COOMA and MONARO PROGRESS ASSOCIATION

Canberra to Eden Rail

Record of
Economic Data for the Proposal

Researched 2021

May 2022

Cooma and Monaro Progress Association www.coomansw.com.au
ABN 22 717 375 506 PO Box 1239 Cooma NSW 2630

Cooma and Monaro Progress Association works to promote the economic development and social wellbeing of the region

Summary

This record has been edited by Cooma and Monaro Progress Association (CMPA) from a document researched in 2021. The record was made to support a recommended economic and financial view to be assessed on restoring the rail link between Queanbeyan and Bombala and extending it to Eden. This railway was proposed in the "*Concept Plan for Canberra to Eden Railway*" by Edwin Michell in 2018 for CMPA.

While it is estimated that rail passenger services would attract many patrons, this alone would not economically justify the cost of the proposed rail improvements. The viability of the proposed railway and its services depends on attracting sufficient freight movements and on further development at Port Eden.

CMPA has recommended assuming that the Port of Eden will be developed so as to enable rail freight to and from Eden to be unconstrained by port capacity.

The attitudes of producers and freight forwarders were tested and validated in a series of interviews in 2021 across the potential catchment area of the proposed railway.

While there was, of course, in some quarters, a degree of scepticism expressed at the probability of the rail proposal being implemented, the commentary very clearly indicated the frustration and cost penalties borne by freight producers and freight forwarders due to congestion and other problems at Port Botany, some of which could be resolved by increased port capacity, be it at Sydney or elsewhere. This is clearly limiting Australia's export market and its economy.

While most of these frustrations were aimed at problems at ports, there were few complaints about rail services excepting where they could not be accessed economically. Several export producers indicated that they could and would expand their international markets and sales if they had access to improved rail services to ports. Where the data available allowed this to be measured it indicated that the added value to the nation's economy far exceeded the costs of the required transport improvements.

Many of the problems facing those producers and freight forwarders interviewed, were not capable of being measured in terms that could be included in economic or financial computations and, in this respect, the complete benefit spectrum available from the proposed rail and port developments could not be quantified.

The lock-down in Canberra and New South Wales due to COVID-19 has meant that it has not been possible to interview several other stakeholders with clear interests in the Rail or port proposal. However it is not considered that these omissions would seriously alter this record.

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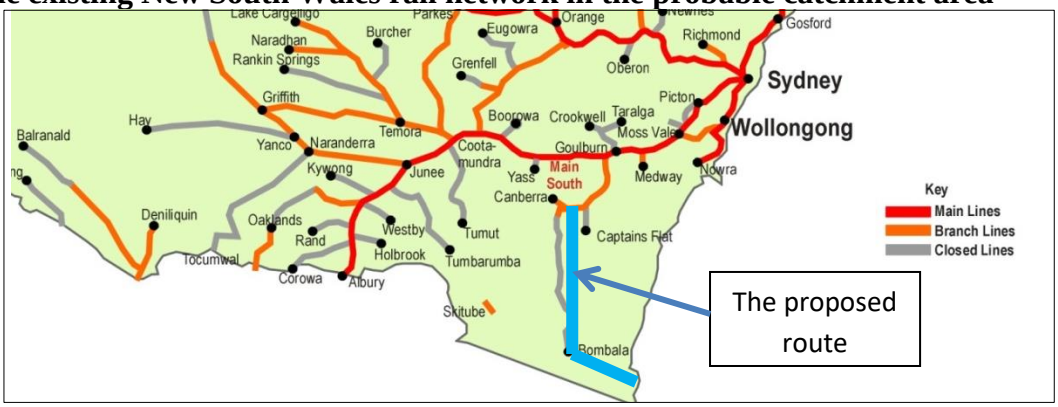
1. Introduction

This record has been prepared by Cooma and Monaro Progress Association (CMPA) from a document researched in 2021. The record was prepared to support a recommended economic and financial view to be assessed on restoring the rail link between Queanbeyan and Bombala and extending it to Eden as proposed in the "*Concept Plan for Canberra to Eden Railway*" prepared by Edwin Michell in 2018 for CMPA.

