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Western Blue Highway Transport Study

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A Report prepared by Warwick Walbran Consulting Limited in conjunction with Murray King & Francis Small & Thompson Clarke Shipping Pty Ltd

For: **Port Taranaki Ltd**

Funded by: New Zealand Transport Agency

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This study used commercially sensitive information provided to the researcher in confidence. As a consequence, aspects of the report which relate to the commercially sensitive information have been excluded and the report has been annotated accordingly.

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1 Executive Summary

The Western Blue Highway (WBH) Study was proposed and commissioned by Port Taranaki Ltd, **to investigate the feasibility and viability of increased use of coastal shipping along the nation's western seaboard**. NZTA funded the study.

The quantity of available freight is a key determinant of viability. Maximum use was made of existing information including available recent national reports, in particular the National Freight Demand Study produced in 2008, the Cubic Transport /Njord Domestic Container Supply Study of 2009, and the Rockpoint Coastal Shipping and Modal Freight Choice 2009 report; a series of background regional reports, and the cargo statistics and commercial client information held by the key ports, in particular Port Taranaki, Southport, Port Nelson and Ports of Auckland. This information was supplemented by over 40 field interviews conducted in the hinterland of the ports.

The **annual inter- regional freight volumes** (000s tonnes) potentially available to a WBH coastal shipping service were determined to be of the order 2.36m tonnes p.a. derived from traffic between 6 relevant regions of New Zealand as shown in the following table:

Table 1 - Inter-Regional Freight Volumes ('000s tonnes p.a.)

From/To	Auckland	Taranaki	Tasman	W Coast	Southland	Canterbury	Total
Auckland	n/a	200	160	50	110	940	**1,460**
Taranaki	100	n/a	10	min	10	40	**160**
Tasman	20	10	n/a	n/a	40	n/a	**70**
W Coast	230	70	n/a	n/a	20	n/a	**320**
Southland	10	Min	20	min	n/a	n/a	**30**
Canterbury	240	80	n/a	n/a	n/a	n/a	**320**
Total	**600**	**360**	**190**	**50**	**180**	**980**	**2,360**

Source: NFDS Paling & Associates 2008

Key drivers of mode choice were determined from field interviews, and were revealed as:

Table 2 - Mode Choice Drivers

Driver	% of Total	WBH Competitive Ability
Price	33%	Possible
Service , Reliability & Flexibility	31%	Possible v Rail;? v Road
Modal Connectivity/Transfer	13%	Comparable to Rail;? v Road
Special Handling Needs	10%	Limited unless RORO
Value Added in the Supply Chain	6%	Unlikely
Security of/lack of damage to cargo	6%	Unlikely v Road
Environmental	1%	Strong

Five **potential coastal shipping services** were modeled with the following results:

Table 3 - Potential Coastal Shipping Services

Service Options	Port Rotation	Service Feasibility	Financial Viability
1	Auckland (Waitemata)-Bluff-Nelson-New Plymouth-Auckland (Waitemata)	No – cannot maintain fixed day of week service	No – makes large loss
2	Auckland (Onehunga)-Greymouth (or Westport)-Nelson-New Plymouth-Auckland (Onehunga)	No – cannot maintain fixed day of week service	No – barely breaks even
3	Auckland (Waitemata)-Lyttelton-Nelson-New Plymouth-Auckland (Waitemata)	Yes	No – barely breaks even
4	New Plymouth-Nelson RORO Shuttle	Yes	Yes
5	Auckland (Onehunga)-Nelson-New Plymouth-Auckland (Onehunga)	Yes	No – barely breaks even

Options 1 & 2 are neither operationally feasible nor financially viable. Options 3 & 5 are operationally feasible, but not financially viable, and as government is unlikely to subsidise a loss making freight transport operation they were not taken forward for further analysis. Option 4 was therefore the only option taken forward for further analysis.

Option 4 is a RORO service requiring RORO berths at the ports of call. Nelson has an operational RORO berth. New Plymouth does not currently have a RORO berth, so a berth would need to be constructed.

Staged investment in the new RORO berth at New Plymouth is proposed as follows:.

Stage 1 – Construct a temporary berth at the landward end of Blyde Quay by Port Taranaki Ltd (PTL), and an associated truck parking area outside the East Gate as State Highway (refer Appendix N: Port Taranaki Ltd Proposed RoRo Berth – Layout Plan). The estimated construction cost of this stage is $3.1M.

Stage 2 – Utilise the truck parking yard constructed in stage 1, and construct a new berth on the eastern side of Blyde Quay (refer plan P03; Appendix N: Port Taranaki Ltd Proposed RoRo Berth – Layout Plan). The estimated capital cost of this option is $38.0M.

PTL propose that the **State Highway should extend to the boundary of the secure area** (as it currently does at the main gate) or the berth face (if the berth face is outside the secure area). Declaration of Bayly Road (from its intersection with SH44/Breakwater Road to Ocean View Parade) and Ocean View Parade (from its intersection with Bayly Road to the face of the new berth to be constructed in stage 2) as State Highway is required.

Construction and maintenance cost estimates have been developed by PTL's civil engineering consultants. These estimates have been split into State Highway costs and PTL costs; and are summarised as:

Table 4 - RORO Berth Construction Costs

Stage	PTL Cost (millions)	State Highway Cost (millions)
1	$2.4	$0.7
2	$20.1	$14.7
Total	**$22.5**	**$15.4**

PTL have advised that acceptance of the principle of extension of the State Highway network to include the truck parking area in stage 1 and to the berth face in stage 2 is fundamental to the proposal.

Consideration has been given to the roading component being a local road. Analysis has revealed that declaration as a State Highway is entirely consistent with NZTA's stated requirements, and that an argument could be mounted that it is required in order to be consistent with NZTA policy. Analysis has also revealed that treating the roading component as a local road would raise substantial equity issues.

Detailed strategic analysis shows that the proposal is consistent with all relevant strategies.

Economic analysis shows that the cost line of the Benefit Cost Ratio (BCR) calculation is negative (i.e. cost savings exceed costs) from both a national and a government viewpoint. Such results have been traditionally presented as BCR 99.

In order to get some comparative "feel" for the results of the economic analysis a pseudo BCR has been calculated, which treats government cost savings due to reduced road maintenance and capital costs as a benefit, and reduced income from Road User Charge (RUC) as a negative benefit. The results of these calculations are:

Table 5 - Pseudo BCR Results

	BCR Pseudo	
Service	**National**	**Government**
Option 4	8.4	5.7
	Net Present Value (millions)	
Option 4	$115.0	$73.2

Government's investment and the return that it can expect over the thirty year analysis period are:

Table 6 - Government Investment & Return

Cash (millions)		Discounted (millions)	
Investment	**Return**	**Investment**	**Return**
$32.8	$314.8	$15.6	$88.7

Sensitivity testing has shown that these results are not unusually sensitive to variation of the input parameters.

Over and above the benefits quantified above are benefits associated with the saving in travel time and vehicle operating cost for the truck operators. These have been quantified as:

Table 7 - Truck Operator Benefits

Travel Time & Vehicle Operating Cost Saving (millions)	
Cash	**Discounted**
$741.1	$251.2

To gauge the economic effect of these savings they would need to be offset against the operating costs of the RORO service. No standard unit values of the economic costs of operating coastal vessels exist, so the quantification of those costs has not been attempted. However, an indication can be gained from:

1. SeaChange (Ministry of Transport) – Page 10 indicates that the CO_2 (which is directly related to fuel consumption) produced by sea freight is about 10% of that produced by road freight. If this ratio were applied to Travel Time and VOC a further $200M (NPV - approx) of benefits could be included in the economic analysis.

2. Freight Transport Costs – this analysis indicates that a transport cost saving in excess of $1,000 per one way truck ($500 per Teu – refer Table 33) would be obtained on key freight routes. This benefit is not included in the economic analysis.

Many roading projects (for some of which central government provides hundreds of millions of funding) save metres of distance and/or seconds of time. The resulting savings per vehicle are measured in cents, or at most a few dollars. This project will save hundreds or thousands of dollars per vehicle, and these savings have not been included in the BCR calculations.

National Strategic Factors have been identified but not quantified as no generally accepted methodology for quantification exists. New Plymouth-Nelson RORO Shuttle Service will provide increased robustness/connectivity of the transport network. New Zealand's road network is reasonably interconnected and robust within each island, while the rail network has a lesser degree of interconnectivity within each island. However the picture is somewhat different when we consider connectivity between the two main islands. The only rail link and the only substantive RORO link both rely on Wellington wharves, with no alternative North Island RORO berth point available outside of Wellington (other than disused RORO berths in Auckland). This lack of interconnection raises questions regarding how robust the inter island network connections are.

Recent work for Greater Wellington has shown that the net present value of benefits from increasing the robustness of Wellington's bulk water supply network are in the $200 million to $600 million range. The intuitive expectation is that the benefits of providing a robust freight transport link between the two main islands would be even greater. These National Strategic Factors have not been accounted for in the economic analysis outlined above, but they are nevertheless real; and should be recognised and taken account of by decision makers.

In summary investment in extending the State Highway system to facilitate the proposed New Plymouth-Nelson RORO Shuttle Service will provide an improved fiscal outcome for government and give a substantial boost to economic activity with consequential economic benefits for the nation.

2 Background

Coastal shipping was formally recognised (in the Sea Change document and by allocation of funding to the Domestic Sea Freight Fund) as an under used freight transport mode. The Sea Change document also recognises that there is potential for inter-regional domestic sea freight to make a significant contribution to New Zealand's overall transport scene.

A proposal for a "Western Blue Highway", to increase the mode share of coastal shipping along New Zealand's western seaboard, was therefore developed by several port companies. The development of the proposal was driven primarily by the Port Taranaki Ltd, with support by other port companies and regional and local government bodies.

Two paragraphs removed.

The Western Blue Highway proposal has support from a number of key players in the land transport industry including the Road Transport Federation at a local level (the RTF are yet to determine their position at a national level), major road transport operators and significant freight generators.

The initial proposal was not just a coastal shipping proposal; it was intermodal, involving road and rail transport (noting that not all the ports considered have rail links). Its focus was on creating the most effective and efficient transport supply chain from origin to destination within New Zealand (or to gateway point of import/export for international freight).

The proposal was:

- Multimodal.
- Industry driven.
- Inter regional and interisland.
- Supported by port companies on the nation's western seaboard.

2.1 Problem Definition

There is currently within the New Zealand transport system a less than optimal modal split between sea, road and rail for the transport of freight to/from and within New Zealand, resulting in excessive transport costs, excessive fossil fuel usage and unnecessarily high levels of greenhouse gas emissions. Sea Change stated that "*because coastal ships can carry high volumes of freight, it would be in New Zealand's interest for them to become a much bigger contributor to inter regional freight movements*". It may also be that there are higher freight transport costs than are desirable. Issues around congestion and road safety could also be addressed through a more optimal mix of freight transport.

2.2 Purpose Statement

The purpose of this project is to carry out an investigation into the economic feasibility of the Western Blue Highway proposal. The proposal focuses on origin to destination freight transport. It initially anticipated enhanced infrastructure at ports on the nation's western seaboard (and possibly on the rail network) to enable a modal switch to increased use of rail and coastal shipping for long distance freight transport; better understanding of and definition of the form of the concept has been one of the outcomes of this study.

The Western Blue Highway Transport proposal is a concept that has considerable potential to address the problem defined in 2.1 above, and to contribute to a wide range of national and regional objectives spanning economic development through improvements to New Zealand's competitive position in the international market, environmental sustainability and road safety. However, the proposal remains little more than an idea or concept until such time as an economic evaluation is completed to provide detailed analysis of the opportunity. This report is that detailed analysis and provides information as a critical step toward implementation.

The project will provide a reasonable and comprehensive proposition to move towards increased economic activity through improved efficiency of key links in the logistics chain.

2.3 Project Funding, Structure & Consultancy Team

Port Taranaki Ltd applied for funding from the Domestic Sea Freight Fund for this study to evaluate the financial viability and economics associated with establishing and operating a much expanded and improved coastal shipping service on the nation's western seaboard. The New Zealand Transport Agency approved the funding.

Warwick Walbran Consulting (assisted by the Thompson Clarke Shipping and the Murray King & Francis Small consultancies) was commissioned to undertake the study.

This project was managed by a Reference Group comprising Douglas Robertson (NZTA), Mark Batt / Michael O'Rourke (MoT), Roy Weaver (Port Taranaki Ltd) and Warwick Walbran (Warwick Walbran Consulting Ltd).

The development of the study was further guided by a Ports Advisory Group comprising representatives of a number of the Ports on the western seaboard, including Port Taranaki Ltd, Ports of Auckland Ltd, Port Nelson Ltd, and South Port Ltd. One sentence removed.

2.4 Previous Work

Given the volume of research that has been undertaken on shipping (both international and coastal) since the previous Labour government's launch of its Sea Change policy, rather than duplicate this considerable body of work, the WBH team built upon the available existing information to enhance its understanding of both freight movement and coastal shipping within New Zealand. Principal sources of information included:

- Available recent national reports, in particular the National Freight Demand Study produced in 2008 by Richard Paling & Associates, together with the Cubic Transport /Njord Domestic Container Supply Study of 2009, and the Rockpoint Coastal Shipping and Modal Freight Choice report, also 2009;
- A series of background regional reports, notably GHD's Southland Integrated Transport Study of 2005, Nelson City Council's Integrated Land Transport Strategy, ECan's Potential for the Increased Use of Rail and Coastal Shipping for Freight in the Canterbury Region, both released in 2009, and Berl's Taranaki Industry Projections 2006 – 2026 for Venture Taranaki; and
- The cargo statistics and commercial client information held by the key ports, part sentence removed.

The WBH team expanded its profile of the freight task relevant to any WBH operation from over 40 field interviews conducted in the hinterland of the ports, primarily with cargo generators, but also including local government, transport operators and freight forwarders.

3 Identification of the Major Components of the Freight Task

The Paling NFDS study profiled actual domestic freight movements in New Zealand in 2006/7. Given the growth in national economic activity the following year and its decline during 2009, the NFDS data still provides reasonably relevant dimensions of this task. Table 8 below defines these as 2.36m tonnes p.a. for the 6 domestic inter-regional transport sectors relevant to a potential WBH shipping service based on NFDS expanded matrix of freight flows.

Table 8 - New Zealand Regional Domestic Freight Flows (tonnes '000s p.a.)

From/To	Auckland	Taranaki	Tasman	W Coast	Southland	Canterbury	Total
Auckland	n/a	200	160	50	110	940	**1,460**
Taranaki	100	n/a	10	min	10	40	**160**
Tasman	20	10	n/a	n/a	40	n/a	**70**
W Coast	230	70	n/a	n/a	20	n/a	**320**
Southland	10	min	20	min	n/a	n/a	**30**
Canterbury	240	80	n/a	n/a	n/a	n/a	**320**
Total	**600**	**360**	**190**	**50**	**180**	**980**	**2,360**

The following should be noted in respect of this table:

- it includes the prime route of Auckland – Canterbury & vice versa (which accounts for 50% of the table total or 1.18m tonnes p.a.) and the marginal secondary route of Taranaki – Canterbury & vice versa because among the potential routes examined is a RORO service between New Plymouth and Nelson which has the theoretical potential to attract freight on these two corridors; and
- movements within a single region or between adjacent regions within either the North or South Islands or those with reasonable linking rail or road infrastructure are excluded. This is on the premise that coastal shipping cannot compete on service or financial viability head to head with parallel land only road or rail services within relatively short distances.

Coastal shipping already plays a significant role in tonnage terms on the following routes:

- Auckland – Canterbury (39% of the total) & vice versa (29%); and
- West Coast – Auckland (54%) – primarily dry bulk cargo

Key commodities identified by the NFDS relevant to the WBH with movements in excess of 10,000 tonnes p.a. are detailed in Table 9 below.

Table 9 - Key Domestic Commodity Movements (tonnes '000s pa)

Dairy		Meat		Horticulture		Retail		Dry Bulk	
Taranaki / Auckland	39	Taranaki / Auckland	26	Auckland / Canterbury	80	Auckland / Canterbury	225	West Coast / Auckland	124
		Canterbury / Auckland	10	Canterbury / Auckland	73	Auckland / Tasman	31	West Coast / Taranaki	46
				Canterbury / Taranaki	45	Canterbury / Auckland	24	Taranaki / Canterbury	29

The other potential element of a WBH Freight Task arises from the need of international container lines to move empty containers, primarily from Auckland and Tauranga, to the export regions of the country and in some cases then move the loaded container back to an international gateway or hub port (increasingly Auckland, Tauranga and Lyttelton). The Cubic/Njord Study completed early in 2009 has analysed this activity in 2008 and Table 10 below profiles the top ten port pairs for the movement of such empty containers in terms of Twenty Foot Equivalent Units (TEUs) as set out in the Cubic/Njord report:

Table 10 - Empty NZ Coastal Container Movements (TEUs p.a.)

Load Port	Discharge Port	TEUs
Auckland	Port Chalmers	17,993
Auckland	New Plymouth	11,528
Auckland	Timaru	9,468
Auckland	Tauranga	8,209
Auckland	Napier	7,290
Lyttelton	Nelson	4,191
Lyttelton	Napier	4,077
Lyttelton	Tauranga	3,309
Wellington	Nelson	3,276
Lyttelton	New Plymouth	3,176

Source: Cubic Transport/Njord Domestic Container Supply Study, 2009

It should come as no surprise that Auckland and Lyttelton are the prime sources of empty containers and between them account for 90% of the top ten sectors for this traffic. What is surprising is the relatively low volume of empty containers shown as flowing into both New Plymouth and Nelson – the ports' own statistics record a movement of some 29,000 empty units in 2008/9 into Nelson and a similar volume into New Plymouth to service their export traffic.

The same study provided a comparable analysis of the coastal movements of full containers by prime routes, which are set out in Table 11 below.

Table 11 - Full NZ Container Movements on the Coast (TEUs p.a.)

