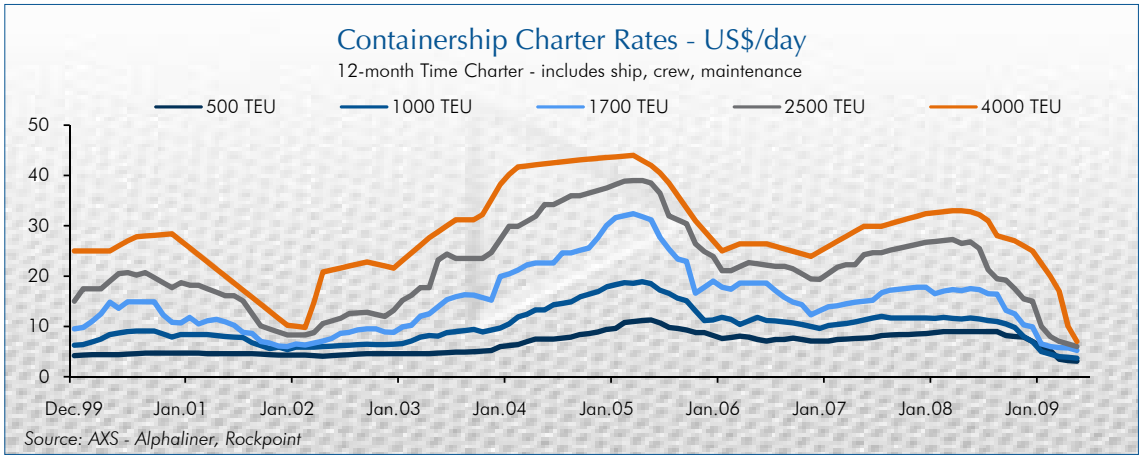
Shipping lines have the option of owning their ships or leasing them. Across the top 20 shipping companies, on average 50% of their entire fleet is chartered (or leased). Typical leases are long term (between 5-15 years) and so provide security for both parties. However there is also an active short-term lease market which provides a better measure of the immediate ship charter rate.

AXS-Alphaliner, Clarksons, Lloyds, Hamburg and the Baltic Exchange each produce charter rate indices. These typically monitor one year "time charter" rates for a variety of different ship sizes. In standard time charters, ship owners provide the ship, its crew, and undertake ship maintenance. Alternatively, for a "bare boat charter" the charterer undertakes agreed maintenance and provides the ship with crew and insurance.

There is a strong correlation between ship prices and short term lease rates for the various ship types and ages, as determined by shipping lines electing the most attractive option.

7.2.4 Ship Operating Costs

Recent financial pressures on shipping lines have resulted in a greater focus on costs, with a range of responses being observed. Cost categories for shipping operations are delineated into charter rates, crewing, repairs and maintenance, insurance, bunkers and container related expenditure.



The above figure presents the extreme volatility in containership charter rates witnessed in recent times.

Crew

The growing international ship fleet in combination with wider employment opportunities in emerging markets has placed pressure on finding officers and crew to man ships. As officers and crew from traditional maritime nations of Western Europe and North America have retired or favoured a less peripatetic lifestyle, shipping lines have increasingly sourced skilled crew from other regions such as Eastern Europe, India, and the Philippines. Manning expenses represent a material portion of ship operating costs and are, in part, the reason for a drive to larger ships. The impacts of the current economic climate have yet to be observed. This will be a mix of reduced demand from increased scrapping of ships, but increased demand resulting from commissioning of new ships. We understand that ships that are laid up still require substantial manning

Repairs & Maintenance

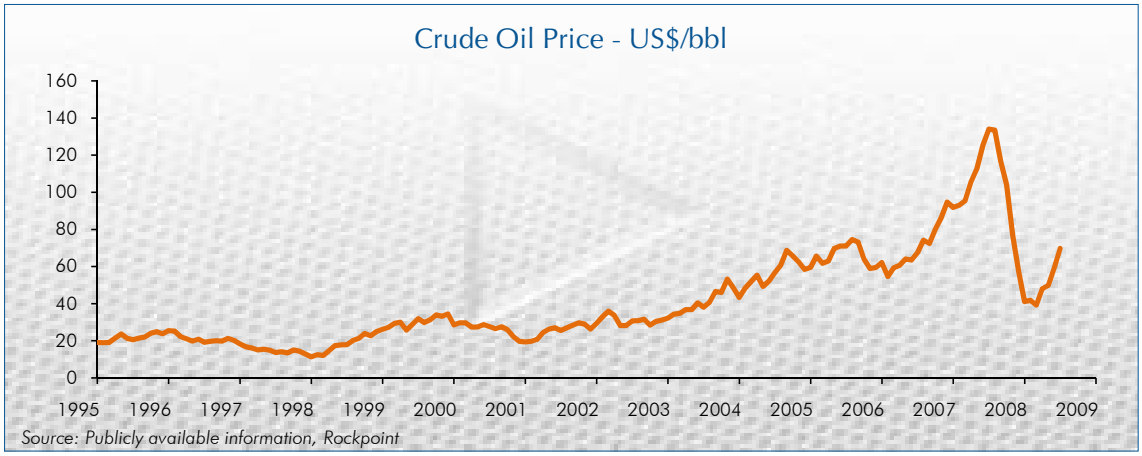
Ship owners set the standards of repairs and maintenance for the chartered fleet. For ships owned by shipping lines, a degree of discretion on routine maintenance timing is permitted, with the use of new remote monitoring technologies allowing for improved scheduling of dry-docking to maximise ship utilisation.

Insurance

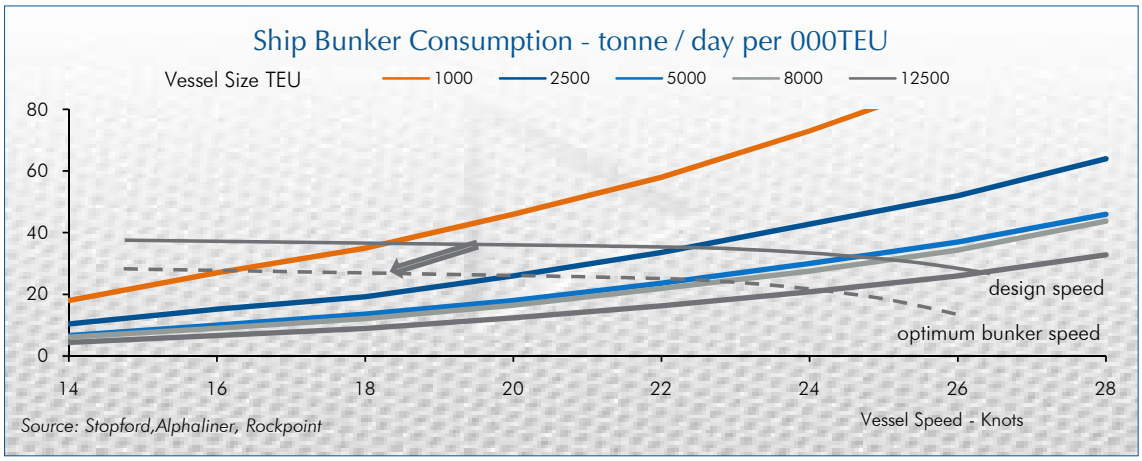
In the lead up to 2008, concentration risk emerged as a key issue for insurers. This resulted from the growing industry consolidation as well as an increase in the size and value of ships covered. A rapid increase in high cost minor claims, and catastrophes, has been compounded by rising piracy concerns around the Suez / Somalia.

Bunkers

Bunkers constitute a major operational expense for ship operators. Typically, bunkers account for 50% of total operating costs. In recent years, this has fluctuated with the oil price. When the oil price peaked at a dramatic new record of over US$140/bbl in June 2008, bunker costs rose to almost two thirds of total operating costs. While oil prices have since fallen, the current pressure on shipping line profitability has seen a continued focus on minimising bunker use.



Shipping lines' key response to price rises has been to adopt "slow steaming" (as low as 10 knots vs earlier 20 knots) to dramatically reduce bunker consumption. For a given ship, bunker consumption is exponentially related to speed. Typically a 10% reduction in speed will result in a 30% drop in bunker consumption. There is an optimal operational level which involves a trade-off between consumption and transit time (if the transit is too slow, additional ships are required to maintain schedule frequency).



Containers

Shipping lines typically own (or lease) two containers for every ship slot. A container fleet represents approximately 30% of the value of the ship itself. This might be materially more if reefer containers are required. In the recent downturn, the first response by shipping lines to pressure on profits was to reduce container maintenance. However, in New Zealand at least, container maintenance has been boosted to keep the fleet serviceable and to so minimise the considerable cost of repositioning empty containers from overseas.

7.3 New Zealand's Reliance on International Shipping

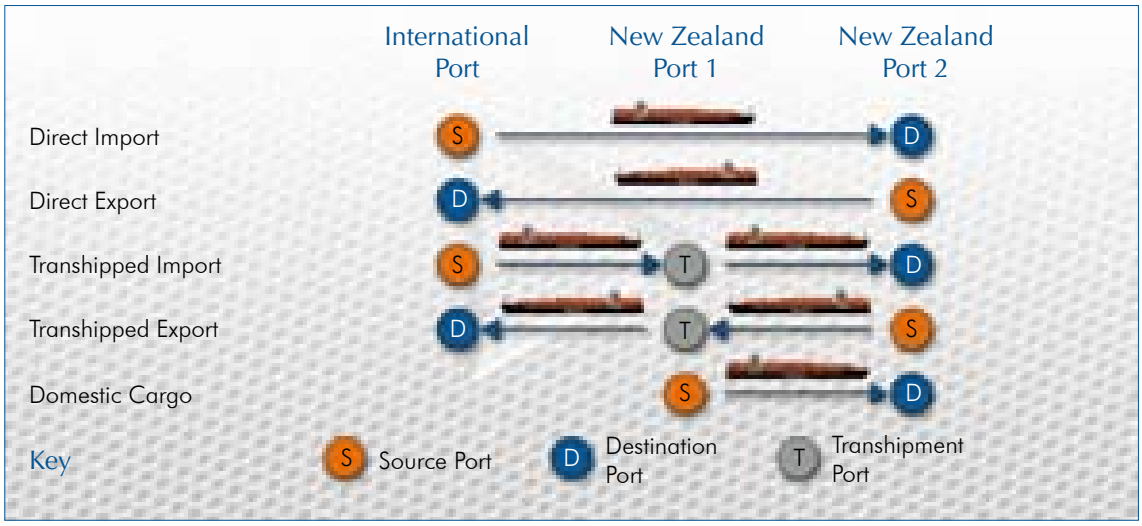
In New Zealand 99.5% of international trade, by weight, is carried by foreign owned ships. Past New Zealand owned / operated companies have either ceased operating or been acquired by international lines. These international lines have served New Zealand exceptionally well for over a century, providing the capacity to carry a diverse range of cargo to and from a multitude of destinations. In return international lines charge prevailing market rates.

Consistent with international experience, New Zealand's international trade is now carried overwhelmingly by pure freight ships. These include containerships and other cargo specific ships. Bulk carriers carry significant volume of often low-value commodities such as oil, logs, cement, fertiliser, ore and coal. Historically, most cargo was hand stacked and later

carried on pallets by break-bulk ships. These still best serve cargo such as large equipment, vehicles, reefers and general cargo. Over the last 30 years, trade has come to be dominated by containerised cargo. Containerised cargo benefits from specialised global infrastructure (ship, port, truck and warehouse), improved protection and security, better tracking and monitoring capability, and the ability to deliver door-to-door without repackaging. Even small 20' containers can accommodate 10-20 pallets, and by representing a bigger unit of cargo reduces documentation.

7.3.1 Service Description

It is necessary to distinguish the freight task to achieve an appropriate classification for domestic (coastal) and international journeys (figure following).



For trade through a given New Zealand port, this can be summarised as:

- Imports: Goods sourced from overseas which remain on the same ship for delivery directly to the destination New Zealand port;
- Exports: Goods destined for overseas which remain on the same ship for delivery directly from the source New Zealand port;
- Transhipments: For imports and exports, where goods are transferred at a New Zealand port between an international ship and a different ship travelling a domestic leg;
- Coastal (domestic) cargo: New Zealand sourced and destined cargo carried by ships between New Zealand ports without leaving New Zealand waters; and
- Interisland Ferries: A subset of coastal cargo, as carried by RORO ships operating between Wellington and Picton effectively on a road or rail "bridge".

Important qualifications are:

- Transhipment ports may or may not be "hub" ports, which are the focus for an international shipping line's import and export activity; and
- For domestic goods carried by ships on the coastal leg no distinction is drawn between a New Zealand operated coastal ship and an international ship.

The majority of import-export cargo transhipped in New Zealand is currently carried by international ships on their scheduled services, and is essentially all containerised cargo. Scheduled services are also termed "liner" services, in contrast with "tramp" services which do not follow set schedules. Slightly more containerised domestic cargo is carried by international containerships than domestic ships. Nevertheless, new domestic services have emerged over recent years, particularly with opportunities for domestic shipments and the repositioning of international cargo in conjunction with international operators.

7.4 COMMERCIAL DRIVERS

While global trade tends to grow at double the rate of economic growth and thus offer shipping companies an expanding market, the competition for market share in the industry is intense. The standardisation of cargo into containers has also facilitated competition, in combination with the trend to larger ships, offering lower unit costs and faster transit times.

7.4.1 Economic Challenges

Shipping by nature is a cyclical (boom-bust) industry. Buoyant rates provoke substantial investment in new capacity and the realisation of new technical efficiencies. New ships are larger, faster and more efficient, with lower costs per slot. Deteriorating global economic conditions, such as those experienced in 2008/09, magnify losses in the shipping industry. The new capacity has now become a significant burden on the industry. Genuine competition, combined with a limited ability for shipping lines to quickly adjust capacity, introduces strong imbalances when trade moves unexpectedly.

The last decade exemplifies these challenges in the shipping industry. From 2000 the world experienced strong global economic growth, particularly from emerging economies such as China and India. In addition to manufactured goods, these economies demanded increasing imports of raw materials (energy, base metals, and other commodities). This stressed available shipping capacity which even record shipbuilding could not immediately relieve. New Zealand faced soaring ship charter rates and absolute capacity shortfalls in some ships such as bulk carriers. Classic bulk cargo like logs were packed into containers. However, in mid-2008 the cycle dramatically reversed. Super-charged global economic growth, principally fuelled by cheap credit, reversed, with the financial crisis quickly transferring to a wider global economic slowdown. International trade has since slumped, falling far below current shipping capacity, most notably for commodities (bulk cargo).

