

# Napier Gisborne Line

## Assessment of the Commercial Viability of the Line

18 May 2012



# Section 1: Introduction

## 1 Executive Summary

- The Napier Gisborne line is currently closed from Wairoa to Gisborne following major storm damage.
- Reinstatement costs to repair the current slips is around \$4m.
- There are currently two services a week operating between Wairoa and Napier.
- The line is not commercially viable to operate today or in the foreseeable future. This is true for both the full line and sub section from Napier to Wairoa.
- Based on current estimations an annualised subsidy in the order of \$6m per annum would be required to continue to operate.
- Advice sought from the NZTA concludes that if the line were closed that there would be minimal impact on the overall level of service on the highway.

## 2 Introduction

The purpose of this paper is to provide an assessment of the future viability of the railway line between Napier and Gisborne. This assessment has been accelerated as a result of a major weather event during March which caused several major washouts between Gisborne and Wairoa.

The line between Wairoa and Gisborne has been closed temporarily pending a decision to repair the damage. Note that this paper presents costing and impacts in ranges as it is difficult to quantify with a degree of specificity the exact numbers. A range provides the likely bounds of the costs and impact assessments.

Note a detailed report is attached to this paper as Appendix 1.

## 3 Background

- The Napier to Gisborne line is part of the Palmerston North to Gisborne Line. By rail, the distance between Napier to Gisborne (212 kilometres) is approximately the same distance by road.
- The corridor currently generates approximately \$1m of revenue per annum, of which \$270,000 is revenue associated with product which either commences or ends its journey on other lines but which passes through the Napier-Gisborne corridor.
- The Wairoa to Gisborne section of the line has suffered four significant washouts, caused when culverts became inundated with wood debris. This has brought forward the decision on the future viability of the line. KiwiRail Infrastructure teams have estimated the cost to reinstate the line by repairing the slide damage at approximately \$4m. This is a one off cost which will enable the line to reopen.

## 4 Current and Potential Revenue Options

- The Napier to Gisborne line until recently carried up to 3 return trains a week. These are timed around the requirements of ██████████ in Napier. Some weeks there are no trains, depending on seasonal fertiliser demand, and on the availability of fertiliser wagons.

- Current rail volumes on the Napier to Gisborne route are approximately 50,000 tonnes per annum – which equates to 1,700 (29 tonne) truckloads of freight a year, which deliver just over \$1m dollars in revenue.
- KiwiRail is currently adopting a conservative level of expenditure, as it considers the future of the line. If the line was to remain open, over the long term line maintenance costs would be between \$4 and \$8m per annum.
- The line currently produces a cash deficit for KiwiRail after operating costs and annual line maintenance costs of approximately \$2.4 m for FY12.
- The line is supported to a degree by key freight forwarders, [REDACTED] however the transit times between Auckland and Napier are such that there is limited potential to grow this market and these volumes can fluctuate considerably. One such customer moved around \$200,000 in 2009, and this has fallen to less than \$35,000 in 2012. [REDACTED]
- The KiwiRail Freight sales team has been reviewing current and potential customers on the line to determine what potential upside revenue is available within the region that, if transported on rail, could assist with the long term viability of the line.
- One of the revenue opportunities identified is the potential to move the large volumes of wood from the Gisborne area to the Napier port once harvesting commences in or around 2019. This is still some seven years away and even then it would appear the opportunity is only available for a period of seven to 10 years depending on the rate at which the forests are harvested. In addition, short haulage distances from some forests, and costs of double handling also combine to make rail a less attractive cartage option for forest owners.
- Viable opportunities that have been identified by KiwiRail are as follows:
  - Forest volumes – KiwiRail has been in discussions with plantation owners with control of major forest plantations in the Gisborne and Wairoa regions. This volume is due to commence harvesting in 2019 and has the potential to travel on rail (for export via the Napier port). Indicative numbers suggest between 1 and 2 million tonnes per annum could travel on rail – albeit this might only last for 7-10 years;
  - Timber products [REDACTED] from Gisborne to Napier port equivalent to 4 TEU per week;
  - Fertiliser – [REDACTED] – 15 wagons per week;
  - Apples and Onions – 8,000 tonnes combined;
  - Squash – 30,000 tonne seasonal between January and April;
  - Aggregate – potential for 20,000 tonne from Gisborne to Napier/Hamilton;
  - Export lamb [REDACTED] averaging 7 FEU per week.
- Each revenue opportunity has been assessed for likelihood and included in a 10 year future look at the line. From this analysis it is feasible to expect the revenue on the line to grow from the current \$1m to approximately \$2.5m per annum.
- Over and above the revenue generated from within the line – there is additional \$266k revenue attributable to other lines, which would be lost to the business if the Napier Gisborne line is no longer available.

### Napier Gisborne Line Performance for FY12

		FY12
<b>Number of Trains on Line</b>	[#]	163
<b>Freight Tonnes Moved</b>	[tonnes]	44,325
<b>Net Tonne Kilometres</b>	[NTKs]	9,369
<b>Revenue Attributable to line</b>	[\$000's]	\$1,044
<b>Above Rail Operating Costs</b>	[\$000's]	\$716
<b>Below Rail Operating Costs</b>	[\$000's]	\$2,125
<b>Capital Expenditure</b>	[\$000's]	\$113
<b>Return on Capital Deployed</b>	[\$000's]	\$512
<b>Cash Deficit</b>	[\$000's]	<b>-\$2,422</b>

*Note: Data has been annualised*

## 5 Options

- Not repairing the slip damage and only operating the line between Wairoa and Napier has been discounted as not viable. Under this scenario the likely revenue falls from \$1.5m per annum to \$0.7m per annum, as the Wairoa traffic is forestry related and has lower yield than Napier-Gisborne traffic.
- KiwiRail has identified three options: reinstate the line; mothball the line; or close the line.
- **Reinstating the Line**
  - To retain the line open in full will require the line to firstly be reinstated at Beach Loop. This is an estimated cost of \$4m and is likely to take six months from a decision to proceed until the line is opened for commercial operation;
  - To keep the line open, the KiwiRail Infrastructure team has advised that to deliver a line which is fit for purpose that would not require any additional major one-off expenditure, either during the next 10 years or beyond, would require annual capital and maintenance in the order of \$4 to \$8m per annum;
  - The additional revenues generate a small positive cash contribution prior to below rail operating and capital costs (\$600k off a \$2.5m revenue base or a margin of 24%);
  - When the long run below rail maintenance and capital costs are added to the equation the line generates an annual cash shortfall in the order of \$4-\$8m;
  - The size of the gap therefore would require the revenue to grow in the order of \$30m (at 24% margin this produces a contribution of \$7.5m);
  - Based on the size of the market and the opportunities identified there simply is not this level of business within the region that could practically travel on rail at rates which would make rail an attractive option over alternative transport modes;
  - From KiwiRail's perspective, the line is not commercially sustainable and would require a separate line of funding to remain open. Over the next

10 years the level of additional funding would be in the order of \$6m per annum;



- **Mothballing:**

- This requires the line to be secured and made safe;
- The rail and operating systems remain in place but no commercial train services will operate on the line. The designation would remain;
- The current twice weekly service between Wairoa and Gisborne would cease with the customer being given 6 weeks' notice of the cessation of services;
- An annual maintenance budget in the order of \$200 - 800k per annum will be set aside to undertake checks on the line and to keep drains clear and weeds and vegetation under control with an initial one off spend of approximately \$2-\$4m to make the line safe;
- In this case the majority of the staff currently employed to maintain the line would be surplus to requirements, this is in the order of [redacted] staff depending on the on-going maintenance requirements. [redacted]
- If the line was to be reinstated into commercial service subsequently the line would require the \$4m to be spent on fixing the current slip damage, plus work to repair and replace components on the track that would have been replaced during the mothballing phase;
- It is concluded that the future revenue opportunity for the line would have to be substantial to make this option even a remote possibility of occurring.

- **Close the line:**

- If it was considered that there was no likely chance of making the line commercially viable in the foreseeable future then the next available option is to close the line;
- The line would be physically uplifted and the usable components used on other parts of the rail network;
- The adjacent land could then be sold back to the adjoining land owners, or sold to the Crown who would then elect what the best alternative use for the benefit of New Zealand could be for the land;
- As with the mothballing option, staff currently employed to maintain the line would be surplus to requirements;
- The closure costs have been estimated to be between \$7 to \$10m;
- The business would look to offset some of this cost by reusing some of the rail or selling this for scrap. An estimate of the value of this has not been determined as a more detailed analysis of the current state of the track and its assets would need to be undertaken.

## 6 Other network implications

- If Gisborne is to cope with the volumes of timber that have been forecast to be harvested from the East Cape, further investment in the Gisborne Port will be required within the next few years.
- KiwiRail understands a plan has been developed for upgrading the Port, including the construction of new berths, storage areas, sea walls and dredging. The estimated cost in 2001 was \$46m. If those improvements are not made there is a risk of the Port being unable to adequately cope. The rail service would at least provide one option for taking product to an alternative port.
- Recent discussions with some forestry owners have indicated that even with the proposed upgrades to Gisborne Port, there would still be a requirement to move a significant portion of the timber from Wairoa and below south to the Port of Napier.
- In preparing this paper, KiwiRail have been working directly with officials from NZTA to gather their input into the wider impacts that this line plays in the region.
- The NZTA advice is that, 81,620 trucks use the state highway annually, and any increase based on current freight carried by rail (1,700 per annum) will have little impact on traffic volumes. Even if freight grows to the 2022 forecast, it would still only add an additional 5,715 truck movements per annum or 16 a day. This level of increase will have minimal impact on the condition of the road, the annual maintenance budget, or road safety.
- The NZTA also advise that there are no significant resilience or route security issues, and that most closures of the road are short duration, with longer duration road closures (over 10 hours) occurring at a rate of less than one per year.

## 7 Risks and opportunities

- The loss of the Napier to Gisborne line will have minimal effect on the overall strategic rail network.
- There is uncertainty surrounding long-term oil prices. The price of fuel for rail has more than doubled over the past three years and over the past seven years has gone up by a factor of four. Both road and rail have been severely affected by fuel price rises. Whilst short trains operating to Gisborne are currently not as efficient as they could be compared to trucking, the potential for bigger trains could make rail more than four times fuel efficient than trucks.



## 8 KiwiRail Conclusion

- The line is not economic to operate today or in the foreseeable future based on the known current list of potential opportunities and their respective probabilities of success.

- The cost of reinstating the line, when considered in the context of the short to medium term revenue does not make commercial sense.
- From a purely financial perspective, mothballing the line presents the lowest net present value number for KiwiRail and therefore is the recommended approach.
- The benefits of mothballing are:
  - It avoids the additional cost associated with reinstating the line following the slips;  
█ [REDACTED]
  - It preserves the option that should a major revenue generating opportunity present itself in the near future then the business is able to consider that opportunity in the light of the actual costs to reinstate and operate the line going forward;
  - Allows the Government time to consider what strategic value the line has to the wider New Zealand economy, including alternative uses for the corridor and how best to realise that value for the good of the New Zealand economy.  
█ [REDACTED]
- KiwiRail would look to engage in conversations with the Government in this regard to ensure the interests of all stakeholders are taken into account.

## Appendix 1

### DETAILED ASSESSMENT OF NAPIER TO GISBORNE LINE

#### 1. Overview/History Napier - Gisborne Rail System

The Napier-Gisborne rail system comprises the Napier to Gisborne portion of the Palmerston North to Gisborne Line (PNGL). For the purposes of this report, the assessment includes all traffic that begins or ends its journey north of Napier.

Figure 1: Napier - Gisborne Rail



The Napier - Gisborne rail system includes 212 km's of track. The rail distance is not materially different from the road distance. However, the road route between Napier and Gisborne is identified as hilly or mountainous. Nevertheless the travel time is three hours by road, and five by rail.

Around 70kms of rail track in the district originally constructed to carry farm produce, logs/quarried rock is now closed. This was predominately the Gisborne to Motohura line (70kms) opened 1914, closed in 1959. The last four kilometres of this line is mothballed (the Makaraka branch) and could potentially be used for private vintage rail operations in the Gisborne area.

