Report to:

Tairawhiti Environment Centre

REVIEW OF ECONOMICS OF NAPIER-GISBORNE RAIL LINE

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Review of Economics of Napier-Gisborne Rail Line

1 Summary

This report has been prepared by BERL for Tairawhiti Environment Centre.

1.1 Background

A considerable amount of effort and work has been put into a campaign by people, mainly in the Gisborne and Hawke's Bay regions to progress and promote the thinking of the need and potential for the Napier to Gisborne rail line and rail services. This campaign has generated positive responses from across business communities in the regions, the political spectrum and other stakeholders.

The purpose of this present report is limited to the professional task of assessing the analyses in the KiwiRail report on the viability of the line and to explore the possibilities that there could be economic and social benefits to continuing and possibly improving the service provided by the line. The scope of this report does not extend to completing a full economic and social Cost Benefit Analysis (CBA) of the continuation of the operation of the Napier to Gisborne rail line and services. Our findings may indicate that a CBA study of the impact on the regional and national economies, society and environment should be completed before the final decision on the line is taken. A summary of our assessment of the position follows.

1.2 KiwiRail report and tonnage required

KiwiRail (KR) has approached the assessment of the viability of the Napier to Gisborne line from a commercial viewpoint as it is required to do. Their financial analysis is very conservative, showing a significant reduction in revenue earnings per tonne compared with the 2012 actual achieved; there are significant increases in the below rail direct maintenance costs projected, despite a significant level of ongoing capital expenditure on the line. This capital expenditure should remedy the accumulation of 'deferred maintenance' on the line over recent decades and contain future direct maintenance costs.

The conservative approach in the KR financial analysis has led to a contradiction within the report in the number of tonnes needed per year for the line to be profitable. In the report text at page 15 it is stated that in the past it was thought that 'an annual freight volume of between 100,000 and 200,000 tonnes would keep the line going'. It then states the present position that for profitability the line would have to move '400,000 tonnes, or even up to 800,000 tonnes per annum'.

The contradiction comes from estimating the implications from the financial analyses table in the KR report page 38 *Attachment 2 – Financial Analysis, Using "Lower" Estimates*. The implication from this analysis is that the line would have to move 1.5 million tonnes to 2.2 million tonnes per annum over the period 2013 to 2022 to be profitable in terms of covering the annual charges and the returns required on the assets.

These numbers are arrived at by the simple process of estimating the gross margin per tonne in 2013 ($2.22 per tonne) and 2022 ($3.58 per tonne) and dividing these margins into the total KR annual charges in each year, namely $5,045,434 in FY2013 (excluding the re-opening cost of $3.3 million) and $4,896,887 in FY2022. The necessary tonnage comes to 2.27 million tonnes in FY2013, and 1.37 million tonnes in FY2022.

The KR statements in the text Page 15 that 400,000 to 800,000 tonnes are required indicate that the financial analyses that imply tonnages of 1.3 million to 2.2 million tonnes per year for profitability are in some way flawed.

Investigation of the key parameters indicates that the reduction in revenue per tonne to 60% of the figure achieved in 2012, as assumed in the financial projections, may not be necessary, when comparing yield with other routes. The average actual revenue per tonne in FY2012 was $23.55. If a figure close to this, namely $20.90 per tonne was achieved, and above rail operating costs were $11.50 per tonne as shown by KR for 2022, the margin is $9.40 per tonne. Then if below rail direct costs are $2.125 million as in FY2012, the cash flow neutral tonnage is only 226,000 tonnes per year. If the below rail direct costs fell further, the cash flow neutral tonnage would be below 200,000 tonnes per year.

1.3 Potential present and future freight

Work done by the Gisborne and Hawke's Bay communities has identified producers and product tonnages in the order of 150,000 to 180,000 tonnes that would be likely to be attracted to a well-run rail freight service. This level of freight flow would ensure retention of the rail while improved access and other aspects of the freight service are pursued, specifically to target wood and wood products.

Investments which allowed rail to compete effectively with road for haulage of wood and wood products initially on the Mohaka to Napier route could result in the rail line becoming economically viable, and potentially profitable, in a few years. KiwiRail has mentioned the Kawerau to Tauranga line favourably in comparison with the Napier to Gisborne line. Our high-level investigations indicate that, given some facilitating investment to improve access, the load factor from wood and wood products on the Mohaka to Napier part of the Napier to Gisborne line could be 750,000 tonnes per year, which is very similar to the Kawerau to Tauranga line.

These facilitating investments could have a capital cost totalling $20 million or less. They could well be attractive to stakeholders like central and local government, ports, and processing plant owners and forest owners, especially if funds were available at public sector borrowing rates.

Other relatively short rail hauls appear to be economic for logs. These include Wairarapa to Centreport, Wellington (90km); Otiria to Portland (about 80km). Also forest harvesters using rail from Wanganui to Napier (270km) claim to save $7 per tonne compared with road.

This freighting of 750,000 tonnes Mohaka to Napier would be the equivalent of taking off the highway 83 trucks a day, each of 44 tonnes gross, carrying 30 tonnes of logs. The NZTA information in the KR report states that there are 220 to 250 trucks per day on the road, so this level of rail freight would prevent the trucks on the road increasing by 33% to 38%.

1.4 Potential funding of capital expenditure

The KR financial analyses contain considerable levels of below track direct maintenance costs, capital expenditure on the line infrastructure, and a full commercial rate of return of 8.9% on the KiwiRail assets. The capital expenditure in the KiwiRail analysis totalled $12.5 million over the ten year period. If that is well-directed, and preferably front-loaded, our engineering advice is that the annual maintenance costs could be reduced. This line is a part of New Zealand's core infrastructure, and the provision of that capital is for the government – it does not need to return a full commercial return to the SOE KiwiRail.

The spending on the Napier to Gisborne road in the last ten years has totalled $102 million. In the last four years it averaged $14.8 million per year. If the number of trucks, and heavy trucks at that, increased by 33% to 38% because the rail line is not available for wood freight, the annual spend on the road can be expected to increase at least proportionately, namely by $4.9 million to $5.6 million per year. This indicates that it would likely be in the national interest to make the capital expenditure required on the rail rather than having to increase spending on the road, and suffer the negative externalities on the road.