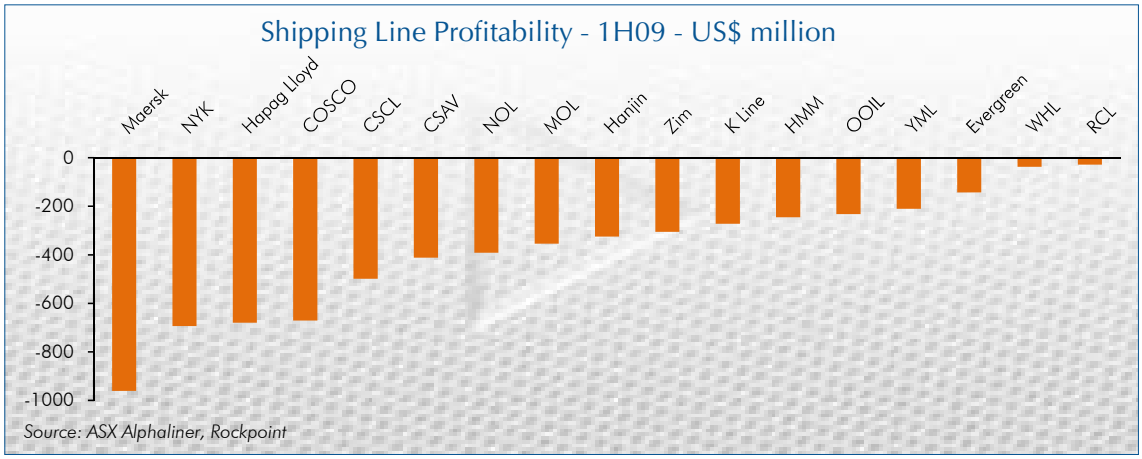
7.4.2 Financial Performance

The decline in trade volumes observed in New Zealand has been mirrored by global trade volumes. Of concern for New Zealand, as a destination at the end of some of the longest trade routes, is the declining profitability of some of the major shipping lines. A sample of recent results includes:

- **NOL lost US$245 million in 1Q09**: Neptune Orient Lines lost US$245 million in the first quarter of 2009, compared to the profit of US$121 million for the same period in 2008. Revenue dropped 36%. Singapore based NOL also owns APL logistics;
- **APL EBIT loss of US$237 million in 1Q09**: Revenues were down 36% at US$1,290 million, with trade of 481,000 FEUs down 27%;
- **A.P. Moller Maersk lost US$373 million in 1Q09**: A.P. Moller-Maersk (Maersk's parent company) reported a loss of US$373 million in the first quarter of 2009 from a profit of $1,005 million a year earlier reflecting a general deterioration in market conditions;
- **Maersk lost US$559 million in 1Q09**: Maersk in particular incurred a loss of $599 million for the first quarter in 2009 against a US$80 million profit in the same period last year. Total volumes transported by Maersk Line fell 14% and average freight rates were 24% lower. This was despite average oil price being 54% lower. Management warned the full year result for 2009 might be negative, with the outlook subject to considerable uncertainty;
- **MISC withdrawal**: MISC announced mid-May that it was withdrawing from Grand Alliance services to Europe effective 1 January 2010. The move was linked to the downturn in container shipping, and reduces its operations to the Indian Ocean and Far East. The MISC link with New Zealand will remain but it is doubtful whether the company will be able to offer competitive rates from Asia to Europe;
- **Hapag Lloyd lost US$295 million in 1Q09**: Hapag Lloyd incurred a loss of US$295 million in the first quarter of 2009 against a profit of US$24 million in 1Q08. Turnover fell 23%, with the decrease in turnover and earnings attributable to a 15% fall in transport volumes and a 14% decline in freight rate levels;

- **Hamburg Süd turnover rose 24% in 2008**: For the 2008 year Hamburg Süd revenue rose 24% to €4,500 million, of which 15% was organic growth and the balance arose from the acquisition of CCL. Capital expenditure for the period was flat at €530 million. Cargo growth began to decline significantly in the fourth quarter of 2008, with ship utilisation falling to 72%. This trend continued in the first quarter of 2009 when utilisation was down to 61% compared with the first quarter of 2008; and
- **CMA CGM reported a profit of US$124 million for 2008**: The 2008 result was a 87% drop from last year, as freight rates collapsed on all major trade routes. Revenue was up 28.2% and freight volumes up 15.6% at 8.9 million TEU.

A summary of reported results for international shipping lines for the first half of 2009 discloses some alarming losses, with selected results presented in the following figure.



In the short term, New Zealand importers and exporters are benefitting from low shipping rates. However, given the country's high reliance on trade, it should be a concern that the shipping lines the country depends upon are currently unprofitable.

7.4.3 Short Term Responses

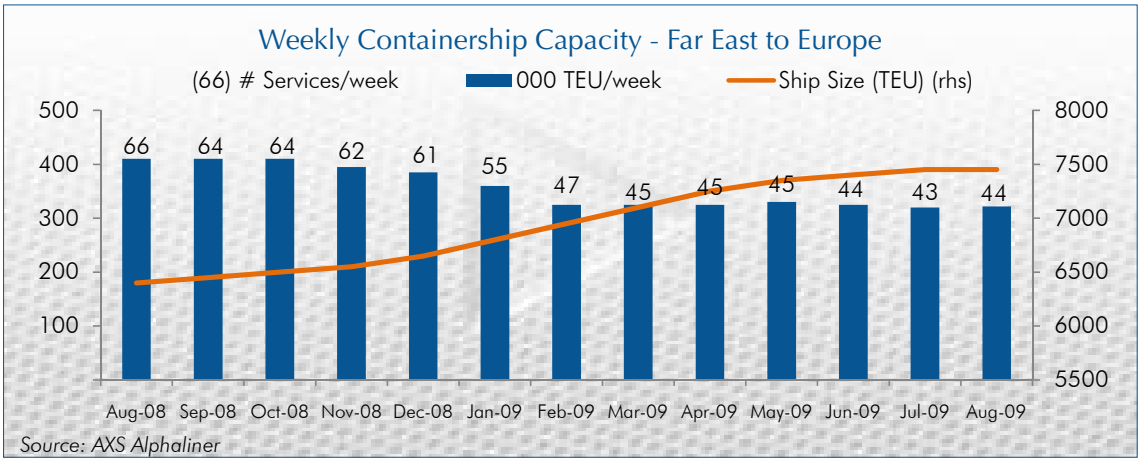
Following the recent dramatic collapse in shipping rates and profitability, shipping lines have a stronger-than-ever incentive to minimise slot (or unit) costs. Resultant initiatives have included schedule reconfigurations, new alliances, and the general removal of slot capacity from services to increase utilisation. Also high bunker costs have seen ships slow-steam, and as trade has fallen, ships have been temporarily taken out of service, even while new deliveries are greatly increasing the global fleet.

These short term shipping line responses to falling profitability are detailed below.

- **Slow steaming**: Reducing transit speed by 10% can reduce bunker costs by 20 - 30%. In order to maintain service levels additional ships may be required but these are more easily met while there is lower demand for ships. Transit times, however, do increase;
- **Capacity utilisation**: Shipping lines have reconfigured schedules to increase capacity utilisation, and hence reduce their cost per occupied slot. Much of this has been achieved through new agreements between shipping lines. Conferences and Vessel Sharing Agreements ("VSA") have always been a feature of the shipping industry however, formation of new VSAs increased in pace over the last 12 months. High capacity utilisation allows less flexibility for shipping lines to accommodate the natural volatility in trade flows. This can result in delays for dispatch of some cargo and less capacity for coastal cargo;
- **Laid up capacity**: Low rates and weak trade have seen a peak in containerships inactivity. As at March 2009 85 ships, 1.42 million TEU or 11.3% of the global fleet were laid up. However, an incipient growth of trade approaching the northern summer and a recovery of sorts in rates have seen the number since fall. Nevertheless, exacerbated by new deliveries, there is a suggestion that up to 20% of the available fleet will be laid up by year end; and

- **Consolidation**: The stress in the sector provides opportunity for more financially able shipping lines to gain scale economies through mergers and acquisitions.

The magnitude of short term changes to international shipping services is illustrated in the following figure. Over the last year, on services between the Far East and Europe, container slots have fallen by 22%, the number of services by a third and significantly, average ship size from 6400 TEU to 7450 TEU.



Source: AXS Alphaliner

7.4.4 Long Term Responses

While revenue growth is proving a challenge in a weaker market, shipping lines have implemented many short term responses observed above to reduce costs and increase capacity utilisation. Given the complexity of the global market, and the sheer inertia of the system, the extent of change to date is remarkable. Section 7.5.2 sets out the change in services, with new alliances, adjusted routes and reduced capacity.

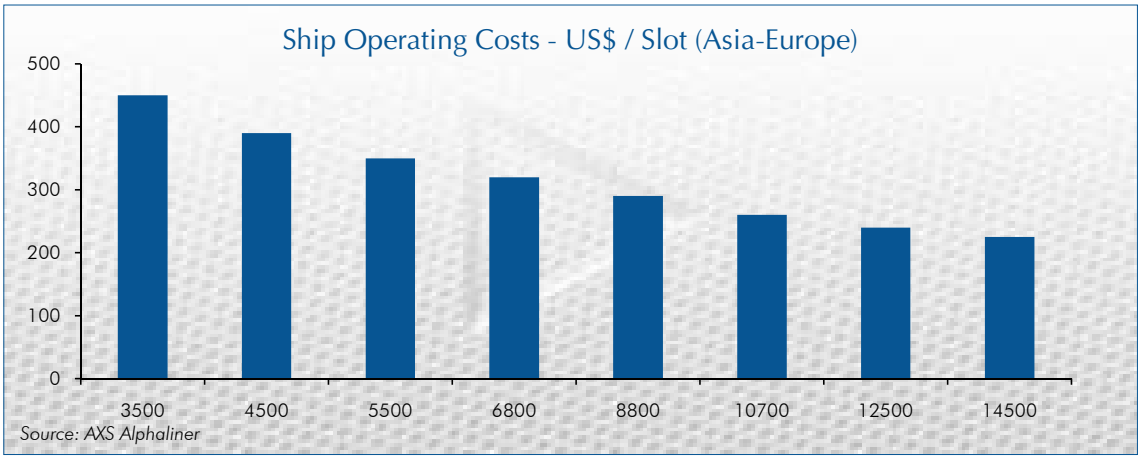
The long term implications of the recent drop in international shipping rates are distressing. Already geographically remote New Zealand has observed a 15% reduction in container slots. The impact has yet to adversely affect importers given past excess capacity and the decline in import trade. The danger for New Zealand, as a trading nation, is assuming that shipping lines will simply ride out these challenging times. The reality is that, unless services are deemed profitable, shipping lines may simply consider exiting. The possibility of this should sound alarm bells to all New Zealanders, and spur stronger partnerships to assure shipping lines reasonable profitability.

Recent service changes are set against wider structural changes in the shipping industry. Key to these are consolidation and fleet improvements. While scale economies permit leading shipping companies to achieve organic growth, merger and acquisition activity accounts for most of the increased share of the top 20. With acquisition prices paid predicated on a buoyant global economy, the current economic realities undoubtedly place unexpected pressure on balance sheets. Nevertheless, scale and market influence remain material benefits.

The commitment to shipbuilding was driven in part by meeting forecast trade growth which evaporated in 2008. Importantly, new generation ships offer valuable operational efficiencies. New ship and engine design reduces bunker consumption, increases speeds, and also provides greater slot capacity for given ship dimensions. The key trend is the progressive increases in ship size. In 2005, ships exceeding 4000 TEU accounted for 17% of the world fleet, and 43% of the available slots. By 2013, the ratios are predicted to increase 32% and 66% respectively. By 2030, ships greater than 4000 TEU are forecast to account for 80% of total slots.

Global Ship Fleet	2005		2009		2013	
Size	Ships #	Slots TEU	Ships #	Slots TEU	Ships #	Slots TEU
>4000TEU	582	3,123,890	1,157	6,864,333	1,831	12,053,290
	17%	43%	25%	56%	32%	66%
<4000TEU	2,780	4,170,381	3,501	5,496,609	3,884	6,219,169
	83%	57%	75%	44%	68%	34%

Larger ships offer considerable economies, particularly in bunker costs (discussed in 7.2.4), and materially lower container slot costs. That is as indicated on the following figure for a long (10,000 nautical mile) route from Asia to Europe (via Suez).



Large ships present significant ramifications for freight networks. First, for a given trade flow, fewer ships are required, and so service frequency falls. Second, large ships require large transfers, so increasing peak congestion pressure on ports (crane and storage) and on downstream road and rail networks. As peak activity rises, lulls occur between ships, with flow-on implications for port resourcing. Third, servicing larger ships requires greater investment by ports (draught, crane capacity, storage) and in transport infrastructure (road and rail). Larger ships also drive a hierarchy in ports, with international services focussed on key hub ports, and other ports providing feeder services. The mechanism to encourage a rational evolution of port status is complex, with some merit in ensuring that both the costs and benefits are somehow shared across a port network.

What is apparent from the analysis undertaken is that the shipping lines drive market changes. While keen to retain their customers, shipping lines rarely consult on their schedule changes. The few exceptions are influential shippers such as Fonterra and the meat industry. Shipping lines encourage ports to invest in new capacity (cranes, draught, storage) but are rarely able / prepared to offer long term commercial contracts to justify that investment.

7.5 SCHEDULED SERVICES

7.5.1 Overview

New Zealand is currently served by 41 international scheduled services provided by 22 shipping lines. These 41 services call at a mix of New Zealand ports and, to the extent they have available slot capacity, could carry domestic cargo. We have mapped all New Zealand scheduled shipping services based on publicly avaliable data. The analyis is based on those schedules as at mid July 2009, noting that these are subject to change.

Scheduled services as at mid July 2009 comprise the following:

International-Global
- 5 to Europe (2 incorporate Australia, 4 Pacific Islands);
- 3 to East Coast North America (including Australia);
- 4 to West Coast North America (3 include Australia); and
- 1 to Middle East.

International-Asian
- 6 to North Asia (2 incorporate South East Asia, 2 Australia); and
- 5 to South East Asia (4 include Australia).

Oceanic
- 11 to Australia (6 include Pacific Islands); and
- 9 to Pacific Islands.

Of these services, 10 International and 12 Oceanic services are provided by a sole shipping line, with the balance being provided by various alliances of up to four shipping lines.

7.5.2 Schedule Changes

Scheduled services are dynamic, with routes and alliances frequently changing. Many services also incorporate multiple route variants (either systematic or one-off). Scheduled shipping services are amended by shipping lines for a variety of reasons including:
- Alliance Changes: Entering (or exiting) arrangements with other shipping lines on certain routes, such as VSAs, conferences or other alliances. Most shipping lines provide services under such arrangements, so broadening service offerings while maintaining capacity utilisation. Such arrangements do, however, reduce the differentiation between shipping lines;
- Freight Patterns: Scheduled capacity may be adjusted to reflect the development (or decline) of trades, or seasonal fluctuations, New Zealand has a peak summer export season for dairy and horticulture;
- Competitive Action: Services amended to meet the needs of major shippers, or to improve profitability, and conversely shipping lines changing schedules to occupy routes vacated by other lines;
- Unforeseen Events: Schedules may be adjusted to miss (or add) ports, reflecting schedule slippage caused by weather, mechanical or other delays, or other opportunities; and
- Market Factors: The recent surge in bunker costs and decline in shipping profitability have been instrumental in driving far-reaching changes to schedules and alliances.

From our database, we have gained an insight into the changes in schedules, capacities and alliances, as well as an understanding of current services and capacity. On occasions the commercial impact of service changes can be substantial, especially on ports. One example has been the impact of changes on Maersk services to Timaru. This had halved container throughput at the port, although subsequent changes have partially reversed this.