1.1 The Project

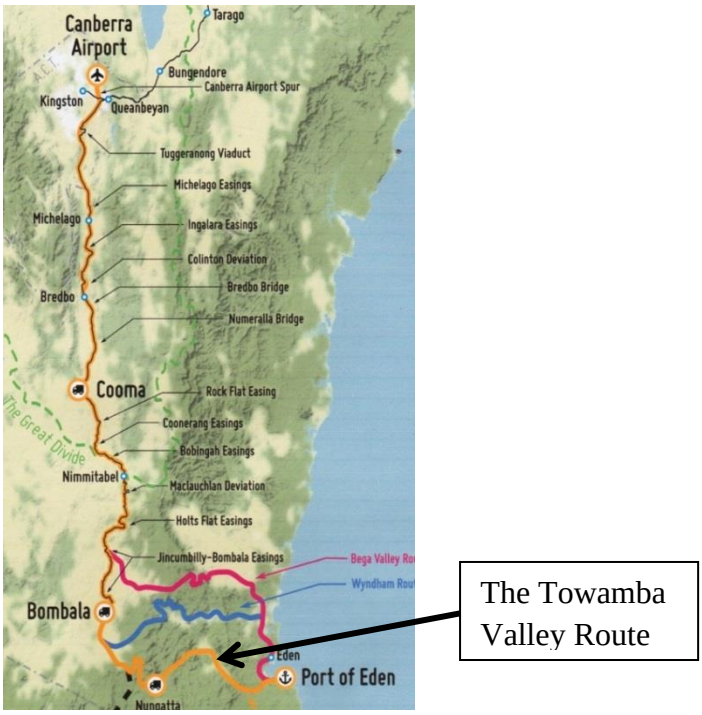
The existing rail network within the potential catchment area of the project is shown in Figure 1.

Figure 1 The existing New South Wales rail network in the probable catchment area



The proposed upgrade and three different potential rail alignments between Bombala and Eden were identified in the report cited above and are shown in Figure 2. The alignment strongly preferred in the above Concept Plan is the Towamba Valley route.

Figure 2 - The proposed route options



Source: "*Concept plan for Canberra to Eden railway*" Stormcloud Engineering 2018.

The record relies on an assumption that the port development in future, together with the social and economic infrastructure within the town of Eden, will be extended to support this development. Some part of the passenger and freight traffic supporting this future development will be induced by the rail development – other development will occur as natural growth.

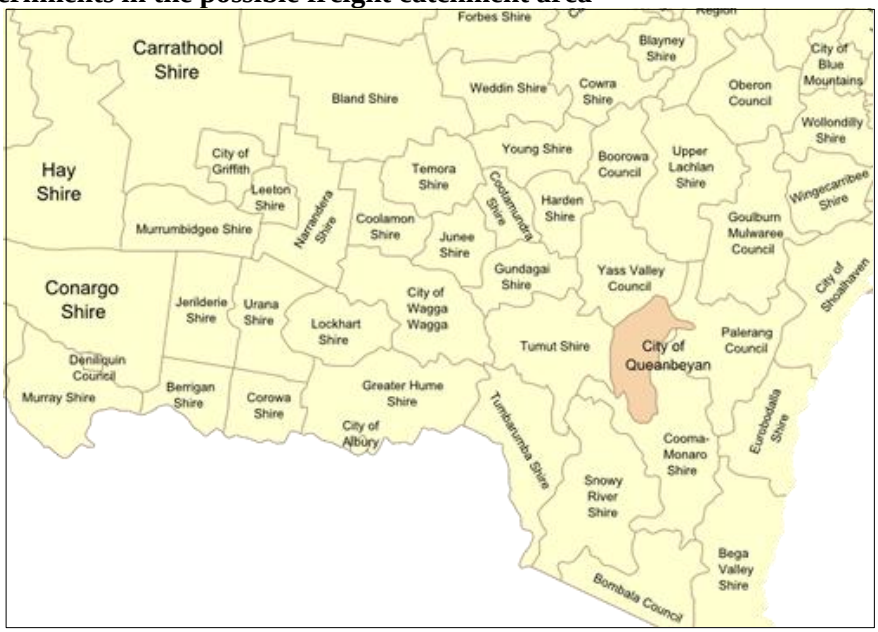
Similarly socio-economic growth will occur at intermediate towns along the proposed rail routes and they also will contain induced elements. It is assumed that both the port and townships development will keep pace with the expected demand for socio-economic services so that rail commerce will not be constrained by social or terminal capacity limitations in future. The natural growth of towns and the port, while essential to the success of the rail proposal, does not form a part of the economic assets of the rail proposal although the value of a part of any new rural growth and industrial production, induced by improved rail services, will be considerable.

1.2 Methodology Overview

Queanbeyan, Michelago, Bredbo, Cooma, Nimmitabel, Bombala and Eden are located on the proposed rail route and would form the most probable primary potential rail passenger catchment, although passengers from Bega, Merimbula, Pambula and other towns in the area may also seek the opportunity for rail travel to Canberra, Sydney and other parts of the catchment area and the reverse.