1.5 The Napier to Gisborne rail decision is a national one

The externalities of rail transport are considerable and increasing with public safety concerns, greenhouse gas concerns and the fact that nearly all the road transport capital and operating costs are imported. With the conversion to electricity on rail our operating costs are increasingly domestic.

The decision on the future approach to business on the Napier to Gisborne line requires sound evidence which is considerably broader in economic scope than the commercial financial analysis presently available to decision-makers. Our findings in this relatively high-level investigation are that such a comprehensive Cost Benefit Analysis is necessary to provide sufficient evidence for a sound decision on the future of the Napier to Gisborne line.

2 Scope of the Report

This report has been prepared by BERL for the Tairawhiti Environment Centre who requested BERL to review a KiwiRail assessment of the commercial viability of the Napier-Gisborne rail line. The intention of the Tairawhiti Environment Centre was to provide high level review of the economic impact evidence to enable government to better assess the KiwiRail decision in the national interest. The time and resource available for BERL's work is not sufficient to complete a full Cost Benefit Analysis (CBA), and so the work has concentrated on reviewing the information provided in the KiwiRail report *Napier Gisborne Line: Assessment of the Commercial Viability of the Line*, 18 May 2012.[1] We have also included work on freight that could potentially be attracted to the line.

2.1 The Viewpoint

The KiwiRail viewpoint, in the report assesses the **commercial viability** of the railway line, including the cost of reinstating the line. It considers the cost of maintaining the line, and of maintaining and operating the freight service between Napier and Gisborne. The objective of their report is to find the best financial solution, given the present KiwiRail operations. This will include considerations of the corporate commitments involved in the very substantial KiwiRail Turnaround Plan over 10 Years.

The Economic viewpoint from national and regional economic viewpoint is to find the optimum long-term solution for the region and the country.

The main differences between the KiwiRail viewpoint and the economic viewpoint are:

1 **Timescale:**

   a. KiwiRail is embarked on a programme to restore commercial viability to the business, and has a relatively short time horizon of ten years.

   b. The economic view takes account of the long term impact on the region and economy. In government, for example, the NZTA generally plans out to 2041.

2 **Cost of Capital:**

   a. As a commercial entity, though an SOE, KiwiRail is expected to operate to generally make a profit. It may therefore charge for capital, even for very

[1] Note that some passages of this report have been blanked out in the version made available to BERL, and obtained under the Official Information Act. However the main numbers in the table *Attachment 2 – Financial Analysis, Using "Lower" Estimates*, at Page 38 of the report version has all numbers present.

long-term investments, at its Weighted Average Cost of Capital, (WACC) on the capital which it raises.

b. The economic viewpoint however would have an SOE arguably charging the Social Discount Rate which is of the order of 4% to 5%. Alternatively it could charge the Government's borrowing cost of the 10-year bond rate, about 3.5%, plus a small margin. There are some countries, e.g. UK which charge as low as a zero discount rate for core investments.

c. **THE BASIS OF TREATING CAPITAL EXPENDITURE AND RETURNS ON VERY LONG TERM, NATIONAL NETWORK INFRASTRUCTURE SUCH AS A RAILWAY LINE IS ABSOLUTELY FUNDAMENTAL TO CONSIDERATION OF THE VIABILITY OF THE NAPIER-GISBORNE RAIL SERVICE.**

This CANNOT be based on a commercial financial analysis.

3 **External impacts:**

a. As an SOE, KiwiRail is expected to take some account of economic externalities, but the primary aim is for commercial viability.

b. Regional and national interests like Territorial and Regional bodies, and central government should take account of external impacts of the rail line closure.

4 **Development effort:**

a. KiwiRail with its major commitment to its ten year KiwiRail Turnaround Plan is unlikely to have executive capacity for new developments which may take some time to reach fruition;

b. There is likely to be further developments that are required to achieve a state of long-term viability of the Napier-Gisborne rail. It may be incumbent upon other interests at regional and national level to provide the development capability, capacity and effort to achieve these developments.

2.2 The BERL approach

Taking account of these viewpoints, the BERL approach now contains three elements:

1. To subject the KiwiRail report analyses and data to scrutiny;
2. To consider external impacts relevant to regional and national considerations;
3. To consider changes to the present business model that could improve economic outcomes.

3 The KiwiRail report analyses

3.1 Technical issues

There are a number of aspects of the KiwiRail report which require comment from a technical economic perspective, especially the treatment of capital charges and inflation.

The KR treatment of capital charges raises some technical questions. However we come to the conclusion in this report that the capital costs of making good the 'deferred maintenance on the line, and investments to improve access for major freight flows are a part of the national infrastructure network. As such they are for the funding by central and regional government. We have not therefore embarked on a detailed examination of the treatment of capital charges in the body of the report. We do include a brief comment on the matter in an Appendix, Section 9.

In regard to treatment of inflation on all figures, there are caveats in the KR report of lack of detailed engineering surveys etc which imply there is a level of uncertainty around the KR numbers. In this case, whether or not inflation adjustments of 2% per annum are made for some items and not others is unlikely to change the overall picture. To avoid confusion, we therefore use the actual numbers from the KR report page 38 *Attachment 2 – Financial Analysis, Using "Lower" Estimates* in our analyses following.

3.2 The KR conditions for annual profitability

3.2.1 Analysis of KR conditions for profitability FY2012

The core conditions for annual profitability are that the gross margin per tonne, times the tonnage carried is sufficient to cover annual charges including the necessary return on capital.

According to the numbers implied in the KR figures on page 38, in FY 2012 the gross margin per tonne was average revenue of $23.55 per tonne carried less the above rail direct cost per tonne of $16.15 per tonne, giving a gross margin of $7.40 per tonne carried.

The Freight tonnage moved was 44,325 tonnes, which at a margin of $7.40 per tonne gives a total margin of $325,094.