A sample of ship schedule changes since early 2008 includes:
- Feb 08: New entrant Goldstar (and parent company Zim) established a Trans Tasman service calling on Auckland, Timaru and New Plymouth. This service ceased in July 2008;
- Mar 08: Hamburg Süd and Maersk Line entered into a VSA for their East Coast North America ("ECNA") services. The resultant 12 x 2800 TEU service replaces the two previous 10 X 2800 TEU services (OC1 and Trident). Port calls to Timaru, New Plymouth and Napier ceased, with the significant adverse impact on Timaru which has been partially reversed;
- Mar 08: Maersk withdrew from its Butterfly service operated jointly with MSC;
- Mar 08: CMA CGM and Marfret's New Europe Mascarene Oceania (NEMO) services via

Suez swapped Auckland for Tauranga, before withdrawing from New Zealand completely in April. The weekly NEMO service now extends only as far as Australia. Meanwhile its fortnightly Panama service switched calls from Auckland to Tauranga, serving Auckland via Metroport, with the export leg incorporating Napier;

- Apr 08: Tasman Orient Line Asian services changed, with the East Asia service adding Marsden Point on a monthly basis and dropping Timaru;
- Apr 08: MISC entered VSA with Maersk on an NZ1 service hubbing out of Tanjun Pelepas (Malaysia), with MISC committing one of the four 4100 TEU ships;
- Apr 08: The NZX1 and NZX2 loops operated by MISC, PIL, OOCL and MOL were reconfigured into a single NZS loop linking to Singapore and Port Kelang. This uses five larger 2200-2800 TEU ships, and dropped calls to Nelson whilst adding Wellington;
- Apr 08: CMA CGM acquired ANL in 2001, and ANL acquired USL in 2007, dropping New Zealand calls;
- Apr 08: MISC established its own agency business separate from Geo H Scales;
- May 08: MSC reconfigured its SE Asia-Australia-NZ Capricorn service to include a call to Bluff;
- May 08: Maersk added alternate calls to Napier on its NZ3 (North East Asia) and Pacific Islands services, after previously dropping Napier on its Southern Star Express and OC1 (ECNA) services;
- Mid-2008: Hapag Lloyd ceased its European-Suez service to New Zealand in mid-2008;
- Jul 08: Hamburg Sud adds a sixth ship to its ANZL service with Hapag Lloyd and Tasman Orient permitting slower transit speeds, and similar changes foreshadowed for the Trident (Europe) service;
- Aug 08: The VSA between Maersk (OC1) and Hamburg Sud (Trident) resume calls to Napier and Timaru. Meanwhile Port Chalmers was dropped from Maersk's Southern Star Express service, principally affecting transhipment cargo;
- Feb 09: Swire commenced its three ship monthly MidEast service serving New Zealand calling at Timaru, Nelson and Tauranga as well as Australia;
- Apr 09: Hamburg Sud reconfigured its Trident (ECNA) service to use Cartagena in Columbia as its transhipment hub and thus remove direct calls to Europe;
- May 09: Pacific Forum Line reconfigured its fortnightly Pacific service;
- Jun 09: In a major revamp, Hamburg Sud's ANZL service (jointly with Hapag Lloyd) is to be consolidated into the ICS / COSCO consortium (with Maersk, MOL and NYK). The revised weekly service will link North Asia and Brisbane on two route variants with Auckland, New Plymouth, Nelson / Wellington, Napier and Tauranga (dropping ICS's Port Otago call). The six -ships will be newer 2800-3500 TEU and with more reefer slots, replacing six ANZL 1800 TEU ships and 6 COSCO 2200 TEU ships; and
- Jun 09: Swire has made significant changes due to weak economic conditions, reducing staff by 200 (35%) and focussing services on the core Asia-Pacific region. Its Eastabout and Westabout services have been suspended, as has the planned Europe Pacific Express, with loss of Westabout's Auckland call. Tasman Orient Line will remain as a brand only.

Cumulatively, the changes to alliances and withdrawals over the last year have reduced available container slots on these combined international services by between 250,000 and 300,000 TEU. This represents between 11% and 13% of the containers collectively handled by the ports (as per port annual reports) and between 15 - 20% of actual container moves.

7.5.3 Current Schedules

On the following pages are presented liner schedules catering for the container trade as at mid July 2009. Sourced from publicly available information, these schedules are subject to frequent change. To the extent possible these represent the routes plied and ports called by ships. However, shipping lines often present "composite" services which may include services to some ports which are actually provided by transhipped or contracted services.

International Shipping Schedules

Shipping Lines	Service	Frequency / Circuit	Foreign Ports Inbound								New Zealand Ports							Foreign Ports Outbound						
Clarkson		30								JEA	TIU	NSN	TRG	TSV	IXY	JEA								
		91								0	46	50	52											
MSC	Capricorn	7						SIN	JKT	FRE	MEL	SYD	BLU	POE	LYT	WLG	NPE	TRG	BNE	SIN				
		42						0	3	8	14	18	23	26	27	28	29	30	35	42				
		6.0						Su	We	Mo	Su	Th	Tu	Fr	Sa	Su	Mo	Tu	Su	Su				
Hapag Lloyd		7	TIL	HAM	RTM	SPE	DAM	SUZ	FRE	SYD	MEL	AKL	NPE	POE	MEL	ADL	CMB	SIN	DAM	SUZ	SPE	TIL		
		84	2	4	10	14	15	32	37	37		43	45	46	50	52	64	60	76	79	80	88		
Swire	Westabout	28	HAM	HUL	ANR	DKK	LEH	PTY	PPT	SUV		AKL	NOU	VLI	SON	HIR	RAB	LAE	MAG	SIN	KLG	Suez	HAM	
		133	0	5	10	13	14	34	45	53		60	63	68	69	73	77	82	84	101	104	119	131	
		4.8	Su	Fr	We	Sa	Su	We	Su	Mo		Mo	Th	Tu	We	Su	Th	Tu	Th	Tu	Fr	Sa	Th	
TOL	East SEA	14					SIN	NOL	LTK	SUV		AKL	WLG	TRG	MAP	SGN	SRI	JKT	PKK	SIN				
		45						16	18	20		24	27	29	31	48	51	56	59	61				
TOL	N Asia	14					PUS	OSA	YOK	NOU		AKL	TIU	WLG	TRG	KEL	TXG	KHH	SHA	PUS				
	BiWkly	63						3	5	15		28	32	33	36	55	56	58	60	63				
		4.5						Tu	Su	We	Sa	Tu	Sa	Su	We	Mo	Tu	Th	Sa	Tu				
Swires	Aust-WCNA	98								PKL		TRG	LGB	KAM	PTL	VAN	PML	PPT	BNE	NCT	MEL	PKL		
		98								0		9	27	32	38	41	45	66	74	80	85	91		
		1.0										We												
Seatrade		14				ANR	DKK	RAD	PPT	NOU		AKL	TRG	ZEE	ANR	SHS	DKK	RTM	HAM					
		70					1	2	25	32		34		64	67	66	68							
Wilhelmsen	Oceania	10		SAV	NYC	NNS	BAL	SAV	MIT	PPT		AKL	NOU	BNE	PKL	MEL	FRE	SIN	UKB	YOK	LGB	MIT	SAV	
				0	4	5	6	9	14	24		31	33	35	38	40	45	52	63	66	79	88	92	
				Th	Mo	Tu	Tu	Fr	We	Sa		Sa	Mo	Sa		Mo	Sa	Sa	We	Sa	Fr	Su	Th	
CMA CGM	PAD1	14	DKK	LEH	NYC	SAV	MIT	PPT	NOU	SYD	MEL	NPE	TRG	KIN	MIT	SAV	PHL	TIL	RTM	DKK				
US Lines	AUS1	88	0	2	10	13	18	29	39	42	44	50	51	68	67	70	72	81	82	84				
Hapag Lloyd	OCE	6.3	Mo	We	Th	Su	Fr	Tu	Fr	Mo	We	Tu	We	Sa	Fr	Mo	We	Sa	Su	Mo				
COSCO	Mitsui OSK	14		TYO	NGC	UKB	PUS	SHA	KEL	HKG		AKL	NPL	WLG	LYT	NPE	TRG	TYO						
Maersk	NZ3 Loop A	42		0	2	3	4	6	8	10		23	25	26	27	28	29	42						
NYK	NZJ Loop1	3.0		Tu	Th	Fr	Sa	Mo	We	Fr		We	Sa	Su	Mo	Tu	Th	Tu						
Hamburg Sud	ANZL1																							
COSCO	Mitsui OSK	14		TYO	NGC	UKB	PUS	SHA	KEL	HKG		AKL	LYT	NSN	NPE	TRG	AKL	YOK	UKB	PUS	SHA			
Maersk	NZ3 Loop B	42		0	2	3	4	6	8	10		23	25	26	27	28	29	36	38	40	42			
NYK	NZJ Loop 2	3.0		Tu	Th	Fr	Sa	Mo	We	Fr		We	Sa	Su	Mo	Tu	Th	We	Fr	Su	Tu			
Hamburg Sud	ANZL 2																							
MISC	NZ0	7					TPP	SIN	TOR	BNE		AKL	POE	TPP										
Maersk	NZ1	28						1	7	8		12	15	28										
Hapag Lloyd	NZE1	4					Mo	We		Th		Mo	Th	Mo										
Mitsui OSK	PIL	4.0					Mo	We		Th		Mo	Th	Mo										
MISC	NZS	7							SIN	BNE		AKL	LYT	WLG	NPE	TRG	PKG	SIN						
Mitsui OSK	PIL	35								11		15	18	19	21	22	34	35						
NYK	NZS	5.0							Su	Th		Su	We	Fr	Sa	Su	Sa	Su						
Hapag Lloyd	NZE2																							
Hamburg Sud	ANZL	7			YOK	UKB	SHA	XIA	HKG	BNE		TRG	NPL	LYT	NPE	MNL	YOK							
Hapag Lloyd	ANZL	42			0	1	4	6	8	18		23	25	27	29	37	42							
		6.0			Sa	Su	We	Fr	Su	We		Mo	We	Fr	Su	Mo	Sa							
Hamburg Sud	PAN01	7							OAK	LGB		AKL	MEL	SYD	TRG	SUV	OAK							
Maersk	PSW-NB	42							0	1		15	20	23	27	30	42							
Hapag Lloyd	WAS1	6.0							Th	Fr		Sa	We	Sa	We	Sa	Th							
US Lines	PSW1																							
Hamburg Sud		14								LGB		TRG	SYD	MEL	ADL	TRG	AKL	PPT	ESE	OAK	SEA	VAN	LGB	
Maersk	PNW-NB	56										15	19	21	24	27	30	35	44	46	48	49	56	
Hapag Lloyd	WAN	4.0											Fr	Tu	Th	Su	Tu	Mo		Fr	Su	Tu	Sa	
US Lines	PSW2																							
Hamburg Sud	EANZ, AANZ	7					PHL	SAV	CTG	BLB		AKL	SYD	MEL	TIU	POE	NPE	TRG	AKL	MIT	MZO	SAV	PHL	
Maersk	OC1	63					0	2	7	9		26	29	31	36	37	39	40	41	57	58	62	63	
Hapag Lloyd	ANP	9.0					Mo	We	Mo	We		Fr	Mo	We	Mo	Tu	Th	Fr	Sa	Mo	Tu	Sa	Mon	
US Lines																								
US Lines		133	HAM	HUL	ANR	DKK	LEH	PTY	PPT			AKL	NOU	LAE	VLI	SON	HIR	RAB	BAA	LAE	MAG	HAM		
		133		5	9	15	18	36	54			52	65		68	80	74	79	82	85	88	133		

LEGEND

AKL	New Zealand
SYD	Australia
PPT	Pacific Islands
LGB	North America
SIN	South East Asia
HKG	North Asia
HAM	Europe

Tasman & Pacific Island Shipping Schedules

Shipping Lines	Service	Frequency	Foreign Ports Inbound					New Zealand Ports						Foreign Ports Outbound		
Emjay (NISE)		42				YMB	NLK	LYT	AKL	NLK	MAP	YMB	NLK			
		42				0	5		9	13	16	23	42			
		1.0				Mo	Fr		We	Su	We	We				
Hamburg Sud		7	FRE	ADL	MEL	SYD	BNE	AKL	TRG	SUV	LTK	PPT	Apia	PPG		
PINA			0	6	7				13	16	17	21	24	25		
			Fr	Th	Fr				Th	Su	Mo	Fr	Mo	Tu		
Hamburg Sud		7			SYD	MEL	BNE	TIU	POE	NPE	TRG	AKL	SYD			
TTAS								5	7	9	10	11	14			
Maersk	Pacific Island	14			NOU	LTK	SUV	AKL	TRG	AKL	NOU					
		14			0	3	4	8	10	11	14					
		1.0			Tu	Fr	Sa	We	Fr	Sa	Tu					
Maersk	Southern Star	21				SYD	MEL	AKL	NPL	LYT	WLG	NSN	AKL	SYD		
		21				0	3	8	10	12	15	15	17	21		
		1.0				Tu	Fr	We	Fr	Su	We	We	Fr	Tu		
Mackay Shipping (PIL, PDL)		20					PPT	MAP	AKL	PPT						
		20					0	9	11	18						
		1.0														
MSC	Butterfly	14				SYD	MEL	POE	LYT	WLG	NSN	SYD				
CMA CGM		14				0	2	7	8	9	10	14				
		1.0				Tu	Th	Tu	We	Th	Fr	Tu				
MSC	Kiwi	14			SYD	BWT	MEL	AKL	TRG	SYD						
COSCO		28				2	4	9	10	14						
		2.0			Fr	Su	Tu	Su	Mo	Fr						
Pacific Forum Line		21		LTK	APW	PPG	TBU	LYT	NPE	AKL	LTK					
		21			3	4	7	12	14	16	21					
		1.0		Mo	Th	Fr	Mo	Sa	Mo	We	Mo					
Polynesian		14			LTK	APW	PPG	AKL	LTK							
Mataroa Intl		14				2	3	10	15							
		1.0			Tu	Th	Fr	Fr	We							
TOL		28	BNE	PKL	NTL	BWT	MEL	NSN	AKL	MAP	TRG	BNE				
		63		3		8	12	47	50	52	54	61				
		2.3	We	Sa		Th	Mo	Mo	Th	Sa	Mo	We				
Swires	TransTasman	28		MEL	PKL	BNE	NOU	AKL	MAP	TRG	NPE	NSN	NPL	MEL		
		28		0	4	7	12	16	18	19	22	24	25	29		
		1.0		Mo	Fr	Mo	Sa	We	Fr	Sa	Tu	Th	Fr			
Swires	TransTasman	14					BNE	AKL	TIU	WLG	TRG	BNE	TSV	NOU		
							0	5	9	11	13	18				
							We	Mo	Fr	Su	Tu					
Sofrana		17	LAE	LHR	RAB	HIR	VLI	TRG	AKL	NOU	BNE	POM	LAE			
		34	0	4		7	11	15	18	23	25	32	35			
		2.0	We	Su		We	Su	Th	Su	Fr	Su	Su	We			
Pacific Forum		21		LTK	APW	PPG	TBU	AKL	LYT	NPE	LTK					
Polynesian		21			4	5	6	13			20					
Mataroa Intl		1.0		Mo	Fr	Sa	Su	Su			Su					
Pacific Forum		14			LAE	MAG	POM	NPE	NSN	TRG	BNE	MEL	SYD	LAE		
Quadrant		35				5	6	19	21	23	28	30	32	35		
		2.5			We	Mo	Tu	Mo	We	Fr	We	Fr	Su	We		
Pacific Forum		26			RAR	AIT	NUI	AKL	RAR							
Reef Shipping		26				2	6	9	14							
		1.0			N/A	N/A	N/A	N/A	N/A							
Mackay (PDL)		14					LTK	TRG	LYT	AKL	LTK					
Neptune		14						4	7	10	14					
		1.0					Th	Mo	Th	Su	Th					
Mackay (PDL)		28			FUN	SON	VLI	AKL	NUI	FUN						
Reef		28						15	21	28						
		1.0						Tu	Mo	Mo						
Mackay (PDL)		21			NOU	VLI	FUT	AKL	NOU							
Reef		21				2	14	16	21							
Sofrana		1.0			Su	Tu	Su	Tu	Su							
Mackay (PDL)		14		TBU	APW	PPG	VAV	AKL	TBU							
Reef		14			2	3		8	14							
Sofrana		1.0		Su	Mo	Tu		Mo	Su							

LEGEND

AKL	New Zealand
SYD	Australia
PPT	Pacific Islands

Observations:

- The International Schedules show complete circuits ranging from 28 days to 133 days in length. The frequency of port call services ranging from 7 days to 133 days;
- Only two international services provide direct links to Europe. These are the Seatrade fortnightly breakbulk reefer service which can carry deck containers and two CMA GGM / US Lines containerships;
- Several international services terminate in transhipment hub ports such as Tanjun Pelepas, Singapore or Hong Kong;
- The Tasman Schedules range from 14 to 63 days in length, with frequency of service ranging from 7 days to 42 days;
- Ship capacity for Tasman services is dictated by the port with the most restricted infrastructure (typically being a Pacific Island port); and
- Of the 20 Tasman services, 9 call only on Auckland and/or Tauranga, while 11 link into Australia.

7.6 ANALYSIS OF PORT CALLS

Translating the shipping schedules (as at mid July 2009) into port calls, we can assess the level of service provided to each port.

7.6.1 Port-to-Port – Services

As at mid July 2009, 43 International and Oceanic services cumulatively made 123 New Zealand port calls on scheduled services, for an average of 72 port calls per week. The Oceanic calls, incorporating New Zealand, Australia and the Pacific Islands, numbered 58. The other 75 calls are from international services travelling further afield. Auckland accounts for 38 of the scheduled ship visits (19 per week), while Tauranga draws 25 total scheduled visits (17 per week) as summarised in the following figure.