**Table: Napier - Gisborne Rail Key Metrics**

Key Metrics - Napier-Gisborne	Metric
Track KM's (Napier - Gisborne)	212
Number of Bridges	79
Number of Tunnels	21
Train KMs per Year	39,774
Wagon KMs per Year	634,709
Trains per Year	189
Average Trains per Week	4
Locomotives	2
Bogie Wagons	29
██████████	█
Tonnes Carried	49,716
Direct NTKs [millions]	10.3
Total NTKs [millions]	18.2
Average Train Size [net tonnes]	263
Average Train Size [gross tonnes]	549

*[above figures relate to 12 month period preceding slip damage]*

## 2. Current Napier – Gisborne Freight Traffic

### 2.1 The Existing Rail Service

The Napier to Gisborne line until recently carried up to three return trains a week. These are timed around the requirements of ██████████ in Napier. Some weeks there are no trains, depending on seasonal fertiliser demand, and on the availability of fertiliser wagons. Wagons are also needed for delivery to destinations to the south and west of Napier and can be held up on these other runs for several days at a time.

### 2.2 Trends in Freight Traffic

Freight volumes have fluctuated significantly between 2006 and today. In 2009 volumes were at their lowest at a mere 13,000 tonnes, with the highest traffic in the 9 months to March 2012 of 44,000 tonnes. Most of the tonnage (normally over 50%) is fertiliser.

The following tables illustrate the usage and commodities carried on the Napier - Gisborne line over the past few years. Of particular note is the fact that fertiliser revenue has fallen away since the 2006 financial year which in part was due to the closure of the line for a couple of months due to the collapse of the Nuhuka Bridge. This effectively saw the line closed for several months of that financial year. The first tables show revenue and tonnage trends from 2006 to 2012 and customer details for revenue directly attributable to line section only while the tables on the following pages show revenue generated by the Napier-Gisborne Line for the network as a whole.



		Napier - Gisborne Line Revenues						
		2006	2007	2008	2009	2010	2011	2012
		[000's]	[000's]	[000's]	[000's]	[000's]	[000's]	[000's]
		***						
Napier - Gisborne Line	Intra Revenue	\$195	\$283	\$155	\$43	\$67	\$77	\$395
	Inter Revenue	\$506	\$466	\$264	\$167	\$327	\$443	\$388
		<b>\$701</b>	<b>\$749</b>	<b>\$419</b>	<b>\$210</b>	<b>\$394</b>	<b>\$520</b>	<b>\$783</b>
Other Lines	Inter Revenue	\$149	\$123	\$134	\$184	\$193	\$152	\$266
		<b>\$850</b>	<b>\$872</b>	<b>\$553</b>	<b>\$394</b>	<b>\$587</b>	<b>\$672</b>	<b>\$1,049</b>
	<i>movement</i>		<b>3%</b>	<b>-37%</b>	<b>-29%</b>	<b>49%</b>	<b>15%</b>	<b>56%</b>
Notes	*** 2012 period is only for 9 months [July-March]							

Over and above the revenue generated from within the line there is an additional \$266k revenue attributable to other lines, which would be lost to the business if the Napier-Gisborne line did not exist.

### 3. Rail Resources Used for Napier – Gisborne Rail

#### 3.1 Existing Locomotive and Wagon Fleet

In April 2012 the Napier-Gisborne Rail locomotive fleet comprised one DX class Locomotive and one DC class locomotive with a provision for a spare locomotive required from time to time. Generally two locomotives would be required to maintain a reliable service, particularly if the service were to run more frequently.

The rail wagon fleet to service the line once a week comprises around 30 wagons providing a capacity of 800 tonnes net.

#### 3.2 Service Requirements and Staffing Levels

Train sizes on the Napier-Gisborne line are generally small with the net payload in both directions usually less than 300 tonnes. Trains can comprise up to 20 wagons during peak season. There were 189 trains run in the 12 months preceding the slip damage that has closed the line.

Counting empty returns, train kilometres were approximately 40,000 for the 12 months preceding slip damage. Wagon kilometres are approximately 630 thousand.

Staff in the Auckland Service Centre are utilised to assist with train planning, locomotive allocation, train build, crew rostering, crew assignment and linehaul management.

#### 3.3 Track Costs

Track costs cover maintenance of track and associated physical structures, train control and other infrastructure services. KiwiRail's estimated fully allocated track maintenance costs for Napier - Gisborne is a cost of \$4.22 m (low end) to \$7.78 m per year (high end).

The table below splits the costs between the Napier to Wairoa and the Wairoa to Gisborne segments on the line. The costs estimates have been undertaken with a high and low range.

It should be noted that the cost ranges exclude any potential one off events such as we have just seen with the Beech Loop slip.

<b>Item</b>	<b>Napier to Wairoa Estimate of Annual Costs</b>	<b>Wairoa to Gisborne Estimate of Annual Costs</b>
Estimate of Future Annual Maintenance Costs to maintain level of service	\$1.474m	\$1.256m
Increase Geotechnical Resilience Estimates (not based on a detailed study)	\$50k to \$150k	\$150k to \$250k
Ahuriri Estuary Bridge  (estimated 15 year period costs converted into an average annual cost)	\$26K to \$53k	
Other Bridges  (estimated 15 year period costs converted into an average annual cost)	\$25k to \$50k	\$53k to \$80k
River Works	\$0k to \$50k	Y1 to Y3  \$0.266m to \$0.5m  (higher spend in 1 <sup>st</sup> three years for repair between 347km – 350km)  Y4 to Y15  \$0k to \$150k
Track Renewals	\$500k to \$1,700k	\$425k to \$1,445k
Incident Costs Per Annum	\$0 to \$250k	\$0 to \$500k
TOTALS	\$2.07m to \$3.727m	Y1 to Y3  \$2.15m to \$4.031m  Y4 to Y15  \$1.884m to \$3.681m

#### 4. Current Financial Performance and Analysis

The Napier to Gisborne line, on a fully allocated cost basis, is making losses. On current and projected financial performance the highest Net Present Value (NPV) to KiwiRail is to mothball the Napier to Gisborne railway line.

The table below illustrates the current financial performance of the Napier to Gisborne line on an avoidable (generally direct) costs basis for 2011-12 patterns of traffic.

**Table: Current Financial Performance Napier – Gisborne Rail**

		FY12
<b>Number of Trains on Line</b>	[#]	163
<b>Freight Tonnes Moved</b>	[tonnes]	44,325
<b>Net Tonne Kilometres</b>	[NTKs]	9,369
<b>Revenue Attributable to line</b>	[\$000's]	\$1,044
<b>Above Rail Operating Costs</b>	[\$000's]	\$716
<b>Below Rail Operating Costs</b>	[\$000's]	\$2,125
<b>Capital Expenditure</b>	[\$000's]	\$113
<b>Return on Capital Deployed</b>	[\$000's]	\$512
<b>Cash Deficit</b>	[\$000's]	<b>-\$2,422</b>

*Note: Data has been annualised*

The above deficit of \$2.4m is forecast to increase to \$4-\$8m over the next 10 years. The key drivers of this deficit remain the below rail costs, with below rail operating costs forecast to average between \$3-\$4m over the 10 year period, with below rail capital expenditure forecast to be \$1-\$4m (combined the below rail portion is between \$4m-\$8m).

The line continues to be particularly exposed to sudden renewals of infrastructure assets:

- Cyclone Bola damage of 1988 nearly closed the line.
- Nuhaka bridge collapse in 2005.
- Recent storm related damage.

Allowance has only been made in analysis for the current damage repair costs – estimated at \$3-\$4m. No allowance has been made for future events of this magnitude.

#### Scenarios

The following options have been considered for the line:

1. Keep the line open in part or in full.
2. Mothball the line – in part or in full.
3. Close the line in part or in full.

### Option 1: Keep the line open in part or in full

To retain the line open in full will require reinstatement of the wash-out damage. This is estimated to cost \$4m and is likely to take six months from a decision to proceed until the line is opened for commercial operation.

The option of not repairing the slip damage and only operating the line between Wairoa and Napier has been discounted as not viable. Under this scenario the likely revenue falls from \$1.5m per annum to \$0.7m per annum, as the majority of freight needs to travel through the current slip area. The Wairoa traffic is forestry related and has lower yield than Napier-Gisborne traffic.

Retention of the full line is assumed to enable the identified growth to be able to be captured on rail. Based on current estimates of future revenue growth, and anticipated annualised below rail costs, the line will require an annual top up of between \$5 and \$8m.

The table below shows the forecast position for keeping the line open in full. Two positions are shown – being the 'lower' infrastructure cost estimates versus the 'upper' infrastructure cost estimates.

<b>Summary of Forecast Position for Line</b>									
		<b>Low I&amp;E Projections</b>				<b>High I&amp;E Projections</b>			
		<b>FY12</b>	<b>FY13</b>	<b>-----&gt;</b>	<b>FY22</b>	<b>FY12</b>	<b>FY13</b>	<b>-----&gt;</b>	<b>FY22</b>
<b>Number of Trains on Line</b>	[#]	163	655	----->	861	163	655	----->	861
<b>Freight Tonnes Moved</b>	[tonnes]	44,325	109,887	----->	165,742	44,325	109,887	----->	165,742
<b>Net Tonne Kilometres</b>	[NTKs]	9,369	19,123	----->	31,781	9,369	19,123	----->	31,781
<b>Revenue Attributable to line</b>	[\$000's]	\$1,044	\$1,541	----->	\$2,498	\$1,044	\$1,541	----->	\$2,498
<b>Above Rail Operating Costs</b>	[\$000's]	\$716	\$1,298	----->	\$1,905	\$716	\$1,298	----->	\$1,905
<b>Below Rail Operating Costs</b>	[\$000's]	<b>\$2,125</b>	<b>\$3,300</b>	----->	<b>\$3,034</b>	<b>\$2,138</b>	<b>\$4,613</b>	----->	<b>\$4,263</b>
<b>Capital Expenditure</b>	[\$000's]	\$113	\$4,464	----->	\$1,299	\$113	\$7,674	----->	\$3,519
<b>Return on Capital Deployed</b>	[\$000's]	<b>\$512</b>	<b>\$430</b>	----->	<b>\$1,014</b>	<b>\$512</b>	<b>\$430</b>	----->	<b>\$1,014</b>
<b>Cash Deficit</b>	[\$000's]	<b>-\$2,422</b>	<b>-\$7,950</b>	----->	<b>-\$4,755</b>	<b>-\$2,435</b>	<b>-\$12,473</b>	----->	<b>-\$8,204</b>
<b>NPV for 10 Yrs [using rate of 8.9%]</b>		<b>-\$34,057</b>				<b>-\$59,259</b>			

### Option 2: Mothball the line

Should Option 1 above prove unacceptable, the next option would be to mothball the line, namely not repair the slip damage and secure the line so as to preserve the option of reopening the line for commercial services if and when the financial justification can be substantiated.

The Infrastructure team has estimated that an initial mothballing cost of \$2-\$4m with annual maintenance costs thereafter of \$0.2-\$0.8m. This shows a net present value for this scenario of between -\$3m and -\$8m.

<b>Mothball Line</b>	<b>Low Projections</b>	<b>High Projections</b>
Initial Mothball costs	\$2.0m	\$4.0m
Ongoing Costs	\$0.2m	\$0.8m
<b>NPV at 8.9%</b>	<b>-\$3m</b>	<b>-\$8m</b>

### Option 3: Close the line.

This scenario closes the line, removes the track and structure where possible, while leaving the corridor safe for other future use. The cost for removal of track and structures is partially offset by scrap revenue. To maintain future safety, there would be ongoing annual costs.

The Infrastructure team has estimated an initial closure cost of \$7-\$10m with annual maintenance costs thereafter of \$0.2-\$0.8m. This shows a net present value for this scenario of between -\$9m and -\$14m.

<b>Close Line</b>	<b>Low Projections</b>	<b>High Projections</b>
Initial Closure costs	\$7.0m	\$10.0m
Ongoing Costs	\$0.2m	\$0.8m
<b>NPV at 8.9%</b>	<b>-\$9m</b>	<b>-\$14m</b>

Based on the above results, mothballing the line shows the lowest cost to KiwiRail. Analysis is shown in more detail in Attachment 2.