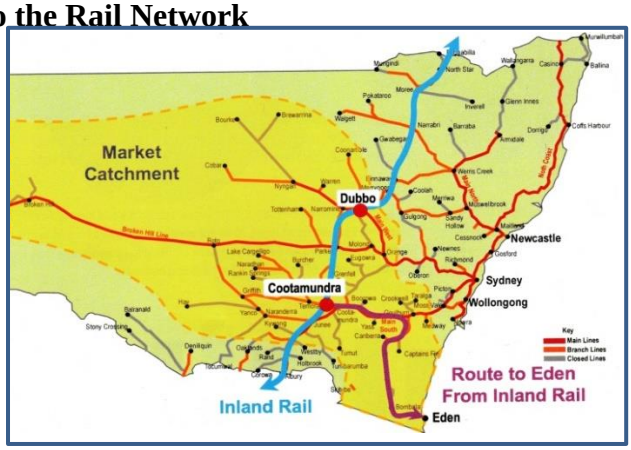
While the proposed rail improvements will connect into the National Rail network it is therefore able to accept passengers and freight loads from any part of the country. However, the most probable freight loads are likely to eventuate from within the catchment area shown in Figure 3 which stretches from Dubbo and Carathool Shire to Bega Valley Shire.

Figure 3 Local Governments in the possible freight catchment area



Although some rail changes are expected in the Riverina, the only significant new rail line is the Inland Rail shown in Figure 4.

Figure 4 - Future changes to the Rail Network



Source: "*Concept Plan for Canberra to Eden Railway*" prepared by Edwin Michell of Stormcloud Engineering

1.3 The relevant potential overseas market for freight

In view of the importance of freight haulage to the rail proposal, the potential market for exports and imports from the catchment area is a primary focus. The primary export products from the catchment area are agricultural products. The top three agricultural commodities produced nationally ranked by export value in 2018-19 were: Cattle and calves ($9.485 billion), Wool ($4.159 billion) and Wheat ($3.676 billion). Out of the $62.2 billion worth of food and fibre Australian farmers produced in 2018-19, 79 per cent ($49.2 billion) was exported.

The pre-COVID value of export sales of commodities produced in the catchment area to countries most easily served from the eastern seaboard (including Melbourne) in the year 2019 is shown in Table 1.

Table 1 - Value of Commodity Exports to Eastern Seaboard Countries $Millions - 2019

Commodity	China	Vietnam	Japan	Korea	Malaysia	NZ	USA	HK	S'pore	Total
Foodgrains	693	373	552	38	225	56	0	0	33	2,470
Meat/Cattle*	3,974	629	2,836	1,759	319	148	3,353	300	270	13,588
Dairy Products	643	61	514	74	149	87	38	101	173	1,840
Cotton	1,116	114	23	1	44	2	0	0	-	1,300
Alcoholic Bevs	1,239	41	56	31	71	171	448	143	177	2,377
Timber	1,497	7	524	7	41	9	3	1	-	2,089
Wool	2,433	0	17	83	13	1	7	0	-	2,554
Total	11,595	1,225	4,522	2,393	862	574	3,849	545	653	26,218

*includes live animals Source:- Department of Foreign Affairs and Trade Pivot Tables

Table 2 illustrates the value of all major imports from the countries in Table 1 of higher exports to Australia.

Table 2 - Value of Imports from Some Eastern Seaboard Countries – 2017/2018 - $Millions

Category/Country	China	USA	Japan	Thailand	Korea	World
Minerals & Fuels	$ 3,138	**$ 2,218**	$ 220	$ 1,256	$ 250	$22,922
Agriculture, Forestry & Fisheries	$ 1,562	$ 1,284	$ 4,020	$ 211	$ 5,395	$41,322
Manufactures	$72,499	$28,779	$16,597	$12,725	$ 6,237	$231,704
Other Goods	$ 1,046	$ 1,697	$ 1,414	$ 394	$ 566	$10,720
Total	**$78,246**	**$33,978**	**$22,251**	**$14,587**	**$12,448**	**$306,668**
Growth Rate %pa 2006/7-2017/8	**6.4%**	**2.0%**	**2.8%**	**4.5%**	**7.0%**	**4.7%**

Source:- Department of Foreign Affairs and Trade Pivot Tables

These five countries are Australia's largest import partners accounting for 53% of total imports. Four other Eastern seaboard countries (Malaysia, Singapore, New Zealand and Vietnam) account for another 13%. The value of agriculture related imports is shown in Table 3.