The net annual costs including below rail annual direct costs, the annual Capex plus the annual required return on assets, (less some net return from the rest of the network) was shown as $2,505,045 in FY 2012. Clearly the margin of $325,094 from the 44,325 tonnes moved was insufficient to cover these annual charges. According to these KR figures the

tonnage that would be required to be profitable in FY2012 is the annual charges divided by the gross margin per tonne.

This is $2,505,045 divided by $7.40, which equals over 338,400 tonnes moved. The KR figures for FY2012 imply that the tonnage required to cover annual charges and give them their required return on capital is over 338,400 tonnes.

3.2.2 The KR stated tonnage for profitability

In the body of the report there are statements about the tonnage necessary, as follows:

Page 15: "*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."*

Page 19: "...about 90,000 tonnes. 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." This seems to imply a minimum target of about 100,000 tonnes.

Page 15 again: *"From a commercial standpoint, for the service to be viable it has to be profitable. ....Somewhere in the order of 400,000 or even 800,000 tonnes per annum would be necessary."*

In terms of the FY 2012 margins and costs, the 400,000 tonnes figure is high, and the 800,000 tonnes figure is unrealistic.

The 800,000 tonnes on the Napier-Gisborne line is noted to be a 'density' of about 3800 tonnes per kilometre, whereas the density on the Kawerau to Tauranga lines is stated to be about 8,000 tonnes per kilometres. Presumably the Kawerau to Tauranga line is profitable.

3.2.3 KR conditions for profitability in FY2013 and FY2022

The largely unexplained doubling of the necessary tonnage from 400,000 tonnes to 800,000 tonnes in the text, pales into insignificance when the costings for FY2013 and FY2022 are analysed to find the tonnage required for profitability.

In these years the implied revenue per tonne is reduced to about 60% of the 2012 figure of $23.55 per tonne. The FY2013 and FY 2022 figures are $14.03 and $15.07 respectively. The above rail direct costs implied are $11,80 and $11,50 respectively, so that the gross margin in 2013 implied is just $2.22 per tonne, and in 2022 the gross margin is $3.57 per

tonne. The annual charges required to be covered are given $5,045,434 in FY2013 (excluding the $3million to re-open the line); and the charges in FY2022 total $4,896,887.

The simple arithmetic of these KR numbers indicate that for the line to be profitable in KR terms, in FY2013, the line would have to carry nearly 2.3 million tonnes and in 2022, would have to carry 1.3 million tonnes.

The required tonnages for profitability in 2013 and 2022 are so far different from the figure for 2012, and the tonnages that KR themselves have stated to be necessary earlier in the report that it calls into question the costing figures and the revenue figures behind the Financial Analysis in the report.

3.3 Details of the implications of the KiwiRail assumptions

KiwiRail has made estimates of the main parameters of continuing freight operations on the Napier-Gisborne railway line from FY2012 to FY2022. KiwiRail states, understandably that *From a commercial standpoint, for the service to be viable it has to be profitable*. From the viewpoint of the national economy, the service is not necessarily expected to provide a full commercial annual return on the very long-term capital tied up in the rail line.

The KR figures are analysed summary in the table. Analysed in this way, the KR analyses can show the implied minimum profitable tonnage needed.

Table 3.1: KiwiRail implied tonnage to be profitable selected years

Item	FY 2012		FY 2013 *(1)*		FY 2022	
	Total	*Per Tonne*	*Total*	*Per Tonne*	*Total*	*Per Tonne*
Number of trains on line	163		655		861	
Freight tonnes moved	44,325		109,887		165,742	
Revenue	$1,043,935	$23.55	$1,541,308	$14.03	2,497,840	$15.07
Above rail direct operating costs	$715,841	$16.15	$1,297,773	$11.81	$1,905,278	$11.50
Cash margin after direct operating costs	**$328,094**	**$7.40**	**$243,535**	**$2.22**	**$592,562**	**$3.58**
Below rail annual direct costs	$2,125,000		$3,300,000		$3,034,000	
Plus: Annual PAYGO capex train, infra.	$113,395		$1,464,346		$1,299,269	
Plus: Annual return on assets	$511,767		$429,675		$1,013,816	
Less: Net contribution to network	$245,117		$148,587		$450,198	
Net annual costs	**$2,505,045**		**$5,045,434**		**$4,896,887**	
Profitable tonnage	**338,428**		**2,276,583**		**1,369,679**	

Source: KiwiRail Report 18May 2012, Attachment 2 - Financial analysis Using "Lower" Estimates; BERL analysis
Note: *(1)* The FY 2013 PAYGO capex omits the $3million capital to reopen the line.

This simple analysis has two important pieces of information:

Firstly it shows that the FY 2012 data imply a cash margin of $7.40 per tonne moved, and in the KR projections this margin is reduced to $2.22 per tonne in FY2013 and $3.58 per tonne in FY2022 as revenue per tonne is reduced from $23 to $14-$15 per tonne.

Secondly it shows that for the line to be profitable in KR terms, the service would have to have moved 338,000 tonnes in FY 2012, and in future would have to move 2.3 million tonnes in FY2013, and over 1.3 million tonnes in FY2022. These figures are away above any of the target figures stated in the text of the report.

3.4 Conclusions from the report

The headline conclusions we draw from the KR report are:

- The KR projections of revenue per tonne in FY2013 and FY2022 are about 60% of the average obtained in FY2012.
- The low projected revenue per tonne generates insufficient cash margin.
- The commercial capital charges are high, and from a national viewpoint, especially in the short term, alternative funding other that KR operating cash flow should be sought;
- The increase in the *below rail* annual direct cost from $2.1 million in 2012 to over $3 million in 2013 and through to 2022 should be investigated.

4 Key factors scrutinised

4.1 Projections of revenue per tonne

The KR data for revenue generated and tonnes moved in FY 2012 imply an average revenue of $23.55 per tonne. The projections of revenue per tonne in FY2013 are $14.03 and in FY2022 are $15.07. These are about 60% of the average obtained in FY2012.