## **5. Viability of the Current Service and Future Prospects**

### **5.1 Introduction**

The existing level of use of the rail line is far from economically viable. It has been suggested that an annual freight volume of between 100,000 and 200,000 tonnes per annum (current tonnage is 44,000 YTD for 2012) would be enough to keep the line going<sup>1</sup>. At this volume the line could be seen as contributing to the strategic rail network, at least in the medium term, and could be sufficient to warrant on-going operating and maintenance expenditure (although not enough to cover long-run capital replacement costs<sup>2</sup>). On the other hand, one could argue that an annual freight volume of 100,000 – 200,000 tonnes would barely cover the annual operating cost of the line. From a commercial standpoint, for the service to be viable, it has to be profitable – either profitable in its own right, or contributing in a significant way to the profitability of the national rail service. From this perspective the Gisborne line currently does neither of these things, and would still not succeed at 100,000 – 200,000 tonnes of freight per annum. Somewhere in the order of 400,000 or even 800,000 tonnes per annum would be necessary. This would be between 10 to 20 times the amount of freight currently transported on the Gisborne line.

As an annual tonnage per kilometre of track (a standard measure of track usage), 800,000 tonnes, over 212 kilometres of rail line from Napier to Gisborne, works out to 3,800 tonnes per kilometre. For comparison, the line from Kawerau to Tauranga in the Bay of Plenty currently operates at 8,000 tonnes per kilometre. A target 800,000 tonnes per annum for the Gisborne service therefore would not be unprecedented, and would still be slightly less than half the load or 'density' of use on the Kawerau line.

### **5.2 Effective Removal of Trucks from the State Highway**

Because of the low freight volumes, the existing rail service is having only a minor effect in terms of reducing the number of trucks on State Highway 2. Fifty thousand tonnes of freight per annum (in a normal year) currently moved by rail is the equivalent of 1,387 loaded 29 tonne truckloads per annum, if the same amount of product was to be transferred to road. This in turn equates to about 6 loaded

<sup>1</sup> This figure is understood to be derived from historical freight loadings on the Gisborne line.

<sup>2</sup> For example replacement of sleepers (currently about 10 years serviceable life remaining) or replacement of major bridges (including the bridge at Pandora).

trucks per day working 5 days a week, or 5 loaded trucks per day over 365 days of the year<sup>3</sup>. It will be making about a 2% difference to the 300 or so heavy trucks a day on the State Highway<sup>4</sup>.

Shifting 100,000 to 200,000 tonnes per annum over 365 days a year would remove the equivalent of between 10 and 20 trucks a day from the state highway – making a 3% to 6% difference to the total number of heavy vehicles on the road.

By comparison, 400,000 to 800,000 tonnes per annum would remove between 40 and 80 heavy vehicles from the state highway – a 13% to 26% reduction in the number of trucks on the highway.

### **5.3 State of the track and structure**

KiwiRail Infrastructure and Engineering advise that the Napier – Gisborne railway line is still in reasonable condition. Some sleepers are in need of replacement, but the majority of them still have at least another 10 years of life remaining. The tracks themselves are sound and the condition of the ballast is also reported to be good.

Of more concern are the bridges. The existing structures are safe, but the collapse of the Nuhaka Bridge in May 2005 illustrates that there are some major structures on the line that are coming due for significant maintenance or replacement. As long as the line continues to attract only marginal volumes of freight, any major replacement works are likely to be held off for as long as possible. The most immediate challenge is the reinstatement costs as a result of the March slips.

If freight volumes (and therefore income on the line) increases significantly over the next couple years then there will be more funding available to put back in to some of these capital expenses. If, however, the volumes of freight do not increase then some difficult decisions may lie ahead for KiwiRail on whether or not it is worth committing to these expenses and keeping the line in operation in the longer term.

### **5.4 Carrying Capacity of the Line**

The main limitation on the Gisborne line is gradient. Towing capacity and drawbar strength limits mean that an individual locomotive making the full journey from Napier to Gisborne is limited to towing a gross weight (including wagons) of up to 820 tonnes. Double locomotives can tow a gross weight of up to 1,400 tonnes.

These limits are not unusual for a railway line in New Zealand. The line south of Hastings, for example, has a limit of 750 tonnes for a single locomotive due to the steepness of the gradient at the Opapa bank (near Te Aute).

The steepest section on the Napier – Gisborne line is in the 80 kilometres of rail track between Wairoa and Matawhero, and in particular, the inclines at Kotemaori and Wharerata. On the easier gradients south of Wairoa loadings of up to 2,000 tonnes are possible, and north of Matawhero they increase again to 1,600 tonnes, but it is the Wairoa to Matawhero section that is the limiting factor.

A gross weight limit of 820 tonnes on a single locomotive equates to about 16 loaded rail wagons, each carrying 35 tonnes of freight<sup>5</sup>. This in turn equates to 560 tonnes of freight per single-locomotive train. This is the about the same carrying capacity as 19 fully-laden road trucks, each carrying 29 tonnes of freight. By adding a second locomotive the total amount of freight that can be carried

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<sup>3</sup> These figures are yearly averages only and do not take account of the seasonal variation. During the peak of the fertiliser season the truck-equivalent will rise to about 18 trucks per day. In the off-season the volumes will be correspondingly lower.

<sup>4</sup> NZTA data shows that there are currently about 300 heavy vehicles a day passing over the permanent road counter at Tangoio. The data shows that while total traffic numbers have increased by about 12%, total heavy traffic volumes have not changed significantly (either up or down) at this count station over the last 5 years.

<sup>5</sup> Assuming an empty carriage weight of 15 tonnes.

increases to about 980 tonnes. This would be the equivalent carrying capacity of about 33 fully laden road trucks.

If a future volume of 100,000 to 200,000 tonnes of freight per annum was aimed for it would require between 3 and 7 single-locomotive trains a week, or between 2 and 4 double-locomotives a week to shift it.

If the target of 400,000 to 800,000 tonnes was used then it would require between 13 and 27 single-locomotive trains a week, or 8 to 15 double-locomotive trains per week to shift this amount of freight. Infrastructure confirms that the line would be able to cope with these volumes. And if such volumes were achieved then this would stimulate intensified maintenance, upgrading and replacement of capital structures on the line.

## **5.5 Opportunities for Achieving Viability**

Clearly, in order to achieve anywhere near the 800,000 or even 400,000 tonnes per annum that KiwiRail consider to be the economic minimum, the Gisborne line would need to pick up a very large amount of additional freight on top of the current 44,000 tonnes per annum.

This is not impossible. If there are 300 trucks a day on the Napier – Gisborne road (SH2), and if each is assumed to be carrying 29 tonnes, then the total freight load on the highway would be in the order 3 million tonnes per annum<sup>6</sup>. If all of this freight were to be transferred from road to rail it would be more than enough to keep the rail service running.

But the problem is that very few businesses seem interested in using rail for sending goods in and out of Gisborne. Instead they are mostly choosing road transport – presumably because they either find it cheaper, or faster, or more convenient than sending goods through the rail service.

Rail has the advantage of lower fuel consumption<sup>7</sup>. It also requires fewer people to run a train than if the same amount of freight was transported by road. But these advantages are diminished by the costs of maintenance of the line itself and often by the costs of double or triple handling of freight at either end of the journey. Added to this are the convenience costs of having to fit in with the timetable for the train (whereas trucks have greater flexibility), and in the case of the Napier – Gisborne line, the lack of a regular scheduled service. Furthermore, because the rail service out of Gisborne only goes south, goods destined for Auckland or Tauranga or other centres to the north of Gisborne, if carried by rail, must take a circuitous route via the Manawatu Gorge (adding about the equivalent of 800 km to the slower time of rail per kilometre and cost of the overall journey). Further the direct rail transit time from Napier to Gisborne is about five hours compared to about three hours by road which makes rail less competitive on timing also. All of these factors, on balance, are favouring the use of road over rail transport in and out of Gisborne at the present time.

It is possible that with on-going marketing effort KiwiRail will secure more of a share of the existing freight business in and out of Gisborne in the future. Unless there is a profound shift in the relative economics of road versus rail transport, specifically between Napier and Gisborne, it seems unlikely that rail will ever do anything more than pick up just bits and pieces of the existing trade – and it will take more than this to make up the 400,000 to 800,000 tonnes per annum that KiwiRail have suggested is the minimum for a viable freight service on the Gisborne line.

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<sup>6</sup> In practice it would be less than this. Not all trucks will be fully loaded. But it would certainly exceed 800,000 T/yr.

<sup>7</sup> A single locomotive towing a full load of carriages on the Gisborne line (about 560 tonnes, or the equivalent of about 19 truck-loads) is reported to consume around 5.15 litres of diesel per km. A fully laden truck will use about 0.66 litres per km. Multiplied by 19 trucks, the total fuel consumption, using road transport, is therefore about two and a half times that of the equivalent load of freight carried by rail on the Gisborne line. The total difference in fuel consumption for a return journey to Gisborne would be about 3,200 litres (roughly \$3,400 worth of fuel). This equates to about 170 more litres (or an additional \$180) of fuel per truck.

## 6. Market Opportunities

The KiwiRail Freight Sales team has over recent months been compiling a long list of current and potential revenue opportunities in the market. The list is extensive albeit when a hard look is taken of converting some of the potential opportunities into commercial reality the list becomes very short. The following section seeks to describe some of these opportunities and the potential market dynamics that are at play as KiwiRail investigates the future of the Napier to Gisborne line.

### 6.1 Forestry

There are large areas of forest both north and south of Gisborne that are now coming to their peak of maturity. Indeed, the total plantation area between Hawke's Bay and Cape Runaway is said to be larger than the whole of Kaingaroa Forest<sup>8</sup>. KiwiRail have recognised that this is the one most promising area for building up future freight volumes.

One option, for example, would be to transport logs from the big [REDACTED] forests at Mohaka. There will be about 1,000,000 tonnes of logs per annum coming out of these forests over the next few years. However, the forest companies have made it clear that rail is simply not an option for them at Mohaka. The total distance from the Willowflat Road/SH2 intersection to the Port of Napier is a mere 71 kilometres. Double handling on to rail wagons for this kind of cartage distance is not considered feasible. Furthermore, if logs were destined for the [REDACTED] mill at Whirinaki (rather than just the Port of Napier) they would have to be transferred back on to trucks again in Napier for cartage to the [REDACTED] site. There is no rail link to the Whirinaki mill.

Another possibility would be to cart logs from the [REDACTED] forests at Wharerata. All of this wood is destined for the [REDACTED] mill just south of Gisborne. But, once again, with a travel distance of less than 40 kilometres from forest to mill there is no way that rail could expect to compete as an alternative to road transport once the costs of double-handling are taken in to account.

The smaller, more scattered forests in northern Hawke's Bay are likewise not an option. If rail cannot work at either Mohaka or Wharerata (which together currently account for at least 80% of all available mature forest off SH2 between Napier and Gisborne) then it is less likely to work for any of other the minor forests in between. These are mostly even closer to Napier than the Mohaka Forest and are individually too small to provide the kind of continuous wood supply needed to keep a rail service running.

It is also unlikely that the rail service will attract any of the timber originating from north of Gisborne, up towards the East Cape. There are vast areas of forest here, but because the rail line goes no further north than Gisborne, any logs originating from the East Cape area would first have to be trucked down to Gisborne before they could be put on to rail. And once the logs arrive at Gisborne, which has its own wood processing industries and, more importantly, its own log port, there is little or no reason for them to be carried any further south. As long as Gisborne's port remains open, and is able to cope with the volume of timber coming on stream, very little timber or wood product (other than containerised product) will need to be sent south – either by road or by rail.

The situation is different for the timber processing plants in Wairoa. There, at least, most product does go south<sup>9</sup>. Wairoa has two established mills [REDACTED] which have recently formed a joint venture and which together produce about 60,000 tonnes of finished wood product per year. But for them rail is not currently an option because of the lack of a

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<sup>8</sup> Pers comm. I. McSparran, East Coast Lumber, Wairoa.