Table 3 - Value of Agricultural-related Imports – 2017/2018 - $Millions

Import	Value $millions	Growth Rate*
Petroleum products	$ 249.63	4.7%
Motor Vehicles and parts	$ 5,395.28	14.1%
Tractors and Farm machinery	$ 6,237.22	1.4%
Fertilisers and Insecticides	$ 565.99	1.6%

* Average 2006/2007 to 2017/2018 Source:- Department of Foreign Affairs and Trade Pivot Tables

1.4 The Competing Ports

The seven Australian ports, which handle the greatest value of export trade, are listed in Table 4

Table 4 - Australia's Seven Busiest Ports – Value of Export Goods Handled - $Billions

Year	Dampier	Port Hedland	Melbourne	Hay Point	Newcastle	Brisbane	Sydney Ports	All
2006-07	$15.5	$6.8	$21.1	$10.4	$6.6	$10.4	$11.4	144.4
2015-16	$33.2	$26.3	$22.4	$12.1	$13.5	$13	$11.7	218.4
Growth	8.8%	16.2%	0.7%	1.7%	8.3%	2.5%	0.3%	4.7%

Source: BITRE – Australian Sea Freight – 2015-16

Possibly the greatest causes of uncertainty for freight exporters or importers in New South Wales are the questions of reliability of Port Botany, which is the possible cause of its slower growth.

The Port of Eden, partly shown in Figure 5, is the southernmost deep water harbour in NSW and is situated equidistant between Sydney and Melbourne. The Port provides a Harbour Master, 24 hour pilotage services, management of a Navy wharf and port security functions. There is also a deep inner anchorage.

Figure 5 - The port at Eden, Snug Cove

The Port occupies the major, southern lobe of Twofold Bay and includes facilities at Snug Cove in the north, and two freight berths on the southern shore.

Snug Cove, which adjoins the town of Eden includes

- The Breakwater wharf, 105 m. It is principally used by fishing vessels, anchor handling tug supply (AHTS) vessels, and for general cargo, and for bunkering. It is a fenced, concrete wharf, with a 3 m depth at the inner end.
- Cruise Ship berth, 325 m (including the Breakwater wharf).
- Mooring jetty, 150 m.

- Another shorter jetty used by the fishing fleet.

On the southern shore of the bay is:

- A private jetty and ship loader with 235 m berth across the end. It is operated by Allied Natural Wood Exports Pty Ltd. It is used principally for woodchips, however it may be used for other bulk commodities.
- The Multi-Purpose (Navy) wharf, of length 200 m including the 185 m berth, and width of 30 m, at the end of a jetty, with an 8 hectare storage yard nearby. This wharf is used principally for naval operations, and for logs, containers, and general cargo. It is a modern, concrete decked wharf and is licensed to handle Class 1 Dangerous Goods (explosives).

The major users of the port are the Royal Australian Navy, wood chippers, cargo ships for logs and cruise ships. The Port Charges include Navigation, Pilotage, Site Occupation and Wharfage and are competitively priced with respect to other Ports in New South Wales. A project to create a berth extension, preparing the port for visits from some of the world's largest cruise ships has recently been completed at a cost of $44 million. This will allow the biggest cruise ships – over 300m in length – to berth in Snug Cove instead of having to anchor in the harbour and ferry passengers to and from shore by tender. Further work is being carried out to repair building substructures.

Port Botany, the largest port in New South Wales, is the seventh largest in Australia but is growing more slowly than any other major port despite the fact that Australia's eastern coast ports handle about two-thirds of all freight and are growing faster than the average as shown in Table 5.

Table 5 - Eastern Seaboard Ports Freight Value $Billions

Year	Eastern Seaboard Ports	Port Botany	All Ports	% Eastern Ports
2006-07	$ 90.0	$ 11.4	$ 144.4	62.3%
2015-16	$ 143.1	$ 11.7	$ 218.9	65.4%
Growth rate	5.3%	0.3%	4.7%	

Source: BITRE – Australian Sea Freight – 2015-16

Port Botany is largely geared to handle containers and imported fuel products, such as petroleum, bitumen, LPG and bulk chemicals.

Figure 6 - Port Botany

Source; Sheep Central

Media reports about the operations at the Port have included issues such as:-

- Queues of up to ten ships waiting off Sydney due to Port delays and industrial action,
- Vessels schedule delays at Port Botany of up to 12 days, due to a combination of adverse weather conditions, infrastructure upgrades and industrial action,
- Ships have been diverted to Melbourne, Brisbane, Adelaide and Perth, and
- The world's biggest freight line, Maersk, has stopped sending ships to Sydney.