Load Port	Discharge Port	TEUs
Auckland	Lyttelton	20,149
Tauranga	Lyttelton	6,894
Auckland	Nelson	3,395
Auckland	Port Chalmers	2,611
Lyttelton	Auckland	2,757
Port Chalmers	Wellington	1,245
Auckland	Timaru	1,187
Lyttelton	Tauranga	699
Lyttelton	New Plymouth	651
Port Chalmers	Timaru	559

Source: Cubic Transport/Njord Domestic Container Supply Study, 2009

The majority of these movements overall, as well as those specifically from Auckland and Tauranga, are likely to have been imports and the majority of the movements from the regional ports to have been exports.

3.1 Current Freight Transport Mode Choice

Coastal shipping operates with intense modal competition, primarily from trucking (both long and short haul) which according to the NFDS accounts for about 90% of the New Zealand domestic freight task in tonnage terms and 67% in tonne-kilometre terms. In comparison, rail was estimated to account for 7% and 18% respectively and coastal shipping 3% and 15% respectively.

The National Government has abandoned its predecessor's Sea Change initiative in respect of any form of subsidy related to coastal shipping. It has also inherited Kiwi Rail, purchased just prior to the last national election from Toll, and committed an initial NZ$770m funding for various expenditure, most of which relates to commuter transport in Auckland and Wellington. In excess of $90M could be attributed to support of KiwiRail's freight operations. Analysis of the four rail routes critically linked to the port stakeholders in the WBH project indicates that contrary to cargo industry opinion there is in all cases reasonable if not substantial unused train path capacity on these lines as detailed in Table 12 below.

Table 12 - Kiwi Rail One Way Train Path Utilisation & Capacity per Day

Line	Current Winter Services	Current Summer Services	Theoretical Capacity
Southland – Dunedin or vice versa	2	4	16
Midland (either direction)	6 coal, 2 freight, 1 passenger	8 coal, 2 freight, 1 passenger	16
New Plymouth – Palmerston North or vice versa	2 milk 1 freight	5 milk 1 freight	16
New Plymouth – Auckland or vice versa	1	1	6*

** dependent on reopening a currently disused crossing loop. Note that the direct Auckland-New Plymouth route is currently not available due to derailment damage, and a decision is pending on whether to reopen it or close or mothball it. Currently traffic for this route is handled via Marton, with an additional train on the NP-PN line as far as Marton.*

These train paths apply in each direction on each line in a 24 hour period and, with further modest investment, are mostly capable of further expansion. Consequently accommodating Fonterra's recently announced increased use of rail both in the South Island and Taranaki region should not pose any significant issues.

To quote the General Manager of Supply Chain Strategy at Fonterra, Nigel Jones, "*when you've got big operations…. having only one sailing a week to handle that volume creates a very fragile supply chain*". Rail or road linkage to hub ports reduces such risk by giving access to more frequent export sailings. In addition, in the case of large volumes of freight that can be contracted, rail can, and in future is likely to, bid aggressively for such business against both road and coastal shipping to provide better frequency of movement than sea at a cost lower than road.

3.1.1 Mode Choice Drivers

The 35 cargo generators confidentially surveyed in mid 2009 in the five regions, on which this study is focused, nominated some 79 drivers of modal choice (refer Appendices A & B). All cargo interests interviewed cited at least a couple of drivers, and despite our efforts often did not prioritise them. The NFDS suggested some 9 drivers of transport mode choice. These have been adopted for this report with a couple of modifications – firstly the two modal drivers (connectivity and ease of transfer) used in NFDS have been combined, since it was hard for those interviewed to distinguish between them; secondly "*personal and industry relationships*" have been omitted since no-one cited them as a driver. Table 13 below tabulates in descending order of frequency cited drivers referred to by those interviewed.

Table 13 - Modal Drivers in WBH Field Interviews

Driver	% of Total	WBH Competitive Ability
Price	33%	Possible
Service , Reliability & Flexibility	31%	Possible v Rail;? v Road
Modal Connectivity/Transfer	13%	Comparable to Rail;? v Road
Special Handling Needs	10%	Limited unless RORO
Value Added in the Supply Chain	6%	Unlikely
Security of/lack of damage to cargo	6%	Unlikely v Road
Environmental	1%	Strong

It is worth noting that intermodal considerations were particularly high among Nelson cargo interests, a number of whom confirmed their dependence on ferry operations on Cook Strait for their domestic supply chain, and their dissatisfaction with the service provided – we believe this arose from the lack of ferry frequency ex Nelson itself and the need to move freight by road to Picton as the alternative. Appendix B provides confidential summaries of feedback from the cargo interests interviewed and their comments and prioritisation of modal drivers.

3.1.2 Western Blue Highway Ability to Influence Mode Choice Drivers

Given:

- the traditional lack of profitability of coastal shipping in New Zealand;
- the difficulty that coastal shipping traditionally has in competing with parallel land transport (road and rail); and
- the critical need to avoid one way freight traffic to ensure freight rates on offer are viable and competitive

it was decided to restrict WBH research to general cargo services and exclude consideration of the bulk (either dry or wet) sector. Table 14 below summarises the variables prompting this approach.

Table 14 - Coastal Shipping of Bulk v General Cargo

Variable	Bulk Cargo	General Cargo
Cargo Base	Single	Multiple
Cargo Flow	Normally one way	Usually two way
Vessel Type	Dedicated	Multi-purpose
Port Terminal	Specialised	Versatile
Trans Shipment	Unlikely for low value cargo ex West Coast	Possible for modular higher value cargo

Additionally it is worth noting that short haul bulk services usually require dedicated specialist vessels and any such bulk shipping opportunities, where the product or market will bear their cost, have normally already been taken up by the relevant cargo interests, who operate such vessels frequently on a one way basis (e.g. Silver Fern for oil products and Holcim and Golden Bay for cement).

The focus of the WBH project is general cargo (i.e. those commodities that can be containerised or unitised with relative ease). Such cargo is normally either of higher value or carries a perishability factor (either physical or market demand). This encourages its owners/distributors to adopt JIT (just in time) distribution practices, involving minimal stock being held either in the market place or even at point of production, combined with frequent and relatively small shipment sizes.

Road transport, although normally most expensive per tonne, traditionally lends itself to such distribution drivers, rail less so, with coastal shipping a poor third. Consequently coastal shipping can only compete effectively if:

a) it provides frequency of service – fixed day of the week is the barest minimum, and twice weekly or more is significantly more attractive;
b) it provides reliability of service - delays due to weather, congestion, breakdowns or mishandling of cargo are likely to destroy whatever competitive service position it might hold; and
c) pricing reflects any inferiority of frequency or transit.

The other areas where it may have the ability to establish competitive edge over other modes will be:

- **either** by servicing areas not accessible to a rival mode (e.g. hinterland of Nelson which has no rail services)

- **or** by assisting road transport reduce costs in long haul trucking by providing RORO services that reduce the time, cost and driver constraints of trucking (e.g. by providing a logistic link between two trucking sectors that are sustainable within the current maximum 13 hour driver limit for the round trip within each trucking sector). A coastal service between New Plymouth and Nelson for freight on the key sector between Auckland and Christchurch would be a good example of this.

3.2 Future Freight Tasks Scenarios

Companies confidentially interviewed for this project were diffident about forecasting future volumes in the current environment. Of 35 cargo generators (as opposed to transport operators) interviewed 55% expected cargo volumes in the near term to remain unchanged, while 20% expected reductions in the

foreseeable future. Only 14% indicated they expected increases in their freight task (be it domestic or export). A further 11% mentioned significant longer term expansion plans (over the next 3 – 5 years) after short term stagnation. Confidential summaries of their feedback on growth prospects by the five regions involved in this study (Southport, West Coast, Nelson, Taranaki and Auckland) are attached in Appendix B: Field Survey Mode and Growth Summary.

NFDS estimated NZ long term domestic freight task growth rates would average 2.3% pa over the long term – there appears to be no reason to disagree with this,other than to comment that given the recent Global Financial Crisis and condition of the NZ economy such rates may not be achieved in the near term. If the NFDS forecast growth rate is achieved on a long term basis, the potential cargo task directly available to a Western Blue Highway service over the next 30 years would increase by 94% from 1.18m tonnes currently to 2.29m tonnes. This estimate excludes the traffic on the Auckland-Canterbury and vice versa sector which is currently served by road, rail and shipping services (both coastal and international); however if the freight volume on this corridor is included (as in Table 8 above) this freight volume doubles.

However should this long term growth rate continue to reflect the current softness in the local economy and prove to be 1% point lower in the long term (i.e. 1.3% p.a.) this potential would only increase to 1.74m tonnes (i.e. by 47% from current levels over the 30 years). Conversely should the NFDS forecast prove unduly conservative by a similar 1% (i.e. prove to be 3.3% p.a.) the WBH freight task potential would more than double over the 30 year period to 2.76m tonnes, i.e. by 133%.

The uncertainties surrounding the financial health and operating viability of the international container lines, compounded by the pressure to introduce newer, larger and therefore more cost effective vessels (on a freight unit cost basis) are likely to be an important future driver of the demand for coastal shipping capacity in New Zealand – both to position empty containers from key import ports such as Auckland and Lyttelton to the regions and to position full export containers from the regions to international gateway ports. It is also one of the reasons that the NZ Shippers Council has embarked on a review of the likely impact on NZ of the potential introduction of 6,000 TEU vessels in selected container trades – the related report is expected to be completed in Q1 2010.

While the data in the Cubic/Nord report on container movements on the NZ Coast is enlightening, it needs to be remembered that this is a snapshot at a particular point in time (2008 – a year that witnessed the tail end of a major economic bubble and the first impact of the Global Financial Crisis). To underline the volatility of this scenario, there has been major change in every NZ long haul container trade lane since the beginning of 2008:

- US East Coast – consolidation of separate Maersk & Hamburg Sud services;
- US West Coast – purchase of US Lines by ANL Container Line (ANLCL) and the withdrawal of its services (consolidated into the Vessel Sharing Agreement service - VSA);
- North Asia – consolidation of the separate Hamburg Sud & Japan/Cosco services;
- SE Asia – establishment of a joint service by Maersk and Malaysian International Shipping Corporation (MISC) and consolidation of all the other carriers in NZ Express Service (NZX); and
- Europe via Suez – withdrawal of both the CMA/CGM and Hapag services, and replacement with feeder operations on the Tasman over Melbourne.

In addition all three of the dedicated Trans Tasman trade operators have revamped their services in the same period with significant changes in port rotation. The current port rotation and frequency of international container services calling at New Zealand is shown in Appendix C. It should be noted that the regional ports involved in the WBH study only enjoy the following effective calls per week from these services:

Nelson	3	(Maersk & MSC Tasman weekly, NE Asia & Swire Tasman fortnightly)
New Plymouth	2.5	(NE Asia & Maersk Tasman weekly, Swire Tasman fortnightly)
Southport	1	(MSC Capricorn to Brisbane & SE Asia weekly)

Other signs of the crisis in international container shipping are evidenced by:

- Many ports around the world in 2008/9 suffering double digit percentage declines in container throughput;

- Maersk, American President Lines and Hapag between them losing over US$1b in the first quarter of 2009;
- BRS Alphaliner forecasting at least 15% of the world's container fleet to be in lay up by the end of 2009 (despite slowing of new build deliveries).
- NYK , Japan's leading shipping line, recently announcing that in 2009 it reduced its container fleet from 115 ships to 90 and in the words its President "even so, the deficits still remain enormous". Consequently NYK plans its fleet in 2015 will be half the level of its previous peak.

In such an industry environment NZ has not seen the end of liner service consolidation and rationalization. The Cubic/Nord profile of container movements on the coast will inevitably be significantly modified over the coming months and years and such traffic cannot therefore form a reliable business base for a coastal service of any description even though long term international container growth rates are expected within a couple of years to return to a long term average rate p.a. of around 5%. One sentence removed.

3.3 General Transport Arrangements

The three available freight transport modes (road, rail, coastal shipping) have different characteristics which make some modes better suited to particular freight tasks than others. This section outlines in broad terms the characteristics of each freight mode.

3.3.1 Road

The key characteristics of road freight include:

- Door to door coverage – road freight can pick from and deliver to any origin/destination served by a trafficable surface. All freight origins/destinations are served by a trafficable surface, effectively giving road freight door to door coverage within and between the North and South Islands (noting the need for a RORO link between the islands);
- Time flexibility – road freight can pick up and deliver at any time to suit the customer, giving 24/7 service times;
- Small loads – road freight can transport comparatively small freight volumes efficiently. A fully loaded truck and trailer rig carries about 27 tonnes, so there is no need to aggregate loads (in the terms that we are discussing in this report);
- Market competition – a large number of road freight operators compete in the market place, the barriers to entry for a new operator are minimal, and consignors have a wide choice of road freight transport providers. The market can be viewed as being mature;
- Subsidy – the road freight industry claims that it is unsubsidised. However the 2005 *Surface Transport Costs and Charges* study revealed that the road freight industry falls well short of meeting its full cost and receives substantial indirect subsidy. The study states that:
  - "Current charges total some $2.63 billion p.a. or $2.34 billion if roading rates are excluded as not being a user charge'.
  - 'The best estimate of total provider/external costs is $5.59 billion p.a., i.e. just over double the current charges"; and
  - "The "social cost recovery" (charges: external costs ratio) is significantly greater for cars than for trucks"
- Minimum transit time – road freight can and usually does achieve door to door delivery in a transit time that cannot be matched by the other modes.

3.3.2 Rail

The key characteristics of rail freight include:

- Terminal to terminal coverage – usually requires road transport to collect freight from origin and transport to rail terminal and to deliver freight from rail terminal to destination (with the exception of major industries and freight forwarders which have their own sidings);
- Time flexibility – rail freight generally runs to a time table (road freight also runs to timetable but can be more flexible);
- Medium loads – rail freight usually requires the aggregation of freight from more that one origin;

- Market competition – there is only one rail provider in terms of trains. The market is a sole supplier situation. However, there are numerous companies that aggregate cargo for carriage by rail, which also use road and coastal shipping;
- Subsidy – the rail industry receives various payments from central government. Most of these payments relate to passenger services, and particularly to urban passenger services. At present, there are some significant payments that do relate to rail freight. However the 2005 *Surface Transport Costs and Charges* study revealed that the rail freight industry comes much closer than the road freight industry to meeting its full cost and receives substantially less indirect subsidy than the road freight industry. The STCC states:
  - "Total system revenue is some $432 million pa (including $26 million public funding for the urban passenger services)".
  - "Total recurrent costs are $331 million pa. An appropriate capital charge to refurbish/replace rolling stock to maintain broadly its present age and condition would add some $64 million, giving total costs of $395 million p.a".
  - "In the medium/long term, it will also be necessary to renew/replace selected infrastructure assets (e.g. track, signalling etc.). An appropriate capital charge on these assets (excluding land) is around $100 million pa. This would increase total costs to $493 million p.a."
- Intermediate transit time – rail freight door to door delivery times are usually intermediate between those of road freight and coastal shipping.

3.3.3 Coastal Shipping

The key characteristics of coastal shipping within New Zealand (other than specialist bulk services) include:

- Port to Port coverage – similar to rail freight, usually requires road transport to collect freight from origin and transport to port and to deliver freight from port to destination;
- Time flexibility – coastal shipping generally runs to a time table (often a weekly timetable), resulting in cut off times for receipt of freight at the port, or inland terminal, and set times for freight availability at the delivery port or inland terminal;
- Large loads – coastal shipping almost always requires the aggregation of freight from more than one origin;
- Market competition – there is limited competition. There are 2 general coastal shipping operations (Pacifica and Strait Shipping), plus the KiwiRail InterIsland line on Cook Strait. Other freight movement by coastal ship is by international vessels or by enterprise operated specialist vessels, such as Holcim and Golden Bay cement and Silver Fern (bulk fuel);
- Subsidy – the coastal shipping industry receives no government subsidy, meeting all of its own costs, as do the stevedoring companies. Most port companies are not subsidised by their local government owners, and are expected to pay a dividend to their owners;
- Longest transit time – coastal shipping door to door delivery times are usually longer than those of road freight and rail freight.

4 Potential Coastal Shipping Services

4.1 Vessel Options

Given the focus of this research on the general cargo freight task (i.e. excluding dry and liquid bulk commodities), this project considered three types of general cargo vessel, each of which is profiled below.

4.1.1 Geared Medium Speed Regional Container Vessel

In order to provide a service capable of operating a fixed day of the week service between Auckland in the North Island and Southport in the South Island, the CV1100 was selected – the smallest readily available cellular container vessel with a design speed of close to 20 knots and already operated in New Zealand Recently built versions of this class of vessel are readily available for purchase or charter in regional or coastal trades, for which it is increasingly recognised as a reliable and cost effective work horse. Maersk Line operates this class of ship in their Southern Star Express service around the NZ coast and across the Tasman, (e.g. m.v. Maersk Radford and m.v. Vega Gotland).

Figure 1 - CV1100 Container Ship

The summary General Arrangement or profile of this vessel is:

Deadweight (DWT)	13,760	**Length OA**	147.9m
Gross Tonnage	9,960	**Beam**	22.4m
NT(Net Tonnage)	4,500	**Draft**	8.5m
Maximum Speed	20 knots	**Gear Type**	Cranes
Total Power HP	13,229	**Gear Details**	2 x C-2 45 t cranes
Fuel per Sea Day	36 tons CST 380	**Charter Rate/Day**	NZ$8,400
TEU Nominal	1,118	**RF TEUs**	220
TEU Actual @ 16 t*	700		

** 14 tonnes cargo and 2 tonnes container tare weight*

4.1.2 Geared Shallow Draft Coastal Container Vessel

The second vessel class considered was a shallow draft coastal service container vessel, being the largest container vessel with gear likely to be able to enter the shallow water West Coast ports of Onehunga, Westport and Greymouth. Pacifica's m.v. Spirit of Resolution is an example of the class. There are believed to be only 3 of this class of vessel in existence, as during the shipbuilding boom of recent years most yards did not wish to allocate scarce yard berths to such small, specialist ships. Pacifica's vessel of this type has for some time operated on a weekly schedule from Onehunga to Lyttelton returning via Nelson and more recently New Plymouth.