<sup>9</sup> Currently about 90% of loads from the mills go south. This will drop to about 60% (36,000T) from 2006 onwards once the proposed new on-site kiln-drying facility has been built. North-bound product (23,000T/yr) mainly goes by road via the Waioeka Gorge to the pulp mill at Kawerau. South-bound product in future will go to the Port of Napier (24,000T/yr) and other southern destinations (12,000T/yr).

rail siding through the mill site. Nor could a siding be easily installed<sup>10</sup>. Any product sent out by rail would therefore have to be first loaded on to trucks and then transferred to rail. As far as the mills are concerned, if double handling is required, they would not be interested in switching to rail.

Overall, therefore, in the Mohaka and Wharerata Forests, the smaller northern Hawke's Bay Forests, the forests to the north of Gisborne and the Wairoa and Gisborne timber mills there appears to be no obvious prospect for either logs or wood product to be carried by rail. The short haulage distances, the need for double-handling, the lack of sidings, the absence of a rail line north of Gisborne, and above all the presence of a log port at Gisborne all combine to make rail either an uneconomic or simply unnecessary cartage option for the purposes of the forest industry in the north.

Concerns have been raised by some forestry owners that the Port of Gisborne will be restricted for volume as age profile of all major east coast forests are similar and the Eastland Port will not be able to cater for all of this volume of circa 35M tonnes in particular as majority of this volume is north of Gisborne and lends itself to short haul road to Gisborne. Napier will have to play a significant part in particular for forests south of Gisborne.

## **6.2 Carting of Aggregate**

Another possibility for rail on the Gisborne line is the carting of aggregate from the Mohaka River. There are understood to be prospects for aggregate from the river to be carried by rail wagon to markets in Napier, Gisborne, and possibly further afield.

The venture is understood to be at the investigation stage only. It therefore still remains to be seen whether or not it will proceed. However, if it does proceed, it could potentially mean the cartage of up to 40,000 tonnes per annum of aggregate on the Napier – Gisborne line. According to the Hawke's Bay Regional Council Works Dept, which oversees the management of regional gravel resources, 40,000 tonnes is about the maximum sustainable annual take from the Mohaka River<sup>11</sup>.

An additional 40,000 tonnes, on top of the normalised 50,000 tonnes of freight already carried, would bring the total volume on the line (or at least part of the line) up to about 90,000 tonnes per year. Although still short of KiwiRail's target, this amount of freight would come close enough to the minimum threshold for what is a viable loading for continued maintenance of the Napier to Gisborne line.

Gravel has been carried out of Raupunga by rail before, but this was discontinued about 5 – 6 years ago. It remains to be seen whether the current investigation finds that the use of rail is once again a viable alternative.

## **6.3 Other Opportunities**

Other emerging freight opportunities in addition to those discussed above on the Napier to Gisborne line being currently investigated include:

- New ply mill being commissioned in 2011 in Matawhero. Potential to move this product via rail;
- Export timber via Napier, with woodchips being sent to Kawerau. KiwiRail has done a trial of moving these woodchips via rail, but the wagons have a 5 day turn around due to having to move the product down to Palmerston North and then up the country from there;
- Currently 25,000 tonnes of Squash goes to Japan in Hi Cube containers;
- A feasibility study is being undertaken [REDACTED] for the movement of diesel from Napier to Gisborne;

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<sup>10</sup> The mills are located about 700 metres from the railway line, with residential houses in between. A siding connection would require the purchase of one or more houses in order to physically put the line through.

<sup>11</sup> Pers comm. V. Byrne, HBRC Works Dept.

- Bulk wine ex Gisborne is currently trucked to Auckland, with the potential to rail the product. The challenge with this product is the long asset turn for the equipment used due to the need to go south to Palmerston North before heading north;
- Meat products from Wairoa.

## 7. General Economic Benefits and Costs – Input from NZTA

### 7.1 Impacts on the State Highway 2

State Highway 2 between Gisborne and Napier (State Highway 2 (south)) is a parallel route for Napier to Gisborne section of the PNGL rail line. Any impacts from a temporary or permanent closure of the Napier to Gisborne section of PNGL would affect this route.

This analysis of impacts responds to key concerns raised by the community, and includes a discussion of the potential impacts: on network efficiency, road safety, maintenance costs, and route security.

### 7.2 Network efficiency

State highway 2 (south) is classified as Regional Strategic route. The classification provides of indication of the general levels of service that road users can expect, and typical service targets for a Regional Strategic route include: providing moderate to high journey speed (70-90 km-rural), targeted improvements to network efficiency and development passing lane opportunities, a 3-4 star safety rating and active maintenance programme.

Using State highway 2 (south), it is two-hundred and fifteen kilometres from Napier and Gisborne. One hundred and ten kilometres of the route is identified as hilly or mountainous and the average journey time between centres is just over 3 hours. In 2011, just over 742,000 vehicles travelled on this road, with trucks making up 11 percent or 81,620 of this total.

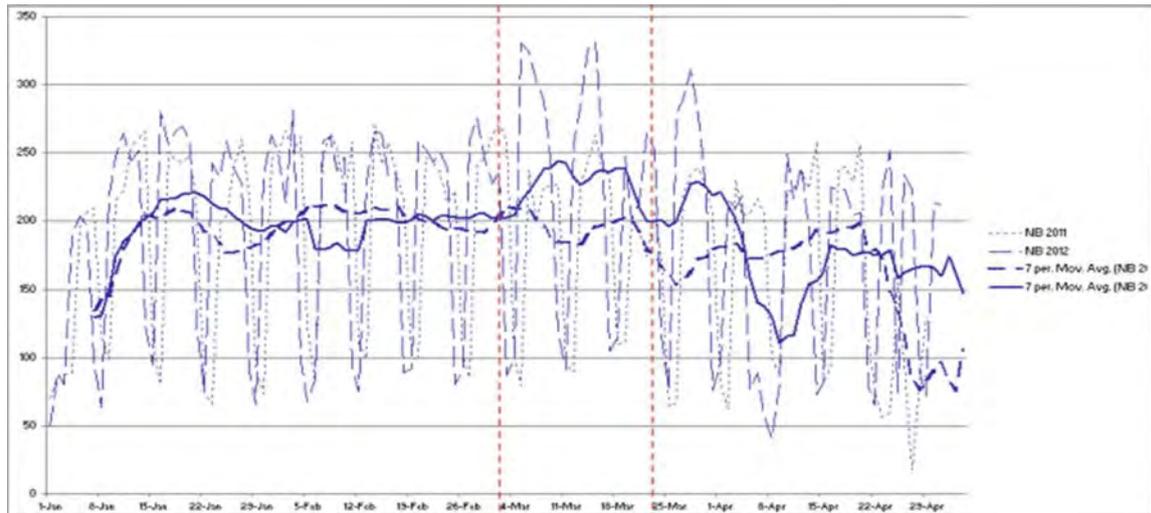
2011 traffic counts SH2 Napier to Gisborne (at Tangoio telemetry site)

	SH2 Napier to Gisborne (Tangoio)				
	north	daily ave	south	daily ave	total
<b>Light vehicles</b>	316522	867	344439	944	<b>660961</b>
<b>11-17m trucks</b>	6692	18	5718	16	<b>12410</b>
<b>&gt;17m trucks</b>	48462	133	20370	56	<b>68832</b>
<b>TOTAL</b>	<b>371676</b>	<b>1018</b>	<b>370527</b>	<b>1015</b>	<b>742203</b>
<b>% trucks</b>	15%		7%		11%

While the daily average can be calculated at just over 220 trucks, in practice the pattern for heavy vehicle movements is a mid week peak of around 200 – 300 trucks day (subject to seasonal fluctuations) tailing off to 100 trucks daily before and after the weekends. These peaks are also impacted by one off events, and the closure of the Waioeka Gorge (on SH2 north of Gisborne) on 3 March, three weeks before the washout on the PNGL rail line, has significant impact on number of vehicles using State highway 2 (south). But while there was a spike in truck volumes following both of these events, truck operators quickly adjusted, and heavy vehicle movements returned to normal patterns.

Average seven day truck numbers (at Tangoio telemetry site)

Waioeka Gorge PNLG closure



If the fifty thousand tonnes of freight (per annum) in a normal year) currently moved by rail, was transferred to road, it would be equivalent of 1,387 loaded 29-tonne truckloads per annum. That is a daily average of just over 4 trucks. However, even that freight is transported according to current pattern of mid week peaks, the increase in volume of trucks, compared to existing number of trucks using the route is so small as to have a minimal impact on the overall level of service provide on the state highway. In fact, the recent closure and continuing limited service (one lane) caused by slip in the Waioeka gorge is likely to have had more impact.

Additionally even if, the forecast growth in tonnages for 2013 were to occur, at one hundred thousand tonnes of freight, this would only be an additional 3789 truck a year, or 10 trucks a day, while forecast growth for 2022 of one hundred and sixty-five thousand tonnes would only be an additional 5715 trucks a year, or 16 a day, neither of which will impact significantly on the total volume of trucks, the capacity of the network or other road users.

Looking forward, the planned development of the route for use by High Productivity Motor Vehicles (HPMV)<sup>12</sup>, will increase the overall capacity of the state highway to increase the tonnage of freight, without increasing the number of trucks. In addition, there is an active programme to improve passing opportunities, and the 12/15 National Land Transport Program is likely to include the development of 6 additional passing opportunities.

### 7.3 Maintenance costs

For the Gisborne region, state highway maintenance and renewals per land kilometre were \$39,447, for 2009/10 year. For local roads, it was \$7,332.00 per kilometre. For purposes of comparison, the aggregated costs (for 2009/10 years) in Hawke's Bay region were \$22,396, and \$5,329 respectively. A key reasons for high average costs in Gisborne, is the cost of maintaining State Highway 35. The average maintenance costs for State Highway 2 (south), (a large portion of which is located in Hawkes Bay) is similar to the Hawkes Bay.

However, the small number of additional truck movements as result of the closure of the line, when considered in the context of the existing numbers of vehicles and other trucks currently using the highway means that any impact on maintenance costs is minimal.

<sup>12</sup> Currently, the route provides for limited HPMV capability. Strengthening, three bridges (with the Waikari Bridge the most significant investment at \$3-4 m) would enable the route to provide for full HPMV capability, and accommodate both longer and heavier truck (up to 58 tonnes), further increasing its capacity.

## 7.4 Road Safety

Although in general, this route is assessed as having a low to medium safety risk, a feature of the safety profile for this region are the relatively high number of single vehicle crashes (including truck rollovers) as a percentage total crashes. There is range of factors (driver behaviour, alcohol, vehicle safety, network condition) that all contribute to this trend, but in relation to trucks, crashes have been steadily trending down. The relatively small increase in the number of trucks if freight is transferred from rail to road will not significantly impact on this trend, or the overall safety risk for the route.

Truck crashes on State Highways across Gisborne and Wairoa districts 2003-2012

Vehicle Crash Type	Local Body	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Grand Total
Truck fatal	Gisborne District				1	1	2	1	1			6
	Wairoa District	3		1	1			1				6
Truck serious	Gisborne District	1	1	2	2	1	1		1	3		12
	Wairoa District		2	3		4	1		1			11
Truck minor	Gisborne District	1	1	5	3	5	5	3	5	3	1	32
	Wairoa District	5	3	3	1	2	4	1	1			20
Truck non-injury	Gisborne District	17	11	9	12	8	10	9	19	16	6	117
	Wairoa District	10	5	11	4	12	5	5	6	4	2	64
<b>Total SH truck crashes</b>		<b>37</b>	<b>23</b>	<b>34</b>	<b>24</b>	<b>33</b>	<b>28</b>	<b>20</b>	<b>34</b>	<b>26</b>	<b>9</b>	<b>268</b>

## 7.5 Route security

A key concern of community is the potential isolation risks to communities of only being able to rely on the road network should the rail line remain closed. Annually, there is an average of 2-3 road closures on each of the two sections of SH2 between Gisborne and Napier. Half of these closures are for less than four hours, while 28 percent (15 closures) are between 4-10 hours duration. Long duration closures are very infrequent and complete road closures for over 10 hours occur at a rate of less than one a year. Any closures tend to be seasonal, with over half of the closures occurring in the winter time.