The Freight & Trade Alliance (FTA) and Australian Peak Shippers Association (APSA) reported that:-

> "Port Botany congestion, due to a combination of operational events and prolonged waterside worker industrial action, has created the 'perfect storm' of disruption to New South Wales supply chains, risking product shortages and other implications to the Australian economy. Vessels are now by-passing Port Botany discharging goods interstate and leaving importers to organise and pay massive logistics costs to move freight across state borders back to Sydney. Those with cargo discharged in Sydney are now subject to extensive delays at the port and are facing Sydney congestion surcharges' from the major international shipping lines.
>
> Once cargo is received, importers are then facing the difficulty of returning the empty containers to a shipping line contracted and nominated depot. With the failure of shipping lines to evacuate surplus empty containers, Sydney's depots are at capacity with transport operators passing on costs for redirections, waiting times, futile trips and storage of containers. Further to the local logistics concerns, we are also seeing shortages of the required equipment in some Asian ports to meet export demand to Australia and other destinations. NSW exporters are faced with a critical reduction in available capacity and irregular services to meet current commercial obligations and seriously jeopardising forward contracts for grain, beef, pork and lamb. Furthermore, the new surcharges alone add direct costs to primary produce eroding margins and crushing farmers who have seen bumper crops after years of drought".

They also reported that the impact of these port delays and problems on Australian businesses include:-

- "Four international shipping lines (Mediterranean Shipping Company, CMA CGM ANL, Pacific Asia Express-Mariana Shipping and Hapag Lloyd) have introduced a Sydney Port Congestion Surcharge without consultation and with insufficient lead times negating importers and exporters the ability to factor in 'landed costs' in forward contracts;
- Shipping lines have commenced what is expected to be an increase in re-scheduling with vessels by-passing Port Botany – this has the obvious impact of restricting options for New South Wales exporters to reach overseas markets and meet contractual obligations;
- By-pass vessels are discharging containers in Melbourne or Brisbane forcing importers to transport goods to Sydney and return the empty container back to the port of discharge at their own expense;
- More than 30,000 more import containers came in through Port Botany than were exported during May, June and July due to shipping lines minimising the use of 'sweeper' vessels to evacuate the surplus empty containers;
- Once import containers are unloaded, the empty container must be dehired (returned) to an empty container park – ECPs are congested due to the imbalance of import versus export containers;
- Extra costs being incurred by transport operators with redirections of empty containers from one ECP to another as each park becomes full are being passed on in the form of new surcharges;
- In many instances these containers are held in transport operator's yards – these transport yards are also quickly reaching capacity;
- Some shipping lines have now issued notices that they will not be accepting certain types of containers on dehire and asking importers to hold onto them – some other shipping lines have suggested returning empties to Melbourne or Brisbane – however, we have seen only one line offer relief via an extension of "free time" before container detention kicks in".

Rail is the major means of delivering containerised agricultural freight including grain, pulses, cotton and meat to Botany's three portside container terminals as operated by DP World, Hutchison, and Patrick. It has been reported that:-

> "Trains at Botany can wait for 12 hours to unload. If that train can't get to the port window to unload in time for the vessel, it goes next door to DP World. To get it from DP World to Patrick it might cost you $340 per box……A 20-foot container carries roughly 24 tonnes of grain or pulses, so around $15/t to carry between terminals, plus $8/t for container-park access is the extra cost until the export supply chain for containers out of Sydney improves".

Coastal movement of non-containerised freight is expected to continue to grow steadily throughout the forecast period. The forecast growth of both container and bulk carriers to Australian Ports is a strong indication that any improvements to Port Eden would be well utilised, particularly any new container or bulk handling facilities.

Container volumes have historically been relatively volatile, leading to substantial uncertainty in their forecasts. However the TfNSW forecast for the growth of container movements to be handled at Port Botany is shown in Table 6.

Table 6 - Forecast Container Loads at Port Botany – Tons pa Millions

	Port Botany Containers			Growth	Overall
Direction	**2016**	**2036**	**2056**	**Rate pa**	**Increase**
Import	9.2	17.2	27.0	2.7%	193%
Export	5.2	8.4	11.7	2.0%	125%
Total	14.4	25.5	38.6	2.5%	168%

Source: TfNSW Freight Commodity Forecasts – 2016-2056

Table 7 displays the current forecasts, prepared by BITRE, for vessel calls to Australian Ports.