KR have told BERL that at present the freight market over this route is very competitive, and that the market will not stand a rate any higher than shown in their projections. While we have no evidence to refute this statement, in the longer term, with increased tonnage moving on the route, we should expect the rail freight rates to be more in line with rates in other places around the country.

Freight rate per tonne are clearly dependent upon the distance the freight is moved. In fact, the longer the haul, the lower the rate per tonne kilometre. We therefore aim to assess the likely revenue yield per tonne kilometre over a haul of approximately 200 kilometres. Analysis of the revenue data in the Attachment 2, Page 38 of the KiwiRail report indicates that the projected revenue yield implied a return of about $8.00 per 100 net tonne kilometres, or NTK.

This is a critical parameter, so we have made estimates of the order of magnitude of revenues per 100 NTKs on other lines in New Zealand using the ready-reckoner on the KiwiRail website. This will give an order-of-magnitude indication of the range of revenues that may be obtained from 20 foot TEUs on a 212 km haul. To convert from the revenue per TEU to per tonne, we assumed a 20 tonne container weight. (We believe that to be conservative, and averages may be about 16 tonnes.) The estimates for revenue per 100 NTKs from a 212 km haul on other lines are shown in the table.

Rail line	**Estimated revenue:** *$ per 100 NTKs*	
	20 Foot container	*40 foot container*
Gisborne – Napier (future)		$8.00
Christchurch south	$12.40	$9.90
Napier south	$13.30	$10.80
Wellington north	$14.30	$11.50.

We estimated in the previous section that the implied yield in FY 2012 was about 60% greater than the future projection. With a projection that implies $8.00 per 100 NTKs, this means that the FY2012 result may have been about $13.00 per 100 NTKs.

Other sources show average revenue yields of $11.50 per 100 NTK on lines overall, including longer hauls.

What is a realistic assumption?

The indications are:

- that the actual yield in FY2012 was significantly higher than the projected yield;
- that the yield on other lines is estimated to be significantly higher, and
- that road freight rates can be expected to increase as the real oil prices continue their trend upwards.

We therefore assess that it is a realistic assumption that the projected medium term revenue on the Napier-Gisborne line can be expected to average $11.00 per 100 NTKs.

4.2 Annual rail maintenance costs

The rail maintenance costs or the *below rail direct costs* are expressed in the KR report under two categories which are defined in section 3.3, page 12 of the report as "*Estimate of Future Annual Maintenance Costs to maintain level of service*." They are shown separated into Napier to Wairoa $1.474 million, and Wairoa to Gisborne $1.256 million, a total of $2.73 million. In the Financial analysis at page 38, the figures are noted to be the "*I&E Version LOW ESTIMATE*" are given as follows:

Table 4.1: Below rail direct costs per annum actual and projected

Fiscal Year	Below rail direct Infrastructure costs p.a.		
	Napier - Wairoa *$ million*	Wairoa-Gisborne *$ million*	Napier-Gisborne *$ million*
FY12	$1.15	$0.98	$2.13
FY13 to FY15	$1.58	$1.73	$3.30
FY16 to FY 22	$1.58	$1.46	$3.03

We understand that our engineer, in discussion with KR staff who prepared the costings, found that the estimated operational costs are based on the existing costs +30%. The increase is aimed at addressing the backlog of work, particularly on joint maintenance. Our engineering advice is that with the large increase in capital works at about $925,000 per year proposed in Years 1 to 10, there should be no need to increase the maintenance expenditure by 30%.

It has been said that annual below line maintenance could be achieved (presumably at least in the long run) for $1.2 million per year. This may be contemplated by KR in the short run if it was assured that the capital funds necessary to upgrade the line is forthcoming from a public source.

The below rail direct costs are very important in determining the future of the line. Leaving other parameters as in the KR analysis, we have estimated the tonnage necessary to be cash flow neutral. We have estimated it with an average revenue yield of $11.00 per 100 NTKs, or, about $20.90 per tonne on the Napier-Gisborne line. The above rail direct operating cost is taken as $11.50 per tonne, the KR figure for FY2022. The cash margin per tonne after above rail direct operating cost is thus $9.40 per tonne.

Table 4.2: Below rail direct costs and cash flow neutral tonnage

	Source	*FY2022*	*FY2012*	*Example*
Cash margin per tonne after direct operating costs	*$ per Tonne*	$9.40	$9.40	$9.40
Below rail direct costs	*$ per year*	$3,034,000	$2,125,000	$1,200,000
Tonnage to be cash neutral after direct costs	*Tonnes*	322,610	225,954	127,598

This analysis shows that using all of the KR assumptions except the projected revenue yield, the tonnage necessary for the line to be cash neutral after direct costs is a range of about 130,000 tonnes to 230,000 tonnes providing the capital funds are found to provide the re-opening and upgrade. Even if the line is required to cover the $3.034 million per year below rail direct costs, the tonnage required to be cash-neutral is 322,000 per year.

These numbers are significantly below the tonnage required for KR to deem it commercially profitable.

This is fairly similar to the range implied in part of the text of the KR report.

4.3 Tonnage likely to be carried

The community and businesses in East Coast, Gisborne and Hawke's Bay have put in major effort, and there is a high level of confidence that an annual base load of freight considerably greater than in previous years will be available to be carried on a well-run rail service.

The main lines of goods for which the community group have obtained some level of commitment to rail is a range of produce, particularly squash, apples and onions; lumber and timber products from identified processors; processed food products; meat, wool and by-products; gravel aggregate; and general freight. Understandably it is not possible to obtain absolutely watertight commitment to shipping by the rail service at this time when the rail itself is down.

However the volume of freight indicated as certain, or highly probable to use the rail service comes to a total of between 150,000 and 180,000 tonnes. If some possibilities like shipping of Gisborne's waste, and fertiliser are added this number could exceed 200,000 tonnes.

If even one half of this total was able to be fairly quickly attracted to the service once it was re-instated, it would provide a considerable base load from which to re-grow the service. The present survival of the line and freight service is necessary to enable development of what can become the main economic driver of the freight service. This is the carriage of large volumes of wood and wood products. The next chapter explores that possibility.