SH2 Gisborne–Napier road closures over 10 year period May 2002-May 2012<sup>13</sup>

SH2 Route	Total closure hours	Total closures	< 4 hours	4 to 10 hours	>10 hours	# >4 hours with no route alternatives	% winter closures June-Sept	% closed 18:00 06:00
Gisborne to Wairoa	132	23	14	6	3	0	43%	22%
Wairoa to Napier ex Matahoura Gorge	265	31	13	9	9	14	55%	45%

<sup>13</sup> These records cover 61 road closure events over the 10 year period from May 2002 to May 2012. This comprises single lane closures, complete closures and complete closures for part of the stated duration. Seven of the closure events on the Wairoa to Napier section will not reoccur, as the Matahoura gorge has now been bypassed by a new alignment. These events are not included in this analysis.

The Gisborne to Wairoa section of SH2 is generally less affected by road closures, particularly those of a long duration (over 10 hours). The impact of any closures is also reduced by the opportunity to divert traffic onto an alternative route via Tiniroto and Frasertown. The Wairoa to Napier section of SH2 has a higher incidence of road closures, particularly those over 10 hours. These longer closures occur on average once per year. While, there is no single alternative route covering the Wairoa to Napier section, there are a number of smaller detours which are able to bypass sections of the state highway during closures. While most of these detours are better suited to cars than trucks, our best information suggests that none of the road closures in the last 10 years have resulted in the transshipment of freight (or passengers) from road to rail.

Cyclone Bola in 1988 is the only event (we have knowledge of) where the rail bridge over Wairoa River, between Awamate Rd and Wairoa airport, was modified and opened as a shared 'rail-road' bridge for 19 months. This reduced the detour around Wairoa from 32km to 12km, until the replacement road bridge was built in Wairoa town.

## **7.6 Conclusion**

In our view, if the PNLG rail line between Napier and Gisborne is closed, any increase in volume of trucks from the potential closure of the rail based on current volumes would have minimal impact on the overall level of service on the highway. Equally, the network has sufficient capacity to cope with any potential increase in truck volumes based on forecast increases in freight volumes.

There are also no significant resilience or route security issues. Although the route does suffer from relatively frequent road closures, these are generally of short duration and there is no evidence that the road closures in the last 10 years have resulted in the transshipment of freight (or passengers) from road to rail. Although one-off events can always occur, possible closure would not have significant impact on current safety risk for the highway.

## **8. Other Considerations**

### **8.1 Tourism Impacts**

Tourism is not such a significant contributor to the Gisborne economy as it is to say the Northland economy. Tourism numbers in the Gisborne region are lower than just about any other region in New Zealand because of Gisborne's out of the way nature.

### **8.2 Future of the Port of Gisborne**

Only if there were a major failure at the Port of Gisborne would this scenario be likely to change. If the Port at Gisborne was no longer operating, or was grossly over-loaded, then there would be no sea outlet for some or all of the logs and wood product (and squash) that is currently exported from there. In that case, the timber that currently passes through the Port of Gisborne would either be carted to Napier, or to Tauranga, or simply left unharvested in the forests because of the added (and often already marginal) cost of transport.

The Port of Gisborne is confident of their future – although further investment will clearly be needed within the next few years if Gisborne is to cope with the volumes of timber that have been forecast to be harvested from the East Cape – if indeed those forecasts prove correct<sup>14</sup>. A plan has been developed for upgrading the Port, including the construction of new berths, storage areas, sea walls and dredging. The estimated cost in 2001 was \$46m<sup>15</sup>.

If, however, the Port of Gisborne failed to make these improvements, there will be an increased risk of the Port being unable to adequately cope with future growth in wood exports or even function as an

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<sup>14</sup> Sources from within the forest industry suggest that these forecasts will not prove correct. There are large amounts of timber north of Gisborne but much of it is said to be in poor condition, with inadequate road access.

<sup>15</sup> Source: GHD Report (2001) *Tairāwhiti Regional Development Plan, Gisborne & Wairoa Districts*, p.30).

export port at all. Under these circumstances there might be a demand for rail transport from Gisborne to Napier. It would not be a desirable outcome, either for Gisborne, or for Hawke's Bay, but the rail service would at least provide one option for taking product to an alternative port.

The use of rail in this scenario assumes that it would still be economically viable to carry logs etc over the extra distance and to double-handle from trucks on to rail wagons for the trip to Napier – although in practice this would not necessarily hold true. There are already doubts over the economic viability of harvesting some of the large areas of remote plantation forest on the East Coast, even if the logs are only carried as far as Gisborne. Much of this timber is unlikely, on current economics, to withstand the additional costs of double-handling and further long distance cartage.

The rail alternative would also require a commitment by KiwiRail to providing additional locomotives and wagons on the Gisborne line. If so, these would most likely be sourced in the first instance from surpluses of older equipment coming out of current planned fleet replacements. This would allow KiwiRail to minimise their commitment until the long-term future of the Port is better known.

Having made this commitment, KiwiRail would look to compete with road transport (and possibly barge transport) for a share of whatever timber may come. But at all times overshadowing the investment would be the risk that the Port of Gisborne would finally complete its make-over, start operating again, and take back all of the wood freight that may by then have transferred to rail.

Under these circumstances it is difficult to see that any kind of investment by KiwiRail (however modest) would be particularly attractive. Furthermore, all that would be achieved in the end is a lesser outcome than just keeping the Port of Gisborne operating. The rail, the road, and barges would be simply ambulances at the bottom of the cliff, and useful only until such time as the Port of Gisborne was able to get back on its feet again.

### **8.3 Historical Subsidising of the Line**

In 2004, when the rail line was still under Tranz Rail's control, the Hawke's Bay Regional Council, Gisborne District Council and central government jointly made a one-off payment of \$250,000 to Tranz Rail to support the continuation of services on the Gisborne line<sup>16</sup>. The line is now Crown-owned and there apparently is now no longer the facility for subsidisation from regional government with the abolition of the Alternative to Roading schemes (ATR) by the new government. Therefore, even if the Hawke's Bay Regional Council wanted to financially support the service a new mechanism would need to be found.

### **8.4 Option Value**

Those users who do not use rail in normal circumstances may receive an "insurance" benefit by knowing that, in the event of road transport being unavailable, rail could be a "reserve". Option value is often included in rail passenger transport evaluations but is less common in freight transport evaluations. For Hawkes Bay/Gisborne Rail, option value could be estimated by comparing road with the next best method in the event of road unavailability. This value would then be multiplied by the perceived probability of road being unavailable or impractical to give an "expected" option value. Given the road network, and the need for some road transport to and from the rail network, the probability of road being unavailable is likely to be low although the probability of HCV unavailability may be higher.

### **8.5 Energy Efficiency Issues**

Uncertainties surrounding long-term oil prices and overseas supply dependency provide a further strategic argument for the retention of a national rail network. The price of fuel for rail has more than double over the past three years and over the past seven years has gone up by factor of four. Both

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<sup>16</sup> The return on this subsidy (based on current freight loads) would have been the effective removal of just 6 to 8 heavy vehicles per day from the Napier – Gisborne highway. At \$250,000 per annum this would have equated to paying \$120 to each of the 8 trucks a day taken off the road and would have made a 2% difference to the volume of heavy traffic on the highway.

road and rail have been severely affected by fuel price rises. Whilst short trains in Gisborne are currently not as efficient as they could be compared to trucking – the potential for bigger trains could make rail more than four times fuel efficient than trucks. With fuel crises possible this could help make rail cheaper to customers compared to road in the longer. Activities requiring longer distance road movements such as forestry, agriculture movements from Gisborne, Wairoa, Napier, Hastings through may become less viable and may see resumption in demand for rail freight.

## **8.6 National Macro Economic Impacts**

Subsidising the Napier to Gisborne line will have some “crowding out” implications. Other investments or consumption may be deferred. This “shadow price” of private and public funds needs to be recognised. Other transport projects that produce some or all the capacity and efficiency gains attributable to the Napier to Gisborne line, such as State Highway improvements, may warrant comparative evaluation. Furthermore, other non-transport investments may become subject to tighter funding constraints. Therefore, for the Rail system to be in the national interest not only should benefits exceed costs but also Rail should outperform other investments both in the transport and non-transport sectors. In assessing funding, the NZTA formula required a four-fold ratio of benefits to funding. It is unlikely that significant “crowding out” would result from funding at such a high ratio.

## **8.7 Environmental, Cultural Heritage Impacts**

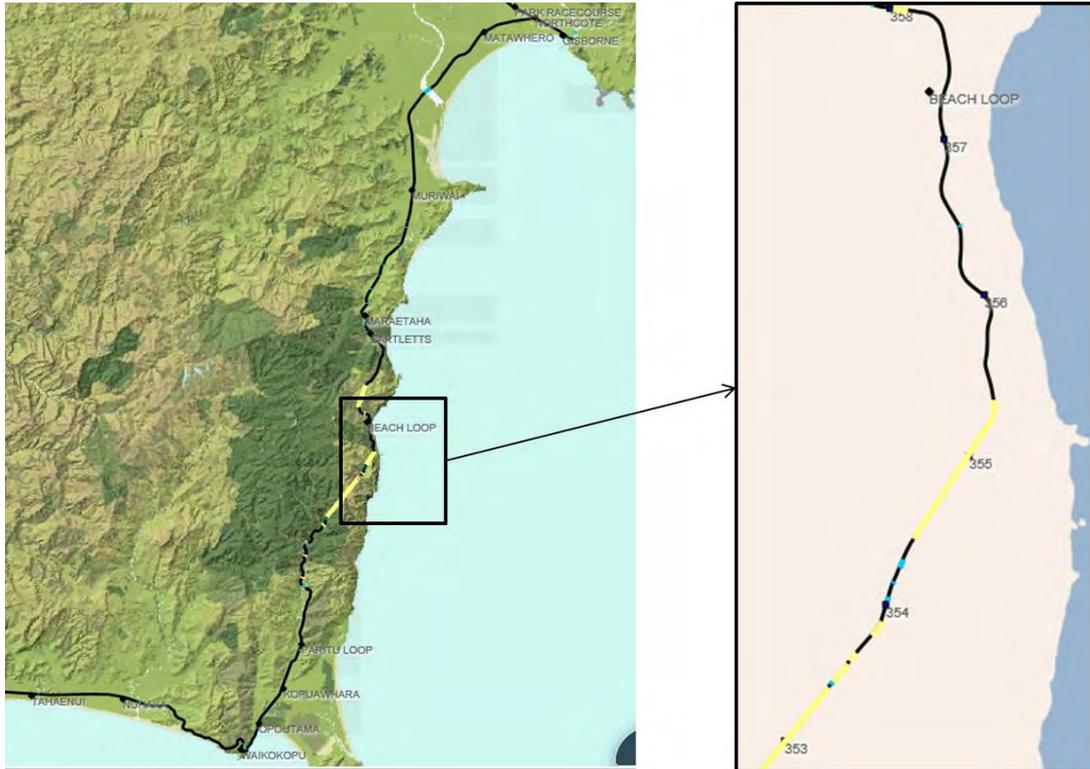
Finally, New Zealanders have a great affection for ‘their’ National Rail System. This is evidenced by the popularity of the TV One Series “Off The Rails” with Marcus Lush. In fact in it he paid a particular tribute to the Napier to Gisborne line. In the past rail closures have been seen to be politically unpopular. The loss of the ability for passenger and tourist and heritage trains to Gisborne from Napier (or from Gisborne) should also not be over looked. The option of converting a disused rail corridor to alternative use to a rail trail such as the envisioned by current national proposed cycle network may be one way of preserving the heritage of the route in line with current government policies. In fact the economic return this could bring to region may be of greater benefit than the current economic return the rail line does. However, it is not up to a commercial entity required to earn a narrow view of economic return to underwrite such an expensive, currently uneconomic proposition. Crown support via a subsidy would be required.