Figure 2 - mv Spirit of Resolution

The summary General Arrangement or profile of this vessel is:

Deadweight (DWT)	4,766	**Length OA**	100.6m
Gross Tonnage	3,850	**Beam**	16.5m
NT(Net Tonnage)	1,969	**Draft**	5.9m
Speed	15 knots	**Gear Type**	Cranes
Total Power HP	4,486	**Gear Details**	2 x C-2 40 t cranes
Fuel per Sea Day	24 tons CST 180	**Charter Rate/Day**	NZ$7,400
TEU Nominal	379	**RF TEUs**	60
TEU Actual @ 16 t*	270		

* 14 tonnes cargo and 2 tonnes container tare weight

4.1.3 Gearless Short Range RoRo Vessel

The third vessel class evaluated was a short haul ungeared RORO coastal vessel. This type of short sea freight ferry is regularly found on European coastal routes. Strait Shipping's m.v. Kent is an example of the class and was originally operated by Maersk before being purchased by Strait Shipping. It now operates twice weekly between Wellington and Lyttelton and once a week between Wellington and Nelson. However it should be noted that there are only 14 such vessels worldwide with comparable cargo capacity, no greater LOA or beam and 6m maximum draft (the limit for Onehunga).

Figure 3 – m.v. Kent

The summary General Arrangement or profile of this vessel is:

Deadweight (DWT)	3,526	**Length OA**	123m
Gross Tonnage	6,862	**Beam**	21m
NT(Net Tonnage)	2,058	**Draft**	4.76m
Speed	15 knots	**Gear Type**	Stern Ramp
Total Power HP	7,200	**Gear Details**	Ro Ro
Fuel per Sea Day	20 tons CST 180	**Charter Rate/Day**	NZ$8,600
TEU Nominal	283	**RF TEUs**	30
TEU Actual @ 16 t*	200	**Trailers 68 x 16m**	1,100 lane meters

* 14 tonnes cargo and 2 tonnes container tare weight

4.2 Service Options

Five options were considered to provide coastal services for the sponsor ports of the WBH:

1. A weekly Pan New Zealand service between Auckland and Southport;
2. A weekly shallow water service on the West Coast;
3. An enhanced weekly Pacific West Coast service operating between Auckland and Lyttelton on the East Coast returning via Nelson and New Plymouth on the West;
4. A three times weekly RORO shuttle between New Plymouth and Nelson; and
5. A twice weekly RORO service between Onehunga, Nelson & New Plymouth returning to Onehunga.

The viability, both operationally and financially, of each of these services is now reviewed.

It should be noted that in the modelling (both operational and financial) of the various services a number of important common assumptions were made:

- Vessels are anticipated to operate 50 weeks per year;
- Domestic cargo volumes are derived from the general cargo freight task only, as defined in the 2008 NFDS study and summarised in Table 8 above, expressed in TEU terms based on 14 tonnes of cargo per TEU
- Service market shares of the relevant task in each port pair trade lane are adopted to reflect the applicable modal (rail and road) competition and coastal service frequency;
- Revenue per TEU is assumed to be on a port to port basis, i.e. should be reasonably competitive with rail, which usually has to have freight positioned to/from the railhead in a manner similar to sea freight being delivered to or picked up from the port. As such it is estimated to be discounted from road rates between the relevant city pairs to allow for the cost of these positioning stages in the supply chain;
- Containers are assumed to be shipper or forwarder owned – no provision is made for carrier box provision;
- On the RORO services, it is assumed shippers/forwarders tender their freight on their own trailers;
- Vessel charter, bunker and port and stevedoring costs are current as of October 2009. The charter rate includes a premium for NZ manning costs;
- No allowance has been made for recovery from shippers by carriers of wharfage charged by ports on cargo shipped (typically around NZ$50 per TEU and included in the model under stevedoring costs) or for higher rates for reefer traffic (at least a 10% premium over general cargo in the coastal trade);
- No positioning of international empty (empty) containers on the NZ coast or feedering of import or export cargo ex/to key gateway ports such as Auckland and Tauranga is included (other than for Nelson) because of the current volatile state of the international container industry and its service patterns in the SW Pacific (refer 3.2 above);
- An exception is made for Nelson because it has channel and draft restrictions (which are likely to become an increasing constraint on international services as ships increase in size and draft), it has no access to rail, and access to the two major export gateway ports (Auckland/Tauranga) on the North Island necessitates a domestic marine leg in the export logistics chain (refer 4.2.6 below). Freight rates to move empty containers into Nelson are at Strait Shipping rates ex WLG; and
- Exchange rates applied to the US$ cost of fuel and vessel charter are US$0.66 = NZ$1

4.2.1 Option 1 – Round New Zealand Service

This service was modelled on a CV 1100 with the port rotation shown in Figure 4 and the operating assumptions set out in Table 15.

Figure 4 - Auckland-Southport-Nelson-New Plymouth-Auckland CV 1100 Service

Table 15 - Service Key Assumptions

Domestic Trade Lane Market Share % & TEUs per Voyage				
Origin/Destination	**Southport**	**Nelson**	**New Plymouth**	**Auckland**
Auckland				
Southport				
Nelson				
N Plymouth		Information Removed		
Voyage Time				
Liftings				
Utilisation				

Data in italics is related to international freight to/from Nelson.

Based on these parameters, and the assumptions set out in section 4.2 the financial outlook for this service is set out in Table 16 below.

Table 16 - Forecast Voyage Result of Round NZ Service NZ $'000S

Item	Subtotals	Totals
SB Coastal Revenue		
- NLS empty Revenue		
NB Coastal Revenue		
- NLS Export Revenue		
Total Revenue		
Stevedoring		
Other Variable Costs	Information Removed	
Variable Costs		
Gross Profit		
Port Costs		
Charter Costs		
Fuel		
Overheads		
Fixed Costs		
Voyage Result		

Supporting detail to this summary is set out in Appendix D: Around New Zealand Service Model.

The following conclusions need to be considered about this option:

- Operationally the service is not viable – with the vessel operating at or near its maximum speed the round voyage time is 7.25 days with no margin for bad weather or other delays; consequently the essential Fixed Day of the Week (FDW) service is not sustainable
- Despite allowing for an 8% share of both the inbound Nelson empty market and full export market, the service is likely incur major losses ($90k per voyage);
- Faster vessels are available but they are larger, will burn more fuel and will generate an even heavier financial loss as the market simply is not there to sustain a CV 1100 let alone a larger vessel;
- A fixed day of the week service (which is critical) is simply not sustainable;
- Unfortunately Southport has too small a domestic general cargo market and it is too far from the key port in the service (Auckland) to permit a viable operation. Cargo volumes would have to increase by 50% without any price discounting to produce a break even result;
- It is recommended that Southport use the weekly MSC Capricorn service, where it is the first NZ port of call, to source empty containers from Australia (particularly Sydney) and to lift both domestic cargo to Wellington, Napier and Tauranga in the North Island and exports for Europe and SE Asia;
- Also that it strengthen its already good working relationship with Lyttelton and use both rail and the cheap back haul northbound trucking services that are available to service its domestic cargo; and
- Some of Southport's cargo (particularly timber) is more suited to a multipurpose service – however, such vessels are generally more expensive to operate than cellular ships, and require more port time for cargo handling.

4.2.2 Option 2 – West Coast Shallow Water Service

This service was modelled on Pacifica's m.v. Spirit of Resolution, the largest vessel operating to Onehunga and potentially able to call at Greymouth/Westport. The service port rotation is as per Figure 5 and the operating assumptions are in Table 17.

Figure 5- Onehunga - Greymouth - Nelson - New Plymouth - Onehunga Service

Table 17- Service Key Assumptions

Domestic Trade Lane Market Share % & TEUs per Voyage				
Origin/Destination	**Greymouth**	**Nelson**	**New Plymouth**	**Onehunga**
Auckland				
Greymouth				
Nelson				
N Plymouth		Information Removed		
Voyage Time				
Liftings				
Utilisation				

Data in italics is related to international freight to/from Nelson.

Based on these parameters, and the assumptions set out in section 4.2 the financial outlook for this service is set out in Table 18 below.

Table 18 - Forecast Voyage Result of Shallow Water Service NZ$'000S

Item	Subtotals	Totals
SB Revenue		
- NLS empty Revenue		
NB Revenue		
- NLS Export Revenue		
Total Revenue		
Stevedoring		
Other Variable Costs	Information Removed	
Variable Costs		
Gross Profit		
Port Costs		
Charter Costs		
Fuel		
Overheads		
Fixed Costs		
Voyage Result		

Supporting detail to this summary is set out in Appendix E: West Coast Shallow Water Service Model.

The following conclusions need to be considered about this option:

- There is just over half a day buffer in the weekly schedule to allow for waiting for high water to enter/leave Onehunga where the Wairopa Channel has a minimum depth of 3.1m. This call (as opposed to Waitemata) is both essential for there to be any possibility of a weekly schedule given the vessel speed, and desirable given the significant South Auckland cargo hinterland;
- However it is still considered inadequate if the essential FDW schedule is to be maintained. The weather (which is particularly pertinent for smaller vessels) off the West Coast of the South Island, particularly in winter, can close the small local ports for days at a time;
- Currently Greymouth cannot accept vessels even of the size of the Spirit of Resolution without dredging and other improvements;
- Ongoing and therefore expensive maintenance dredging would be required;
- The terminals and wharves at both Westport and Greymouth are in very poor condition and would require significant upgrading work;
- The service is dependent on positioning of empty containers to Nelson and export feeder cargo ex Nelson to break even (8% market share in both cases) – and this critically depends on schedule integrity - well nigh impossible with a vessel small enough to call at Greymouth/Westport, given the prevailing marine access and weather constraints; and
- Consequently it is recommended that West Coast cargo interests channel their freight either via Nelson by road or use the Midland Line or road to/from Lyttelton as a gateway port.

4.2.3 Option 3 – Enhanced Western Service

This service was modelled on a CV 1100 whose speed is needed for a FDW service with the port rotation in Figure 6 and the operating assumptions set out in Table 19.

Figure 6 - Auckland - Lyttelton - Nelson - New Plymouth - Auckland CV 1100 Service

Table 19 - Service Key Assumptions

Domestic Trade Lane Market Share % & TEUs per Voyage						
Origin/Dest	**LTL**	**Spt/LTL**	**Nelson**	**Gm/NLS**	**NPL**	**AKL**
Auckland						
Lyttleton						
Spt/LTL						
Nelson						
GMT/NLS			Information Removed			
N Plymouth						
Voyage Time						
Liftings						
Utilisation						

Data in italics is related to international freight to/from Nelson.

Based on these parameters, and the assumptions set out in section 4.2 the financial outlook for this service is set out in Table 20 below.

Table 20 - Forecast Voyage Result of Enhanced Western Service NZ$'000S

Item	Subtotals	Totals
SB Revenue		
- NLS empty Revenue		
NB Revenue		
- NLS Export Revenue		
Total Revenue		
Stevedoring		
Other Variable Costs		
Variable Costs	Information Removed	
Gross Profit		
Port Costs		
Charter Costs		
Fuel		
Overheads		
Fixed Costs		
Voyage Result		

Supporting detail to this summary is set out in Appendix F: Enhanced Western Service Model.

The following conclusions need to be considered about this option:

- Currently Pacifica offers two coastal services ex metro Auckland to Lyttelton – an East Coast service with m.v. Spirit of Endurance ex Waitemata and a West Coast service with m.v. Spirit of Resolution ex Onehunga. Both effectively have an end of week cut off in Auckland and start of week inbound cargo availability in Lyttelton;
- This proposed service would be scheduled to operate in conjunction with m.v. Spirit of Endurance and to provide a spaced twice weekly service in both directions in the critical key Auckland/Lyttelton trade lane. The incremental benefit of such scheduling has not been taken up but should be positive;
- The above service would return via the West Coast, where the main cargo demand is northbound to Auckland, and permit Southport cargo to feed over Lyttelton and West Coast South Island cargo over Nelson;
- The vessel is larger and faster than Pacifica's m.v. Spirit of Endurance as this is necessary to achieve a FDW schedule with the Northbound routing via the West Coast while preserving a 5% overall margin for weather or other delays;
- No allowance is made for potential future traffic via New Plymouth to/from the growing intermodal hub at Palmerston North; and
- For the service to break even it needs to generate one third of its freight volumes from empty container movements into Nelson (a market of 29,000 TEUs p.a.) and export feeder movements northbound (market of 40,000 TEUs p.a.) – about a 15% share of each market, where two Tasman services call weekly and only one NE Asian and one Tasman container service now call fortnightly.

4.2.4 Option 4 – New Plymouth – Nelson RoRo Service

This service was modelled on Strait Shipping's m.v. Kent with a shuttle port rotation shown in Figure 7 and with the operating assumptions set out in Table 21.

Figure 7- New Plymouth - Nelson RORO Shuttle Service

Table 21 - Service Key Assumptions

Domestic Trade Lane Market Share % & TEUs per Voyage

Origin/Dest	N Plymouth	Nelson	Lyttelton	Greymouth	Auckland
Auckland					
N Plymouth					
Nelson					
Lyttelton			Information Removed		
Greymouth					
Voyage Time					
Liftings					
Utilisation					

Data in italics is related to international freight to/from Nelson.
** includes contract movement of ISO tanks 3 per voyage in each direction, Southbound empty*

Based on these parameters, and the assumptions set out in section 4.2 the financial outlook for this service is set out in Table 22 below.

Table 22 - Forecast Voyage Result of RORO Shuttle Service NZ$'000S

Item	Subtotals	Totals
SB Revenue		
- NLS empty Revenue		
NB Revenue		
- NLS Export Revenue		
Total Revenue		
Stevedoring		
Other Variable Costs	Information Removed	
Variable Costs		
Gross Profit		
Port Costs		
Charter Costs		
Fuel		
Overheads		
Fixed Costs		
Voyage Result		

Supporting detail to this summary is set out in Appendix G: RoRo Shuttle Model.

The following assumptions and conclusions need to be considered about this option:

- The schedule assumes departures ex New Plymouth at 0700 on Sunday/ Tuesday/Thursday and ex Nelson at the same time Monday/Wednesday/ Friday; the vessel would lay over in New Plymouth after arrival on Friday evening until departure Sunday morning to maintain fixed day of the week schedules in each direction;
- The vessel is versatile with an upper deck accessed via an internal ramp, and the model assumes containers (2 x 20 or 1 x 40) are on 12 - 16m trailers: it can take regular domestic trailer traffic and has accommodation for up to 12 drivers;
- Auckland – Christchurch traffic & vice versa is critical to the service and the model assumes round trip trucks run overnight ex both cities to connect with the vessel; this should allow evening departures for cargo from both locations by truck on day 1 and give early morning arrival by truck at destination on day 3;
- Such arrangements will be competing with daily services by road and rail for the same city pairs via Cook Strait arriving late afternoon of day 2 at destination.
- It assumes the driver and tractor can make the round trip ex either Christchurch or Auckland within log book hours (a maximum of 13 hours);
- It also assumes some Greymouth/Westport traffic would be attracted via road by the planned 3 services weekly;
- The vessel can take TEUs on the upper deck and with the assumed volumes should be able to handle up to 37 empties per voyage southbound ex New Plymouth to Nelson;
- Information removed.
- Should 3,300 TEUs vessels become the norm for the North Asian trade the potential feeder traffic to/from Nelson for this trade could double and a vessel the size of Kent would struggle to handle the likely ensuing volume northbound (full containers);
- No allowance has been made for Nelson outbound traffic to Palmerston North;
- Rates are assumed to be comparable to Strait Shipping's tariff between Wellington and Nelson & vice versa i.e ;
- This service produces a solid potentially positive result, information removed;
- Information removed;
- Strait Shipping currently operates this vessel weekly from Wellington to Nelson, where it turns round overnight and has the use of some 6,700 m2 of nearby truck parking area;
- The vessel is serviced adjacent to Brunt Quay where its stern ramp connects with a coastal barge pontoon and ramp originally installed for the Lynx fast ferry service with Wellington (refer Appendix I: Port Nelson RoRo Facility). This facility has a ramp width of 20 ft, maximum inclines of 1: 5 upwards and 1:7.5 downwards on a 73' ramp to access the connected pontoon with a 1.7m freeboard at different tidal heights (typical range is c 3m). It can service loads of up to 50 tonnes at a time;

- The proposed RORO service would require establishment of a temporary RORO berth facility in New Plymouth (whose tidal range is comparable to Nelson) at the western (shoreward) end of Blyde Wharf to accommodate the vessel's stern ramp; and
- Port Taranaki's planning includes a new berth east of Blyde Wharf for RORO and Cruise vessels up to 180 metres in length (refer Appendix N: Port Taranaki Ltd Proposed RoRo Berth – Layout Plan). This will be required when the temporary berth is unable to service traffic demand and will involve dredging to 10m, reclamation of 15,000 m2, a linkspan and direct highway access.

4.2.5 Option 5 – West Coast RoRo Service

This service was modelled on Strait Shipping's m.v. Kent with the port rotation shown in Figure 8 and the operating assumptions set out in Table 23.

Figure 8 - Onehunga - Nelson - New Plymouth RoRo Service

Table 23 - Service Key Assumptions

Domestic Trade Lane Market Share % & TEUs per Voyage				
Origin/Destination	**Gmt/Nelson**	**Nelson**	**New Plymouth**	**Onehunga**
Onehunga				
Gmt/Nelson				
Nelson				
New Plymouth			Information Removed	
Voyage Time				
Liftings				
Utilisation				

Data in italics is related to international freight to/from Nelson.