Port Visits - by Services

Port	Code	International	Trans Tasman	Total
Marsden Point	MAP	1	4	5
Auckland	AKL	17	21	38
Tauranga	TRG	15	10	25
Napier	NPE	8	5	13
New Plymouth	NPL	2	2	4
Wellington	WLG	5	3	8
Nelson	NSN	2	5	7
Lyttelton	LYT	5	6	11
Timaru	TIU	3	2	5
Otago	POE	4	2	6
Bluff	BLU	1	0	1
Total		**63**	**60**	**123**

An opportunity exists for international ships visiting consecutive New Zealand ports to make available slot capacity for the movement of domestic cargo. We have no direct measure of the capacity available given slots some will be occupied by containers from preceding foreign ports and destined for subsequent foreign ports. Even if slots were available, practically many of these international shipping services would be unable to provide a competitive option for shippers due to:

- Conflicting Priorities: The core business of international lines is in carrying long haul import and export cargo. With defined berth windows, most shipping lines are unwilling to risk

delays to established schedules to carry domestic containers, and would place higher priority on repositioning empty containers to meet shippers' needs;

- Short Distances: Most of the port pairs incorporated into existing schedules are too close for shipping to be a viable option against road and rail. Indeed, 13 of the 38 direct weekly port-to-port connections (that is those with no interceding port calls) are between immediately adjacent ports such Auckland and Tauranga (4.9 per week) and from Napier to Tauranga (4.5 per week);
- Delivery Times: Shipping competes with road and rail which offer reliable long distance daily Auckland to Christchurch connections of 24 hours and 36 hours respectively. The equivalent steaming time for a ship exceeds 40 hours and excludes cargo aggregation port clearance and the door-to-door transfer times;
- Frequency Constraints: Shippers prefer direct and regular connections. Typically these do not coincide with the scheduled calls on domestic ports as part of international services;
- Direction: A greater weighting of port-to-port connections by service number from south to north (43) than north to south (28), although the first port for 20 services lies north of the next port, while only 10 lie to the south (the balance visit only a single New Zealand port); and
- Marginal Pricing: International shipping lines which do accommodate domestic cargo can offer very competitive rates given they need only recover marginal costs.

International Ship Capacity

	Direction	# services	000TEU/wk
Adjacent Port	South to North	16	21.2
	North to South	15	9.1
All Ports	South to North	44	51.5
	North to South	43	39.4
Total		**87**	**90.9**

7.6.2 Port-to-Port – Weekly Services

The following figure summarises all direct port-to-port connections provided by international services, expressed as aggregate visits per week. This shows 101 scheduled links between all New Zealand ports and a portion of foreign ports. Of these calls 52 are direct links between two New Zealand ports, and so represent the opportunity for visiting ships to provide coastal shipping services.

International Shipping - Visits per Week

Direct Port-Port Links														Foriegn	Total	
From\ \To		MAP	ONE	AKL	TRG	NPE	NPL	WLG	MLB	NSN	LYT	TIU	POE	BLU	Ports	NZ	All
New Zealand Ports	MAP			0.4	0.5										0.2	0.9	1.0
	ONE														0.0	0.0	0.0
	AKL	0.5			2.5	1.0	0.8	0.5			1.8		1.0		10.0	8.2	18.2
	TRG	0.5		2.4		0.3	1.0	0.0		0.5	0.5				8.2	5.2	13.3
	NPE			0.3	4.5			0.0		0.8			1.0		1.3	6.6	7.9
	NPL							0.5			1.3				0.3	1.8	2.1
	WLG					2.0	0.0			0.8		0.0			0.0	2.8	2.8
	MLB														0.0	0.0	0.0
	NSN			0.6	0.7	0.8					0.3				0.5	2.3	2.8
	LYT			0.5		2.2	0.0	2.8		0.5			0.0		0.0	6.0	6.0
	TIU				0.0					0.0			1.0		0.0	1.0	1.0
	POE				0.0	1.0		0.0			1.5				2.0	2.5	4.5
	BLU												1.0		0.0	1.0	1.0
Foreign		0.4	0.0	13.4	4.1	1.0	0.0	0.0	0.0	0.3	0.3	1.2	0.5	1.0			
NZ		1.0	0.0	4.2	8.2	7.2	1.8	3.8	0.0	2.6	5.4	0.0	4.0	0.0		38.2	
All		1.4	0.0	17.6	12.3	8.2	1.8	3.8	0.0	2.8	5.8	1.2	4.5	1.0			82.9

7.6.3 Port-to-Port – TEU Capacity

Ship size provides an indication of available capacity, although containers slots may be occupied by other containers in transit. Whilst the appetite of international shipping lines for domestic cargo varies, of the 145,700 TEU slots calling at New Zealand ports weekly, 70,800 provide links between New Zealand port pairs.

International Shipping - '000 TEU per Week

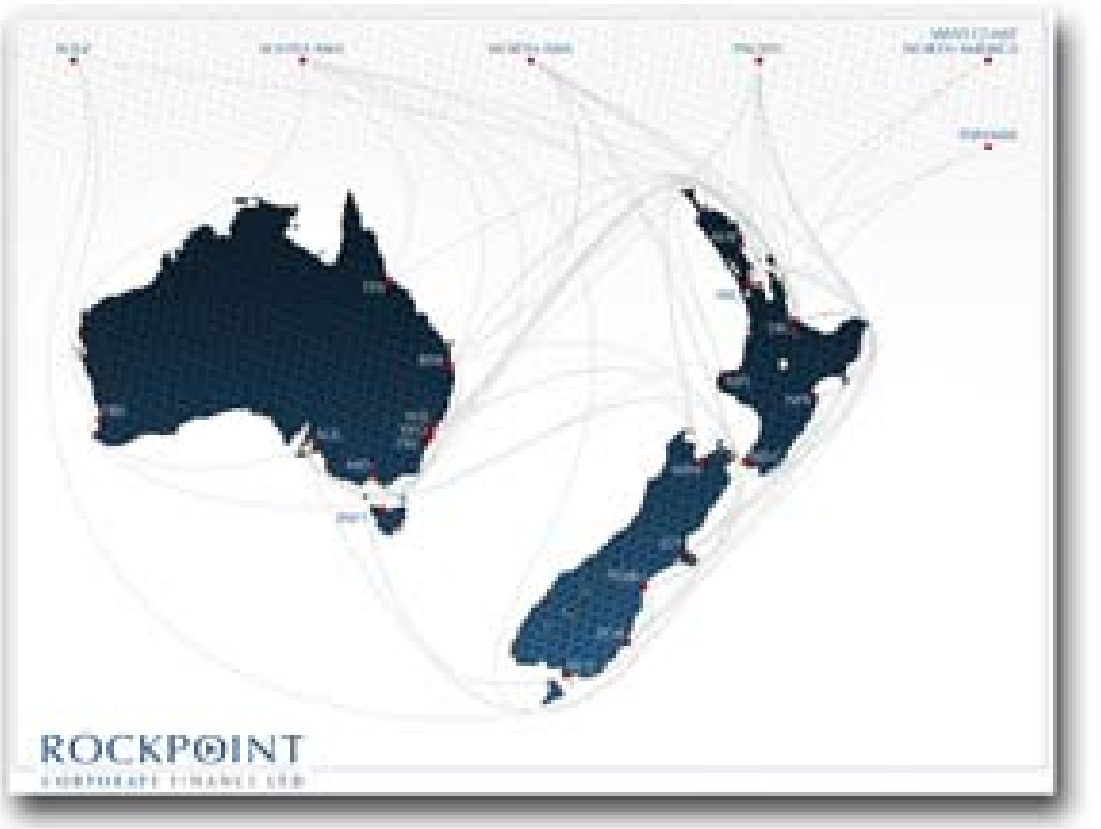
Direct Port-Port Links														Foriegn	Total	
From\ \To		MAP	ONE	AKL	TRG	NPE	NPL	WLG	MLB	NSN	LYT	TIU	POE	BLU	Ports	NZ	All
New Zealand Ports	MAP			0.2	0.3										0.1	0.5	0.6
	ONE														0.0	0.0	0.0
	AKL	0.3			2.2	2.4	1.4	0.5			3.9		4.1		14.2	14.8	28.9
	TRG	0.5		4.7		0.1	1.8	0.0		0.8	0.3				14.1	8.2	22.3
	NPE			0.1	11.1			0.0		0.6			2.4		1.8	14.2	16.0
	NPL							1.1			2.2				0.1	3.3	3.4
	WLG					5.0	0.0			1.0		0.0			0.0	6.0	6.0
	MLB														0.0	0.0	0.0
	NSN			0.5	1.0	1.2					0.1				0.7	2.8	3.5
	LYT			0.3		3.0	0.0	6.0		1.1			0.0		0.0	10.4	10.4
	TIU				0.0					0.0			2.8		0.0	2.8	2.8
	POE				0.0	2.8		0.0			2.9				6.5	5.7	12.1
	BLU												2.2		0.0	2.2	2.2
Foreign		0.2	0.0	22.0	7.1	1.6	0.0	0.0	0.0	0.1	0.1	3.3	0.7	2.2			
NZ		0.8	0.0	5.8	14.6	14.5	3.3	7.6	0.0	3.5	9.3	0.0	11.5	0.0		70.8	
All		1.0	0.0	27.8	21.7	16.1	3.3	7.6	0.0	3.6	9.4	3.3	12.1	2.2			145.7

Our observations from the above figure include:

- Additional container capacity is available on domestic ships providing dedicated coastal services (Pacifica, Strait Shipping), and from break bulk ships (Trans Orient Line, Swire Shipping and Seatrade). Inter-island ferry services are considered to be a separate market, as well as any ships operating on unscheduled (tramp) services;
- Not all slot capacity on scheduled ships is available. For the most part these slots will be occupied by containers in transit, reserved for subsequent scheduled ports visits, or simply not made available by international shipping lines;
- International ships on scheduled services provide 45 direct port-pair links between the 11 New Zealand ports visited;
- Of the 70,800 weekly slots on direct services between NZ ports, Auckland, Tauranga, Lyttelton or Otago account for 57%; and
- This analysis is derived from data as at mid July 2009. Over the previous 18 months, we estimate that 15% of slot capacity has been removed from scheduled services.

7.6.4 Port-to-Port – Regional Perspective

The following diagram presents the pattern of international scheduled ship movements within New Zealand and to selected international destinations.



Note: Animated versions of representative schedules are available at www.rockpoint.co.nz.

We note that New Zealand has historically enjoyed a range of direct international services, disproportionate to that of many other countries. This has provided strong direct global trade links. Increasingly, international shipping lines have adopted a structure of global hubbing, such that there are now very few direct services from New Zealand to Europe. While these hubbing structures continue to serve New Zealand well, the challenging trading conditions at present have dramatically affected profitability of shipping lines.

7.7 COMPETITIVE POSTION

The following commentary presents the perceived strengths and weaknesses of international shipping in the provision of coastal shipping services.

Further assessment of shipper perceptions is provided in Section 13.9 under "Results of Interview Programme."

7.7.1 Strengths

- Price: International shipping line's key source of revenue is in provision of 'blue water' services. As such they are able to marginally price coastal freight services;
- Capacity: International shipping lines have substantial capacity to carry coastal cargo during the off-season, given seasonal swings in import-export trade;
- Repositioning: International shipping lines can potentially offset the cost of repositioning empty containers by providing empty containers to domestic operators such as Cubic and Sea Road Logistics;
- Service: International shipping lines might offer a coastal freight service to attract or maintain key importers and exporters; and
- Regulatory: As foreign entities, international shipping lines are subject to less regulatory and manning requirements than coastal operators.

7.7.2 Weaknesses

- Service: Scheduled services for international shipping lines are dictated by regional and global trade patterns. Accordingly the potential for schedule changes may discourage a reliance by domestic shippers on services provided by international shipping lines;
- Reliability: While international shipping lines provide reliable services, they prioritise the import and export trade, and the repositioning of empty containers to facilitate this trade. Accordingly, domestic cargo risks being abandoned on scheduled services;
- Capacity: Schedules are designed to meet, but not materially exceed, peak flows. At seasonal peaks limited capacity will be available for domestic cargo;
- Focus: Catering for domestic cargo requires a commitment to planning, logistics and administration which international lines may be unwilling to make; and
- Transparency: While international lines may provide a domestic freight service (particularly for the domestic leg of an international movement), they may not disclose the service or mode. Some lines in practice use road and rail.

7.8 KEY OBSERVATIONS / CONCLUSIONS

The following presents key observations and conclusions from our review of operational characteristics for international shipping:

- Global Characteristics: The global shipping industry is highly competitive and has seen increasing consolidation over the last decade. This has been driven primarily by the need to achieve economies of scale. The top ten global shipping lines now represent in excess of 60% of the total global market share.
- Significance to New Zealand: New Zealand, as a geographically remote trading nation, is reliant on extended trade routes for the exchange of goods with other nations. Internationally flagged commercial ships carry 99.5% (by weight) of New Zealand's trade with the rest of the world. However, slot capacity committed to scheduled services to New Zealand has declined by approximately 15% in the 18 months to July 2009.
- Competitive positioning:
  - International ships carry a material share (~70%) of coastal cargo, in both full domestic cargo and repositioned empty containers.
  - The coastal transfer of domestic originated cargo is not a core business focus for international shipping lines. These lines understandably focus on international trade and the repositioning of international cargo. Maintaining schedule flexibility is an important aspect in servicing these trades.
  - International lines typically marginally price domestic and transhipment cargo as it is a non core portion of their business. These prices cannot be matched by other service providers including domestic coastal shipping operators.
- Response to Global Downturn:
  - In the current economic climate many operators are struggling. This has prompted a range of commercial responses to minimise operating costs, including slow steaming, laying up ships, returning charter ships to charter companies, and seeking to cancel new builds.
  - A significant reduction in port calls has been observed in New Zealand as shipping lines withdraw from non-core services on which they cannot operate profitably in the current market conditions. While this has been matched by a decline in trade volume, the issue for New Zealand is whether the lost capacity will be restored when trade conditions improve.
  - Shipping lines have entered into a range of collaborative arrangements such as VSAs and slot charters, to try and bolster capacity utilisation.
- Potential Impact on New Zealand:
  - With a continuation of pressure on shipping line profitability, there remains a significant risk to New Zealand of a further reduction in scheduled services.
  - Deliveries of new container ships provides an opportunity for shipping lines to introduce larger ships onto New Zealand services. While larger ships can offer lower slot costs, no

New Zealand port can currently accommodate ships much larger than 4000 TEU on an "all tides" basis. Accordingly, a move to larger ships will almost certainly necessitate structural change, with shippers, shipping lines and ports required to establish an agreed hierarchy of hub and feeder ports.

8 Operational Characteristics - Domestic Shipping

8.1 Introduction

While New Zealand's reliance on international shipping services for trade is paramount, the domestic shipping industry also enjoys a rich history. Domestic shipping is defined as ships which solely (or at least predominantly) ply New Zealand coastal waters, and are thus subject to the local regulatory environment. These operations may or may not be partly owned by offshore parties.

New Zealand operates 3,800 domestic commercial ships, principally tourism and fishing ships, and a further 450,000 recreational craft. The New Zealand commercial freight fleet is very small, with only 16 domestic commercial ships exceeding 45 metres.

8.2 Historical Perspective

New Zealand is a maritime nation, with the seventh largest Exclusive Economic Zone ("EEZ") in the world spanning 4 million square-km. Early Maori and European settlement relied heavily upon sea-craft for discovery, travel, communication and trade. New Zealand's topography made early land travel challenging but as no part of the country's 270,000 square-km landmass is more than 100 km away from the coast or navigable rivers, sea-going vessels provided an ideal means of transport. From the early 1800s, increased domestic and international trade led to the development of more than 160 ports along New Zealand's 15,000 km coastline, focused on natural harbours and rivers. Early deep sea ships were built in Britain and principally used for trade and passenger links with Britain. Given their size, they could either berth at ports in better natural harbours, or stand at sea and ferry passengers and goods to shore by long boats. However, it was the inexorable trend towards larger ships, needed to facilitate international trade, which exceeded the capacity of many "natural" harbours and accordingly progressively reduced the number of commercial trading ports in New Zealand to just 16. Despite this, on the more sheltered east coast, operating commercial ports remain evenly spaced at intervals of less than 200 km. These ports are closer and serve materially smaller populations than in most comparable countries.