The environmental impacts of rail closure should also not be ignored, for example the destruction over even more protected vegetation/flora by the construction and or widening of roads to handle additional road freight that may occur should transport volumes from the East Coast/Gisborne are increase in the future.

## Attachment 1

### Beach Loop Slip Cost to Repair Assessment

The affected section of the PNGL is shown below.



Within this section of line there are four significant washouts:

- 353.7km – Northern portal of Tunnel 22
- 355.6km – “Big Hut”
- 357.15km – South End of Beach Loop
- 358.4km - Tunnel 26

## 1. Site 1: 353.7km – Northern Portal Tunnel 22



The washout at 353.7km PNGL was most likely caused by an earth slide on the upstream side of the embankment which blocked the inlet to the culvert. This would have caused water to back up against the embankment and saturate the soil. As the pressure from the water increased the embankment would have given way allowing the water to wash through.

The basic concept for the repair methodology for this washout is to source fill material from a local site (possibly from the top of Tunnel 22). For the sake of the cost estimate it has been assumed that fill material can be sourced from the surrounding area.

### **Design and Planning**

First a hydrology study of the catchment and stream will need to be done. From this analysis, the culvert can be sized to cope with the design flood flow.

Geotechnical investigation and testing of the surrounding area and design of the new embankment will need to be performed by professional geologists and geotechnical engineers. Planners will also be required to gain resource consent to obtain local fill material. This design and planning process would be expected to take between 6 and 8 weeks. There may be options to accelerate this work as the railway is a Life Lines service provider.

### **Site Work**

All site hut and ablutions, plant and equipment can be transported directly to site via a farm access track. A 35 tonne excavator and D6 or equivalent bulldozers will also be able to access the site via the same route. Some upgrade work would need to be done to some of the farm access track to make it safe and suitable for access. No approaches have been made to the land owners at this point.

An access track from the rail down the washout slope to the stream bed will be constructed and the stream diverted or dammed and pumped to allow the stream bed to be prepared for the installation of the culverts.

Some assumptions have been made using good judgement on the size of culverts required. The culverts will be transported to site via a work train and lifted into position using an excavator. Once all culverts have been positioned, the stream can be re-diverted to flow through the culverts.

Work can then begin on benching the wash out site as per the design in preparation for reconstruction of the embankment.

Locally sourced fill can then be cut and placed over the culvert while being compacted to the design requirements to rebuild the rail embankment.

If the volume of fill required is suitable and close to the volume of material required to be cut to daylight Tunnel 22, then there is a possibility to remove a tunnel during the required work.

The estimated time required to undertake the work above would be 6-8 weeks for the investigation and design followed by 10 -12 weeks of site work.

The estimated cost to complete the work listed above is between \$1.52m and \$1.97m.

## 2. Site 2: 355.6km – Big Hut



The likely cause of the washout at 355.6km is a blocked culvert due to vegetation and slip debris carried by the flow of water during the weather event. The blocked culvert may have diverted the water flow to the site of the washout which would have saturated and eroded the soil.

The methodology to repair the washout is to access the site via the rail corridor from Maraetaha. Fill material would be sourced locally.

The washout area would be cut back to sound ground and benches cut into the washout to help key in the fill. This will make the repair more stable. The fill will be placed into the washout area and compacted in layers. A pipe culvert may need to be installed at the appropriate level to transfer water from the side drains under the formation. The use of geotextiles to help with the slope stability may also be required.

A small standard designed retaining wall may also need to be constructed to help support the toe of the fill material to prevent future ground movement.

The estimated time to complete this work is 6-9 weeks at a cost of between \$730k and \$950k.

### 3. Site 3: 357.15km – South End of Beach Loop



The likely cause of the washout at Beach Loop is a blocked culvert due to vegetation and slip debris carried by the flow of water during the weather event. The blocked culvert may have diverted the water flow to the site of the washout which would have saturated and eroded the soil.

The methodology to repair the washout is to access the site via the rail corridor from Maraetaha. An assumption has been made that the fill material can be sourced locally.

The washout area would be cut back to sound ground and benches cut into the washout to help key in the fill. This will make the repair more stable. The fill will be placed into the washout area and compacted in layers. A pipe culvert may need to be installed at the appropriate level to transfer water from the side drains under the formation.

A small standard designed retaining wall may also need to be constructed to help support the toe of the fill material to prevent future ground movement.

The estimated time to complete this work is 4-6 weeks at a cost of between \$380k and \$500k.

#### 4. Site 4: 358.400km – South end tunnel 26 PNGL



At this site the railway track is still intact, but impassable as the slip has undercut the rail by 0.5m. If more heavy rain was to fall there is a high risk that this embankment could wash away all together if left in its current condition. A large concrete arch culvert is blocked with debris causing water to back up behind the embankment. The backed up water is now draining through a relief pipe culvert. However, where the water is exiting the relief culvert it has eroded away the embankment causing it to slip away. The backed up water has also saturated the embankment adding to its instability. At the time of writing some work is taking place on site in order to limit any further damage.

While the embankment has not yet washed away, the damage at this site has made it a very high risk area and repair work will need to be carried out to resume normal operation.

The proposed repair would start with pumping or draining the water on the upstream side of the embankment and then removing the debris and unblocking the large concrete arch culvert.

Once the stream is flowing through the concrete arch culvert work can begin on rebuilding the downstream side of the embankment. This will involve placing and compacting suitable local fill as per the designed repair.

The estimated time to repair this site is between 8-10 weeks at a cost of between \$670k and \$870k

#### 5. Estimate Summary

A summary of the cost and time estimates for the repair of the four washouts sites is provided below

Location	Volume to Fill (m³)	Design Time	Time to Repair	Cost Estimate
353.700km	54000	6-8 weeks	10-12 weeks	\$1.52m - \$1.97m
355.600km	22000	2-3 weeks	6-9 weeks	\$0.73m – \$0.95m
No.1 Points	10000	2-3 weeks	4-6 weeks	\$0.38m – 0.50m
358.400	46000	2-3 weeks	8-10 weeks	\$0.67m - \$0.87m
Total	86,000.00			\$3.30m – \$4.29m

These estimates are first order given that there has not been thorough investigation. Further detailed work will be required to create increased certainty on the costs.

There are also a number of small slips across the track in this section. It is expected that these slips will take around 2 to 5 days to clear. The costs of clearing these can be accommodated within the estimates of treating the large items above.

## **6. Other Considerations and Information**

### **6.1. Cause of Damage**

All four of the washouts have occurred due to culverts becoming inundated with flood debris. At the time of the weather event the culverts in this section of track were code compliant and were last maintained in May 2011.

Detailed culvert inspections are performed once every six years and look at the structural integrity of the barrel, inlet and outlet. The detailed inspection also looks at the stream condition as well as blockages and debris build up. The detailed inspection is supported by a weekly track inspection.

After a severe weather event a special inspection is carried out in the affected area. Infrastructure listed on the essential features list (risk register) is also inspected in greater detail. Any remedial work is generated from this inspection.

### **6.2. Immediate Works**

If a decision is taken not to repair the damage immediately then work will still be required at each site to ensure that the sites do not present a hazard to the local environment and the community at large.

This work would involve stabilising the washouts and slips and improving or diverting the drainage away from the washout sites. This work is estimated to cost between \$25k to \$50k.

### **6.3. Damage Post March 2012**

The more recent inclement weather post the March event has not caused any further significant damage. However, there has been one small drop out near the edge of the track between Napier and Wairoa at Kotemaori. As an overall comment, the country is very saturated at the moment and will be susceptible to further slips and drop outs – even for lesser rain events than caused the original damage.

### **6.4. Current and Future Costs associated with the PNGL North of Napier**

KiwiRail is currently spending approximately \$2.1m annually to maintain the infrastructure to its current condition north of Napier. This is very minimal amount and with the increased frequency of trains over the recent summer season, local staff had observed that increased maintenance would be required in order to hold the existing level of service.

Increasing Drain and Culvert Resilience: Because of the susceptibility and climate conditions in this part of the country, there may be a case to increase the culvert inspections from once every six years to annual inspection. This would add a further \$6,000 to the inspection cost per year. The maintenance work found from the extra inspections is estimated to cost between \$40,000 and \$70,000 per year.

Geotechnical Risks and improve resilience: To decrease line outages due to slips and drop outs, prudent engineering works could be undertaken. A detailed study has not been undertaken so reasonable judgement has been used to generate the estimates used in the table below. The Wairoa to Gisborne section is more vulnerable than the Napier to Wairoa section and this is reflected in the estimates. In this section alone there are at least 13 embankments of similar height to those that have failed recently and may pose a similar risk of embankment collapse due to upstream ponding. Added

to this, between Wairoa and Gisborne there are an estimated 30 to 40 cuttings and slopes above track that may pose varying levels of risk to the operation of the line.

River Works: One high risk area that will need a significant amount of work is between 347km and 350km where the rail runs alongside the Kopuawhara River. A combination of river protection, slope stability and drainage work is required along this stretch of the corridor. To remove the risks associated with this area could cost between \$0.8m to \$1.5m. A nominal amount has been included for the Napier to Wairoa section to acknowledge there are numerous rivers that the railway runs close to.

Bridge 218 PNGL - Ahuriri Estuary Bridge: To maintain bridge 218 PNGL to its existing condition is estimated to cost between \$400k and \$800k over a 15 year period. This estimate is based on the recent pile repair work completed in 2010. To renew this bridge would cost between \$8m to \$10m.

Other bridges on the line between Wairoa and Gisborne that will require significant work within the next 15 years are bridges 251, 253, 257 and 260 PNGL. These bridges are located within 500m of the coast and the steel plate girders are severely corroded and therefore have reduced section loss in the steel. These spans will need to be renewed with refurbished spare spans and will have a combined cost of approximately \$800k and \$1.2M.

Other Incidents: Taking into account past history, we could expect a major infrastructure outage due to weather to occur every 2 to 4 years. Given the geography of the line, it makes it difficult to eliminate damage against such events. However, we can certainly limit the damage by improving at risk areas and by maintaining drains, culverts and slopes after severe weather events. Regarding track related derailments, renewals expenditure north of Napier is very low. With large amounts of relatively old track infrastructure, it would not be unexpected to have an occasional derailment on this line. To account for possible incident costs an allowance has been made in the table below.

Tables summarising the estimated costs by line section:

## Napier to Gisborne Cost Estimates and Staff Impacts

Item	Napier to Wairoa Estimate of Annual Costs	Wairoa to Gisborne Estimate of Annual Costs
Existing Annual Maintenance Costs (prorated by km length)	\$1.134m	\$0.966m
Immediate Costs	\$12.5k to \$25k	\$12.5k to \$25k

<b>Item</b>	<b>Napier to Wairoa Estimate of Annual Costs</b>	<b>Wairoa to Gisborne Estimate of Annual Costs</b>
Estimate of Future Annual Maintenance Costs to maintain level of service (30% multiplier applied to existing figures)	\$1.474m	\$1.25m
Increase Geotechnical Resilience Estimates (not based on a detailed study)	\$50k to \$150k	\$150k to \$250k
Ahuriri Estuary Bridge  (estimated 15 year period costs converted into an average annual cost)	\$26K to \$53k	
Other Bridges  (estimated 15 year period costs converted into an average annual cost)	\$25k to \$50k  (nominal amounts used in this cell without reference to detailed asset information)	\$53k to \$80k
River Works	\$0k to \$50k  (nominal amounts used in this cell without reference to detailed asset information)	Y1 to Y3  \$0.266m to \$0.5Mm (higher spend in 1 <sup>st</sup> three years for repair between 347km – 350km)  Y4 to Y15  \$0k to \$150k
Track Renewals (new line added)	\$500k to \$1,700k	\$425k to \$1,445k
Incident Costs Per Annum	\$0 to \$250k	\$0 to \$500k
<b>TOTALS</b>	<b>\$2.07m to \$3.727m</b>	Y1 to Y3  \$2.15m to \$4.031m  Y4 to Y15  \$1.884m to \$3.681m

## Section 2: Close the Line, Recover the Asset and Make Safe

Parts of the asset that can be recovered are salvaged (rails, sleepers, bridge spans, level crossing equipment, etc). Bridge piers, large viaducts, culverts, formation, etc will remain in place. It is assumed that the rail land and designation would continue to be held on the line. Some civil works would be required in order to prevent negative effects from our infrastructure impacting on the environment/others (e.g. prevent water/erosion/debris issues and ensure asset left in a safe state as far as practical).