Based on these parameters, and the assumptions set out at the end of the previous section the financial outlook for this service is set out in Table 24 below.

Table 24- Forecast Voyage Result of West Coast RoRo Service NZ$'000S

Item	Subtotals	Totals
SB Revenue		
- NLS empty Revenue		
NB Revenue		
- NLS Export Revenue		
Total Revenue		
Stevedoring		
Other Variable Costs	Information Removed	
Variable Costs		
Gross Profit		
Port Costs		
Charter Costs		
Fuel		
Overheads		
Fixed Costs		
Voyage Result		

Supporting detail to this summary is set out in Appendix H: West Coast RoRo Service Model.

The following assumptions and conclusions need to be considered about this option:

- The vessel is versatile with an upper deck via an internal ramp: the model assumes containers (2 x 20 or 1 x 40) are on 12m - 16m trailers, but it can take regular domestic trailer traffic and has accommodation for up to 12 drivers;
- There are 5 hours spare in the voyage schedule for Onehunga tidal delays and a 10% weather margin on each of the 2 voyages per week;
- The model assumes that the vessel can enter Onehunga via the Wairopa channel – normal restrictions are 23m beam and 6m draft with LOA over 95m requiring Harbourmaster's dispensation after a risk assessment (which normally is about a 90 day process costing about $25k). m.v. Kent has an LOA of 123m and subject to dispensation could be accommodated at the West Wharf (138m);
- It would appear the Onehunga 47m ramp between the East and West wharves and the link to the East wharf can handle a stern ramp RORO vessel and 16m trailers – the axle load currently for this ramp is 55 tonnes and for the Eastern Wharf 78 tonnes, but in part of the northern truck parking area it is only 19 tonnes (refer Appendix J: Onehunga Berth & Wharf Layout and Loadings);
- The adequacy of the staging area for trailers and empty containers at Onehunga will need to be verified – 5,500 m2 has been identified as available for this activity, together with 8,800 m2 currently used by Pacifica for its LOLO operation; in addition a mobile crane would be needed for loading empty containers Southbound should this market sector be serviced;
- Port time is assumed as 12 hours in Onehunga and 6 hours in each of Nelson and New Plymouth;
- West Coast cargo is assumed to use road to/from Nelson, but unlike the RORO Shuttle (Service Option 4) the service is not expected to penetrate the Auckland – Christchurch market or vice versa owing to inferior transits, less consistent cargo availability timing at destination and a frequency limited to twice weekly – on all counts inferior to Service Option 4;
- Neither this vessel nor m.v. Spirit of Resolution has sufficient speed to call at New Plymouth in both directions and maintain 2 services weekly with a reasonable weather margin; however, southbound cargo to New Plymouth is assumed to accept a transit via Nelson with 2 x FDW service. No southbound cargo ex New Plymouth for Nelson is included as it would be routed over Onehunga and complicate the space availability on the dominant northbound leg into Onehunga as well as stevedoring operations in that port.
- The proposed RORO service would require establishment of a temporary RORO berth facility in New Plymouth (whose tidal range is comparable to Nelson) at the western (shoreward) end of Blyde Wharf to accommodate the vessel's stern ramp;
- Port Taranaki's planning includes a new berth east of Blyde Wharf for RORO and Cruise vessels up to 180 metres in length (refer Appendix N: Port Taranaki Ltd Proposed RoRo Berth – Layout Plan). This will be required when the temporary berth is unable to service traffic demand and involve dredging to 10m, reclamation of 15,000 m2, a linkspan and direct highway access.
- 56 empty Southbound movements to Nelson ex Onehunga and the same number of full export containers to New Plymouth per sailing are assumed - Information removed

- The service, with about 64% utilization, would produce a result marginally over breakeven, and on an annual basis less than half that of the Enhanced Pacifica Service (Option 3 – refer 4.2.3 above);
- A LOLO container operation in the same service (m.v. Spirit of Resolution) would make a loss owing to higher stevedoring costs at the ports of call.

4.2.6 International Traffic to/from Nelson

The movement of empty containers on the New Zealand coast and positioning of export full containers have with one exception been excluded from all voyage models in this report on the rationale that the international container services calling in New Zealand have been so volatile in the last 18 months that any business case would not be safely sustainable if significantly based on penetrating such traffic. This volatility is not expected to diminish in coming months given the parlous state of the container shipping sector (refer Chairman John Parker's remarks at the Port of Tauranga 2009 AGM).

Information removed. It should, however, be noted that it is served by all 3 of the current dedicated Tasman services (Maersk weekly Southern Star Express, MSC weekly New Kiwi service and Swire Shipping new fortnightly multipurpose service – refer Appendix C: International Container Services & NZ Port Rotations, October 2009). All these services call at Auckland before or after Nelson, and therefore are capable of sourcing empty containers in either Auckland or Australia. The New Zealand port coverage of services calling at Nelson is shown in Table 25 below. The sequence of port rotation is represented by the numbers in the column for each service, those offered weekly in normal font, those fortnightly in *italics.*

Table 25 - Port Rotation for International Container Services Calling at Nelson

Port	Maersk	MSC	Swire	NE Asia	Calls/week
Auckland	1 & 7	2	*1*	1	**4.5**
Lyttelton	3	4	-	4	**3**
Marsden Pt	-	-	*2*	-	**0.5**
Napier	-	-	*4*	5	**1.5**
Nelson	6	1	*5*	*3*	**3**
New Plymouth	2	-	*6*	2	**2.5**
Port Chalmers	4	-	-	-	**1**
Tauranga	-	3	*3*	6	**2.5**
Wellington	5	5	-	*3*	**2.5**

Appendix K: Port Nelson Container Traffic 2008/9 details Nelson's container traffic in 2008/9 – it will be seen that it includes 29,000 empty inbound TEU movements and some 40,000 TEU exports. Table 26 below sets out what TCS estimates to be the natural share of these two trade sectors for each of the above services based on two criteria:

- frequency of call; and
- whether or not the operator is offering capacity on the coast as part of an international service (i.e. a wayport carrier).

None of the WBH coastal services examined in this study are in the latter category, in marked contrast firstly with the international container and secondly with the import car carrier/RORO services (which are currently offered southbound to Nelson from Auckland for wheeled traffic).

Table 26 - Nelson Inbound Empty & Export Natural Market Share by Service

Service	Frequency	Empty Market Share	Export Market Share
Maersk SSE	Weekly	Information Removed	
MSC New Kiwi	Weekly		
Swire Tasman	Fortnightly		
North East Asia	Fortnightly		
RORO ex Auckland	Weekly		
WBH Options 3 - 5	Weekly or better		

In estimating market share for modelling purposes it should be noted that the following weightings have been given to the various services:

- 1 for all services calling at least weekly
- 0.5 for those calling less than weekly but more than fortnightly
- 0.25 for those calling fortnightly or less

This weighting has been doubled for services that are part of an international schedule (the first four in Table 26) and which therefore have (in stark contrast with dedicated coastal services) both an international commercial motive and a shared cost base for moving empty containers into or full exports out of Nelson directly.

Paragraph removed

It is also worth noting Nelson does not feature prominently in domestic forwarder schedules. Based on those advertised by a leading operator, Cubic Transport Services (refer Appendix K: Port Nelson Container Traffic 2008/9 and Appendix L: Container Services for NZ Domestic Freight, October 2009 for RORO), Table 27 below compares the frequency of those services on offer in Nelson to/from Auckland with those available to cargo interests in Christchurch.

Table 27 - Comparative Domestic Coastal Service Frequency from/to Auckland

Port	Container		RoRo	
	Southbound	Northbound	Southbound	Northbound
Nelson	Every 14 days	Every 14 days*	Every 8 days	Nil
Lyttelton	Every 2 days	Every 2.5 days	Every 8 days	Nil

** to Tauranga, not Auckland.*

New Plymouth, with a similar volume of Exports and inbound Empties, is not in the same position as Nelson, given it has no comparable marine access constraints, it has direct rail service to the port hinterland and is within road service range of both Auckland and Tauranga without including a sea leg in the logistics chain.

4.2.7 Financial Sensitivities

Table 28 below sets out the financial sensitivities in NZ$'000s to a discrete 10% variation in the key service variables per voyage for the five WBH services examined. For reference purposes the bottom line of the table provides the estimated financial result for each of the service options BEFORE the impact of any of the specified sensitivities. It should be noted that Options/Services 1 – 3 are weekly at best, whereas Option/Service 4 would operate 3 times a week and Option/Service 5 twice weekly.

Table 28 - Voyage Financial Sensitivities (+/-10%) in NZ$'000s

Variable	Option 1 Plan NZ	Option 2 Shallow Water	Option 3 Enhanced Pacifica	Option 4 Shuttle	Option 5 W Coast RoRo
Price Volume Stevedoring Fuel Charter Hire Voyage Result Frequency			Information Removed		

Price and Volume (the latter net of stevedoring costs) are in most cases the two most sensitive variables. The greatest risk (as in all shipping operations) is that there is a decline in both volume and price simultaneously. Stevedoring is also significantly sensitive, particular for the larger LOLO (lift on lift off) operations – the first and third options operated by a CV 1100. It is a much less significant variable in the two RORO options (4 & 5), which do not involve crane hire (unless containers are moved without trailers on the upper deck) and require a lower level of stevedoring manpower.

Table 29 below takes this a step further, quantifying the annual result for each service, and the affect of a simultaneous 10% variation on both price and volume.

Table 29 - Service Annual Result NZ$'000S – Sensitivity

Service	Voyages per	Weeks	Result per	Annual profit	Sensitivity NZ$K Positive	Negative

	week	pa	voyage	NZ$k	10%	10%
1. Pan NZ						
2. West Coast Shallow Water						
3. Enhanced Western						
4. NPL – NLS Roro						
5. West Coast Roro			Information Removed			

- Option 1 was eliminated from further consideration because a FDW service is not achievable, and because it is loss making.
- Option 2 was eliminated from further consideration because a FDW service is not achievable with sufficient margin for weather, and because it is loss making.
- Option 3 was eliminated from further consideration because it does not return sufficient profit to be considered financially viable, and because a down turn in volume and price would result in a significant loss.
- Option 4 (New Plymouth-Nelson RORO Shuttle) was taken forward for further analysis.
- Option 5 (Onehunga-Nelson-New Plymouth-Onehunga RORO) was eliminated for the same reason as Option 3.

4.2.8 Option 4: RoRo Shuttle Service Build Up – Year 1

All new shipping services take time to build up to full potential, owing to a number of factors, primarily arising from both teething problems with the operation, and initial reticence of cargo interests to try the new service, combined with period contract obligations between cargo generators and their current service provider (road, rail or sea). In recognition of these issues we believe it is likely to be Year 2 of the operation before the forecast volumes and financial results in constant NZ$ for this operation are realised. In the interim we would suggest that the outcome of the new operation is likely to be no better than a 50% load factor (on a maximum of 68 x 16m trailers in each direction or 136 TEUs) in Year 1 resulting in a marginal profit per voyage of Information removed. In year 2 the full potential of the service is reached information removed. Based on these parameters, and the assumptions previously set out the financial outlook for this service per voyage in the build-up year 1 is set out in Table 30 below.

Table 30 - Forecast Voyage Result of RoRo Shuttle Service NZ$'000S - Year 1

Item	Subtotals	Totals
SB Revenue		
- NLS empty Revenue		
NB Revenue		
- NLS Export Revenue		
Total Revenue		
Stevedoring		
Other Variable Costs	Information Removed	
Variable Costs		
Gross Profit		
Port Costs		
Charter Costs		
Fuel		
Overheads		
Fixed Costs		
Voyage Result		

It should be noted that these build up estimates do not make any allowance for dilution of freight revenue on the Auckland – Christchurch sector & vice versa to match current rates charged by Interisland Line on Cook Strait.

4.2.9 Capacity Increases

When the m.v. Kent becomes either uneconomic for reasons of age, maintenance and running cost or has inadequate capacity to service the growth in the trade (c 3% p.a. for domestic and 5% for

international) she should be replaced in Service Option 4 by a vessel some 40% larger in capacity terms. A summary General Arrangement or profile of such a vessel is likely to be as follows:

Deadweight (DWT)	4,946	**Length OA**	135m
Gross Tonnage	5,930	**Beam**	22.4m
Maximum Speed	20 knots	**Draft**	6.31m
Total Power HP	12,200	**Gear Type**	Internal Ramp
Fuel per Sea Day	38 tons CST 180	**Gear Details**	RoRo
TEU Actual @ 16 t*	278	**Charter Rate/Day**	NZ$10,000

* 14 tonnes cargo and 2 tonnes container tare weight

There are reasonable numbers of such ROROs operating in short sea trades in both Asia and Europe built in the last 10 – 15 years.

The key feature to note of such vessels is their speed – generally up to 20 knots which effectively means they could operate a round trip daily between Nelson and New Plymouth based on an 8 hour as opposed to 11 hour sea crossing. This assumes the ability of both ports to turn the vessel in 4 hours at each port, which with focus on the operation and some upgrade of the terminal environment should be possible given current terminal operating performance of the ferries on Cook Strait.

Fixed operating costs (excluding stevedoring, cargo insurance and running repairs) for such a daily round trip for a vessel of this type operated 6 days a week or 300 days pa are likely to be as follows:

Port Costs	
Charter	
Bunkers	Information Removed
Overhead	
Total Cost per Voyage	

It will be noted that this is slightly less (2%) than the round voyage cost for the mv Kent at information removed – while the larger vessel is more expensive to operate in terms of fuel, port and charter costs, this is offset by the potential doubling of its utilisation from 3 round voyages a week to 6. Given the forecast growth rates (3% domestic and 5% international) such an option is likely to become a serious requirement from about year 7 onwards.

5 The Proposal

5.1 Services

Further analysis in this project is limited to Option 4 (the New Plymouth – Nelson RORO service) having determined that only this service can still return a projected operational profit if both price and volume decrease by 10%.

5.2 Infrastructure

Nelson has an operational RORO berth, which is currently used for loading/unloading Strait Shipping's m.v. Kent service. At some stage this berth will need upgrading – however timing and degree of such an upgrade will depend on a number of variables, including how successful the service is and how quickly it grows. Port Nelson has not undertaken any studies or costings for such an upgrade – a nominal amount of $3m has been included in the economic analysis at year 7 to allow for such an upgrade requirement.

New Plymouth does not have a RORO berth. PTL commissioned CPG New Zealand to investigate options for the location of a RORO facility at the port. CPG identified two potential sites:

- **At the foot of the western side of Blyde Quay**

This site (refer Appendix N: Port Taranaki Ltd Proposed RoRo Berth – Layout Plan) is attractive from a construction cost standpoint (estimated cost $3.1M – refer Appendix O: Port Taranaki Ltd Proposed RoRo Berth – Construction & Maintenance Cost Estimates) and from a time to commissioning standpoint (estimated 6 months from decision to proceed to commissioning). However, the site has a number of disadvantages associated with it including:

a. Marine position – it faces the breakwater entrance, and so is exposed to any northerly swell – there are likely to be occasional periods (particularly around the spring equinox) when the vessel is unable to lower its ramp and conduct a safe operation because of surge conditions; these occur for about 3 hours around high water on 3 – 4% of tides p.a., a constraint which is likely to be manageable with a 12 hour port window for each call; and

b. Berth clashes – Blyde has two 225m berths which are currently used by 3 weekly container services (and one fortnightly break bulk). In 2008/9 berth utilisation was 26% and if the proposed Roro RORO service is added utilisation would still less than a normally very manageable 50%. As the service grows in freight volume attracted it will reach a point where this berth is not suitable - probably in about 7 years from commencement of service when a larger vessel will be required (refer section 4.2.10.1 above). This issue is expected to become more pronounced if the success of the RORO service has a consequential effect of attracting further international services to New Plymouth.

- **At the eastern side of Blyde Quay**

This site (refer Appendix N: Port Taranaki Ltd Proposed RoRo Berth – Layout Plan) is less attractive from a construction (estimated cost $38.0M – refer Appendix O: Port Taranaki Ltd Proposed RoRo Berth – Construction & Maintenance Cost Estimates) and maintenance cost standpoint. However, it can accommodate a moormaster system which will to some extent mitigate any effects of surge and swell. It also allows for ease of safe access to the linkspan by incoming trucks.

PTL have considered whether the cheaper western side of Blyde Quay option could be used as a temporary facility to prove the concept, and come to a conclusion that it could; however the constraints outlined above result in it not being a long term solution. These considerations, and a desire to have the service established and proven prior to committing to the significant expenditure, have resulted in PTL adopting a 2 stage approach to the creation of a RORO berth at New Plymouth:

Stage 1 – Construct the temporary berth at the landward end of Blyde Quay, and associated truck parking area outside the East Gate (refer plan P02, Appendix N: Port Taranaki Ltd Proposed RoRo Berth – Layout Plan). The estimated construction cost of this stage is $3.1M.

Stage 2 – Utilise the truck parking area constructed in stage 1, and construct a new berth on the eastern side of Blyde Quay (refer plan P03; Appendix N: Port Taranaki Ltd Proposed RoRo Berth – Layout Plan). The estimated cost of this option is $34.8M.

Cost estimates for construction and maintenance are contained in Appendix O: Port Taranaki Ltd Proposed RoRo Berth – Construction & Maintenance Cost Estimates.

PTL's consultants have provided the following text in relation the proposed Stage 2 facility:

"*The main components of the facility (ref drawing 2873 P03) are;*

- *A truck parking area with 500 lane metres of parking for both inbound and outbound vehicles.*
- *An extension of state highway 44 from the bottom of Bayly Road to the linkspan.*
- *A reclamation of 1.5 hectares to provide support land for the terminal*
- *A heavy duty link span suitable for the 3.5m tidal range*
- *A berth suitable for vessels in excess of 180m LOA and draft of 9.0m.*
- *A dredged berth basin to 10 m below chart datum.*
- *Landscaping to screen the assembly yard from Ngamotu Beach.*

Because of the wave exposure of the site, we have developed the concept using a fully suspended linkspan. The alternative types, such as a pontoon supported span or a semi submersible type need to be considered in the feasibility and design stage to balance economics against operability and maintenance.