5 Wood and Hawke's Bay – Gisborne freight

By far the most important single factor relevant to the pattern of freight movements around Hawke's Bay and Gisborne is the development of the freight network to handle the additional recoverable volume of wood from the forests in the region.

5.1 Scale of wood available:

The most important areas to the Napier-Gisborne rail are those in Northern Hawke's Bay. Taking Hawke's Bay as a whole, to be conservative we take the recoverable volume of radiata pine from all large-scale owners. This volume has been at 1.5 million m^3 (which is approximately equal to the tonnes) per year, and is projected to continue at that level until at least 2040.[2] The great majority of these forests are in northern Hawke's Bay, and perhaps a half of this volume, namely 750,000 tonnes could be economically hauled on the Napier-Gisborne rail line were minor investments made to improve access in the form of forest railheads, and access to the processing plants in Napier and Gisborne. There is considerable increase in production from small growers and some of that is also likely to be available to be hauled by rail.

In the Gisborne-East Coast region the bulk of the forests are north of Gisborne, however about 15% are to the south, between Gisborne and Nuhaka. The present off-take of 1.5 million tonnes per year from the large-scale owners in the whole East Coast region is expected to continue until at least 2040.[3] The forests south and west of Gisborne presumable harvest approximately 200,000 tonnes per year; and these could potentially be hauled by rail to processing or port in Napier or Gisborne.

The indications are in summary that of the order of 900,000 to 1 million tonnes of logs per year could be available to be hauled on the Napier-Gisborne line, mainly from large-scale forest owners. This tonnage could increase considerably with up to a further 1 million tonnes of harvest from the smaller-scale owners, building up from now until 2020 and from then onwards.

5.2 Economics of rail haulage

There are clearly differences of opinion on this matter. Some forest owners see rail as a way to reduce freight costs and restore some viability to the industry. Some other players

[2] Ministry of Agriculture and Forestry (now Ministry of Primary Industries), Hawkes Bay forest industry and wood availability forecasts, Wellington, 2008. Figure 4.8, Page 21.

[3] Ministry of Agriculture and Forestry (now Ministry of Primary Industries), East Coast forest industry and wood availability forecasts, Wellington, 2008. Figure 4.8, Page 23

note the general problem with rail, which is that unless there is reasonably good access of rail to the forests and to the processing plants and ports, the costs of double handling from road to rail and back to road for final delivery makes it uneconomic, especially for short hauls.

To make rail attractive, there is clearly a need to be able to better-tailor the rail service to the access needs of the forests, processing plants and ports. There is undoubtedly some capital expenditure needed to improve access, but these investments do not seem to be out of scale, given that significant volumes could be carried on the line permanently into the future.

5.3 Mohaka to Napier example

Looking first at Mohaka to Napier, we note above that if only half of the wood that MPI expects to come from forests of large-scale owners in northern Hawke's Bay were carried by rail that would be 750,000 tonnes per year now and into the future. There are perhaps a number of reasons why that is not happening, but it is widely recognised that a spur line into the forests in the Mohaka area, and access to the PanPac processing plant by construction of a bridge over the Esk River, and a short spur line would go a long way to facilitate the access necessary.

5.3.1 Comparison of density with Kawerau to Tauranga line

Some indication of the likelihood of this being economic comes from comparison with the Kawerau to Tauranga line, which KR in their comments appear to imply that it is profitable, or at least acceptable.

KR says Kawerau to Tauranga moves 8,000 tonnes per kilometre per year, and that line appears to be about 95 kilometres long. This would imply that it moves about 750,000 tonnes per year.

If one-half of the MPI wood tonnages from Northern Hawke's Bay were moved from around Mohaka to the Port and the Napier processing plants including PanPac, the tonnage would be about 750,000 tonnes per year and the average overall distance would be of the order of 90 kilometres. This implies that the wood haulage density on the Mohaka to Napier section of the line would be of the order of 8,000 tonnes per kilometre per year.

5.3.2 The economics of short rail hauls

There are some relatively short hauls of logs by rail, which presumably indicates that these are economic. Two examples are the haul from the Wairarapa to CentrePort in Wellington a haul of 90 kilometres. We understand also that logs are hauled by rail from Otiria to Portland

in Northland, a distance of only about 80 kilometres. The haul from Murupara to Kawerau is 57 Kilometres

Also the rail line from Wanganui to Napier is 270 kilometres, and we understand is now carrying logs. Forest harvest managers are reported as saying that they are saving $7 per tonne using trucks and rail compared with using trucks alone on this haul.

These all indicate that it can be economic and competitive to haul logs reasonably short distances by rail in New Zealand.

5.3.3 Operating costs and charges

We do not have the knowledge and information necessary to estimate accurate operating direct costs per tonne of product for a movement of 750,000 tonnes per year for an average of 90 kilometres on the Mohaka to Napier line. We have seen commercial data for freight charges for tonnages less than this, for bulk products, for similar distances and these charges imply a cost per tonne kilometre which is of the order of $0.06 to $0.08 per NTK. These figures are $6 to $8 per 100 tonne kilometres. We have completed a rough assessment from the KR data which would indicate a figure of around $8 per 100 tonne kilometres.

As to competitiveness of these costs with road transport, approximate costings of log transport pipelines in the industry indicate that a cost of $7 to $8 per tonne of logs for rail hauls of this distance could well be competitive with road even at present oil prices. The competitive position is very dependent on whether or not there is good access from forest to railhead, and direct rail access to the processing plants. As real prices of oil inevitably increase in future as in the past, the rail option can be expected to become more competitive, even without taking account of the externality costs of road transport.

5.3.4 Impact on road freight

The access of logs and wood products to effective, economic transport by rail would have a significant impact on the road freight traffic. Industry sources indicate that if 750,000 tonnes of logs were hauled by rail rather than road, that would take over 17,000 trucks per year off the road. These costs may well be reduced if this section of the track was strengthened so that it could accommodate KR's new DL locomotives. The KR website extols the virtues of their new DL locomotives by saying that these DLs can run a 2,000 tonne train with a single locomotive, and that this is equivalent to 100 trucks on the road. If we took their implied figure of 20 tonnes per truck, the rail hauling 750,000 tonnes of logs would take 37,500 trucks off the road.