On-going minimal inspections/works would be required to ensure the rail corridor is OK and there are no issues relating to our assets that are having a negative impact on others or the environment. For example, clearing debris off bridge piers, clearing blocked culverts, etc). Some of the major assets like the viaducts and tunnels would be left as is and will have a future liability when their condition reaches a certain point.

It would take approximately six to twelve months to salvage the recoverable assets. There will need to be staff available for on-going management and inspection input to ensure the corridor continues to be safe. This is estimated at being equivalent to 0.5 to 1 FTE per line section. There is a risk that should future infrastructure damage take place, the line will progressively become more segmented and harder to get to in order to keep up corridor inspections and safety works.

- This option would make it very difficult and unlikely that the line would be reopened again.
- Line remoteness in places has a factor on the salvage costs being high.
- Accuracy of the estimates are as far as practical +/- 30%.

Item	Napier to Wairoa Closed	Wairoa to Gisborne Closed
Track Asset Salvage	~\$4.7m (cost)	~\$4.1m (cost)
Track Scrap Value	~\$3.56m (income)	~\$3.04m (income)
Make Asset Safe (particularly around geotech and drainage issues)	~\$0.5m to ~\$1m (cost)	~\$0.5m to ~\$1m (cost)
Structures Asset Recovery (recover bridge spans for reuse – assumed that low to no value income is derived due to handling and refurbishment required in order to re-use)	~\$1.5M (cost)	~\$2m (cost)
On Going Annual Corridor Asset Management Costs (inspections, corridor management, responding to asset issues affecting 3 <sup>rd</sup> parties, incidents, clearing debris of bridge piers, etc)	\$100k to \$400k per annum	\$100k to \$400k per annum

### Section 3: Mothball the Line and Make Asset Safe

Some civil works would be required in order to prevent negative effects from our infrastructure impacting on the environment/others (e.g. prevent water/erosion/debris issues and ensure asset left in a safe state as far as practical).

On-going minimal inspections/works would be required to ensure the rail corridor is OK and there are no issues relating to our assets that are having a negative impact on others or the environment. For example, clearing debris off bridge piers, clearing blocked culverts, etc).

There is a risk that should future infrastructure damage take place, the line will progressively become more segmented and harder to get to in order to keep up corridor inspections and safety works.

There will need to be staff available for on-going management and inspection input to ensure the corridor continues to be safe. This is estimated at being equivalent to 0.5 to 1 FTE per line section.

- Accuracy of the estimates are +/- 30%.

Item	Napier to Wairoa Mothballed	Wairoa to Gisborne Mothballed
Make Asset Safe (particularly around geotech and drainage issues)	~\$0.5m to ~\$1m (cost)	~\$0.5m to ~\$1m (cost)
On Going Annual Corridor Asset Management Costs (inspections, corridor management, responding to asset issues affecting 3 <sup>rd</sup> parties, incidents, clearing debris of bridge piers, vegetation management, etc)	\$100k to \$400k per annum	\$100k to \$400k per annum

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degree)	\$40m to \$60m <b>Total \$40m to \$70m</b>	\$20m to \$50m <b>Total \$23.3m to \$54.29m</b>
<b>If Line Was Mothballed</b> (will be a function of how long the line has been mothballed, required Level of Service once re-opened, etc. Assumes 2/3rds of the asset can be reused with minor titivation.)	\$0m to \$10m (Ahuriri Bridge) \$13m to \$20m <b>Total \$13m to \$30m</b>	\$3.30m – \$4.29m 2012 Damage \$7m to \$17m <b>Total \$10.3m to \$21.29m</b>

# Attachment 2 – Financial Analysis

## Using “Lower” Estimates

### Napier Gisborne Line

### Projections Over 10 Years - Using "Lower" I&E Cost Estimates

W:\Strategy & Planning\Napier-Gisborne Line\20120424 Nap-Gisb Data.xlsx\Forward Projections

Net Present Value Analysis over 10 years	
Using Effective Interest of	8.9%
1 - Re-instate line and continue to operate	<b>-\$34,057,402</b>
2 - Mothball line	<b>-\$3,003,939</b>
3 - Close line	<b>-\$8,703,939</b>

	Year 0 - FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22
<b>Re-Instate and Continue to Operate</b>											
<b>Statistical Data</b>											
Number of Trains on Line	163	655	729	756	768	782	798	813	829	845	861
Freight Tonnes Moved	44,325	109,887	136,867	145,825	147,671	150,500	153,575	156,569	159,753	162,678	165,742
Net Tonne Kilometres (000's)	9,369	19,133	25,741	27,588	27,927	28,528	29,193	29,830	30,519	31,133	31,781
Gross Tonne Kilometres (000's)	18,429	37,588	49,922	53,289	53,980	55,136	56,405	57,628	58,946	60,132	61,380
Revenue Attributable to Line	\$1,043,935	\$1,541,308	\$2,066,661	\$2,227,920	\$2,258,201	\$2,295,933	\$2,335,788	\$2,375,345	\$2,416,761	\$2,456,612	\$2,497,840
		32%	34%	8%	1%	2%	2%	2%	2%	2%	2%
<b>Above Rail Direct Costs</b>											
Locomotive Running Costs (R&M)	\$119,603	\$301,176	\$354,236	\$370,732	\$376,280	\$383,772	\$391,781	\$399,656	\$407,975	\$415,820	\$423,976
Fuel	\$205,525	\$324,380	\$430,817	\$459,877	\$465,941	\$475,817	\$486,771	\$497,322	\$508,691	\$518,926	\$529,695
Wagon Costs (R&M)	\$44,479	\$76,311	\$97,338	\$102,379	\$103,859	\$105,163	\$108,671	\$111,103	\$113,707	\$116,086	\$118,579
Locomotive Engineers	\$120,949	\$219,708	\$261,442	\$274,120	\$278,180	\$283,763	\$289,746	\$295,618	\$301,833	\$307,667	\$313,741
Rail Terminals	\$131,914	\$206,923	\$235,261	\$243,869	\$246,626	\$250,417	\$254,479	\$258,466	\$262,686	\$266,648	\$270,772
Other Costs / Overheads	\$93,371	\$169,275	\$206,864	\$217,647	\$220,618	\$224,900	\$229,717	\$234,325	\$239,234	\$243,772	\$248,515
	\$715,841	\$1,297,772	\$1,585,957	\$1,668,624	\$1,691,404	\$1,724,922	\$1,761,166	\$1,796,491	\$1,834,126	\$1,868,919	\$1,905,278
Cash Surplus / (Deficit) After Above Rail Direct Costs	\$328,093	\$243,536	\$480,704	\$559,296	\$566,797	\$571,011	\$574,621	\$578,854	\$582,635	\$587,694	\$592,562
<b>Below Rail Direct Costs</b>											
Infrastructure Costs : Napier-Wairoa	\$1,146,500	\$1,575,000	\$1,575,000	\$1,575,000	\$1,575,000	\$1,575,000	\$1,575,000	\$1,575,000	\$1,575,000	\$1,575,000	\$1,575,000
Infrastructure Costs : Wairoa-Gisborne	\$978,500	\$1,725,000	\$1,725,000	\$1,725,000	\$1,459,000	\$1,459,000	\$1,459,000	\$1,459,000	\$1,459,000	\$1,459,000	\$1,459,000
Costs before Capex	\$2,125,000	\$3,300,000	\$3,300,000	\$3,300,000	\$3,034,000	\$3,034,000	\$3,034,000	\$3,034,000	\$3,034,000	\$3,034,000	\$3,034,000
Cash Surplus / (Deficit) After All Direct Costs	-\$1,796,907	-\$3,056,464	-\$2,819,296	-\$2,740,704	-\$2,467,203	-\$2,462,989	-\$2,459,379	-\$2,455,146	-\$2,451,365	-\$2,446,306	-\$2,441,438
<b>Capital Expenditure</b>											
PAYGO Capex for Infrastructure : Napier-Wairoa	\$0	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000	\$500,000
PAYGO Capex for Infrastructure : Wairoa-Gisborne	\$0	\$425,000	\$425,000	\$425,000	\$425,000	\$425,000	\$425,000	\$425,000	\$425,000	\$425,000	\$425,000
PAYGO Capex for Infrastructure : Wairoa-Gisborne Re-Opening	\$3,300,000	\$3,300,000	\$3,300,000	\$3,300,000	\$3,300,000	\$3,300,000	\$3,300,000	\$3,300,000	\$3,300,000	\$3,300,000	\$3,300,000
PAYGO Capex for Locomotives	\$70,355	\$113,978	\$145,190	\$153,799	\$155,945	\$159,213	\$162,761	\$166,208	\$169,893	\$173,274	\$176,814
PAYGO Capex for New Wagons	\$56,969	\$73,127	\$77,193	\$77,193	\$78,289	\$79,997	\$81,857	\$83,660	\$85,591	\$87,355	\$89,203
PAYGO Capex for Existing Wagons	\$43,040	\$68,399	\$88,589	\$94,065	\$95,359	\$97,377	\$99,574	\$101,704	\$103,985	\$106,668	\$108,252
	\$113,394	\$464,346	\$1,281,906	\$1,250,057	\$1,254,593	\$1,261,586	\$1,269,193	\$1,276,573	\$1,284,470	\$1,291,697	\$1,299,269
Cash Surplus / (Deficit) After Capex Expenditure	-\$1,910,301	-\$7,520,810	-\$4,051,202	-\$3,990,761	-\$3,721,795	-\$3,724,575	-\$3,728,571	-\$3,731,719	-\$3,735,834	-\$3,738,003	-\$3,740,707
<b>Return on Assets Deployed</b>											
Locomotives	\$202,047	\$175,885	\$357,609	\$443,556	\$456,804	\$470,078	\$484,411	\$498,913	\$514,414	\$529,651	\$545,751
Wagons	\$309,720	\$253,790	\$375,616	\$426,979	\$430,824	\$436,656	\$442,986	\$449,138	\$455,710	\$461,746	\$468,065
Infrastructure	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	\$511,767	\$429,675	\$733,226	\$870,535	\$887,628	\$906,734	\$927,397	\$948,050	\$970,124	\$991,397	\$1,013,815
Direct Cash Contribution to Line Section	-\$2,422,068	-\$7,950,486	-\$4,784,428	-\$4,861,296	-\$4,609,423	-\$4,631,309	-\$4,655,968	-\$4,679,769	-\$4,705,958	-\$4,729,401	-\$4,754,522
Revenue Attributable to Other Sections	\$354,965	\$215,176	\$408,813	\$438,641	\$469,986	\$498,093	\$530,693	\$560,800	\$594,576	\$622,156	\$651,951
Additional Variable Costs Attributed to Other Sections	-\$109,848	-\$66,589	-\$126,512	-\$135,742	-\$145,442	-\$154,140	-\$164,229	-\$173,546	-\$183,998	-\$192,533	-\$201,753
Line Section Contribution to Other Sections	\$245,117	\$148,587	\$282,302	\$302,899	\$324,543	\$343,952	\$366,464	\$387,255	\$410,578	\$429,623	\$450,198
Net Total Cash Contribution Line Section Operations	-\$2,176,950	-\$7,801,898	-\$4,502,126	-\$4,558,397	-\$4,284,880	-\$4,287,357	-\$4,289,504	-\$4,292,515	-\$4,295,380	-\$4,299,778	-\$4,304,324
<b>Mothball</b>											
Staff Closure Costs : Wairoa-Gisborne		\$300,000									
Staff Closure Costs : Napier-Wairoa		\$300,000									
Mothball Costs : Wairoa - Gisborne		\$500,000									
Mothball Costs : Napier - Wairoa		\$500,000									
Annual Costs : Wairoa - Gisborne		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Annual Costs : Napier - Wairoa		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Net Total Cash Contribution Line Section Operations		-\$1,800,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000
<b>Close Line</b>											
Staff Closure Costs : Wairoa-Gisborne		\$300,000									
Staff Closure Costs : Napier-Wairoa		\$300,000									
Closure Costs : Wairoa - Gisborne		\$3,560,000									
Closure Costs : Napier - Wairoa		\$3,140,000									
Annual Costs : Wairoa - Gisborne		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Annual Costs : Napier - Wairoa		\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000
Net Total Cash Contribution Line Section Operations		-\$7,500,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000	-\$200,000