The domestic shipping industry traces its history back to the development of small ships opportunistically servicing early ports. Communities progressively invested in port infrastructure to encourage and facilitate this coastal fleet and maintain their viability through communication, passenger and cargo transport with the outside world. As ports developed, they tolled ship operators for their use via wharfage charges. Over time a fleet of coastal craft grew, comprising those best suited to meet the range of natural challenges posed by the harbours and ports. The government-owned Union Steamship Company was formed in 1876 with a base in Dunedin, and slowly but progressively extended regular trade to the west coast of the USA, South East Asia, Pacific Islands and the Indian sub-continent. In addition to the blue water capacity, the Union Steamship Company also invested in coastal freight services and fast, comfortable ferry services linking North and South Islands. These services became focused on the more sheltered east coast, the material exception being coal trade out of Greymouth and Westport river ports.

As New Zealand developed, demand grew for a more comprehensive and reliable transport network, and as funding permitted, land connections were established, initially for foot traffic, then horse, carts and in the early 1900's cars. Over time, land transport infrastructure improved, providing more attractive alternatives than coastal transport. The early rail lines dated back to the 1850's and were developed to aid local trade in timber and coal. However, it was a Central Government initiative to build a standardised national rail network from the 1870's

to connect local networks. The Auckland to Wellington link was completed in 1908 and after delays due to the wars, the South Island link by 1945. Rail was to have a serious competitive effect on coastal shipping.

Road and rail quickly and progressively competed against coastal shipping for trade. Ironically, it was a new ship which accelerated this competition – the Aramoana Roll-On-Roll-Off inter-island ferry introduced in 1962. The rail link proved popular, although road operators also recognised the opportunity, with trucks soon dominating traffic flows. Of the six ships currently operating across the Cook Strait, two have rail capability.

With the prevalence of road transport more ports have closed to coastal and international shipping trade. Examples over the last 50 years include Greymouth, Oamaru, Wanganui, Patea, Kaiapoi, Opua, Wairoa and Tarakohe. While almost certainly disappointing for the communities involved, the service provided by road transport was superior, and better able to meet the needs of freight movement. This trend to road transport has continued also at the expense of rail, where protection was lifted in 1986. Road now carries 92% of the freight task in New Zealand in tonnes, and 70% in tonne-km.

8.3 COASTAL SHIPPING OPERATIONS

8.3.1 Bulk Trades

New Zealand's only oil refinery is at Marsden Point, Northland, and processes principally imported crude oil. Coastal shipping is the key freight mode for the oil industry despite an increasing portion of imported petroleum products arriving directly at destination ports and half refinery output travelling to Auckland via a pipeline. The sheer scale of the task of distributing 3 billion litres of product around New Zealand annually demands coastal tankers. Currently two bulk petroleum tankers transport oil products from Marsden Point to storage facilities in Auckland, Tauranga, Napier, Wellington, Timaru, Lyttelton, Otago, Bluff, Nelson and New Plymouth.

Similarly, the pure bulk and weight of cement, in combination with the remoteness of manufacturing sites around New Zealand, favour the use of coastal ships for the distribution of this product. The key quarrying and processing sites are Golden Bay's operations in Portland, Northland and Holcim's operation near Westport, West Coast, while demand centres are national, and broadly reflect population distribution. Both companies operate coastal tankers to undertake this task, pumping into specialist bulk storage facilities at eight New Zealand ports. Holcim is currently considering moving its manufacturing site to a new-build facility in Weston, near Oamaru. If this occurs it will replace the older MV Westport with a larger new ship.

8.3.2 General Cargo

The Cook Strait provides another "natural" market for coastal services, with operations between dedicated facilities in Wellington and Picton. The New Zealand Railways's inter-island operations commenced in 1962. While passengers and their vehicles are accommodated, the key users are freight operators. Competition in the market, particularly for passenger services, commenced in the 1980's. However, the first enduring competition was a large road transport carrier to meet the growing need for moving dairy livestock to the South Island. KiwiRail operates three RORO's ferries serving its own rail operations and also a range of road carriers, notably large long-haul operators Toll Tranzlink, Mainfreight and Linfox. Pacifica Shipping, founded in 1982, has operated up to 4 ships on various coastal routes. It currently operates 2 ships, a LOLO on the west coast of the North Island, and a containership on the east coast. Strait Shipping has now built its fleet to three ships, two RORO ships dedicated to the

Wellington-Picton route, and an open-deck RORO "Kent" which links Wellington to Lyttelton and Nelson. The shipments of oil products and cement, and inter-island traffic, account for up to 80% of all coastal cargo.

8.3.3 International Operators

Since the enactment of Section 198 of the (1994) Maritime Transport Act it has been possible for owners of non-New Zealand flagged international trading ships to move intra-New Zealand cargo along the coast. For immigration purposes however, international ships and their crew must exit local waters before a 28 day period has elapsed. In essence the period spent by these ships in New Zealand waters is often only a quarter of the permitted period and the coastal cargo carried is primarily in goods that are less time sensitive.

8.4 DOMESTIC OPERATORS

New Zealand operated and crewed ships carrying freight fall into three categories: specialist bulk carriers, inter-island ferries and general freight ships. While the inter-island fleet has expanded, the coastal fleet has diminished over recent years, and New Zealand crewed ships no longer operate in international waters.

New Zealand Crewed Ships					
		1990	2000	2009	Owner/Operator
Coastal	Dry Bulk	Milburn Carrier II, Westport, Golden Bay	Milburn Carrier II, Westport, Golden Bay	Milburn Carrier II, Westport	Holcim
				Golden Bay	Golden Bay Cement
	Liquid Bulk	Amokura, Taiko, Kuaka, Kotuku, Tarihiko	Taiko, Kakariki	Kakariki, Torea	Silver Fern Shipping
				Awanuia	Ports of Auckland
	Inter-Island Ferries	Arahura, Aratika, Arahanga	Arahura, Aratere, Lynx	Arahura, Aratere, Kaitaki	Interislander (KiwiRail)
				Santa Regina, Monte Stello	Bluebridge (Strait Shipping)
	Liner	Spirit of Competition, Spirit of Freedom, Holmdale	Spirit of Competition, Spirit of Freedom, Spirit of Vision, Spirit of Enterprise	Spirit of Resolution, Spirit of Endurance	Pacifica Shipping
			Suilven, Straitsman	Kent	Strait Shipping
	General Cargo (tramp)			Anatoki	Coastal Bulk Shipping
				Rangitira	Black Robin Freighters
Trans-Tasman	Liner	Auckland Express, Canterbury Express, Union Rotoiti, Union Rotorua, Union Endeavour, New Zealand Mariner	ANZDL's* Rotoiti, Rotoma		
	Specialist and Bulk	Tasman Venture, Tasman Enterprise, Pioneer Tween, Union Auckland	P&O Nedlloyd's* Sydney Express, Wellington Express		
Pacific Island	Liner	Forum New Zealand II, Star Siranger (Forum Papua New Guinea)			
Offshore		Western Tide, Ragna Viking, Pacific Ariki	Offshore Solutions'* Pacific Chieftain		
Asian Trade		Aotea			
European Trade		New Zealand Pacific			
Research		James Cook, Rapuhia, Kaharoa	Tangaroa, Kaharoa	Tangaroa, Kaharoa	NIWA
Other			Sea Works'* Sea Ranger	Pacific Chieftan*, Sea Ranger*	Seaworks

Source: Shipping Industry Review Dec 2000, Rockpoint ** foreign flagged operator with NZ Crew*

The specifications of the current New Zealand crewed ships are presented in the following figure.

New Zealand Operated Ships								
	Name (flag if ex-NZ)	Build	Dwt	GRT	Length	Beam	Draught	Product
Silver Fern Shipping	Kakariki	1998	46724	27795	183	32.2	12.92	black oil
	Torea	2004	37069	25400	175.9	31.03	10.5	white oil
Ports of Auckland	Awanuia	2008	3900	2750	79.9	15	5.9	Bunker fuel
Holcim	Milburn Carrier II	1987	8465	6200	118.5	16.8		bulk cement
	Westport	1976	4081	3091	94.5	14.3		bulk cement
Golden Bay Cement	Golden Bay	1990	5782	3964	99.3	15.9		bulk cement
KiwiRail	Arahura	1983	2457	7583	148.4	20.5		rail ferry (RORO)
	Aratere	1998	3977	12596	150	20.5		rail ferry (RORO)
	Kaitaki (IRL)	1995	5794	22365	181.6	23.9		RORO ferry
Strait Shipping	Santa Regina (FRA)	1984	3750	13358	136	22.6		RORO ferry
	Monte Stello (FRA)	1979	3000	4788	126.5	21		RORO ferry
	Kent	1977	7000		123			RORO ferry (200TEU)
Pacifica Shipping	Spirit of Resolution (NL)							RORO cargo ship
	Spirit of Endurance	2008	7464		130			containership (445TEU)
Coastal Bulk Shipping	Anatoki	1992	447	171	51	8.4		bulk carrier
Black Robin Freighters	Rangatira	1970	710	300	49.7	8.3		cargo ship

Source: Shipping Industry Review Dec 2000, Rockpoint

The number of ships operating coastal services has remained relatively static over recent years. The 16 cargo ships currently operating in New Zealand waters can be divided into those operating on scheduled services and those on unscheduled, tramp services. Each caters for different customer needs and materially different cargo. This distinction is important given it is primarily the scheduled services catering for general trade which will drive a greater market share for coastal shipping of the national freight task.

8.5 DOMESTIC SERVICES

The following section presents an overview of scheduled domestic coastal services.

8.5.1 Scheduled Services

Of the 16 New Zealand coastal ships, eight operate on scheduled services, and of these we separate two categories; inter-island services (operating solely between Wellington and Picton), and those which serve other ports.

Inter-Island

Two operators and five ships ply the Wellington-Picton route, with a combined 7000+ annual sailings. This represents more than 90% of all scheduled coastal services:

- **Interislander (KiwiRail)**: The Interislander operates three RORO ships solely on the Wellington-Picton route. The Arahura and Aratere offer rail and road vehicle capability, while the largest, Kaitaki, caters only for vehicles. Collectively, these ships provide 5,700 Cook Strait freight and passenger crossings per year at an average of 7 - 8 sailings per day. In addition to an annual move of 2 million lane meters of freight, these ships carry 1 million passengers and 230,000 passenger accompanied vehicles. It is not possible to ascertain with total accuracy the correlation between 'lane meters' and total freight tonnage.
- **Strait Shipping / Bluebridge**: Strait Shipping operates two RORO ships on the Wellington-Picton route. The Santa Regina and Monte Stello provide 26 road freight and passenger return trips a week, or 1350 crossings annually.

Coastal Services

Coastal services represent New Zealand's core general freight coastal shipping capability, offering ~700 port-port links annually. These services are provided by the following two operators:

- **Pacifica Shipping**: Established in 1982, Pacifica has operated up to four ships on scheduled services in New Zealand. Currently Pacifica operates two ships; The Spirit of Resolution and the Spirit of Endurance. The Spirit of Resolution is a geared Lift On, Lift Off (LOLO) ship that plies a weekly round trip linking Lyttelton and Auckland (Onehunga) with northbound calls at Nelson and Port Taranaki. The Spirit of Endurance is a new ungeared 700 TEU containership which commenced operations in November 2008, with a weekly route servicing Lyttelton, Dunedin, Tauranga and Auckland through container terminals. While the Spirit of Resolution can carry general / breakbulk cargo, its principal cargo is containers; and
- **Strait Shipping**: In addition to the inter-island RORO ships, Strait Shipping operates the RORO ship Kent, on a weekly service linking Wellington-Nelson weekly and Wellington-Lyttelton twice weekly. Strait Shipping has recently reconfigured its Kent service, now connecting Lyttelton at the expense of calls to Nelson and Napier (and briefly Tauranga).

Industry plans and proposals for additional / expanded coastal services exist, although these require either an underwrite, or at least a firm expectation, of volumes.

New Zealand Coastal Shipping Schedules

Shipping Lines		Frequency Circuit							
Pacifica	East Coast	7	POE	TRG	AKL	LYT	POE		
		7	0	2	4	6	7		
		1.0	Sa	Mo	We	Fr	Sa		
Pacifica	West Coast	7	ONE	LYT	NSN	NPL	ONE		
		7	0	3	5	6	7		
		1.0	Th	Su	Tu	We	Th		
Strait Shipping	East Coast	7	WLG	NSN	WGN	LYT	WGN	LYT	WGN
		7	0	1	2	3	4	5	7
		1.0	Mo	Tu	We	Th	Fr	Sa	Mo
Strait Shipping	Bluebridge	0.25	WLG	MLB	WLG				
		0.5	0	0.25	0.5				
		2.0	All	All	All				
KiwiRail	Interislander	0.18	WLG	MLB	WLG				
		0.5	0	0.25	0.5				
		3.0	All	All	All				

8.5.2 Unscheduled (Tramp) Services

Tramp services do not run to a formal schedule, but they typically still offer regular services where there is trade. Usually tramp services carry product requiring special or dedicated facilities. We have considered two categories for tramp services; those dedicated to a single product group, and those catering for general trades.

Dedicated Services

Several industries require dedicated, specialist ship(s) as part of their core logistical supply chain, the providers of these services in New Zealand include:

- **Silver Fern Shipping**: Owned by ASP Ships, Silver Fern Shipping operates exclusively for the four international oil company shareholders of the Marsden Point oil refinery. Silver Fern has two double hulled tankers; Kakariki and Torea that distribute 2.32 million tonnes of oil products annually from Marsden Point to ten ports around New Zealand. Each port possesses dedicated offload and storage facilities feeding into road tanker fleets that distribute product to regional wholesale and retail outlets;
- **Holcim Cement**: Holcim operates the Milburn Carrier II (7,700 tonne) and MV Westport (3,700 tonne), which link its Westport cement processing facility with eight ports around New Zealand. Holcim is currently considering a major new manufacturing operation at

Weston, North Otago. Should this plant go ahead, Holcim proposes to replace at least one of its current ships with a 12,000 tonne carrier; and

- **Golden Bay Cement**: Golden Bay operates a 4,000 tonne bulk carrier, the MV Golden Bay that makes 120 voyages annually from its manufacturing plant at Portland (near Whangarei) to five New Zealand discharge ports. In addition, a 2,000 tonne, pneumatic self-discharging, barge undertakes about 100 voyages for Golden Bay. At the time of writing Golden Bay was considering a replacement ship, although this is on hold due to the current downturn in cement production. The approximate total of bulk cement carried by Golden Bay and Holcim via coastal shipping annually is 1.44 million tonnes.

General Cargo

Several operators provide coastal ships to carry spot or one-off cargo:

- **Black Robin Freighters**: Black Robin employs the 520 tonne Rangitira on the Chatham Islands trade predominantly linking with Napier and Timaru. The Rangitira handles livestock, general dry goods and petroleum products. This service is currently under review due to a MAF supported move towards larger livestock movements under the Farm Sustainability programme. At 38 years old Rangitira is slow and overdue for replacement. Black Robin has purchased a more modern ship, the Jaguar, which is currently operating in the Caribbean;
- **Sea-Tow Limited**: Sea-Tow, now owned by Pacific Bay Shipping, it is primarily engaged in the operation of tugs and barges in coastal and international voyages covering Australia, the South West Pacific and South East Asia. Sea-Tow operations within New Zealand are minimal, extending to occasional coal shipments from the West Coast of New Zealand and 'spot' project cargo movements; and
- **Coastal Bulk Shipping Limited**: Coastal Bulk Shipping has been operating the 700 tonne bulk carrier Anatoki since 2008, carrying bulk shipments of wheat, dolomite, cement and fertiliser. Anatoki attracted NZTA funding, under the domestic sea freight development fund, to increase its lifting capacity with the addition of ship-side sponsons. Whilst originally designated at 48.6 meters, modifications have been made to reduce its official length below 45 meters thus exempting the ship from SOLAS and MARPOL regulations, and reducing required crew numbers from seven to four.