The orientation of the berth is to align the vessel into the incoming waves from the entrance. As the location to the east of Blyde wharf is one of the most exposed areas in the port, we have adopted a number of features that are designed to reduce the potential movement of vessels at the RORO berth and at the adjacent supply boat berth, Blyde 3. These are:

- *The use of Moormaster units for mooring. These will not only provide operational efficiency in respect of berthing and un-berthing the vessel but will also offer considerable advantages in reducing wave induced surge and sway motions to an absolute minimum.*

- *A low reflective face to the reclamation. To limit the reflected wave effects on the supply boat berth a wave dissipation structure on the north-eastern face of the reclamation has been provided.*

- *A reflective face beneath the linkspan has been provided to limit the effect of wave reflection on the RORO vessel. A dissipative angled surface has been included beneath the deck of the linkspan to reflect energy away from the berth.*

The boundary between the port facilities and the highway facilities has been struck on two broad assumptions.

The first is that port assets created which cannot be recovered for use by other parties at some time in the future, or could be utilized by the port company for purposes other than the blue highway, remain with the port company. The reclamation, wharf structure and dredging fell into this category.

The second was that where assets were created specifically to enable the blue highway proposal to take place and could be considered part of the highway then these were assigned to the state highway. Into this category fell the link span and road costs above the reclamation and landscaping. The boundary between these is set at the end of the linkspan and along the edges of the road. That is, all (except the reclaimed land) assets that formed the road up to the end of the linkspan are categorized as highway.

The planning and engineering costs were either proportionally distributed in relation to the size of the capex spend or they fell where they belonged - eg hydraulic investigations fell with the port and the consenting costs fell with the port because it is assumed that the consenting issues would principally be dominated by issues associated with the reclamation."

In short this staged planning of the RORO berth utilises the cheapest possible option for the longest possible period.

5.2.1 Truck Parking Area

5.2.2 Infrastructure Ownership

PTL propose that the State Highway should extend to the berth face on land to be owned by government, and have mooted this to representatives of various bodies, including central government. This includes State Highway declaration of Bayly Road (from its intersection with SH44/Breakwater Road to Ocean View Parade) and Ocean View Parade (from its intersection with Bayly Road to the face of the new berth to be constructed in stage 2).

Construction and maintenance cost estimates have been developed by PTL's consultants - refer Appendix O: Port Taranaki Ltd Proposed RoRo Berth – Construction & Maintenance Cost Estimates. These estimates have been split into State Highway costs and PTL costs and are summarised in Table 31.

Table 31 – Construction Cost Estimates NZ$m

Stage	PTL Cost	State Highway Cost
1	$2.4m	$0.7m
2	$20.1m	$14.7m
Total	$22.5m	$15.4m

PTL have advised that acceptance of the principle of extension of the State Highway network to include the truck parking area in stage 1 and to the berth face in stage 2 is fundamental to the proposal.

5.2.3 State Highway or Local Road

In discussions with staff from NZTA and MoT the question of whether the roading component of the new infrastructure should be State Highway or Local Road was raised.

Information on NZTA's website (Planning Policy Manual version 1: Chapter 3 - Planning and design) relevant to this issue includes:

"*The primary purpose of state highways is to provide for the needs of long distance traffic and freight travelling between and within major centres of population and to:*

- *major ports and airports;*
- *major industrial areas;*
- *major primary production areas; and*
- *major tourist areas and places of interest"*

and

"*One of the key functions of state highways is to assist New Zealand's economic development and international competitiveness. This places a strong focus on the importance of catering effectively for freight. Transit's focus on maintaining the strategic function of national state highways in particular directly assists with meeting the needs of long-distance freight and providing access to ports and airports*"

And

"*Freight makes up a significant and rapidly growing proportion of traffic on state highways:*

- *currently 1 in 6 vehicles on state highways is a heavy commercial vehicle (HCV) (i.e. exceeds 3.5 tonnes gross weight);*
- *the volume of HCVs on state highways is growing at 5-6% per annum;*
- *research suggests freight will grow by around 85% by 2020;*
- *there will be increased carriage of freight by rail and coastal shipping – but this will only account for about 20% of the total freight to be transported and the largest part (80%) of freight movement will be by HCV (ibid);*
- *by 2020 1 in 4 vehicles on NZ roads will be a HCV (ibid);*

- *freight growth will be particularly significant in Waikato, Auckland, Bay of Plenty and Christchurch (ibid);*
- *freight growth will have specific regional and local impacts, e.g. forestry;*
- *there will be increasing pressure for greater vehicle mass limits, driven by productivity demands; and*
- *likely structural changes internationally in freight services (e.g. larger containers, fewer ports) may place new requirements on the state highway network"*

and

"*Catering for the volume and impacts of freight movements on the state highway network requires a multi-sector and multi-agency approach. For its part, Transit must ensure the state highway network is appropriate to meet the demands placed on it by HCVs and overall economic development requirements. However, a national strategic approach involving multiple agencies is required to ensure that expected freight growth is catered for by all modes in the most cost effective and sustainable way*"

and

"*Freight policy*

Transit will implement the Integrated Planning Policy by giving effect to this supporting policy:
Transit is committed to ensuring the state highway network supports and provides for the cost-effective and sustainable movement of freight within New Zealand by:

- *participating in a comprehensive multi-agency approach to develop a national freight strategy that takes account of the impact of projected freight movements on the state highway network;*
- *contributing to land use planning processes and decisions that affect state highways and freight movement and growth;*
- *working with local authorities and other agencies in the development and delivery of multi-modal regional freight strategies;*
- *taking into account freight movements and regional freight strategies in the identification, planning, prioritisation and design of state highway projects including bypasses, passing and overtaking measures, rest areas, motorway service centres, weigh stations, effluent disposal sites and travel demand management measures (e.g. heavy commercial vehicle-only lanes);*
- *participating in discussions and joint projects with other freight carriers including rail and coastal shipping;*
- *emphasising safety in relation to heavy commercial vehicles and state highways;*
- *managing the impact of heavy commercial vehicles, increased mass limits and oversized vehicles on existing infrastructure; and*
- *collecting, monitoring and improving heavy commercial vehicle movement information and working collaboratively to forecast freight growth"*

All the service options considered in this study are totally and solely focused on the long distance interregional movement of freight between:

- major centres of population;
- major ports;
- major industrial areas; and
- major primary production areas

The proposed New Plymouth-Nelson RORO shuttle service caters significantly more effectively for freight than the transport options currently available (a freight transport cost reduction on the key trade routes considered ranging between $100s to in excess of $1,000 per truck and trailer movement is potentially available – refer Table **33**) and will as a consequence assist New Zealand's economic development and international competitiveness. The extension of the current state highway network to the berth face will cater almost solely for freight traffic. The services will allow a multi modal approach to achieving the most effective and efficient logistics supply chain possible. To quote the NZTA documents again

"*For its part, Transit must ensure the state highway network is appropriate to meet the demands placed on it by HCVs and overall economic development requirements. However, a national strategic approach involving multiple agencies is required to ensure that expected freight growth is catered for by all modes in the most cost effective and sustainable way*".

Declaring the roading component (i.e. access to the RORO berth) a State Highway would be giving positive effect to NZTA's policies of:

- *"working with other agencies in the development and delivery of multi-modal regional freight strategies; and*
- *participating joint projects with other freight carriers including coastal shipping"*

Insisting that the roading component be a local road would be inconsistent with NZTA's policies as set out above; and would also raise equity issues, which are discussed in 5.2.2.1.

5.2.3.1 Equity

The roading component will provide access to the RORO berth for inter regional freight traffic (i.e. trucks), it will not serve any other purpose.

If the roading component of the proposed services is required to be a local road substantial equity issues will arise. The local road would be administered by New Plymouth District Council and require a little less than 50% funding from New Plymouth District rate payers.

However residents of New Plymouth would receive little direct benefit from the proposed service. Most of the benefits fall to residents of other areas. Consider freight that would other wise move by road between Auckland and Christchurch. When the proposed service is established, that freight will switch from a SH1 Auckland Christchurch route (with short local road sections and a Cook Strait ferry crossing) to a route that utilises Auckland New Plymouth by road, New Plymouth Nelson by sea, and Nelson Christchurch by road. The national benefits that accrue are:

- reduced truck crashes (none of which would otherwise have occurred in New Plymouth, as the trucks did not otherwise travel through New Plymouth);
- reduced road congestion (congestion benefits within the Wellington Region have been quantified in the economic analysis; in reality there will be substantial, but unquantified, congestion benefits in other regions);
- reduced carbon dioxide emissions (these emissions would not have taken place within New Plymouth District);
- reduced particulate emissions (these emissions would not have taken place within New Plymouth District); and
- reduced road capital and maintenance expenditure on State Highways (these costs would not have fallen to New Plymouth District Council ratepayers except to the extent that they contribute to funding of the National Land Transport Fund).

From a New Plymouth District view point the effects are negative. Within the District truck crashes, noise, congestion, carbon dioxide and particulate emissions, road capital and maintenance expenditure are all expected to increase. The residents of New Plymouth District are being asked to bear the adverse impacts of this proposal; to also ask them to contribute funding would not be equitable.

In summary if the road component of the proposed services were to be a local road almost half the costs would fall on New Plymouth District Council ratepayers, yet they would be the recipients of the adverse impacts, while the nation as a whole received national benefits and central government would benefit through reduced maintenance costs on State Highways. An inequitable situation would have been created.

6 Existing & Potential Rail Service

Opportunities for rail freight, while not the main focus of this study, were considered.

Goods for rail are full container loads (FCL). Since major freight forwarders use rail for the line haul of the goods, generally the actual traffic is less than container load (LCL). LCL consolidation is what freight forwarders do, even if there is enough for a direct TEU, because they mix weight and volume to optimise the load and thus "general goods" or "freight forwarding" make up the majority of the traffic on the Auckland-Christchurch route. Road and rail are on a more even footing, not needing a transfer haul to the customers' premises (because of the private sidings to forwarders terminals, and because even a road haul of LCL ends up at the terminal rather than direct to the end customer). Direct delivery to the terminal is usually required, and it can occur by both road and rail (but not sea).

Further, the optimisation of weight and volume can allow use of rail's greater weight capability. This cannot happen if the container is to move anywhere on road, e.g. for line haul or for a delivery to ship.

7 Existing & Potential Road Service

The proposed New Plymouth-Nelson-New Plymouth RORO service competes with road freight, primarily for freight with origins/destinations of Auckland, New Plymouth, Nelson, Christchurch and the West Coast of the South Island.

7.1 Additional Road Infrastructure Required

7.1.1 Road Routes

Every sailing of the proposed New Plymouth-Nelson-New Plymouth RORO service (3 per week in each direction initially) would transfer about 50 truck and trailer trips from SH1 Auckland/South Island to an Auckland/New Plymouth and thence South Island route. Southbound trucks from Auckland would depart SH1 at Horotiu onto SH39, joining SH31 just north of Tihiroa, and then join SH3 at Otorohanga, remaining on SH3 as far as New Plymouth.

The South Island road leg for freight to/from Christchurch would traverse SH6 from Nelson to Blenheim, and then SH1 from Blenheim to Christchurch. The total road travel distance would be reduced from 994 km (SH1 route) to 781 km (New Plymouth-Nelson RORO route); a saving of 213 km in road distance and about 1 hour 40 minutes of driving time.

An alternative South Island route via the Lewis Pass is available and may prove attractive.

7.1.2 Capital & Maintenance Costs

The parts of the route most sensitive to additional truck traffic are SH3 (particularly in the vicinity of Mount Messenger) and SH6 between Nelson and Blenheim.

NZTA's maintenance engineer responsible for the Taranaki region (Ross McCoy) was asked for his opinion on whether an additional 50 or so truck and trailer units on the SH3 route 3 days per week would have any significant effect on maintenance requirements. He advised that it would not, that at Mount Messenger the road currently carries about 400 trucks per day, and an additional 50 would not make a significant difference, and that truck traffic on the route could increase by 50 trucks per day in a small number of years due to natural growth.

Frank Porter of Marlborough Roads was asked about the impacts of the additional truck movements on South Island roads. He advised that trucks may use either the Nelson Blenheim route (SH6, SH1) or the Lewis Pass route (SH6, SH 65, SH7, SH1). He advised that there would be no significant negative impact on either route; and that additional trucks on the Lewis Pass route might be a benefit in terms of helping to manage ice in winter.

We conclude, based upon advice from NZTA staff, that there would be no significant additional road capital or maintenance costs.

8 Strategic Fit

8.1 Roads of National Significance

Central Government has identified seven Roads of National Significance (RoNS). These are:

- Puhoi to Wellsford – SH1
- Completion of the Auckland Western Ring Route – SH20/16/18
- Auckland Victoria Park bottleneck – SH1
- Waikato Expressway – SH1
- Tauranga Eastern Corridor – SH2
- Wellington Northern Corridor (Levin to Wellington) – SH1
- Christchurch motorway projects

The New Plymouth-Nelson-New Plymouth RORO service would reduce heavy traffic on a section of the Waikato Expressway – SH1, and on Wellington Northern Corridor (Levin to Wellington) – SH1.

The proposed service is an excellent strategic fit with the RoNS.

NZTA's criteria for Strategic Fit include:

Table 32 - Strategic Fit

Activity Class	HIGH
New and improved infrastructure for State highways and local roads	Potential for a major contribution to national economic growth and productivity on Freight routes

The economic analysis described in section 9 clearly demonstrates that the proposed service(s) would make a **major contribution** to national economic growth and productivity on **Freight routes**. Total national economic benefits are calculated as $33.7 million discounted and $107.5 million undiscounted over the thirty year evaluation period. The proposed services are rated HIGH for Strategic Fit.

8.2 Relationship to Government Policy Statement on Land Transport Funding 2009/10 – 2018/19

The Government Policy Statement on Land Transport Funding 2009/10 – 2018/19 (GPS) sets out what central government wishes to achieve from its investment in land transport. The GPS includes:
"*Of particular importance to this priority are:*
• investing in the State highway network, as a key to the efficient movement of freight and people
• generating better value for money from the government's investment across all land transport activity classes and enhancing the economic efficiency of individual projects"
The proposed New Plymouth-Nelson-New Plymouth RORO service and associated extension of the state highway is an opportunity for central government to invest "*the State highway network, as a key to the efficient movement of freight*" and Section 9 of this report demonstrates that such investment would generate "*better value for money from the government's investment"* in road freight transport infrastructure and to enhance *"the economic efficiency of individual projects*".

The GPS notes that "*Investing in the State highway network is important as there are significant constraints on its current capacity to efficiently move freight and people, leading to congestion in New Zealand's major cities. Unless investment in State highways is addressed, congestion will continue to negatively impact on economic growth and productivity*". Investing in the state highway extension associated with the proposed New Plymouth-Nelson-New Plymouth RORO service will ease some of this congestion, including on the Wellington Airport to Levin RON.

The GPS includes "*In particular, more emphasis should be placed on the economic efficiency of individual projects*". The economic efficiency of the proposed New Plymouth-Nelson-New Plymouth RORO service is examined in section 9, which demonstrates that the project would perform particularly well in economic efficiency terms with a BCR of 99 (savings exceed costs), a pseudo $BCR_{National}$ of 8.7 and a pseudo $BCR_{Government}$ of 5.7. These results demonstrate that the economic efficiency of government's investment

in the proposed New Plymouth-Nelson-New Plymouth RORO service is amongst the higher range of BCRs for projects that NZTA funds.

Transfer of the general cargo from road to coastal shipping will make significant contribution to increasing national economic growth and productivity – getting freight to market efficiently is critical to national economic growth and productivity. The proposed New Plymouth-Nelson-New Plymouth RORO service will result in significant reductions in internal freight transport costs (a freight transport cost reduction on the key trade routes considered ranging between $100s to in excess of $1,000 per truck and trailer movement is potentially available – refer Table 33).

The GPS goes on to list "*other objectives*" which are:
- Assisting economic development
- Assisting safety and personal security
- Improving access and mobility
- Protecting and promoting public health
- Ensuring environmental sustainability.

These objectives are discussed in section 8.5 below.

The GPS sets out "*The specific impacts the government expects to be achieved through the use of the National Land Transport Fund*" which are

Impacts that contribute to economic growth and productivity

- *Improvements in the provision of infrastructure and services that enhance transport efficiency and lower the cost of transportation through:*
  - *improvements in journey time reliability* Journey time reliability is enhanced by bypassing the Wellington to Levin RONS and its associated journey time unreliability
  - *easing of severe congestion* Removing long distance heavy freight traffic from the Wellington to Levin RONS will ease severe congestion on that RON.
  - *more efficient freight supply chains* The potential increase in efficiency in the freight supply chain is demonstrated in Table 33 - Door to Door Freight Rates.
  - *better use of existing transport capacity.* The proposed project gives much better use of existing transport capacity (both fixed infrastructure capacity and truck capacity). The improvement in truck utilisation is reflected in Table 33 - Door to Door Freight Rates. The improvements in fixed infrastructure utilisation are partially demonstrated in the economic analysis
- *Better access to markets, employment and areas that contribute to economic growth.* The proposed projects substantially improves access to/from supply points, production points and markets, again Table 33 - Door to Door Freight Rates demonstrates and quantifies the improvement.
- *A secure and resilient transport network.* The proposed projects contribution to a secure and resilient network is discussed in section 9.2.5 below..

Other impacts

- *Reductions in deaths and serious injuries as a result of road crashes.* The crash reduction benefits have been quantified in the economic analysis and are discussed in section 9.2.3 below.
- *More transport choices, particularly for those with limited access to a car where appropriate.* The proposed project has little or no effect on transport choices.
- *Reductions in adverse environmental effects from land transport.* The potential reduction in adverse environmental effects is substantial. Some of the reduction is quantified in section 9.2.2 below.
- *Contributions to positive health outcomes.* The potential positive contribution to health outcomes is also substantial. Some of the reduction is quantified in section 9.2.4 below.