# Using "Higher" Estimates

## Napier Gisborne Line

Net Present Value Analysis over 10 years	
Using Effective Interest of	8.9%
1 - Re-instate line and continue to operate	-\$9,258,967
2 - Mothball line	-\$8,615,758
3 - Close line	-\$14,315,758

### Projections Over 10 Years - Using "Upper" I&E Cost Estimates

W:\Strategy & Planning\Napier-Gisborne Line\20120424 Nap-Gisb Data.xlsx\Forward Projections

	Year 0 - FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21	FY22		
<b>Re-Instate and Continue to Operate</b>													
<b>Statistical Data</b>													
Napier-Gisborne Trains		120	193	211	214	219	224	230	235	240	246		
Napier-Wairoa Trains		535	535	545	554	564	574	584	594	604	615		
Number of Trains on Line	163	655	729	756	768	782	798	813	829	845	861		
Napier-Gisborne Freight Tonnage	33,706	38,668	65,647	73,436	74,089	75,701	77,535	79,254	81,156	82,764	84,485		
Napier-Wairoa Freight Tonnage	10,619	71,220	71,220	72,389	73,582	74,799	76,040	77,306	78,597	79,914	81,258		
Freight Tonnes Moved	44,325	109,887	136,867	145,825	147,671	150,500	153,575	156,560	159,753	162,678	165,742		
Napier-Gisborne NTKs	8,116	9,823	16,442	18,133	18,312	18,751	19,250	19,718	20,236	20,674	21,143		
Napier-Wairoa NTKs	1,671	9,300	9,300	9,456	9,615	9,777	9,942	10,111	10,283	10,459	10,638		
Net Tonne Kilometres (000's)	9,369	19,123	25,741	27,588	27,927	28,528	29,193	29,830	30,519	31,133	31,781		
Napier-Gisborne GTKs	16,189	19,074	31,408	34,459	34,827	35,654	36,587	37,467	38,435	39,265	40,149		
Napier-Wairoa GTKs	2,988	18,514	18,514	18,831	19,154	19,483	19,819	20,161	20,511	20,867	21,231		
Gross Tonne Kilometres (000's)	18,429	37,588	49,922	53,289	53,980	55,136	56,406	57,628	58,946	60,132	61,380		
<b>Revenue Attributable to Line</b>	<b>\$1,043,935</b>	<b>\$1,541,308</b>	<b>\$2,066,661</b>	<b>\$2,227,920</b>	<b>\$2,258,201</b>	<b>\$2,295,933</b>	<b>\$2,335,788</b>	<b>\$2,375,345</b>	<b>\$2,416,761</b>	<b>\$2,456,612</b>	<b>\$2,497,840</b>		
		32%	34%	8%	1%	2%	2%	2%	2%	2%	2%		
<b>Above Rail Direct Costs</b>													
Locomotive Running Costs		(based on forecast loco kms)	\$119,603	\$301,176	\$354,236	\$370,732	\$376,280	\$383,772	\$391,781	\$399,656	\$407,975	\$415,820	\$423,976
Fuel		(based on forecast GTKs)	\$205,525	\$324,380	\$430,817	\$459,877	\$465,841	\$475,817	\$486,771	\$497,322	\$508,691	\$518,926	\$529,695
Wagon Costs		(based on forecast wagon kms)	\$44,479	\$76,311	\$97,338	\$102,979	\$103,859	\$106,163	\$108,671	\$111,103	\$113,707	\$116,086	\$118,579
Locomotive Engineers		(based on I&E cost per train)	\$130,949	\$219,708	\$261,442	\$274,120	\$278,180	\$283,763	\$289,746	\$295,618	\$301,833	\$307,667	\$313,741
Rail Terminals		(based on RD cost per train + terminal cost)	\$131,914	\$206,923	\$235,261	\$243,869	\$246,626	\$250,417	\$254,479	\$258,466	\$262,686	\$266,648	\$270,772
Other Costs / Overheads			\$93,371	\$169,275	\$206,864	\$217,647	\$220,618	\$224,990	\$229,717	\$234,325	\$239,234	\$243,772	\$248,515
			\$715,841	\$1,297,772	\$1,585,957	\$1,668,624	\$1,691,404	\$1,724,922	\$1,761,166	\$1,796,491	\$1,834,126	\$1,868,919	\$1,905,278
<b>Cash Surplus / (Deficit) After Above Rail Direct Costs</b>	<b>\$328,093</b>	<b>\$243,536</b>	<b>\$480,704</b>	<b>\$559,296</b>	<b>\$566,797</b>	<b>\$571,011</b>	<b>\$574,621</b>	<b>\$578,854</b>	<b>\$582,635</b>	<b>\$587,694</b>	<b>\$592,562</b>		
<b>Below Rail Direct Costs</b>													
Infrastructure Costs : Napier-Wairoa		Use I&E Version	\$1,159,000	\$2,027,000	\$2,027,000	\$2,027,000	\$2,027,000	\$2,027,000	\$2,027,000	\$2,027,000	\$2,027,000	\$2,027,000	
Infrastructure Costs : Wairoa-Gisborne		HIGH ESTIMATE	\$978,500	\$2,586,000	\$2,586,000	\$2,586,000	\$2,236,000	\$2,236,000	\$2,236,000	\$2,236,000	\$2,236,000	\$2,236,000	
Costs before Capex			\$2,137,500	\$4,613,000	\$4,613,000	\$4,613,000	\$4,263,000	\$4,263,000	\$4,263,000	\$4,263,000	\$4,263,000	\$4,263,000	
<b>Cash Surplus / (Deficit) After All Direct Costs</b>	<b>-\$1,809,407</b>	<b>-\$4,369,464</b>	<b>-\$4,132,296</b>	<b>-\$4,053,704</b>	<b>-\$3,696,203</b>	<b>-\$3,691,989</b>	<b>-\$3,688,379</b>	<b>-\$3,684,146</b>	<b>-\$3,680,365</b>	<b>-\$3,675,306</b>	<b>-\$3,670,438</b>		
<b>Capital Expenditure</b>													
PAYGO Capex for Infrastructure : Napier-Wairoa		Use I&E Version	\$0	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	\$1,700,000	
PAYGO Capex for Infrastructure : Wairoa-Gisborne		HIGH ESTIMATE	\$0	\$1,445,000	\$1,445,000	\$1,445,000	\$1,445,000	\$1,445,000	\$1,445,000	\$1,445,000	\$1,445,000	\$1,445,000	
PAYGO Capex for Infrastructure : Wairoa-Gisborne Re-Opening		HIGH ESTIMATE	\$420,000										
PAYGO Capex for Locomotives			\$70,355	\$113,978	\$145,190	\$153,799	\$155,945	\$159,213	\$162,761	\$166,208	\$169,893	\$173,274	\$176,814
PAYGO Capex for New Wagons			\$43,000	\$56,969	\$73,127	\$77,193	\$78,289	\$79,997	\$81,857	\$83,660	\$85,591	\$87,355	\$89,203
PAYGO Capex for Existing Wagons		(not based on volume growth)	\$43,000	\$58,399	\$88,589	\$94,065	\$95,359	\$97,377	\$99,574	\$101,704	\$103,985	\$106,068	\$108,252
			\$113,394	\$7,674,346	\$3,451,906	\$3,470,057	\$3,474,939	\$3,481,586	\$3,489,193	\$3,496,573	\$3,504,470	\$3,511,697	\$3,519,269
<b>Cash Surplus / (Deficit) After Capex Expenditure</b>	<b>-\$1,922,801</b>	<b>-\$12,043,810</b>	<b>-\$7,584,202</b>	<b>-\$7,523,761</b>	<b>-\$7,170,795</b>	<b>-\$7,173,575</b>	<b>-\$7,177,571</b>	<b>-\$7,180,719</b>	<b>-\$7,184,834</b>	<b>-\$7,187,003</b>	<b>-\$7,189,707</b>		
<b>Return on Assets Deployed</b>													
Locomotives		8.9%	\$202,047	\$175,885	\$357,609	\$443,556	\$456,804	\$470,078	\$484,411	\$498,913	\$514,414	\$529,651	\$545,751
Wagons		8.9%	\$309,720	\$253,790	\$375,616	\$426,979	\$430,824	\$436,656	\$442,986	\$449,138	\$455,710	\$461,746	\$468,065
Infrastructure		0.0%	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	
			\$511,767	\$429,675	\$733,226	\$870,535	\$887,628	\$906,734	\$927,397	\$948,050	\$970,124	\$991,397	\$1,013,815
<b>Direct Cash Contribution to Line Section</b>	<b>-\$2,434,568</b>	<b>-\$12,473,486</b>	<b>-\$8,317,428</b>	<b>-\$8,394,296</b>	<b>-\$8,058,423</b>	<b>-\$8,080,309</b>	<b>-\$8,104,968</b>	<b>-\$8,128,769</b>	<b>-\$8,154,958</b>	<b>-\$8,178,401</b>	<b>-\$8,203,522</b>		
Revenue Attributable to Other Sections			\$354,965	\$215,176	\$408,813	\$438,641	\$469,986	\$498,093	\$530,693	\$560,800	\$594,576	\$622,156	\$651,951
Additional Variable Costs Attributed to Other Sections			-\$85,008	-\$51,531	-\$97,304	-\$105,047	-\$112,553	-\$119,285	-\$127,092	-\$134,302	-\$142,391	-\$148,996	-\$156,131
Line Section Contribution to Other Sections			\$269,957	\$163,645	\$310,510	\$333,594	\$357,432	\$378,808	\$409,601	\$426,498	\$462,186	\$473,160	\$495,820
<b>Net Total Cash Contribution Line Section Operations</b>	<b>-\$2,164,610</b>	<b>-\$12,309,841</b>	<b>-\$8,006,918</b>	<b>-\$8,060,701</b>	<b>-\$7,700,991</b>	<b>-\$7,701,501</b>	<b>-\$7,701,367</b>	<b>-\$7,702,271</b>	<b>-\$7,702,772</b>	<b>-\$7,703,240</b>	<b>-\$7,707,702</b>		
<b>Mothball</b>													
Staff Closure Costs : Wairoa-Gisborne		HIGH ESTIMATE	\$500,000										
Staff Closure Costs : Napier-Wairoa		HIGH ESTIMATE	\$500,000										
Mothball Costs : Wairoa - Gisborne		HIGH ESTIMATE	\$1,000,000										
Mothball Costs : Napier - Wairoa		HIGH ESTIMATE	\$1,000,000										
Annual Costs : Wairoa - Gisborne		HIGH ESTIMATE	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	
Annual Costs : Napier - Wairoa		HIGH ESTIMATE	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	
<b>Net Total Cash Contribution Line Section Operations</b>			<b>-\$3,800,000</b>	<b>-\$800,000</b>	<b>-\$800,000</b>								
<b>Close Line</b>													
Staff Closure Costs : Wairoa-Gisborne		HIGH ESTIMATE	\$500,000										
Staff Closure Costs : Napier-Wairoa		HIGH ESTIMATE	\$500,000										
Closure Costs : Wairoa - Gisborne		HIGH ESTIMATE	\$4,060,000										
Closure Costs : Napier - Wairoa		HIGH ESTIMATE	\$3,640,000										
Annual Costs : Wairoa - Gisborne		HIGH ESTIMATE	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	
Annual Costs : Napier - Wairoa		HIGH ESTIMATE	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	\$400,000	
<b>Net Total Cash Contribution Line Section Operations</b>			<b>-\$9,500,000</b>	<b>-\$800,000</b>	<b>-\$800,000</b>								