Note: This review has not considered ships engaged in near shore trades (such as to Waiheke, Great Barrier Island, Marlborough Sounds and Stewart Islands), nor ships involved in survey and research operations (such as NIWA).

8.5.3 National Overview

The following figure illustrates the scheduled service routes around New Zealand, highlighting the relative intensity of activities and excluding bulk and inter-island traffic. The importance of the Auckland-Lyttelton route is clearly emphasised representing the repositioning of import cargo and the distribution of domestic manufactured product from Auckland to Christchurch, as the South Island's key distribution centre. The flow from Nelson to Wellington largely represents the repositioning of export cargo and reverse flows for empty containers. Note the volumes in this figure exclude transhipment flows.

New Zealand
Coastal Shipping Intensity

8.5.4 Domestic Service Changes

Similar to international shipping services, coastal shipping schedules have also recently been amended. Examples include:

- Nov08: Pacifica Shipping dropping its earlier East Coast service and reconfiguration of its weekly West Coast service to visit Onehunga, Lyttelton, Nelson, New Plymouth;
- Nov08: Pacifica Shipping introducing its Spirit of Endurance containership offering a weekly coastal service between Auckland, Tauranga, Lyttelton and Port Otago. This coincides with Pacifica ceasing operations with its Spirit of Competition ship; and
- Nov08 Strait Shipping changing its service pattern for the ship Kent reducing calls to Nelson, dropping calls at Napier and picking up two of the previous three weekly slots on the Wellington – Lyttelton run disbanded by Pacifica.

8.6 COMPETITIVE POSITION

The NFDS reported that coastal shipping currently carries 4.2 million tonnes annually. This represents an estimated 1.9% of the national freight task, or 15% measured by tonne-km. Coastal shipping is principally represented by the trade between the North and South Island and in specialised bulk commodities, such as petroleum and cement. Analysis conducted in the 'National Freight Task' Section of this report revises the estimate of general cargo carried by coastal shipping to 0.865 million tonnes (vs. NFDS was 0.982). Coastal shipping has a 38% share of total trade flows between Auckland to Christchurch, and another 13% of the market between Wellington to Nelson. In no other market does coastal shipping's share exceed 8%.

Coastal shipping is the preferred option for many shippers and is able to quickly introduce new capacity to meet demand. Further assessment of shipper perceptions is provided in Section 13, titled "Results of Interview Programme".

8.6.1 Strengths

Shipping is particularly suited to bulky and heavy products although there are currently limited growth opportunities for coastal shipping's key cargo of petroleum and cement. With the oceans uncongested, additional capacity via new ships can be readily added. As we discussed in Section 4.6.2, berth occupancy also suggests additional ships and throughput could be accommodated with little incremental port investment.

The configuration of ships, particularly break-bulk or RORO ships, is suited to non-conventional cargo, as load dispositions are generally flexible. Non conventional cargo in coastal ships includes oversized or overweight goods which cannot be easily accommodated / permitted on the road and rail networks. Typically these are specifc cargo for major civil projects, such as dairy factories, wind or hydro projects.

Coastal shipping offers a significant pricing advantage over road and rail, with the lowest transit costs in cents/tonne-km. However, this advantage needs to be balanced against higher collection, port and distribution costs, given most journeys also require a road or rail leg.

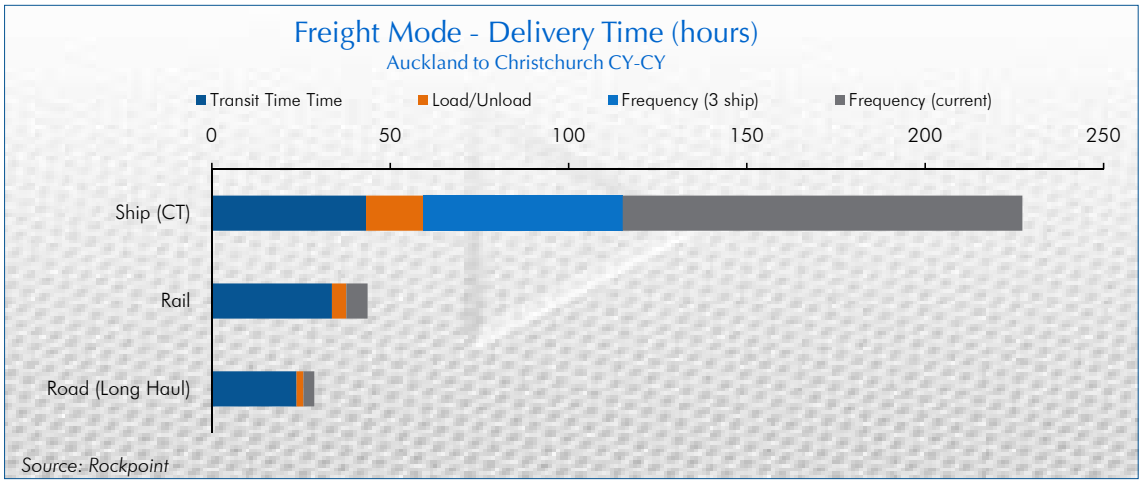
With rising concerns around the impact of transport externalities, coastal shipping offers potential benefits via reduced CO2 and other greenhouse gas emissions, lower congestion and fewer accidents.

8.6.2 Weaknesses

Coastal shipping's low market share is indicative of disadvantages apparent in the freight mode.

The largest impediment to growth is delivery time and service frequency. Ships travel more slowly than trucks or trains, with transit time for Auckland to Christchurch being more than 40

hours by ship against 24 hours by truck and approximately 36 hours by train. Furthermore, additional time is required for cargo aggregation and exchange due to fewer, larger ships operating to fewer destinations. Except for inter-island ferry services and the two weekly Wellington-Lyttelton service, all scheduled domestic services are weekly.



Coastal shipping also requires a more complex logistics chain. While one truck can collect and deliver the same goods, ships (and to lesser extent trains) require intermodal solutions with a road component linking to a port or railhead. Furthermore, the documentation required by ships and ports is more complex, in part because ports handle international cargo which demands secure (bonded) areas for customs and bio-security.

The multiple physical moves required by coastal shipping pose a risk of loss or damage to freight.

Finally, in part due to the above factors, coastal shipping is perceived as an outdated and more complex freight mode. Accordingly, changing perceptions via marketing and simplifying transaction processes are important considerations in growing market share.

8.7 KEY OBSERVATIONS / CONCLUSIONS

The following presents key observations and conclusions from our review of operational characteristics for domestic shipping:

- New Zealand has always hosted a domestic shipping industry although it is now completely reliant on international shipping services for its international trade.
- The New Zealand commercial freight fleet is very small, with only 16 domestic commercial ships exceeding 45m.
- Inter-island ferry service capacity has expanded, with five RORO ships (two of which are rail capable) providing >7000 annual crossings.
- Dedicated coastal ships provide services for key bulk trades, including petroleum and cement.
- The coastal fleet catering for general cargo has diminished over recent years, with only three providing scheduled general freight services and two ships providing tramp services.
- Improvements in efficiency and price competitiveness have seen road transport gain 70% market share of freight tonne-kilometres, at the expense of rail and more particularly coastal shipping.
- Other than core inter-island ferry services, only seven ports receive scheduled coastal services, of which four receive a single weekly service.
- Domestic coastal operators cannot compete against the marginal pricing of international shipping lines, although do offer a more reliable service.
- The development of hub-and-feeder structures and port consolidation will provide a material opportunity for coastal shipping.

9 OPERATIONAL CHARACTERISTICS - RAIL

9.1 INTRODUCTION

Rail, is the closest competitor to coastal shipping in the movement of long haul freight, and possesses distinct industry dynamics shaping the relative pricing and capability of its service. The provision of rail services is particularly constrained by the age of rolling stock, legacy infrastructure issues, and by reported customer care deficiencies in the movement of general freight for smaller customers. Where rail places the greatest competitive pressure on coastal shipping is in the market for high volume bulk freight and long distance general cargo. This is demonstrated by the Pike River Coal withdrawal from a coastal shipping operation to Port Taranaki in favour of a rail service to Lyttelton in 2007, and the significant market share of the two modes in general freight between Auckland and Canterbury. In other cases rail may serve to complement coastal shipping through the connection of production from inland regions to ports.

9.2 A HISTORICAL PERSPECTIVE

In the late 19th and early 20th century the construction of New Zealand's rail network was fundamental to the country's economic development and opened up inland regions to greater settlement and trade.

In the early days, rail was primarily competing against coastal shipping, providing a faster, more regular service, combined with a capacity to handle a wide range of goods. By the 1930's, road transport proved to be yet more flexible, to such a degree that the Government sought to protect rail by limiting the activities of road transport via the Transport Licensing Act of 1931. Whilst regulation limited competition for rail, the road-transport industry nevertheless expanded considerably. In response to these increasing pressures from road transport, the Government progressively eased the restrictions on distances trucks could operate, from 30 miles in 1936, to 40 miles in 1960 and finally to 150 km in 1977. Faced with the economic reality, and the sheer difficulty of policing them, distance restrictions were removed completely by 1986.

In the 1980's, it was apparent that rail was a significant financial burden on the government. As a government department it was required to fulfil roles as a passenger and freight operator, but also a training institution and a major source of employment. This was addressed in 1990, when the New Zealand Railways Department was corporatised, and operations were progressively streamlined for sale. In September 1993, following a bidding process, the company was sold to Tranz Rail Holdings with the principal shareholders of Wisconsin Central Transportation Corporation, Berkshire Partners LLC and Fay Richwhite & Company. The company was subsequently listed on the New Zealand stock exchange in 1996. While under private ownership freight volumes increased and reported profitability surged, it became apparent that this primarily reflected a focus on deep operational cost-cutting and the neglect of capital investment.

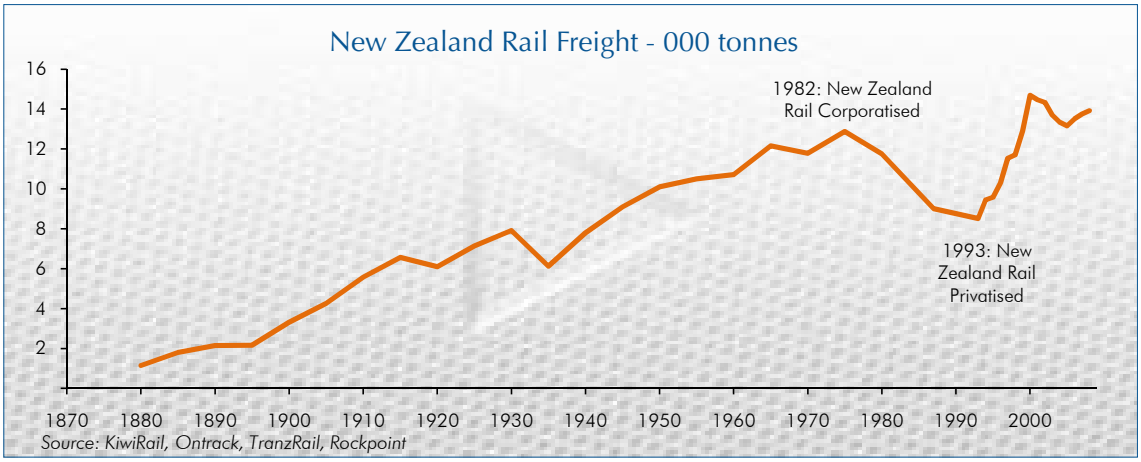
As its debt burden increased, TranzRail came close to insolvency until Australian transport operator, Toll Holdings, made a successful takeover offer in 2003. As part of this deal, the network assets were sold to the Government for $1 subject to a commitment to invest $200 million in track repairs and improvements. The stresses remained between Ontrack (the government network operator) and Toll Holdings over Track Access Charges ("TAC"). These were finally resolved when the Government acquired Toll's interest in 2008.

9.3 OWNERSHIP AND MANAGEMENT

On 1 July 2008 the New Zealand Government repurchased the country's rail and ferry operating businesses from Toll Holdings Ltd for $675 million. Since the ownership transfer on 1st October 2008 these commercial entities, in combination with the government owned rail network provider Ontrack, have run under an integrated business entity; the New Zealand Rail Corporation, trading as the KiwiRail Group ("KiwiRail"). KiwiRail, in its entirety, is now responsible for the operation of rail freight and passenger services, the management and development of the rail infrastructure and the operation of passenger and freight ferry services. KiwiRail is both a State Owned Enterprise and a statutory corporation. KiwiRail is accountable to the Ministry of Transport under current Minister Steven Joyce. The current Chief Executive of KiwiRail is Jim Quinn and Rt. Hon Jim Bolger is Chair of the Board.

9.4 SCALE OF ACTIVITY

In the financial year ending December 2008, approximately 13.92 million tonnes of freight moved by rail, for a total of 4,013 million tonne-km. Of the national freight task, this constitutes 6% of total freight tonnes (compared to an estimated 30% in 1980) and 15% of total tonne-km. Rail's greater proportion of total tonne kilometres is indicative of the high volume, low cost, long-distance freight suited to rail. Agricultural products (especially logs, wood, milk and dairy products) and coal constitute about 75% of current rail freight in tonnage terms. KiwiRail perceives itself as a wholesaler of freight services and they actively encourage customers with less than a wagon load of trade to deal directly with intermodal freight providers such as Toll Tranzlink. Nationally rail moves over 70% of coal volumes, and 50% of export dairy. Of total tonne kilometre rail movements, 42% is bulk (up to 400 km), 26% is export goods (up to 400 km), 32% is domestic (300-1200 km). The average freight haul on rail is 283 km, compared to 118 km for road. The characteristics and cargo handling requirements of the two different modes make haulage distance a defining factor. However, rail can also compete effectively in short haul trades given significant volume and rail sidings. The link between City / Depot and the Port of Lyttelton is evidence of this.



9.5 KEY TRADES

9.5.1 The East Coast Main Trunk Line

The East Coast Main Trunk Line (incorporating a portion of the NIMT from Auckland to Hamilton) is the country's busiest rail freight corridor. Inbound and outbound container traffic totals 170,000 TEU per annum. The service links Port of Tauranga to its inland container terminal, MetroPort, in Auckland's industrial south. The number of return services plying the route between MetroPort and Tauranga varies between 5 – 8 per day, for an average transit of 3,270 TEU per week (based on the 2007 financial year). In the current economic environment, just 6.5 return services travel a day. In addition to container traffic, raw materials for steel production and finished steel products are freighted to and from Glenbrook and Port of Tauranga. Imported coal is railed from Port of Tauranga to Genesis Energy's Huntly power station. Smaller volumes of coal similarly move on this line from Huntly mines and forestry products from the Eastern Bay of Plenty.

9.5.2 The Main Trunk Line

The Main Trunk Line covers the rail route from Auckland to Wellington in the North Island and Picton to Christchurch in the South Island, with rail enabled Inter-Island ferries (the Arahura and Aratere) linking Wellington and Picton. 4 - 5 return freight services per day travel the Picton - Christchurch segment of the line, predominantly with domestic general cargo in containers but also with small volumes of steel, urea, grain and export meat traffic for Auckland and Tauranga. 4 - 5 return freight services a day travel the North Island segment between Auckland and Wellington with again mostly general cargo destined for the south and some forestry products.

9.5.3 Lower North Island Line

The main Lower North Island Line links the Hawkes Bay with Manawatu and Taranaki. The line provides dairy production in the east with access to the Fonterra's Whareroa plant at Hawera in the west and export trade access to both Port of Napier and Port Taranaki. The milk train season peaks between September and December with 5-7 return services operating daily. Distribution centres for other products centre around Palmerston North in the middle of the rail network.