We understand that the larger High Productivity Motor Vehicles (HPMVs) capable of carrying 39 tonnes of logs are not allowed on SH2 between Napier and Mohaka. We have therefore made estimates using the industry figure of 44 tonnes gross per truck combination, which is 30 tonnes of logs per truck combination, or 25,000 trucks a year. The number of trucks per day, over a 6-day, 50-week year is therefore 83 trucks a day. The NZTA information in the KR report, pages 20 and 21 indicates an average of 220 trucks per day on the road at present with mid-week peaks of about 250 trucks a day. The 83 trucks per day, each carrying 30 tonnes of logs is an increase in truck traffic by 33% to 38%, a considerable increase.

5.3.5 Capital charges and profitability

We imagine that the capital costs of establishing the Kawerau to Tauranga line have been largely, if not totally written off over time. The profitability of that line is presumably assisted by its need to cover low capital charges annually. The similarity of the operating parameters between that line and the Mohaka to Gisborne part of the Napier to Gisborne line imply that if the capital charges on the latter are covered from elsewhere, the Mohaka to Gisborne line could be similarly profitable.

We believe that there is a very strong case for the national and regional governments to take some responsibility for restoring the capital which was run-down on the line with major 'deferred maintenance' over the years while the rail network was under private ownership.

There is also a strong case for investigating the feasibility and cost of achieving effective rail access to the northern Hawke's Bay forests, and the Napier processing plants and port. Once the simple feasibility is established, the financing of these long term improvements to the national network should be addressed by public sources and beneficiary stakeholders.

5.4 Broadening the approach

Once a viable approach to moving significant volumes of wood on the Mohaka to Napier section of the line has been demonstrated, the similar approach can be applied to the volumes of wood to south and west of Gisborne. These volumes are expected to be smaller than the volumes from the northern Hawke's bay. In this way the wood product freight will quite early add to the movement of increased general freight to make the line economically viable, and quite possibly even commercially profitable.

6 External impacts of line closure

6.1 External benefits of rail freight

This section gives some consideration to the external benefits that can be expected by continuing the operation of a rail service, particularly a rail freight service along the route between Napier and Gisborne.

The main external benefits to rail freight compared with road are:

- Less wear and tear on roads, and therefore roading costs;
- Fewer crashes involving trucks on the road;
- Fewer trucks passing through urban areas on the route. This creates less impact on health, and less congestion;
- Less greenhouse gas emissions.

These are all capable of being measured in a full Cost Benefit Analysis. The amount of detail necessary to adequately investigate these external benefits is beyond the scope of this present report. However the NZTA gave some consideration to external impacts in the KR report. We therefore consider the aspects raised in the NZTA assessment.

We provide more information on the likely impact of rail haulage of logs in reducing truck numbers on the road in section 5.3.4 above. We also compared annual costs on the road, and costs estimated for the rail, in section 7.1 below.

6.2 Economic and environmental externalities

A full Cost Benefit Analysis (from a regional and national viewpoint) will take specific account of the direct and indirect tangible impacts, and the direct and indirect intangible impacts.

The direct tangible impacts are the direct economic and social costs and benefits from the existence and maintenance on the line, and the operation of the services on the rail line. The direct economic impacts are the cash flow incomes and expenditure, and the social costs and benefits are mainly the benefits due to employment and incomes in a region where there is generally under-employment of the 'labour resource'.

The indirect tangible impacts are the similar indirect economic and social costs and benefits, as for example the indirect employment to support the rail line and operation, and also any indirect impacts on the level of economic activity that may be due to the availability of rail transport.

The intangible impacts in the present line of thinking are mainly the environmental impacts, direct and indirect of closure of the line.

Being a transport service, the analyses would generally be based upon the intangible and environmental measures as detailed in the NZTA Economic Evaluation Manual. However there are a number of measures being explored as alternatives to economic measures of success such as GDP per capita.

One such alternative measure is the Genuine Progress Index (GPI). The use of this index however relies on development of a whole range of indicators and monitoring these over time. Such work is not feasible in the case of analysing the impacts of closure of the Napier-Gisborne rail line.

To give an idea of the categories in which indicators are developed, the Wellington Regional Council GPI index includes indicators of: ECONOMY: Prosperous community; Entrepreneurial; ENVIRONMENT: Healthy environment, (for which there are 17 indicators); SOCIAL: Healthy community, Connected community, Sense of place, Quality lifestyle, Regional foundations (infrastructure); and CULTURAL, Strong and tolerant.

6.3 Externalities assessed in KiwiRail report

The core analyses in the KiwiRail report are the direct, tangible costs and benefits of operating costs and revenue, and capital costs as well as costs of closure options. Some of the externalities are assessed in the section of input provided by NZTA.

6.3.1 General economic benefits and costs – input from NZTA

The externalities discussed by NZTA in the Kiwirail assessment are listed below. Overall, that discussion relies heavily on the assertion that closure of the rail line would lead to little increase in the number of trucks using SH2.

Undoubtedly, this is one of the fundamental aspects that lies at the heart of the balance between benefits and costs of the line's closure.

In essence, a proper definition of the 'counterfactual' has not been established. That is, what is the state of affairs in the line's closure? The NZTA input assumes there to be relatively small quantities of freight to be moved from rail to road over the forecast horizon (to 2022). However, there is a relatively high level of forest harvest at present, and the potential for a significant increase in forest harvests in the area. Incorporating an element of this increase onto the road transport task in the area would, we argue, significantly change the discussion of these externalities.

Network efficiency

The KR report indicates that NZTA believes SH2 to be able to cope with expected increases in capacity to 2022 “of one hundred and sixty-five thousand tonnes (which) 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”.

The average 16 additional trucks per day is the equivalent of a 7% increase on the current truck load on SH2. While not overwhelming, a 7% increase in road use is undoubtedly significant.