Table 7 - Forecast Numbers of Vessels calling to Australian Ports

Vessel Type	**Year**			**% Growth**	
	2007-08	2012-13	2029-30	08-13	08-30
Container Ships	7,161	6,910	11,200	-0.7%	2.1%
Bulk Carriers	14,439	15,500	23,100	1.4%	2.2%
General Cargo	3,633	3,710	4,080	0.4%	0.5%
Other	2,201	2,242	2,475	0.4%	0.5%
Total	27,434	28,362	40,855	0.7%	1.8%

Source: Bureau of Infrastructure, Transport and Regional Economics (BITRE), 2010, Australian Maritime Activity to 2029–30,

The actual number of vessels that called at ports in New South Wales in 2018-19 is shown in Table 8 and the total tonnage of these ports is listed in Table 9.

Table 8 - Actual number of Vessels calling at NSW Ports – 2018-19

Vessel Type	**Botany**	**Kembla**	**Newcastle**	**Eden**	**Yamba**	**Total**
Dry Bulk	-	310	1,910	25	-	2,245
Container	1,149	23	22	-	-	1,194
Bulk Liquid & Gas	349	41	135	-	-	525
Car Carrier	-	368	1	-	-	369
General Cargo	2	48	172	25	31	278
Total	1,500	790	2,240	50	31	4,611

Source: Ports Australia Trade Statistics

Table 9 - Tonnage handled at NSW Ports 2018-19

NSW Port tonnage - 2018-19 – '000 Tonnes			
Port	**Import**	**Export**	**Total**
Botany	15,500	9,579	25,079
Newcastle	5,420	161,718	167,138
Kembla	8,412	7,820	16,232
Eden	-	263	263
Total	29,332	179,380	208,712

Source: Ports Australia Trade Statistics

Port Kembla, situated in Wollongong and 90 Km south of Port Botany, also handles bulk liquids and has New South Wales' largest grain export terminal. It handles motor vehicle imports and mining product exports, such as coal.

The port at Newcastle is primarily a coal loading port but it has facilities for other types of cargoes. Recent initiatives to establish larger container handling facilities have been thwarted by a Federal Court decision so that this Port is limited to 30,000 TEU per annum (about 350,000 Tonnes).

1.5 The Potential for Passenger Travel

The potential for a regular passenger service to attract patronage encompasses:-

- Commuting to Canberra and elsewhere for work,
- Day-trips for business,
- Commuting to Canberra for educational purposes, particularly TAFE and University, and
- General travel to Canberra and elsewhere for shopping, medical purposes or entertainment

In addition, there has been an accelerating trend for residents to move out from Canberra into surrounding small towns in New South Wales. This is predicted to continue and, in addition, it is likely that any rail passenger service would induce further ex-urban relocation.

Tourism presents another major source for rail patronage, particularly snowfields patrons from Sydney and Canberra. About 17.7 million tourists visited the catchment area in 2020 as shown in Table 10. They spent about $4.27 Billion.

Table 10 - Tourism in the catchment area - 2020

Region	Tourists	No '000	Expenditure $M	% Car	NSW Residents
South Coast	Domestic Day	6,100.0	$ 533.6	92%	78%
	Domestic Night	3,700.0	$ 1,700.0	96%	96%
	International	87.8	$ 91.9	98%	na
Snowy Mountains	Domestic Day	694.5	$ 537.3	98%	76%
	Domestic Night	452.7	$ 56.5	98%	71%
	International	11.1	$ 9.2	98%	na
Riverina	Domestic Day	900.0	$ 330.8	88%	65%
	Domestic Night	1,300.0	$ 96.0	96%	94%
	International	15.2	Na	97%	na
Capital Country	Domestic Day	1,200.0	$ 384.3	92%	77%
	Domestic Night	2,700.0	$ 284.2	98%	76%
	International	17.6	$ 247.5	87%	na
Murray	Domestic Day	410.0	$ 2.80	89%	34%
	Domestic Night	163.9	$ 0.16	98%	52%
	International	14.4	na	69%	na

Source: Destination New South Wales

The fact that they travelled mostly by car and generally came from within New South Wales suggests that there is potential for tourists to utilise rail services in this corridor.

Tourism in the coastal areas is highly seasonal but the snow country peaks at different times than the coastal beaches. Given the high proportion of visitors who are residents of New South Wales and their dependence on car travel, the potential for attracting rail passengers, particularly to the snow fields, is substantial.

2. Socio-economic Profile of the Catchment Area

2.1 Population, employment and wealth generation

Table 11 shows the primary socio-economic features of Local Governments in the catchment area.