8.3 NZTA's Strategic Investment Direction

NZTA's Planning Programming and Funding Manual includes:

The NZTA's strategic investment direction is developed from the GPS. It provides the background against which assessment of activities and combinations of activities is carried out.

Activity class	***Increased priority for ....***	***Maintain focus on ....***

12 New and improved infrastructure for local roads ***13 New and improved infrastructure for state highways***	*Investment in state highways and local roads where greatest economic growth and productivity impacts can be achieved through:* • *Investing in Roads of National Significance (RONS) to improve access through, in and out of the major urban areas* • *Investing in key freight and tourism routes to lift productivity and improve access to markets* • *Investing in infrastructure on local road networks that support RONS.*	• *Improving journey time reliability on key routes* • *Easing severe congestion* • *Better use of existing capacity* • *Increasing capacity on key routes* • *Reducing the risk and number of fatal and serious injuries* • *Reducing risk from natural hazard or other transport operations disruptions* • *Managing adverse environmental effects from land transport.*

The New Plymouth-Nelson-New Plymouth RORO service would **support investment in the Wellington to Levin RONS** by removing heavy freight traffic from the traffic stream on that RON, which will **improve access in and out of Wellington**. The investment in the state highway extension would **improve the key North Island-South Island freight route** resulting in a consequential **productivity lift**. It would **improve journey time and ease severe congestion on the Wellington Airport to Levin RON**, **increase freight capacity** on the key North Island-South Island freight route, **reduce the risk of truck related fatal and serious injuries**, **increase the resilience of the land transport network** between key centres of economic activity, and **reduce the adverse environmental effects of freight transport**.

The New Plymouth-Nelson-New Plymouth RORO service would make a major contribution to **network security and resilience** (refer section 9.2.5) and **improve journey time reliability and ease congestion** in the Wellington urban area (refer section 9.2.1). It would also make a **major contribution to economic growth on key freight routes** and **maximizes access to significant markets, areas of employment or economic growth** (Auckland, New Plymouth, Nelson, Christchurch, and West Coast).

8.4 NZTA Policy

For discussion in relation to NZTA policy refer section 5.2.2.

8.5 Relationship to the Land Transport Management Act

8.5.1 Objective – Assisting Economic Development

Efficient and effective transport of containerised products is an essential component of an efficient economy. The New Plymouth-Nelson-New Plymouth RORO service will assist economic development by:

- removing traffic from congested sections of SH 1 in the Auckland and Wellington urban areas. The project has substantial positive net benefit on other road users (i.e. traffic remaining on the road network), the national travel time, reliability and vehicle operating cost benefits in the Wellington region alone are calculated as $12.6 million discounted and $46.7 million undiscounted (36% of the quantified benefits are improvements in travel time and reliability for other road users); and;
- • reducing overall transport costs. The proposed New Plymouth-Nelson-New Plymouth RORO service will result in significant reductions in internal freight transport costs (a freight transport cost reduction on the key trade routes considered ranging between $100s to in excess of $1,000 per truck and trailer movement is potentially available – Table 33; and
- removing structural loading from some existing pavement infrastructure and thereby extending its useful life

Transporting containerised products efficiently is in itself a contribution to economic development. Work on previous commissions using input-output models has demonstrated that this activity will have a useful multiplier effect that will add not only to the economic performance of transport and port activities, but will

also flow on to other areas of the economy. These benefits have not been included in the economic evaluation.

The operation will contribute to the NZTS targets of:

- improving the reliability of journey times on critical routes; and
- reducing average journey times on critical routes.

8.5.2 Objective – Assisting Safety & Personal Security

Transport of general cargo products by coastal shipping will improve safety by:

- reducing the length of road traversed by loaded truck and trailer units which will address both the real and the perceived safety risk associated with heavy vehicles operating in a mixed traffic environment.

The project will contribute to the NZTS targets of reducing road deaths to no more than 200 per annum by 2040 and reducing serious injuries on road to no more than 1,500 per annum by 2040. Transfer of the freight transport task from road to coastal shipping is predicted to reduce the cost of injury crashes by more than $0.8 million annually by 2015 by well over $1.4 annually by 2042. The national accident cost benefits are calculated as $12.0 million discounted and $35.5 million undiscounted (34% of the quantified benefits are reductions in accident costs).

8.5.3 Objective – Ensuring Environmental Sustainability

The New Plymouth-Nelson-New Plymouth RORO service will:

- Minimise the use of non-renewable fossil fuels, which will in turn minimise green house and other gas emissions resulting from the transport of the containerised freight. The total predicted reduction in fossil fuel usage is 42.5 million litres over the 30 year evaluation period;
- Increase coastal shipping's share of the freight task;
- Reduce the noise impact of the transport operation;
- Reduce the emission of particulates. National net benefits of particulate emission reduction have been quantified at $6.8 million discounted and $18.9 million undiscounted; and
- Reduce the deposition of other contaminants on the road surface attributable to the transport of containerised freight.

Transport of containerised product by coastal shipping will contribute to the NZTS targets of:

- Halving per capita greenhouse gas emissions from domestic transport by 2040; and
- Increasing coastal shipping's share of interregional freight to 30 percent of tonne kilometres by 2040.

8.5.4 Objective – Improving Access & Mobility

Transport of general cargo products by coastal shipping will make a minor contribution to promoting cycling and walking. The rural state highway routes generally experience minor use by touring cyclists. Reducing the length of road traversed by loaded truck and trailer units will improve cyclists' perception of the routes.

Additionally the removal of trucks from sections of State Highways with relatively heavy pedestrian usage can be expected to improve pedestrians' perception of the walking environment.

8.5.5 Objective – Protecting & Promoting Public Health

The operation is expected to contribute to the NZTS targets of:

- reducing the number of people exposed to health endangering noise levels from transport;
- reducing the number of people exposed to health endangering concentrations of air pollution in locations where the impact of transport emissions is significant.

The national benefits associated with reduced exposure to particulate emissions are calculated as $6.8 million discounted and $18.9 million undiscounted. 20% of the quantified benefits arise from reduced exposure to particulate emissions.

8.6 New Zealand Energy Efficiency & Conservation Strategy – October 2007

The proposal will make a contribution to achieving the outcomes desired by contributing to the high level target of reducing the overall energy use and greenhouse gas emissions from New Zealand's transport system (high level target clause 1.5) and the more detailed target in chapter 4 of halving the per capita greenhouse gas emissions by 2040. Energy (i.e. fuel) saving are calculated 42.5 million litres over the 30 year evaluation period.

8.7 Relationship to Regional Land Transport Strategies

8.7.1 Taranaki Regional Land Transport Strategy

The Regional Land Transport Strategy for Taranaki February 2006 includes the following statements:

"*It is important to note that this document is a land transport strategy and therefore does not include direction or provisions for sea transportation in the Taranaki region. However, the Strategy does recognise the importance of Port Taranaki for its transportation links (both domestic and international) and the role that it plays within Taranaki's wider transportation network. Further discussion on the integration of both sea and air modes of transportation with other land transport modes occurs in Chapter 10 (Integration)*".

Chapter 10 goes on to state:

- *"the interface between land transport networks and air/sea transport is very important*
- *integration across all modes of transport in Taranaki is vital to future economic development and sustainability – without such integration, ad hoc programmes and projects continue to exist and operate"*

Establishment of the RORO service as proposed clearly contributes to integration of the region's freight transport services, and to the objectives of the RLTS.

8.7.2 Nelson Regional Land Transport Strategy

The Regional Land Transport Strategy for Nelson City Council June 2009 does not have a strong focus on freight transport. However it includes the following statement:

"*Roads and traffic management Policy 3*

Ensure the efficiency of the transport network by …… encourage increased use of alternative modes of transport"

Transferring a portion of the freight transport task from road transport to coastal shipping is consistent with increasing use of alternative modes of transport.

8.7.3 Support from Regional Councils

The Taranaki, Auckland, and Horizons Manawatu regional councils supported the investigation phase of this project, as did Nelson City Council (which is a unitary authority having the powers and responsibilities of both a regional council and a territorial authority). They have not yet been approached to determine their attitude to implementation, however given their support of the investigation phase support for the implementation phase seems likely.

9 Economic Analysis – Methodology & Results

Economic evaluation of the proposed New Plymouth-Nelson-New Plymouth RORO service has been undertaken in accordance with the New Zealand Transport Agency's Economic Evaluation Manual Volumes 1 & 2.

The results of the economic analysis of the introduction of any new coastal shipping service are influenced by the assumptions around which mode the freight would be carried by in the absence of hat coastal shipping service. For instance if the freight would, in the absence of a Western Blue Highway service, be transported by road the benefits are large and positive. However if the freight would otherwise be transported by sea (from say Auckland to Lyttelton) and the new service involves an Auckland to New Plymouth road leg, a New Plymouth to Nelson sea leg, and a Nelson to Lyttelton road leg the benefits are negative.

The study team has put considerable effort into attempting to reliably identify which mode the freight would be carried by in the absence of hat coastal shipping service.

Current operating patterns are in a state of flux (all are under pressure and are not just likely to change substantially in coming years – let alone 30 years out – but have changed in some cases already since the NFDS study was completed in 2008).

International shipping schedules around the NZ coast are being modified to respond to cost pressures on the operators who are cutting out NZ ports wherever they can and starting to charge more realistically for eccentric services away from main gateways; for instance Maersk SSE (weekly coastal and Tasman service) has changed NZ port rotation 3 times in the last 12 months, which vitally affects to which ports it moves Empties and whether or not it will pick up export feeder cargo. And we know it has problems with capacity between selected ports.

Pacifica's operations are LOLO. Our modelling has shown that LOLO operations attract high stevedoring costs and leave the operators under serious cost pressure on short haul coastal services (as opposed to long haul international). Our LOLO voyage models are loss making or break even at best which suggests that the future of a LOLO based service may be fragile. Continued operation of a LOLO based service cannot be assured.

KiwiRail as we know is in transition; any assumptions about its freight services and pricing medium term must necessarily be speculative.

The road freight industry, which has the majority of the domestic market, is finding it increasingly difficult to recruit drivers and cope with increasing operating costs (fuel, capital and RUC). Therefore it has increasing incentives to focus its physical operations on the market sector only road can serve cost effectively, i.e. short to medium haul.

Any detailed comparative modal assessment (i.e. who in which mode carries what on the various trade lanes from which the RORO service will draw freight) is therefore impossible to quantify logically over any significant period of time. You can try to take a photo at the present; but the one thing you can be sure of is that within a few years into the 30 year analysis period the competitive modal context will have changed substantially.

For these reasons we have not included the movement of full export containers or the movement of empty containers in our financial or economic analysis, with the exception of freight to/from Nelson.

Nelson is treated differently from other ports because:

- it is not served by rail, and cannot be served by rail without considerable investment, which even with a 30 year time line, appears very unlikely; and
- it has few deep sea general cargo international calls (other than Trans Tasman) and even those calls it does have are threatened by the combination of Nelson's limited water depth and access channel as the international shipping lines move to larger vessels.

The modal splits used in our analysis were derived from estimates of door to door container/trailer freight costs between the port city pairs of interest. The costs of the coastal shipping movement on the RORO

services of interest have been investigated in some detail as a part of this study. The costs of other coastal shipping and rail services were taken from the Rockpoint "Coastal Shipping and Modal Choice" study undertaken for NZTA in 2009. It should be noted that the coastal shipping service costs in that report appear to be an amalgam of coastal shipping and transhipment costs. Road freight rates were provided by a major road freight transport operator.

For the New Plymouth-Nelson-New Plymouth RORO service estimates adopted for the comparative door to door costs for an FEU in NZ$ in each direction were as set below:

Table 33 - Door to Door Freight Rates

Information Removed

Information removed

Information Removed

The table shows that for:

- Information removed.

9.1 Base Date & Time Zero

The base date is 1 July 2008. Time zero is 1 July 2010.

9.2 Benefits

Benefits are derived from removing trucks from the roading network (i.e. reduction in truck Vehicle Kilometres Travelled (VKT)). The calculated benefits accrue to the nation, and in particular to road users remaining on the parts of the road network that would otherwise be used by the trucks diverted to the New Plymouth-Nelson-New Plymouth RORO service.

Benefits arise from reduced numbers of heavy vehicles in congested urban areas (particularly the Wellington urban motorway), reduced carbon dioxide emissions, improved health for those that would otherwise be exposed to the damaging effects of particulate emissions, and accident costs avoided through a reduction in truck VKT.

Benefits start from commissioning of the stage 1 RORO berth at New Plymouth.

9.2.1 Travel Time, Vehicle Operating Costs & Congestion

Greater Wellington modelled travel time, congested travel time and vehicle operating and congestion costs associated with a heavy truck and trailer units within the Wellington region using the Wellington Transport Strategic Model and reported this work in their report titled "Road User Benefits from Road to Rail Transfer of Logs and Wood Products - Marton, Masterton and Wanganui" dated June 2004. This modelling used benefit unit values with a base date of 2002, and produced the unit road user cost per VKT for trips within Wellington region. The modelling accounted for the effects of the addition or removal of truck and trailer units on other road users, and found that the costs increased as over time (as would be expected).

The calculated travel time, vehicle operating and congestion benefits (which might be better described as an improvement of travel conditions from a reduced number of heavy vehicles on the road) have been calculated within the Wellington Region only. Most of the VKT avoided by implementation of the New Plymouth-Nelson-New Plymouth RORO service will be beyond the Wellington region, so there are substantial benefits known to exist, which have not been quantified. We are not aware of any similar modelling in other regions that would allow these benefits to be quantified for a greater portion of the truck VKT avoided.

9.2.2 Carbon Dioxide

The emission of carbon dioxide from engine exhausts is directly linked to fuel consumption, the more fuel burned the more carbon dioxide emitted. Road transport has been assumed to be able to average 1.5km per litre of fuel burned, and capable of carrying 2 TEUs or 1 FEU per vehicle combination.

Coastal shipping is predicted to burn 3.9 million litres per year, giving a net fuel; saving of 42.5 million litres over the 30 year evaluation period.

9.2.3 Accident Costs

The New Zealand Transport Agency has developed a model for predicting truck accidents. This model is in Appendix 6 of the Agency's Economic Evaluation Manual Volume 1, and has been used to calculate the accident reduction benefits of transferring the freight from road to coastal shipping.

9.2.4 Particulate Impacts

The New Zealand Transport Agency has developed a methodology for valuing particulate emissions. This methodology is in Appendix 9 of the Agency's Economic Evaluation Manual Volume 1, and has been used to calculate the particulate benefits of transferring the freight from road to rail.

9.2.5 National Strategic Factors

National Strategic Factors have been identified by this study.

The New Plymouth-Nelson-New Plymouth RORO service will provide increased robustness/connectivity of the transport network. That networks with a greater number of interconnections are more robust than networks with a fewer number of interconnections is well known. New Zealand's road network is reasonably interconnected and robust within each island, with some limitations which relate to the linear nature of the country and its topography. The rail network has a lesser degree of interconnectivity within each island.

However the picture is somewhat different when we consider connectivity between the two main islands. The only rail link and the only substantive RORO link both rely on Wellington, with no alternative North Island RORO berth point available outside of Wellington (other than disused RORO berths in Auckland). This lack of interconnection raises questions regarding how robust the land transport network connections are.

The robustness of lifelines is a subset of this interconnectedness. There are a great many lifelines type events that could and almost certainly will at some point in time disrupt the nation's transport system. To illustrate the point consider a scenario involving a major seismic event in Wellington (which the experts tells us is a question of when, not if). It is likely that Wellington's wharves (including its RORO berthing facilities) could be inoperable for many months, or possibly years. If the seismic event resulted in a significant rising of the seabed (as has occurred in previous events, including the 1855 event) the present wharf site might never be a usable wharf again. Precisely this problem has just arisen with the recent Haitian earthquake in Port au Prince. Such an event would result in a very substantive reduction in inter island freight transport capacity, with an extremely serious medium term negative effect on the national economy.

Provision of a substantive appropriately configured RORO facility at New Plymouth would largely avoid the substantive reduction on North Island / South Island freight transport capacity, and avoid the consequential extremely serious medium term negative effect on the national economy.

Quantifying these effects is beyond the scope of this study; techniques for doing so are only now emerging and are not yet widely accepted. However it is interesting to note that Greater Wellington (Wellington Regional Council), with some involvement/guidance from the Wellington Lifelines Group, recently obtained an economic assessment of a proposal to reduce the restoration period for bulk water supply following a major seismic event in Wellington. That assessment quantified the present value of the benefits as between $200M and $600M. Intuitively, it would appear that the benefits of maintaining a high capacity freight link between our two main islands could be much greater than those of reducing the water supply restoration period.

These National Strategic Factors have not been accounted for in the economic analysis, but they are none-the-less real; and should recognised and taken account of by decision makers.

9.2.6 Disbenefits

No net disbenefits have been identified by this study. Local disbenefits associated with increased exposure to truck traffic have been identified, particularly in New Plymouth and Nelson.

9.2.7 Equity Impacts

Equity Impacts have been identified by this study, implementation of the proposed RORO shuttle will have a negative impact on people living near the routes that attract increased freight traffic, and a positive impact on people living near routes that attract less freight traffic. Provided the road extension is funded as a State Highway these impacts will be minimised. There would be significant negative equity impacts on New Plymouth rate payers if the road extension were to be funded as a local road, refer 5.2.2.1 above.

9.2.8 Other Impacts

Other positive impacts exist, but have not been quantified as there is no generally accepted methodology for doing so. These include reduced deposition of heavy metals to the road surface from truck operations, and consequently less suspended heavy metals entering the water borne ecosystem.