Further, these numbers are heavily reliant on the growth in tonnages remaining at the low end of the potential range.

Information on the age of the forests in the Gisborne and Hawke’s Bay regions suggests an increase in harvestable forests around 2015 to about 1.5 million tonnes and rising to 2020 to 2.5 million tonnes. Should forestry harvests bring forth greater volumes to be transported (e.g. say between 750 thousand and one million tonnes per year), then in the absence of a rail transport option the number of trucks on SH2 would soar dramatically. We have shown above that haulage of 750,000 tonnes by rail per year would be the equivalent of 33% to 38% of present truck numbers on the road. It would be the equivalent of an additional 83 trucks each carrying 30 tonnes of logs each per day.

In such a case, network efficiency considerations would need to be assessed in much more detail.

Maintenance costs

Road maintenance costs stated in the KR report are not impacted by the rail line closure because of the assumed low volume of freight to be transferred to road.

However, we note that annual expenditure on SH2 for the last 10 years has averaged $10.8m in current dollars, with the latest four years averaging $14.8m.

While a 7% increase in truck numbers may not dramatically increase maintenance spend, it would seem clear that a 33% to 38% increase in truck numbers arising from increased forest volumes would certainly do so.

This suggests that the ‘counterfactual’ (the scenario against which the rail line closure is to be compared) takes on a very different flavour where increased harvest volumes, and processed wood volumes are incorporated in the analysis. In essence, a significant increase

in (potential) road network maintenance costs would need to be factored in as a significant indirect cost (from a national perspective) of the closure of the rail line.

The scale of the increase would be significant, given that road wear has an exponential relationship with load weight, and the 33% to 38% increase in truck numbers are all at the high 44 tonne gross weight necessary to carry 30 tonnes of logs. Even if roading costs of $14.8 million a year increased by only the 33% to 38% increase in truck numbers, this is equivalent to a direct cost increase of $4.9 million to $5.6 million per annum.

The counterfactual would show this as a saving accruing to rail, and some of it could economically be spent to improve the effectiveness of the rail.

Road safety

The KR reports 12 fatalities from truck accidents in the Gisborne and Wairoa districts over the past 10 years, and a further 23 serious injuries. Again, significant increases in truck use would likely see these numbers increase in the absence of significant spend on road safety improvements.

Again, the costs of any potential increase in fatalities and injuries would need to be included in any comprehensive costing (from a national perspective) of the closure of the rail line.

Route security

In the KR report, NZTA notes that "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".

Again, the potential increase in truck volumes would impact on the cost of such closures in the absence of alternative route/mode options.

Conclusion

Somewhat surprisingly, this section reaches the conclusion that "the (highway) network has sufficient capacity to cope with any potential increase in truck volumes based on forecast increases in freight volumes".

This seems a remarkable conclusion based on a relatively cursory review of options. In particular, the increase in forest volumes alone suggests "potential" increases in truck volumes well beyond those expected in the report.

6.3.2 Other considerations

The following considerations are listed and discussed:

Tourism impacts: The impact on tourism in the Gisborne region is assessed by NZTA as minimal given little existing tourism activity in the area

Future of Port of Gisborne: This is related to possible future wood exports, especially from north of Gisborne. The assessment in this section implies that if there is an increase in harvest volumes, then the planned development of the Port of Gisborne would be the preferred investment option. This remains to be tested.

Historical subsidising of the line: In 2004, by central government, Hawke's Bay Regional Council and Gisborne District Council, under the Alternative to Roading scheme (ATR). But this was abolished by the present government so a new mechanism would be needed.

Option value: The assessment in this section is based on the premise that the likelihood of the road option being unavailable, and hence rail being required as a 'reserve' option, is relatively small.

Another option, though not considered, would be the cost of road being the only option. In such a case, the reduced competition for freight along this line would impact on the potential cost structures facing producers in the region.

Energy efficiency issues: This section indicates that with bigger trains, rail could be more than four times as efficient as trucking. It implies that increased fuel prices "*may see resumption in demand for rail freight*." The lack of any assessment of the cost of rising real oil prices on this is conspicuous by its absence. A related matter, but more from the national perspective, is the impact on (and the nation's liability for) carbon emissions.

National Macro economic impacts: Subsidising the Gisborne line will have "crowding out" implications. .."*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*."

This paragraph raises a number of issues around the assessment. In short though, the benefit-cost ratio for maintaining, investing, and operating the rail line should be rigorously assessed against the benefit-cost ratio of soundly-based counterfactual options. Implicit in the KR assessment is a counterfactual of not much change in the future Gisborne economy, not its level of economic output and activity.

Environmental, cultural heritage impacts: This paragraph gives very cursory consideration to these aspects, talking of a potential 'rail trail' etc. Perhaps the most telling (accurate?) statement is "*it is not up to a commercial entity required to earn a narrow view of economic return to ...*" . This sentence could be completed with any required phrases, such as "… *take account of regional and national economic, environmental and social impacts*".

While that is true of a commercial entity, it is not true of a government making major decisions on the basis of such narrow commercial evidence.

6.4 Cost-Benefits and the broader national interests

The KiwiRail assessment leaves the impression of a cursory coverage of 'indirect economic' and other external impacts. We would argue that the potential consequences to the region (and the nation) of the line's closure would call for a more comprehensive analysis of these impacts.

Noticeably, there is no mention of the contribution of the region and its transport infrastructure in the nation's export effort. The productivity and competitiveness of major export industries are pivotal to the central government's Business Growth Agenda.

At the least, the impact on the nation's potential export earnings and its import bill would be worthy of a mention. However, it is understandable that these are not covered in an assessment by KiwiRail of the Financial impact on its profitability.

The onus, though, is on regional and national governance bodies to weigh such narrow perspectives against the broader indirect and externality impacts on the nation, which are only cursorily noted in the KiwiRail assessment.