Table 11 - Population and Productivity of the Catchment Area

Region	Local Government	Area Km2	Population 2018	Population 2021*	Growth Rate	Gross Regional Product $m
Riverina	Bland	8,558	5,985	5,612	-2.12%	$381
	Carrathool	18,935	2,802	2,500	-3.73%	$118
	Coolamon	2,431	4,368	4,209	-1.23%	$114
	Gundagai	3,981	11,260	11,081	-0.53%	$407
	Griffith	1,639	26,882	26,240	-0.80%	$1,303
	Hay	1,326	2,979	2,952	-0.30%	$112
	Junee	2,030	6,631	6,226	-2.08%	$182
	Leeton	1,167	11,436	11,868	1.24%	$459
	Lockhart	2,896	3,295	2,905	-4.11%	$98
	Murrumbidgee	6,881	3,961	3,559	-3.50%	$86
	Narrandera	4,116	5,931	5,713	-1.24%	$202
	Tumut	8,959	14,532	14,965	0.98%	$513
	Temora	2,802	6,274	5,705	-3.12%	$218
	Wagga Wagga	4,825	64,820	69,461	2.33%	$3,154
Murray	Albury	306	53,767	54,495	0.45%	$2,657
	Balranald	21,691	2,340	2,211	-1.87%	$159
	Berrigan	2,066	8,707	8,343	-1.41%	$452
	Edward River	8,884	8,995	8,407	-2.23%	$488
	Federation	5,685	12,462	12,698	0.63%	$591
	Greater Hume	2,220	10,686	10,338	-1.10%	$488
	Murray River	11,864	12,118	11,886	-0.64%	$512
	Wentworth	26,256	7,042	6,894	-0.71%	$570
South East	Bega Valley	6,279	34,348	34,893	0.53%	$1,529
	Eurobodalla	3,428	38,288	39,468	1.02%	$1,452
	Goulburn Mulwaree	3,220	30,852	31,079	0.24%	$1,450
	Hilltops	7,141	18,782	18,821	0.07%	$923
	Queanbeyan Palerang	5,319	59,959	67,263	3.91%	$2,238
	Snowy Monaro	15,164	20,733	21,079	0.55%	$1,190
	Upper Lachlan	7,127	7,961	7,519	-1.89%	$448
	Yass Valley	3,995	16,953	18,743	3.40%	$589
Australian Capital Territory		2,358	414,400	464,900	4.05%	$39,440

*Estimated Source:- NSW Govt. Health Statistics & ACT Government

Table 12 provides some of this data about employment in some industries in the catchment area.

Table 12 - Catchment Area Employment in Transport and Certain Rural Industries – 2006*

Transport Mode	Employment
Road	8,000
Rail	750
Air	1000
Other	100
Transport Services	3,600
Total	13,450

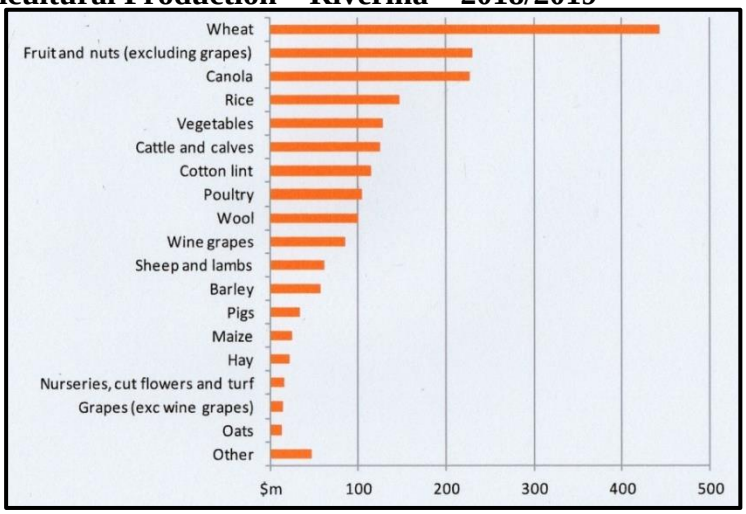
Rural Industry	Employment
Agriculture	20,600
Forestry	1,350
Fishing	800
Mining	4,900
Food processing	600
Total	28,200

*Rounded Source:- BTIRE Industry Structure Database

2.2 Rural Industry and Freight Production

In 2018–19, the gross value of agricultural production in the Riverina region was $2.5 billion, which was 21 per cent of the total gross value of agricultural production in New South Wales ($11.7 billion). The value of each agricultural crop grown in the Riverina is shown in Figure 8.