9.5.4 The Midland Line

The Midland line crosses the South Island from the West Coast to Christchurch. Up to 8 coal trains per day use the line along with two general cargo / other bulk freight trains (milk, logs, finished products, domestic coal) for a total of 10 freight services in a 24 hour period along with one passenger train. Coal from Solid Energy, and more recently Pike River, railed to Port of Lyttelton for export, is the key trade on the line. General cargo services only operate as far as Reefton, whereas coal trains travel beyond to Westport and the northern Buller region. The lines traverse rugged terrain and are subject to extreme weather conditions.

9.5.5 The Main South Line

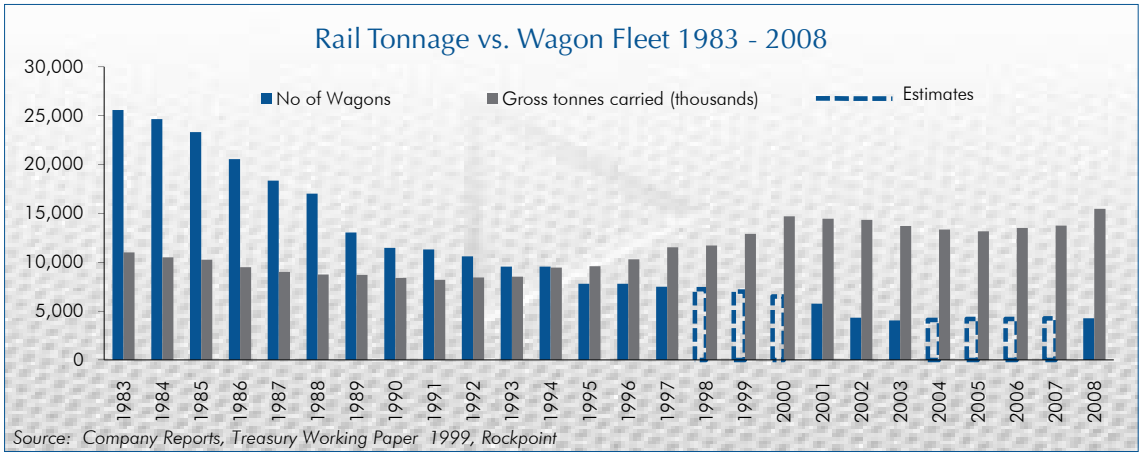
The Main South Line extends from Christchurch to Otago and Southland. Five trains a day travel between Christchurch and Dunedin, four of which carry on to Invercargill. 70% of traffic on this line is related to international movements, with most of the southbound movements carrying general freight and empty containers, and the northbound trains hauling bulk commodities like milk powder, meat, timber and coal. Volumes on the line are broadly static. One train carries retail products from Christchurch to Dunedin and one from Christchurch to Invercargill. A lower standard branch line connects mines at Ohai to Invercargill and delivers coal to Temuka for onward delivery to Clandeboye and other industrial customers in the South Island.

9.5.6 Other Lines

Outside of the key freight routes identified, the New Zealand rail network spans north to Whangarei and Dargaville, east to incorporate the Wairarapa and Gisborne, and west to include the Okahukura to Stratford line. These sections of track carry comparatively little freight volume and are not considered core to KiwiRail's freight operations.

9.6 CAPACITIES AND CONSTRAINTS - ROLLING STOCK

KiwiRail's current wagon and locomotive fleet is identified by management as a key constraint to the potential expansion of rail business. Rolling stock limitations, in terms of fleet size, age and technical characteristics, all reduce the competitiveness of rail against service offerings from road and shipping. The need for rolling stock re-investment is most keenly felt during seasonal peaks, when demand for services exceeds wagon and locomotive supply. The current rolling stock shortage problem is compounded by long lead times in procurement, particularly for locomotives.



KiwiRail's wagon fleet totals 4,273, of which about 96% are currently available for use. The average age of a wagon is between 25-30 years and 83% of wagons are limited by a 14 tonne axle load. The combination of these design and age restraints place a greater restriction on rail service offerings than New Zealand's 1,067mm (narrow) gauge rail network, which has a current maximum axle tonne load of 18 tonnes. With regard to design, wagon characteristics vary by freight type. Of the total KiwiRail fleet, 55% are flat container wagons, and the remainder are general freight box carts and specialised wagons for the carriage of bulk products like coal, logs, milk, refrigerated goods and automobiles. 100 new container wagons with 25 tonne axle load capacity were added to the fleet in late 2008. These are used primarily on the Port of Tauranga – MetroPort service.

Although current freight volume and rail network constraints might negate the need for wagons with axle loads greater than 18 tonnes, as the busiest segments of track are upgraded, this will move to 22.5 or 25 tonne maximum axle loads. Internationally, rail standards have shifted to 22.5 and 25 tonne axle loads and longer wagon bases than the 14 tonne axle load wagons currently in service. These developments have been necessary with increases in global average container weights and sizes. In New Zealand the greater weight capacity is most applicable for heavy commodities in the dairy and meat export trade.

KiwiRail Wagon Fleet

Wagon Type	Number	Average Age	Average Axle Load	Availability
Container flat wagons	2263	28	14T	95%
New Container flat wagons	100	0	20T	100%
Box	467	30	14T	97%
Logs	356	30	14T	98%
Coal	330	10	18T	96%
Milk tanker	66	18	18T	100%
Flat general	130	35	14T	95%
Infrastructure	179	30	14T	78%
4 Wheelers	144	35	12T	100%
Canopy	142	22	14T	95%
Reefer	36	20	18T	88%
Grain / Fertilizer	39	23	18T	95%
Auto	21	25	14T	90%
Total:	**4273**	**26.40**		

Source: KiwiRail

KiwiRail owns and runs 149 locomotives, the youngest in the fleet is 20 years old and the average age is 36 years old. Most of the high horsepower diesel locomotives (DXB and variants) are used on dedicated freight routes to optimise capacity, such as Auckland to Tauranga

line, the Midland Line and North Island bulk milk operation. EF class electric trains run from Palmerston North to Te Rapa, and connect with diesel locomotives at either end. In March 2009 the National government committed $75 million to buy 20 new Chinese-constructed diesel locomotives for delivery in April 2010 and August 2010. The new locomotives on order are rated at 18.5 tonne axle loads and will improve the efficiency of rail's current service offerings. On present configurations however, they will likely be too high and heavy for the South Island network, where bridge constraints are a key factor.

KiwiRail Locomotive Fleet

Class	Number	Weight	Power	Traction	Built	Upgraded
EF	17	108t	4000hp	256kN	1988	
DXR	2	104t	3000hp	280kN	1972-1976	1993 & 2006
DXB	15	103t	2600hp	280kN	1972-1976	2002 - 2008
DX	21	100t	2600hp	185kN	1972-1976	
DFM-DFB	12	87t	2450hp	240kN	1980	1998
DFT	18	87t	2450hp	175kN	1980	1992-1997
DQ	4	87t	1500hp	175kN	1968	1997
DC	54	82t	1500hp	160kN	1965	1978-1983
DBR	6	68t	950hp	85kN	1965	1980-1982
Total	**149**					

Source: KiwiRail

*Note: Excludes 20 new locomotives on order for delivery in April 2010, August 2010

9.7 FREIGHT GROWTH

9.7.1 Projections

The 2008 New Zealand Transport Strategy ("NZTS") sets a target of increasing rail's freight market share to 25% by 2040, from current levels of 15%, in tonne-km. The NFDS forecasts overall freight volume will increase by 75% in the next 20 years, implying rail freight will need to grow by 160% to nearly 12 billion net tonne kilometres to meet the NZTS target over this time period. For the realisation of such a modal shift, significant changes will need to occur within rail that improve upon the current competitive strengths and undoubtedly greater investment from the government is a core caveat.

Rail particularly requires more competitive capacity at critical transit times, both with improved speed, but primarily reliability. Improved connectivity with customers, through the likes of a spur line to Marsden Point and changes to the ways in which freight is moved between Temuka and Clandeboye will further expand rail's potential market base, although the provision of these developments is uncertain given the current business case. Additional heartland terminals at strategic geographic locations could also encourage freight to switch from road to rail and ensure transfers are streamlined for time and cost. New Zealand's maturing forests provide the most obvious market opportunity for rail to expand operations on lines in the Bay of Plenty and Northland. However, without significant investment from Government it is unlikely rail will capture market share from road or coastal shipping and meet targets outlined in the 2008 Transport Strategy.

9.7.2 Key Customers

Top 10 KiwiRail Freight Customers*	
1	Toll Tranzlink
2	Solid Energy
3	Fonterra
4	Port of Tauranga
5	Maersk
6	Mainfreight Group
7	Hamburg Sud
8	New Zealand Milk Products
9	NZ Steel
10	Kaingaroa Timberlands

Source: KiwiRail

* Customers ranked by percentage of total revenue

9.8 COMPETITIVE POSITION

Rail is well suited to the carriage of high volumes of heavy bulky cargo where it can develop optimised logistics chains with these customers. In the market for general containerised freight, rail is better suited to compete in the 'Stock Transfer' portion of the market, rather than fitting into a 'Just in Time' model.

9.8.1 Strengths

- On dedicated freight corridors rail can consistently deliver larger consignments of heavier freight than road;
- Rail's core market is in the transport of high volume bulk products over longer distances. Coal, milk and timber are readily identifiable examples of compatible commodities where rail enjoys relative success in establishing long term relationships with customers;
- Multi-year contracts enable rail to implement operating models which optimise asset use and provide the most efficient outcome for all parties. The settlement of rail ownership has also provided confidence for selected shippers to make multi-year freight commitments; and
- Cost efficiency is regularly cited as a core competitive strength of rail, but this is contentious given the significant government subsidies required to maintain the national network and keep rolling stock at minimal operational standards.

9.8.2 Weaknesses

- In the market for general containerised freight, rail asserts it is more readily suited to compete in the 'Stock Transfer' portion of the market, rather than fitting to a 'Just in time' model (KiwiRail briefing to incoming ministers). This constrains rail's customer base;
- Time sensitivities are a key issue for rail, as evident by the current role that rail performs in the supply chain of some of its larger customers. Toll Tranz Link, KiwiRail's largest customer by revenue, offers door to door solutions for their client base and operates a fleet of trucks. Toll utilises intermodal solutions that incorporate rail when it makes economic sense to do so. This is naturally for less time sensitive, long haul trade, stock repositioning and the connection of inland ports to sea ports;
- For door-to-door services, logistics providers offer a 24 hour service guarantee for intra-island freight as an industry standard. Rail struggles to meet this timeline given the limits of train schedules, the need for cargo aggregation and handling times in intermodal connections. For door-to-door freight delivery rail relies on intermodal operators which necessitate double handling loads. Such freight solutions only become cost competitive over longer distances or where there is high volume;
- In the interviews conducted as part of this study, feedback confirmed the focus of rail on businesses with scale. Larger customers of rail were generally pleased with the level of

service they received, whilst smaller to mid-sized operators criticised the lack of customer care provided and an unwillingness on the part of KiwiRail to tailor solutions to their individual freight needs. Deficiencies were identified particularly in areas of freight tracking and product care;

- KiwiRail's IT systems lag those employed by road by a considerable margin, and this impacts the service quality offered to clients. Current legacy systems reportedly associate wagons with locomotive power, and containers with wagons. We understand however that there is significant manual input required. Such factors in the general freight market can be seen to have a real effect. The Auckland – Christchurch general freight route for instance is key for the profitability of rail but, as the continued growth of the commercial vehicle traffic on the Interlslander indicates, rail is struggling to provide a competitive offering across these different time gates and origin / destination pairs. It is noted however, that for a significant component of trade, current IT systems are considered sufficient. A number of interviewed parties cited instances of lost containers on the rail network and in cases a need to dispatch their own personnel to locate them; and
- Further assessment of shipper perceptions is provided in Section 13 "Results of Interview Programme".

9.9 KEY OBSERVATIONS / CONCLUSIONS

The following presents key observations and conclusions from our review of rail operations:

- Key Competitor to Coastal Shipping: Rail is the closest competitor to coastal shipping in the movement of long haul freight. Rail moved 13.93 million tonnes of freight for the 2008 financial year.
- Market Focus: KiwiRail actively encourages smaller customers with less than wagon load / LCL to deal directly with intermodal freight providers. In addition, rail is effectively reliant on third parties for provision of intermodal connections and warehousing services.
- Customer Base: Rail's fortunes are tied substantially to the wellbeing of New Zealand's primary sector and the need for inland terminal connections to ports. Rail's greater proportion of freight in tonne kilometres is indicative of the high volume, low cost, long-distance freight suited to it. Agricultural products (especially logs, wood, milk and dairy products) and coal constitute about 75% of current rail freight in tonnage terms. Rail can also offer profitable shorter haul services given appropriate volume and demand frequency.
- Key Trade Routes: Key trade routes for rail include the Metroport connection from South Auckland to Port of Tauranga, the main trunk general freight line from Auckland to Christchurch and the coal route from West Coast to Christchurch.
- Economic Considerations: Historically, rail has generated an insufficient return on capital invested. In the decade following privatisation, a programme of deferred capital maintenance was implemented as a means of improving profitability. This was not viable long term and since 2005, the government through Ontrack, has been called upon to invest increasing amounts in network upgrades to maintain and improve service capacity.
- Capacities and Constraints: Rail operations are limited by the age, design and condition of rolling stock as well as characteristics of the country's underlying network infrastructure. Rolling stock is the primary constraint at present with a significant portion of KiwiRail's wagon fleet limited to 14 tonne axle loads.
- Competitive Position: Rail offers the benefits of scale and operates well in the provision of freight services on dedicated corridors. Rail suffers from a lack of service flexibility and perceived customer care in the delivery of smaller, time sensitive freight. Rail relies upon intermodal connections provided by third parties for door-to-door deliveries.
- Freight Growth Projections: Freight growth forecasts for rail are considerable given projected increases in the national freight task and the targeted market share for rail by the NZTS. Potential growth targeted has significant implications for network infrastructure.

10 OPERATIONAL CHARACTERISTICS - ROAD

10.1 INTRODUCTION

Road is the dominant mode for freight and passenger transport in New Zealand. The NFDS estimates that road carries 92% of freight by tonnes and 70% of freight by tonne-kilometres. Road is forecast to remain the dominant mode of transport for the foreseeable future. It is also an essential intermodal component for most rail, coastal and international shipping movements. Road connections carry freight to and from ports and railheads for long haul journeys by ship or train. For movements to and from airports road is used exclusively.

10.2 INDUSTRY STRUCTURE

The industry structure of road transport in New Zealand is typical of that of most domestic industries, being predominately made up of small locally based companies. Of a total number of 5,100 businesses in the road transport industry, 83.9% employ five or less staff and 95.3% employ less than 20 people. These figures compare closely to the national average, with 97% of all businesses employing less than 20 staff. In New Zealand only 85 businesses or 1.67% of all trucking businesses employ 50 people or more. However, of the total industry workforce, these larger companies comprise 11,170 employees or 44.26% of the total 25,240 employed in the industry.

Several of the transport companies interviewed believed that there will be a shake-out of medium sized firms in the road transport industry in the current economic downturn and that the industry would come out of the recession "leaner and meaner" than before. However, given the persistence of unfavourable industry dynamics, including a flat industry structure and relatively low barriers to market entry, the dynamics of the industry are unlikely to change rapidly and intense competition in road transport is expected to continue. Increasing industry compliance costs may serve to provide a greater hurdle to entry for new entrant firms.

The results of the Operator Comparison Report undertaken by The University of Waikato in 2006 for the Road Transport Forum demonstrate the low average profitability achieved by owner drivers and small truck fleet owners.