9.3 Government Costs

9.3.1 Road User Charges

Road freight is carried on trucks of varying configurations, which consequently pay varying rates of Road User Charge. Discussions with a major road freight operator have revealed that at the low end of the range trucks can be configured to pay Road User Charge of $505/1000km, and this figure has been used to calculate the Road User Charge foregone.

Road User Charge foregone over the 30 year evaluation period as a result of implementation of the New Plymouth-Nelson-New Plymouth RORO service are calculated as $128.4 million undiscounted, with a present value of $43.5 million.

9.3.2 Road Maintenance & Capital Cost Savings

The New Zealand Transport Agency's Economic Evaluation Manual Vol 2 includes a methodology for quantifying the road maintenance and capital cost savings to government on page 13-14. This methodology has been used to quantify these costs.

The calculated Road maintenance and capital cost savings $297.2 million undiscounted, with a present value of $100.7 million.

9.3.3 Subsidy

No operational subsidy of he proposed RORO is being sought.

9.4 State Highway Extension

9.4.1 Bridge from Road to Sea at New Plymouth

For the favoured option (New Plymouth-Nelson-New Plymouth RORO service) to operate, RORO capable berths (including associated truck parking areas) are required at New Plymouth and Nelson.

A RORO capable berth exists at Nelson. Port Taranaki does not currently have a RORO capable berth. Options for temporary and permanent berths have been explored by Port Taranaki Ltd and their maritime consultants, refer 5.2 above.

A "bridge" from the current roading network to the berth face will be required.

9.4.2 Proposed Funding Arrangements

Port Taranaki Ltd proposes that the extension of the roading network to the berth face be State Highway. The estimated construction cost of the State Highway portion is $15.4 million; the Port Taranaki portion is estimate at $22.5 million, giving a total construction cost of $38.0M over the two stages. These costs exclude land value. The estimated land area required is 1.3 hectares at a rate of $1 million/hectare, giving a land cost of $1.3 million. This cost is allowed for in the economic analysis; whether or not it is a cash cost is a matter for negotiation between Port Taranaki Ltd and the New Zealand Transport Agency.

9.5 Benefit Cost Ratio

9.5.1 Benefits– National

The net present value of national benefits has been calculated as:

Table 34 - Net National Benefits

Description	Benefits (Millions)
Accidents	$12.0
Road User Benefits	$12.7
CO_2	$2.2
Particulates	$6.8
TOTAL	**$33.7**

9.5.2 Costs to Government – National

The net present value of national costs has been calculated as:

Table 35 - Net National Costs

Description	Costs (Millions)
Additional Maintenance Costs	-$96.9
Construction and Maintenance Costs	$15.6
TOTAL	**-$81.3**

To summarise over the 30 year evaluation period, on both a cash basis, and on a discounted basis New Plymouth-Nelson-New Plymouth RORO service will generate substantial net national economic benefits, save the nation substantially more money than it costs, so leaving the nation in an improved economic position.

9.5.3 BCR National

As the cost line of the BCR calculation is negative (i.e. government cost savings exceed the combined total of government construction costs, maintenance costs and loss of Road User Charge) the $BCR_{National}$ is taken as 99.

9.5.4 Costs to Government – Government

The net present value of government costs have been calculated as:

Table 36 - Net Government Costs

Description	Cost (Millions)
RUC Foregone	$41.9
Additional Maintenance Costs	-$96.9
Construction and Maintenance Costs	$15.6
TOTAL	**-$39.5**

To summarise over the 30 year evaluation period, on both a cash basis, and on a discounted basis the New Plymouth-Nelson-New Plymouth RORO service will save government substantially more money than it costs, leaving government in an improved fiscal position.

9.5.5 BCR – Government

As the cost line of the BCR calculation is negative (i.e. government cost savings exceed the combined total of government construction costs, maintenance costs and loss of Road User Charge) the $BCR_{Government}$ is taken as 99.

9.6 Other Economic Indicators

Agency staff have requested that the evaluation include consideration of the present value of the project and calculation of a pseudo BCR that treats government cost saving as a benefit and road user charges foregone as a negative benefit.

9.6.1 Present Value

For present value of the New Plymouth-Nelson-New Plymouth RORO service (i.e. NPV benefits minus NPV Costs) is $116.2 million from a national perspective and $74.3 million from a government perspective.

9.6.2 Pseudo BCR

The pseudo BCR from a national perspective (i.e. ignoring RUC foregone) is 8.4, and 5.7 from a government perspective (i.e. treating RUC foregone as a negative benefit).

9.6.3 BCR Figures in Context

To put these BCR figures in context the NZTA classifies project BCRs as LOW, MEDIUM or HIGH. A LOW is assigned to any BCR less than 2, a BCR between 2 and 4 is assigned a MEDIUM, a BCR greater than 4 is assigned HIGH.

9.6.4 Government's Return

In summary government's investment and the return that it can expect are:

Table 37 - Government's Return

New Plymouth-Nelson-New Plymouth RORO service			
Cash (millions)		Discounted (millions)	
Investment (capex + maintenance)	Return	Investment (capex + maintenance)	Return
$32.8	$314.8	$15.6	$88.7

9.7 Sensitivity

9.7.1 BCR Sensitivity

Sensitivity testing was undertaken, varying the value of each benefit class up and down 20%, as is normal practice.

BCR is not altered by any benefit changes. The cost line of the BCR calculation (net present value of cost) remains negative, and the BCR remains at 99.

9.7.2 BCR_{pseudo} Sensitivity

The table below summarises the sensitivity of the pseudo BCR:

Table 38 - BCR Sensitivity

Pseudo BCR - National

	Base Case	Lower Bound		Upper Bound	
	BCR	Value	BCR	Value	BCR
Accidents		-20%	8.2	+20%	8.5
Road User Benefits		-20%	8.2	+20%	8.6
CO_2		-20%	8.4	+20%	8.4
Particulates	8.4	-20%	8.3	+20%	8.5
Container Traffic Growth Rate		-1%	7.5	+2.7%	9.4
Construction and Maintenance Costs		-20%	10.5	+20%	7.0
Government Cost Savings		-20%	7.1	+20%	9.6

Pseudo BCR - Government

	Base Case	Lower Bound		Upper Bound	
	BCR	Value	BCR	Value	BCR
Accidents		-20%	5.5	+20%	5.9
Road User Benefits		-20%	5.5	+20%	5.9
CO_2		-20%	5.7	+20%	5.7
Particulates	5.7	-20%	5.6	+20%	5.8
Container Traffic Growth Rate		-1%	5.1	+2.7%	6.4
Construction and Maintenance Costs		-20%	7.1	+20%	4.7
RUC Foregone		-20%	6.2	+20%	5.2
Government Cost Savings		-20%	4.5	+20%	6.9

The project economics are less sensitive to fluctuations of the benefit or cost parameters than most projects. There is some sensitivity to the growth in container trade and to the government cost savings.

9.8 Economic Benefits That Have Not Been Quantified

Other benefits exist that have not been quantified because appropriate techniques and/or standard values do not exist, or have only recently been developed and are not yet accepted by central government. The significant Lifelines benefits that exist have been discussed in section 9.2.5.

9.8.1 Vehicle Operating Costs & Travel Time

Reducing the truck VKT on the roading network produces substantial benefits, which are offset by the additional cost of the new coastal shipping service. Standard values exist in NZTA's Economic Evaluation Manuals for the Vehicle Operating Cost (VOC) and Travel Time (TT) associated with heavy vehicles. These values have been used to quantify the benefits associated with reducing the heavy vehicle VKT on the road network and have shown that the present value of these benefits is in excess of $261M. To calculate a net present value for use in the BCR calculation we would have to subtract the present value of the equivalent coastal ship costs. Standard values for the equivalent coastal ship costs do not exist, so these VOC and TT savings have not been included in the BCR calculation.

10 Risk Analysis & Other Issues

10.1 Risk Analysis

The risks to the Agency that the author has identified would appear to be low, as set out in the table below:

Risk	Control
Capital Risk	The usual capital controls applied to State Highway projects can be applied to this project
Project inconsistent with GPS	Project appears to be consistent with, and contributes to GPS impacts.
Project inconsistent with LTMA objectives	Project appears to be consistent with, and contributes to LTMA objectives.
Project inconsistent with RLTS	Project appears to be consistent with regional councils RLTSs. The RLTSs include specific policies supporting activities of this type.
Project costs higher than anticipated	Final decision can be dependant upon acceptable construction tender prices being obtained.
Road user benefits not realised	Benefits are based on standard values from NZTA and output from the Greater Wellington model. The model has been developed by BCHF and SKM, independently peer reviewed by Arup Australia and is conservative. Low risk. Accident reductions are based on Agency model, low risk.
Government Cost Savings not realised	Government Cost Savings are based on Agency model, low risk.

10.2 User Benefits

There are no User Benefits associated with this proposal.

10.3 Audit of Road User Benefits

This analysis has not been peer reviewed.

10.4 Confirmation that the Roading Alternative is Not Constrained by the Regional Land Transport Strategy

We confirm that the roading alternative is not constrained by the any of the Regional Land Transport Strategies (RLTSs) considered during this investigation.

APPENDICES

Appendix A: Field Survey Cargo Summaries

Commercially sensitive information removed

Appendix B: Field Survey Mode and Growth Summary

Commercially sensitive information removed

Appendix C: International Container Services & NZ Port Rotations, October 2009

Trade/ Ships	Lines	No. of Ships	Freq. in Days	NZ Ports										
				Akl	Ltl	MPt	Nap	Nel	NPL	PCH	Tau	Bluff	Tim	Wlg
Dedicated Tasman														
New Kiwi	ANL/MSC	2	7	2	4			1			3			5
SSE	Maersk	3	7	1,7	3			6	2	4				5
Swire	TTN	2	14	1		2	4	5	6		3			
Calls per week				**3.5**	**2**	**0.5**	**0.5**	**2.5**	**1.5**	**1**	**1.5**		**-**	**2**
Others														
Capricorn	MSC	7	7		3		5			2	6	1		4
OC 1	HS/ML/HL	11	7	1/6			4			3	5		2	
NZ S/1	PIL/MISC/OOCL	5	7	1	2		4							3
Sofrana	Sofrana	2	18	2							1			
NZ-PAC IS	PFL	1	21	3	1		2							
NZ - Fiji	Neptune	1	14	4	3		2				1			
NZ-Tahiti	PDL	1	21	2		1								
NZ-PAC IS	Polynesia	1	21	1							2			
NZ1	ML/MISC	4	7	1						2				
NEA	HS/JP/COSCO	6	7		3		4	Alt 2	1		5			Alt 2
Panama	CMA/MF	6	14				1				2			
Kiwi C	*Kiwi*		*10*	*1*	*2*									*3*
Toyofuji	*Toyofuji*		*14*	*1*	*3*									*3*
Calls per week				**7.54**	**5.03**	**0.33**	**5.33**	**0.5**	**1**	**3**	**4.71**			**3.7**
TOTAL CALLS Weekly*				**11.04**	**7.03**	**0.83**	**5.83**	**3**	**2.5**	**4**	**6.21**	**1**	**1**	**5.7**

N.B. Numbers represent the order in which the service calls at the ports

Appendix D: Around New Zealand Service Model

Commercially sensitive information removed

Appendix E: West Coast Shallow Water Service Model

Commercially sensitive information removed

Appendix F: Enhanced Western Service Model

Commercially sensitive information removed

Appendix G: RORO Shuttle Model

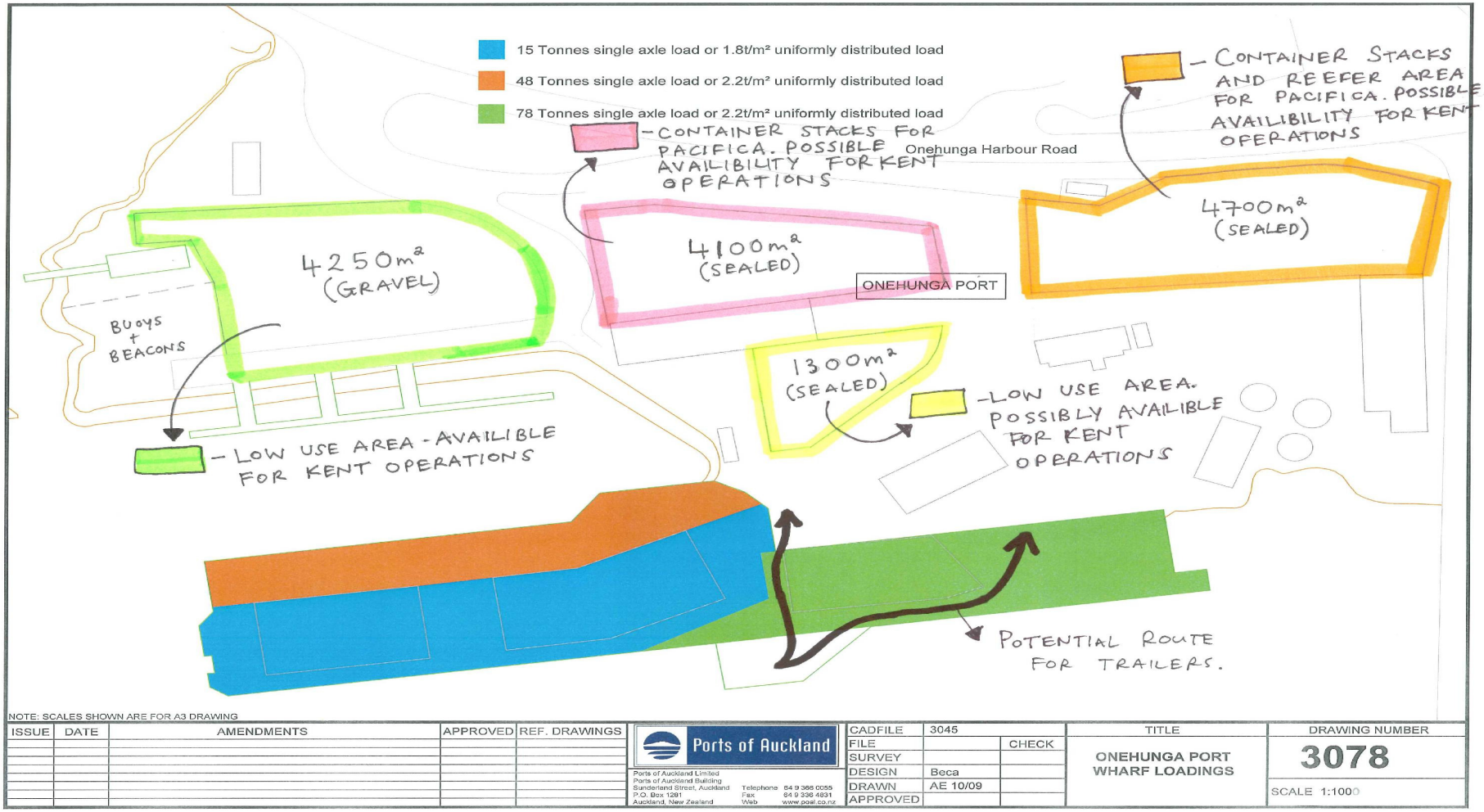
Commercially sensitive information removed

Appendix H: West Coast RORO Service Model

Commercially sensitive information removed

Appendix I: Port Nelson RORO Facility

Appendix J: Onehunga Berth & Wharf Layout and Loadings



Appendix K: Port Nelson Container Traffic 2008/9

Commercially sensitive information removed

Appendix L: Container Services for NZ Domestic Freight, October 2009

Cubic

Cubic Transport Services Ltd
PO Box 13151, Onehunga, Auckland
0800 2 CUBIC (0800 22 82 42)
Ph +64 9 63 44 944 Fax +64 9 636 0100

Bookings - ops@cubic.co.nz
Quotes - sales@cubic.co.nz
www.cubic.co.nz

5 October 2009

AUCKLAND TO CHRISTCHURCH	ETD	ETA
Endurance 3096	8-Oct	10-Oct
ACX Diamond 96	8-Oct	13-Oct
OOCL Melbourne 90	11-Oct	14-Oct
Endurance 3098	15-Oct	17-Oct
Cap Manuel 929	15-Oct	20-Oct
California Mercury 240	18-Oct	21-Oct
Endurance 3100	22-Oct	24-Oct
JPO Leo 88	22-Oct	27-Oct
Kota Permata 32	25-Oct	28-Oct

AUCKLAND TO NAPIER	ETD	ETA
ACX Diamond 96	8-Oct	15-Oct
OOCL Melbourne 90	11-Oct	17-Oct
Cap Manuel 929	15-Oct	22-Oct

AUCKLAND TO WELLINGTON	ETD	ETA
Tasman Challenger 210919	9-Oct	15-Oct
Tasman Endeavour 110931	9-Oct	12-Oct
OOCL Melbourne 90	11-Oct	16-Oct
Cap Manuel 929	15-Oct	19-Oct
California Mercury 240	18-Oct	23-Oct
Pacific Destiny 110932	19-Oct	22-Oct

AUCKLAND TO NELSON	ETD	ETA
ACX Diamond 96	8-Oct	11-Oct
JPO Leo 88	22-Oct	26-Oct
Cap Capricorn 929	5-Nov	9-Nov

AUCKLAND TO TIMARU	ETD	ETA
Tasman Challenger 210919	9-Oct	13-Oct
Tasman Mariner 210920	27-Oct	31-Oct
Tasman Trader 210921	12-Nov	16-Nov

AUCKLAND TO DUNEDIN	ETD	ETA
Maersk Damascus 940	12-Oct	15-Oct
Maersk Duffield 941	19-Oct	22-Oct
Maersk Dunafare 942	26-Oct	29-Oct
Maersk Denton 943	2-Nov	5-Nov
Maersk Damascus 944	9-Nov	12-Nov

TAURANGA TO NELSON	ETD	ETA
Tasman Chief 7235	10-Oct	15-Oct
Pacific Chief 7010	25-Oct	30-Oct
Tasman Chief 7236	7-Nov	12-Nov