7 Long term capital for part of the national network

The Napier to Gisborne line is a part of the national transport network. The national transport network is the basic long-term fabric around which New Zealand's productive economy grows and, over time gains in productivity and efficiency. KR states that the Napier to Gisborne line has been allowed to deteriorate due to lack of past investment, and finally has become inoperable due to a weather event. The line is now said to require considerable capital expenditure over time, and even with that expenditure, the direct costs of maintaining the line are said to be considerably higher than in the past.

The question arises from these statements as to the impact on the operating costs, and maintenance costs if the intended capital costs were all invested at the beginning of the planning period.

7.1 The capital spend on rail and road 2013 to 2022

The capital costs given by KR of the PAYGO Capex for the infrastructure on the line from 2013 to 2022 is $9.25 million. Additionally there is an estimate of the cost of $3.3 million for re-opening the line following the weather event. This implies a capital expenditure of $12.5 million over the ten year period.

The capital expenditure on Napier- Gisborne highway over the past nine years is recorded as $102 million. In the past four years the spend has been just under $60 million, or $14.8 million per year.

If an amount equal to this $14.8 million was diverted to rail, perhaps $7.4 million per year for each of two years, it would seem that the capital value of the line could be considerably improved, and operability largely restored. To the extent that this is purely restoring a national asset, these capital charges should be carried by central government.

7.2 Capital for public good and stakeholder benefits

We have noted that there are opportunities to improve the attraction to businesses of using rail, by improving access to production areas like forests, and processing and transport nodes like ports. These investments yield a combination of national and regional public good, and some 'private' good to stakeholders. Some of these stakeholders are SOEs at national or regional levels, the latter including the ports.

Transport is a facilitating function and simple transformational transport investments such as these have the ability to significantly increase growth, productivity and thus competitiveness in export industries.

Where there are identified stakeholder beneficiaries, it is reasonable to expect them to take responsibility for at least some of the capital costs. However there are strong public good benefits, and there is therefore economic justification for such funding to be raised and be available for investment at central government borrowing costs. At present this interest rate on 10-year government bonds is 3.5% per annum.

Such a sound economic approach to funding these developments is consistent with more recent economic thinking as to the roles of governments in generating economic growth following the failure of the previous economic and financial approach.

8 Conclusions

- KiwiRail has approached the assessment of the viability of the Napier to Gisborne line from a commercial viewpoint as it is required to do. In the text, KR has stated that for profitability the line would have to carry 400,000 tonnes, or even up to 800,000 tonnes per year. Their financial analysis is very conservative, and the number resulting imply that for profitability the line would have to move 1.5 million tonnes to 2.2 million tonnes per annum over the period 2013 to 2022.

- These contradictory statements indicate that the financial analyses that imply necessary tonnages of 1.5 million to 2.2 million tonnes per year are in some way flawed.

- Investigation of the key parameters of the KR analysis indicate that the tonnage needed to be cash flow neutral (before capital charges) could be similar to the level of tonnage which the local community now indicate could become available to the line, namely about 180,000 to 200,000 tonnes per year.

- Investments which allowed rail to compete effectively with road for haulage of wood and wood products, initially on the Mohaka to Napier route could attract 750,000 tonnes per year to this section of the line, and eventually result in the rail line becoming economically viable, and potentially profitable in a few years.

- The financial analyses contain considerable levels of capital expenditure on the line. If the capital expenditure is well-directed, and preferably front-loaded, our engineering advice is that the annual maintenance costs could be reduced.

- This line is a part of New Zealand's core infrastructure, and the provision of that capital is for the government – it does not need to return a full commercial return to the SOE KiwiRail. The transport of wood products by rail will save spending on the road which is a similar order of magnitude to the spend needed on rail.

- The external benefits of rail transport are considerable and increasing with increasing public safety concerns, greenhouse gas concerns and the fact that the transport capital and operating costs are mostly imported. It therefore implies that comprehensive Cost Benefit Analysis is necessary to provide sufficient evidence for a sound decision on the future of the Napier to Gisborne line

9 Appendix: KiwiRail treatment of Capital Costs

At Attachment 2 – Financial Analysis, Using "Lower" Estimates at page 38 in the KR report, there is, what is in our experience an unusual treatment of capital costs, which results, we believe in some double-counting.

The overall analysis is characterised as a Cash Flow analysis, as at the top of the page is a Net Present Value Analysis figure given as negative (-)$34,057,402, *'Using Effective Interest of 8.9%.'*

This figure is approximately equal to the Net Present Value (NPV) of the line on the table titled " *Net Total Cash Contribution Line Section Operations'* over the period FY2012 to FY2024, discounted at 8.9% per annum. (We have taken this Net Total Cash Contribution in FY2023 and FY2024 to be the same figure as the KR figure in FY2022.

The problem comes because an NPV should be calculated as the actual cash flow, i.e. flow of cash. Capital costs should therefore be included when the item is purchased.

Capital replacement: In cash flow analysis, where there are capital replacements, they are shown as the discrete payment of cash in the year in which they are made. This being the case there is no need to account for depreciation in annual figures

We assume that the KR items under the heading Capital expenditure, and titled PAYGO Capex are entered to reflect capital replacement. In effect they appear to be a form of depreciation, and e.g. for the rail lines, or 'Infrastructure', the figure is a constant $925,000 per year. Another interpretation could be that the line has deteriorated to such an extent that $925,000 a year must be added to its capital value for a period of ten years.

The same approach of an annual PAYGO Capex is applied to locomotives and wagons. With wagons it is applied to new wagons and to existing wagons. It is difficult to conceive of adding capital value each year to existing wagons.

Return on Assets: This is the main point where definite double-counting occurs. An amount of 8.9% '*Return on Assets Deployed'*, i.e. 8.9% of the value of assets in locomotives and wagons is charged, and subtracted from the cash flow, before the "CashFlow" line *Net Total Cash Contribution Line Section Operations'* is arrived at. In effect that 8.9% return is taken out as cash, and then the remaining cash is discounted at 8.9% to arrive at an NPV. The 8.9% discount rate to arrive at the NPV is the overall return on the cash flow in the operation, including any return on the capital employed.