Operator Comparison

	Metropolitan	Intercity	Rural North	Rural South	General
Gross Income per Truck					
Owner Driver	139,313	288,713	108,934	85,631	140,000
Small Fleet	104,301	275,000	203,846	169,991	
Meduim / Large Fleet	139,089	264,637	199,100	173,836	223,090
Industry	115,500	279,377	198,472	156,498	193,808
Return on Assets					
Owner Driver	2.0%	-0.9%	-3.1%	-6.1%	6.6%
Small Fleet	15.2%	11.4%	30.0%	-5.9%	
Medium / Large Fleet	8.2%	15.3%	-2.2%	9.0%	5.7%
Industry	8.2%	8.1%	-1.2%	-4.0%	6.1%

Source: Road Transport Forum NZ 2006 Operator Comparison Report

Larger companies in the sector are increasingly positioning themselves as providers of comprehensive logistics services in an attempt to differentiate product offerings from smaller firms and capture more of the value chain. These services may include inbound freight management, customs and freight consolidation, warehousing, order fulfilment, and distribution and management of outbound freight to its client's customers. They seek to utilise the cheapest

transport mode that meets the service standards agreed with clients, including rail and coastal shipping where appropriate. In the current climate, customers are increasingly seeking lower cost alternatives, and in some instances may be prepared to trade these off against the faster transit times offered by road transport.

10.3 SCALE OF ACTIVITY

The NFDS estimated that the total freight task in New Zealand in 2006-07 was 225.8 million tonnes and 26,700 million tonne-km per annum. Of this, approximately 92% of tonnage is carried by road, falling to a market share of approximately 70% on a tonne-km basis. These statistics reflect the relative advantages of rail and coastal shipping over road for the carriage of heavier products over longer distances. Rail and shipping hold a greater market share of longer distance movements and for some movements, for example between Auckland and Christchurch, their combined market share is estimated to be in excess of 70%.

In assessing road volumes it is imperative to remember that freight transport movements, both light and heavy, are only a small portion of overall vehicle numbers and vehicle kilometres travelled. The permanent count sites on the State Highway network record the highest flows of Heavy Commercial Vehicles ("HCV") as set out in the following figure for March 2009. HCV shares vary from 4.5% to 21.2%, with the average of 9.7%.

Busiest Roads for Heavy Vehicles Mar 2009

Region(1)	State Highway	Location	HCVs	Total Daily Flow All Vehicles	Percentage
1	1N	Drury-SB	2,539	29,117	8.70%
1	1N	Drury-NB	2,427	29,520	8.20%
2	1N	Taupiri	2,150	21,447	10.00%
1	1N	Bombay-SB	2,017	17,926	11.30%
1	1N	Bombay-NB	2,006	18,245	11.00%
2	1N	Karapiro	1,974	15,230	13.00%
2	2	Maungatawhiri	1,696	13,118	12.90%
4	1N	Pukerua Bay	1,582	23,653	6.70%
5	1S	Evans St Timaru	1,578	20,900	7.60%
3	1N	Ohau	1,534	15,318	10.00%
2	1N	Lichfield	1,497	9,202	16.30%
3	50	Taradale	1,486	22,081	6.70%
5	1S	Dunsandel	1,479	10,473	14.10%
3	1N	Sanson	1,475	12,324	12.00%
4	6	Stoke	1,365	20,881	6.50%
2	30	Te Nga	1,352	17,655	7.70%
2	29	Kaimai	1,245	9,361	13.30%
2	2	Te Puna	1,216	16,278	7.50%
1	1N	Whangarei	1,015	22,761	4.50%
5	1S	St Andrews	935	6,024	15.50%
3	1N	Hihitahi	923	4,582	20.10%
2	27	Kaihere	892	4,216	21.20%
6	1S	Milton	888	6,608	13.40%
3	3	Manawatu Gorge	869	7,153	12.10%

Source: NZTA

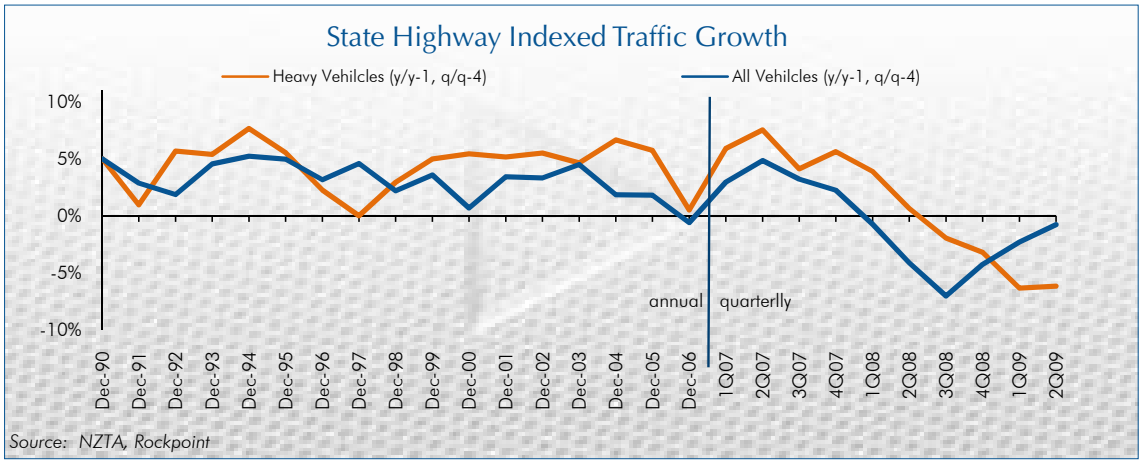
Notes (1) Regions are as follows:-

1. Northland/Auckland
2. Waikato/Bay of Plenty
3. Taranaki, Manawatu-Wanganui, Hawkes Bay and Gisborne
4. Wellington, Nelson, Marlborough and Tasman
5. Canterbury and West Coast
6. Otago and Southland

Of the sites set out in the figure above, in only two do heavy vehicles represent more than 20% of the total traffic flow and these are on the most lightly trafficked roads. What this data also demonstrates is the importance of SH1, particularly in the North Island, for the movement of heavy vehicles.

There are approximately 3.2 million vehicles in New Zealand of which 2.96 million are light passenger or commercial vehicles. There are only 115,200 trucks, defined as goods vehicles weighing more than 3.5 tonnes, making up 3.6% of the total. Goods vans, trucks and utilities weighing under 3.5 tonnes are defined as light commercial. New Zealanders' own approximately 694 vehicles per 1,000 people, placing the country in the top three globally for per capita vehicle ownership. Of this figure, 96% are light passenger vehicles that account for approximately 80% of total vehicle kilometres travelled.

After many years of steady growth in both heavy transport and private vehicle traffic, transport volumes across the state highway network abated in 2007, before declining steadily during 2008 and 2009 YTD.



'All vehicle' traffic volumes declined earlier than those for heavy vehicles in 2007 and the trend has continued throughout 2008 into 2009. National volumes for 'all vehicles' were down 1.6% in May 2009 compared with May 2008. The few regions that did record increases in traffic were Taranaki, Manawatu-Wanganui, Hawkes Bay, Gisborne, Otago and Southland. All other regions experienced reductions in activity.

With regard to heavy transport vehicles, volumes declined significantly in all regions. The biggest fall for the year to May 2009 was in Northland - Auckland traffic, which experienced a 14.8% decrease. National volumes in aggregate declined 10.3%.

Over time it is expected that vehicle volumes will recover to long term growth rates. Long term growth in the freight task has typically been in excess of GDP growth, both in New Zealand and abroad. The Rockpoint Port Sector Report noted that Merchandise Trade Growth for New Zealand on a percentage annual compound basis was 1.5x GDP growth for the period 1950 – 1980, 1.9x for 1980 – 2000 and 1.4x for 2000 – 2006. In the NFDS (2008) the domestic carriage of New Zealand commodities was expected to increase by 70-75% in tonnes lifted and tonne-km over the period 2006/07 to 2031. Similar predictions are observed in MoT internal forecasts and also by Transport Engineering Research New Zealand, albeit for slightly different timeframes.

10.4 CONGESTION

Significant portions of the State Highway network suffer from congestion at current traffic volumes. As noted in the NFDS, whilst congestion largely reflects higher flows of passenger vehicles, goods vehicles are also part of the mix. Areas of current congestion include the main urban areas in New Zealand and portions of the Auckland - Hamilton route, the Auckland to Whangarei route, the Tauranga Eastern Corridor, Wellington to Paraparaumu, and the approaches to both Christchurch and Dunedin. Not surprisingly many of these areas of concern are priorities for development and expenditure as reflected in the Roads of National Significance in the recently released GPS.

As representative of the impact of congestion on heavy transport in urban areas, one Auckland transport company interviewed indicated that on average they could now only manage two trips per day between Ports of Auckland and their South Auckland base. This suggests that the problems of congestion impact not only road based movements, but also those intermodal movements made by road, on specific routes. Other anecdotal evidence quoted in the NFDS observes delivery times increasing by 20% and couriers in Auckland only being able to make four deliveries per day compared with seven deliveries ten years ago.

Longer term, NZTA plans to substantially improve vehicle movements within Auckland. Key proposals include through the completion of the Western Ring Route, an alternative cross-harbour route and a series of traffic management initiatives which may see the introduction of traffic priority measures to benefit heavy vehicle movements. In addition, the Government via KiwiRail, has contributed to the cost of establishing the Wiri Inland Port rail connection which will enable the transfer of containerised freight between South Auckland and the Ports of Auckland's Waitemata container terminals. The rail connection will reportedly relieve 100,000 truck movements annually from the heavily congested Auckland CBD. With additional road construction increasingly constrained, authorities are also looking to traffic management strategies as the best mechanism to improve the capacity and effectiveness of New Zealand's road network. The desire to move substantial numbers of private passenger vehicles off the roads is key and forms part of the motivation behind the expansion and enhancement of Auckland's rail and public transport system.

A number of Regional Councils in New Zealand are developing freight strategies to plan for the anticipated growth in the freight task in their region. While few other Councils face challenges of the same magnitude as Auckland, each major urban area experiences complications specific to its region.

The transport industry is also looking to make changes to achieve greater capacity and efficiency on the road network. This includes a wide range of initiatives, such as increasing the maximum gross laden vehicle weight from the current limit of 44 tonnes to 53 tonnes for approved routes. There is widespread support within the road transport industry for this initiative. Results from trials and research show productivity could increase in the range of 10% to 20%, with trip numbers falling by 16% and fuel use by 20%. In the interviews undertaken as part of this study, some transport operators believed increases in maximum truck weights would have a limited impact on their business as their loads were typically constrained by volume rather than weight. However, for the movements of basic products like aggregates and liquid milk the advantages could be greater.

In industry there are also embryonic initiatives to establish web based data services which would enable greater load matching opportunities and improve backhaul utilisation. The dairy industry is actively looking to increase the amount of product which is transported between its processing plants and export ports by rail. In addition it is investigating technologies to reduce the water content of raw milk prior to its transportation from the farm gate to its processing plants, thereby reducing the total volumes transported by road.

10.5 COMPETITIVE POSITION

Road transport is made up of three different sectors; urban distribution, rural pickup and delivery, and larger long haul movements transporting freight on a regional and inter-regional basis.

10.5.1 Strengths

- Urban: In urban areas it is difficult to envisage any other transport mode that can match the capacity and flexibility of trucks in the consolidation and distribution of freight. Although a significant portion of inter-regional freight moves by other transport modes, much of this requires a road transport leg to deliver and collect freight from a railhead or port;
- Rural: The same predominance of road transportation is also witnessed in the rural sector although truck sizes are typically much larger. Given the freight requirements of individual farms for stock pickup and delivery, along with fertiliser delivery and application, there is no practical alternative to trucking, although the movement of liquid milk and logs by rail provide examples of where other modes can play a part;
- Flexibility: As a mode road transport provides the maximum flexibility of capacity, handling everything from a single pallet up to 40' containers, and covering a multitude of routes, as required. Vehicles range from light vans up to the largest B-Train curtainsider and container flatdeck units to meet customer needs;
- Speed of Delivery: To cargo owners road offers considerable advantage in speed of delivery. Trucking companies are able to deliver product to most parts of the country within 24 hours and to all parts of the country within 36 hours. This service aspect has become embodied in the customer commitment and competitive positioning of many companies;
- Reliability: The reliability of road transport is unrivalled, a vehicle breakdown can be repaired within a few hours, or a replacement unit provided within a similar timeframe. Rail and shipping do not enjoy such flexibility but can provide substantial cost advantages. Customer confidence in road solutions is further supported by the employment of GPS technology, enabling vehicle location identification and the estimation of expected time of arrival / delivery at the customer's discretion; and
- Truck Size: Trials to increase gross laden weights to 53 tonnes have been undertaken and supported by industry. This will provide road transport with additional economies of scale.

10.5.2 Weaknesses

- Inter-Regional Transport: Long distance movements have a different set of capabilities and requirements which are more akin to the commercial characteristics of rail or shipping. For a range of longer distance movements where speed of delivery is not an issue, the cost advantages of rail or coastal shipping outweigh observed disadvantages. Reflective of this, regular weekly movements of freight between distribution centres in Auckland and Christchurch, are transported by rail or coastal shipping, with road's portion of market share primarily in urgent ad hoc deliveries;
- Industry Competition: The profitability of trucking firms is more often dependent on the acquisition of backhaul loads to supplement long haul movements. The market is intensively competitive; the charge for a one-way trip does not always cover the full cost of a two-way journey. This needs to be supplemented by revenue from the return trip, if the activity is to be profitable. In the current economic climate a number of operators are struggling to meet cash costs, let alone make a return on capital employed;
- Inter Island: If delivery requires an inter-island movement, this substantially impacts the total duration and cost of the trip offered by road. Ferry timings and the requirement to ship at least the trailer unit on an inter-island ship impacts the level of service offered, and as discussed, provides greater opportunities for rail and coastal shipping;
- Congestion: Vehicle movements are increasingly impacted by delays caused by congestion in key metropolitan areas. In New Zealand these are primarily experienced in Auckland and approaches to major cities; and

- **Externalities**: Of the three modes analysed road transport produces the highest level of indirect costs on external parties by way of emissions, pollution and accidents. The impact of these externalities is not captured and accordingly, pricing offered by road transport does not reflect the impact of these costs to broader society.

10.6 KEY OBSERVATIONS / CONCLUSIONS

The following presents key observations and conclusions from our review of road operations:

- **Dominant Mode**: Road is the dominant mode of freight and passenger transport in New Zealand and is expected to remain so for the foreseeable future.
- **Service Delivery**: Road transport holds a significant market share of the national freight task as it best meets the objectives of cargo owners, particularly in terms of timeliness, reliability and frequency.
- **Flexibility**: Road transport is very flexible, with most shippers able to make a telephone call and have their freight moved the next day to anywhere in New Zealand. Major road transport firms now offer their clients comprehensive logistical services. They offer a full service including pickup and delivery to port or railhead at origination, pickup and delivery at destination, and will typically charge a single price for the comprehensive service provided. As part of this service offering they are prepared to use other transport modes where they meet client service standards.
- **Relative Attractiveness**: Rail and coastal shipping are effective competitors for the transport of particular types of freight where the advantages of timeliness and service frequency do not justify the additional cost of road transport. However, even when other modes are utilised, there is typically an intermodal connection required.
- **Sector Competition**: Road transport is an intensively competitive industry with a large number of owner drivers, and small trucking firms often providing services at or below full cost. Evidence suggests that the larger operators typically service longer distance routes and are able to earn more adequate financial returns.
- **Vehicle Fleet Composition**: Trucks, both light and heavy, are only a small portion of the total New Zealand vehicle fleet. As a result of their weight, heavy trucks have a disproportionate impact on roads. This is reflected in the structure of weight related road user charges that heavy vehicles pay.
- **Congestion**: Vehicle movements, including trucks, are increasingly impacted by congestion related delays in key metropolitan areas. Trucks constitute only a small percentage of the total national vehicle fleet, at 3.6%. Efforts aimed at improving the operational capacity of the road network and reducing congestion are likely to be primarily focused on a reduction in passenger vehicle effects.
- **Externalities**: Road transport produces a greater amount of indirect costs to external parties than other modes. The impact of these externalities is not incorporated in the pricing offered by road transport.

Golden Gate Bridge - San Francisco