TAURANGA TO CHRISTCHURCH	ETD	ETA
Endurance 3096	7-Oct	10-Oct
Endurance 3098	14-Oct	17-Oct
Endurance 3100	21-Oct	24-Oct

NAPIER TO AUCKLAND	ETD	ETA
COSCO Yingkou 21	7-Oct	11-Oct
Maersk Jaun 936	9-Oct	11-Oct
ACX Diamond 96	15-Oct	18-Oct

NAPIER TO TAURANGA	ETD	ETA
COSCO Yingkou 21	7-Oct	8-Oct
Maersk Jaun 936	9-Oct	10-Oct
Kota Segar 026	10-Oct	11-Oct
MSC America 940	13-Oct	14-Oct

CHRISTCHURCH TO AUCKLAND	ETD	ETA
COSCO Yingkou 21	6-Oct	11-Oct
Endurance 3097	10-Oct	15-Oct
Spirit of Resolution 1243	12-Oct	15-Oct
ACX Diamond 96	13-Oct	18-Oct
Endurance 3099	17-Oct	22-Oct
Spirit of Resolution 1245	19-Oct	22-Oct
Cap Manuel 929	20-Oct	25-Oct
Endurance 3101	24-Oct	29-Oct
Spirit of Resolution 1247	26-Oct	29-Oct

CHRISTCHURCH TO TAURANGA	ETD	ETA
COSCO Yingkou 21	6-Oct	8-Oct
Kota Segar 026	7-Oct	11-Oct
Endurance 3097	10-Oct	14-Oct
MSC America 940	11-Oct	14-Oct
ACX Diamond 96	13-Oct	16-Oct
OOCL Melbourne 90	14-Oct	18-Oct

CHRISTCHURCH TO NAPIER	ETD	ETA
COSCO Yingkou 21	6-Oct	7-Oct
Kota Segar 026	7-Oct	10-Oct
MSC America 940	11-Oct	13-Oct

CHRISTCHURCH TO WELLINGTON	ETD	ETA
Kota Segar 026	7-Oct	9-Oct
MSC America 940	11-Oct	12-Oct
OOCL Melbourne 90	14-Oct	16-Oct

NELSON TO TAURANGA	ETD	ETA
ACX Diamond 96	11-Oct	16-Oct
JPO Leo 88	26-Oct	30-Oct
Cap Capricorn 929	9-Nov	13-Nov

TIMARU TO AUCKLAND	ETD	ETA
Maersk Jaun 936	6-Oct	11-Oct
Cap Bianco 937	12-Oct	18-Oct
Cap Cleveland 938	20-Oct	25-Oct
Cap Beaufort 939	27-Oct	1-Nov

TIMARU TO TAURANGA	ETD	ETA
Maersk Jaun 936	6-Oct	10-Oct
Cap Bianco 937	12-Oct	17-Oct
Tasman Challenger 210919	13-Oct	19-Oct
Cap Cleveland 938	20-Oct	24-Oct

DUNEDIN TO AUCKLAND	ETD	ETA
Maersk Jaun 936	7-Oct	11-Oct
Cap Bianco 937	14-Oct	18-Oct
Cap Cleveland 938	21-Oct	25-Oct

DUNEDIN TO TAURANGA	ETD	ETA
Maersk Jaun 936	7-Oct	10-Oct
MSC America 940	10-Oct	14-Oct
Cap Bianco 937	14-Oct	17-Oct
MSC Canberra 941	15-Oct	20-Oct

BLUFF TO TAURANGA	ETD	ETA
MSC America 940	8-Oct	14-Oct
MSC Canberra 941	12-Oct	20-Oct
MSC Tasmania 942	19-Oct	27-Oct

Appendix M: RORO Services for NZ Domestic Freight, October 2009

Cubic Transport Services Ltd
PO Box 13151, Onehunga, Auckland
0800 2 CUBIC (0800 22 82 42)
Ph +64 9 63 44 944 Fax +64 9 636 0100

Bookings and Quotes
roro@cubic.co.nz

16 September 2009

www.cubic.co.nz

Auckland to Lyttelton	ETD	ETA	Ramp	Door
Polaris Ace 2A	19-Sep	22-Sep	80T	4.9m
Comet Ace 96A	23-Sep	26-Sep	80T	4.9m
Trans Future 6 31	24-Sep	26-Sep	50T	4.5m
Trans Future 7 31	7-Oct	9-Oct	50T	4.5m
Salvia Ace 13A	17-Oct	20-Oct	80T	4.9m
Trans Future 5 35	22-Oct	24-Oct	50T	4.5m
Trans Future 6 32	4-Nov	6-Nov	50T	4.5m

Auckland to Nelson	ETD	ETA	Ramp	Door
Comet Ace 96A	23-Sep	27-Sep	80T	4.9m
Trans Future 6 31	24-Sep	28-Sep	50T	4.5m
Trans Future 7 31	7-Oct	11-Oct	50T	4.5m
Salvia Ace 13A	17-Oct	21-Oct	80T	4.9m
Trans Future 5 35	22-Oct	26-Oct	50T	4.5m
Trans Future 6 32	4-Nov	8-Nov	50T	4.5m

Auckland to Wellington	ETD	ETA	Ramp	Door
Polaris Ace 2A	19-Sep	21-Sep	80T	4.9m
Trans Future 6 31	24-Sep	27-Sep	50T	4.5m
Trans Future 7 31	7-Oct	10-Oct	50T	4.5m

Auckland To Timaru	ETD	ETA	Ramp	Door
Tasman Pathfinder 210917	24-Sep	27-Sep	LoLo	LoLo
Tasman Challenger 210918	10-Oct	14-Oct	LoLo	LoLo
Tasman Mariner 210920	24-Oct	31-Oct	LoLo	LoLo

Tauranga to Lyttelton	ETD	ETA	Ramp	Door
Capitaine Wallis 0251N	21-Sep	24-Sep	LoLo	LoLo
Capitaine Wallis 0253N	19-Oct	22-Oct	LoLo	LoLo
Capitaine Wallis 0255N	16-Nov	19-Nov	LoLo	LoLo

Wellington to Lyttelton	ETD	ETA	Ramp	Door
Polaris Ace 2A	21-Sep	22-Sep	80T	4.9m
Comet Ace 96A	25-Sep	26-Sep	80T	4.9m

Lyttelton to Auckland	ETD	ETA	Ramp	Door
Capitaine Wallis 0251N	24-Sep	27-Sep	LoLo	LoLo
Capitaine Wallis 0253N	22-Oct	25-Oct	LoLo	LoLo
Capitaine Wallis 0255N	19-Nov	22-Nov	LoLo	LoLo

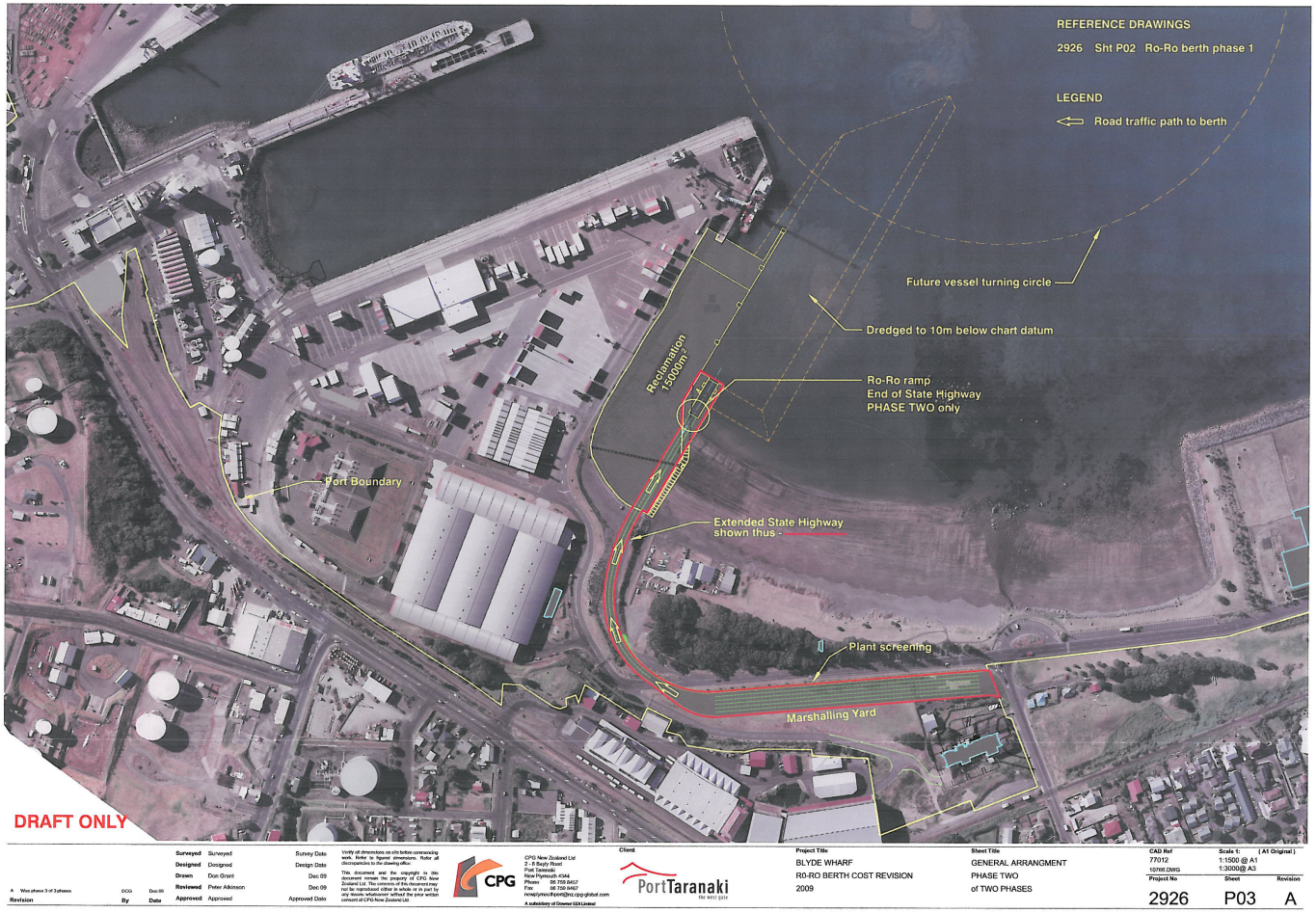
Lyttelton to Wellington	ETD	ETA	Ramp	Door
Trans Future 6 31	26-Sep	27-Sep	50T	4.5m
Trans Future 7 31	9-Oct	10-Oct	50T	4.5m

Lyttelton to Nelson	ETD	ETA	Ramp	Door
Trans Future 6 31	26-Sep	28-Sep	50T	4.5m
Comet Ace 96A	26-Sep	27-Sep	80T	4.9m

Appendix N: Port Taranaki Ltd Proposed RORO Berth – Layout Plan

Stage 1

Stage 2


REFERENCE DRAWINGS
2926 Sht P02 Ro-Ro berth phase 1
LEGEND
Road traffic path to berth
Future vessel turning circle
Dredged to 10m below chart datum
Reclamation 15000m²
Ro-Ro ramp
End of State Highway
PHASE TWO only
Port Boundary
Extended State Highway shown thus -
Plant screening
Marshalling Yard
DRAFT ONLY
CPG
PortTaranaki
BLYDE WHARF
RO-RO BERTH COST REVISION
2009
GENERAL ARRANGMENT
PHASE TWO
of TWO PHASES
2926
P03
A

Appendix O: Port Taranaki Ltd Proposed RORO Berth – Construction and Maintenance Cost Estimates

Phase 1 (refer drawing 2926 P02)

Item		Capex	Port Taranaki Ltd	State Highway	Annual Maintenance	10 yr Maintenance
Roading and Civils						
Roading		382,117		382,117	11,500	152,847
Drainage and manholes		51,060		51,060	1,000	
Landscaping		22,200		22,200	5,550	22,200
Excavation		33,300		33,300		
Retaining wall		49,950		49,950		4,995
Demolition		33,300		33,300		
Subtotal		571,927		571,927	18,050	180,042
Temporary Ro Ro Berth						
Preliminaries		180,000	180,000			
Demolition		5,000	5,000			
Earthworks and Excavation		3,100	3,100			
Paving		24,800	24,800		2,232	9,920
Piling		1,310,000	1,310,000			13,100
Concrete work		242,000	242,000			
Electrical		68,000	68,000		2,040	
Metalwork		40,000	40,000		4,000	10,000
Fenders		80,800	80,800		12,120	32,320
Landscaping		5,000	5,000		1,000	5,000
Subtotal		**1,958,700**	**1,958,700**		**21,392**	**70,340**
Total		**2,530,627**				
Contingency	15.0%	379,594	293,805	85,789		
Engineering	5.5%	139,184	107,729	31,456		
Tendering and project Management	3.5%	88,572	68,555	20,017		
Consents		5,000	5,000			
TOTAL Phase 1		**3,142,977**	**2,433,788**	**709,189**		

Phase 2 (refer Drawing 2926 P03)

Item	Capex	Port Taranaki Ltd	State Highway	Annual Maintenance	10 yr Maintenance
Reclamation Area					
Sheet pile wall	3,113,550	3,113,550		6,230	
Bund wall	266,400	266,400		550	
Sand fill (marginal cost)	466,200	466,200		0	
Pavement	832,500	832,500		41,625	333,000
Services				0	
lighting	33,300	33,300		1,500	
drainage and stormwater	16,650	16,650		500	
power	333,000	333,000		1,200	
Wharf Stucture					
Akmons	194,250	194,250			50,000
Stone fill	888,000	888,000			
Wharf Deck and piles	5,494,500	5,494,500			55,000
Fenders	799,200	799,200		19,980	160,000
Bollards	66,600	66,600		333	
Dredging					
Mobilisation	333,000	333,000			
Dredging	3,330,000	3,330,000		27,306	
Subtotal	*16,167,150*	*16,167,150*		*99,224*	*598,000*

Roading and Civils						
Roading		127,373		*127,373*	*11,464*	*11,464*
Hongi Hongi Culvert extension		149,850		*149,850*		
Linkspan						
Wharf Structure		3,006,713		3,006,713	6,015	
Steel work		3,885,000		3,885,000	194,250	582,750
Lighting		55,500		55,500	1,200	
Fenders		133,200		133,200	6,660	
Mooring sysytem		4,440,000		4,440,000	66,600	
Subtotal		*11,797,635*		*11,797,635*	*286,189*	*594,214*
Total		***27,964,785***	***16,167,150***	***11,797,635***	***385,413***	***1,192,214***
Planning and Engineering						
Hydraulic Investigations		55,500	55,500			
Design	5.5%	1,538,063	889,193	648,870		
Tendering & project management	3.5%	978,767	565,850	412,917		
Consents		11,100	11,100			
Contingency	15.0%	4,280,507	2,425,073	1,855,434		
TOTAL Phase 2		**34,829,000**	**20,114,000**	**14,715,000**		
PROJECT TOTAL		**37,971,977**	**22,547,788**	**15,424,189**		

Appendix P: Economic Analysis

Commercially sensitive information removed

Appendix Q: Glossary

AGM – Annual General Meeting
AKL – Auckland
ANLCL – ANL Container Line
BAF – Bunker Adjustment Factor
B/B – Breakbulk (non containerised freight)
BCR – Benefit Cost Ratio
Bunkers – vessel fuel
Capex – Capital Expenditure
CHC – Christchurch
CO2 – Carbon Dioxide (also CO_2)
CY – Container Yard
DC – Distribution Centre
DG – Dangerous/Hazardous Goods
DUN – Dunedin
DWT – vessel deadweight (amount vessel can carry)
ECNA – East Coast North America (also USEC)
FCL – Full Container Load
FDW - Fixed Day of the Week
FEU – Forty Foot Equivalent Unit
GA – General Arrangement of Ship (specifications)
GFC – Global Financial Crisis
GMT - Greymouth
GP – General Purpose/Dry Container
GPS – Government Policy Statement
GT – Gross Tonnage (of vessel) – basis of port charges
HC – High Cube Container
HCV – Heavy Commercial Vehicle
HSDG – Hamburg Sud
IB – Inbound
IFO – Intermediate Fuel Oil
ISO – International Standard Organisation
JIT traffic - Just in Time Traffic
KN – Kuhne Nagel
Kts – Knots, speed of ship in nautical miles per hour
LCL – Less than Container Load
LOA – Length Overall (of vessel)
LOLO – Lift On Lift Off Container Vessel
LTL – Lyttelton
LTMA – Land Transport Management Act
MAF – Ministry of Agriculture and Fisheries
MGO – Marine Gas Oil

ML – Maersk Line
MLO - Main Line Operator
MoT – Ministry of Transport
MSC – Mediterranean Shipping Company
MT – Empty container
M.V. – Motor Vessel
NB – Northbound
NFDS – National Freight Demand Study
NI – North Island
NLS - Nelson
NPL – New Plymouth
NPV – Net Present Value
NT – Net tonnage of vessel
NZTA – New Zealand Transport Agency
NZTS – New Zealand Transport Strategy
NYK – Nippon Yusen Kaisha (Japanese shipping line)
OB - Outbound
OG/OD cargo - Out of Gauge/Over Dimension cargo
PCH – Port Chalmers
RF – Refrigerated Container
RLTS – Regional Land Transport Strategy
RONS – Road of National Significance
RoRo – Roll on Roll off Vessel
RUC – Road User Charge
SB – Southbound
SI – South Island
SOB - Shipper Owned Box
SPT – Southport
SSE – Southern Star Express (Maersk Tasman service)
TAU - Tauranga
TCS – Thompson Clarke Shipping
TEU – Twenty Foot Equivalent Unit
TIM - Timaru
TKM – Ton Kilometres
TT – Transit Time (or Travel Time)
USWC – US West Coast
VKT – Vehicle Kilometers Travelled
VOC – Vehicle Operating Cost
VSA – Vessel Sharing Agreement
WBH – Western Blue Highway
WLG - Wellington