Figure 7 – Value of Agricultural Production – Riverina – 2018/2019



Source: Australian Bureau of Statistics, cat. no. 7503.0, Value of agricultural commodities produced, Australia 2020

NSW yearly produces 52 kilotons of rice, 755 kilotons of cotton lint and seed, and 4,750 kilotons of wheat. Regional NSW supplies agricultural commodities, food and beverages to the world's largest and growing consumer markets in Asia, the Pacific Rim and Europe. Table 13 shows the value and growth rates of rural production in New South Wales.

Table 13 - Value of NSW Rural Produce

Agricultural Industry	$Millions pa	Growth rate
Cropping	$ 2,498	Variable
Meat	$ 4,671	4.0%
Livestock products Incl. Wool	$ 2,062	4.0%
Fishing	$ 181	2.1%
Food products	$ 30	5.0%
Wine	$ 2	Variable

Source: 'NSW Primary Industries – Performance, Data and Insights 2019'

At present all export wheat is carried to port by rail, some to Port Geelong and some to Port Kembla. Most rice, cotton and nut crops in the Riverina are currently forwarded to Melbourne and this will continue unless the rail service is renewed to Hay and/or Tocamwul. Figure 8 shows a vast rice plantation.

Figure 8 - A Rice Plantation in the Riverina

Source: Google Earth

There are numerous cattle farms and/or Feedlots in New South Wales of various sizes. Cattle in the Riverina are currently processed through Wagga Wagga but the Abattoir at Cootamundra is due to reopen.

Figure 9 - A New South Wales Feedlot

Source; Farm Transparency Project

New South Wales Wool Bales ready for Export

China is the greatest buyer of wool grown in New South Wales as shown in Table 14 and is the fastest growing market for beef from New South Wales as shown in Table 15.

Table 14 - Value of NSW Wool Exports - $Millions

Year	2015-16	2016-17	2017-18	2018-19	2019-20
Total	583.6	673.1	870.8	807.5	527.5
China	441.7	532.1	719.5	684.7	435.4
% China	75.7%	79.1%	82.6%	84.8%	82.5%

Source: DPI, NSW Research

Table 15 - Value of NSW Beef Exports - $Millions

Year	2015	2016	2017	2018	2019	2020	%	Growth Rate
Total	$1,720	$1,580	$1,300	$1,480	$1,800	$2,110	100.0%	4.2%
China	$ 180	$ 210	$ 150	$ 250	$ 500	$ 750	20.4%	33.0%
Japan	$ 320	$ 320	$ 360	$ 380	$ 400	$ 410	21.9%	5.1%
USA	$ 630	$ 460	$ 250	$ 280	$ 270	$ 330	22.2%	-12.1%
Korea	$ 220	$ 240	$ 230	$ 200	$ 240	$ 220	13.5%	0.0%
Other	$ 380	$ 340	$ 320	$ 360	$ 390	$ 400	21.9%	1.0%

Source: DPI, NSW Research

Figure 10 - Packaged Plant for Meat and Grains Export

There is further potential for the export of Dairy produce from the Bega and the Murray-Goulburn areas where producers are already exporting dairy produce. The world market for dairy products is set out in Table 16.

Table 16 - Value of Global Dairy Imports by certain Countries - $Trillions – 2013

Country	WMP	Milk	IMF	Cheese	Total	%
China	$ 2.60	$ 0.23	$ 1.23	$ 0.23	$ 4.29	51.5%
Hong Kong	$ 0.31	$ 0.09	$ 0.02	$ 0.07	$ 0.49	5.8%
Singapore	$ 0.38	$ 0.05	$ 0.02	$ 0.06	$ 0.50	6.1%
Sri Lanka	$ 0.25	-	-	$ -	$ 0.25	3.0%
Indonesia	$ 0.21	$ 0.01	-	$ -	$ 0.22	2.7%
Taiwan	$ 0.22	$ 0.03	$ 0.09	$ 0.12	$ 0.46	5.5%
Thailand	$ 0.14	$ 0.00	$ 0.18	$ 0.04	$ 0.36	4.3%
Malaysia	$ 0.08	$ 0.02	$ 0.79	$ 0.08	$ 0.97	11.6%
Sth Korea	$ 0.01	$ 0.01	$ 0.03	$ 0.37	$ 0.42	5.1%
Philippines	$ 0.12	$ 0.07	$ 0.11	$ 0.08	$ 0.37	4.5%
Total	**$ 4.32**	**$ 0.52**	**$ 2.45**	**$ 1.05**	**$ 8.33**	**100.0%**

Source: DPI, NSW Research Note: WMP is Milk Powder, IMF is Infant Formulae

NSW has diverse wine regions which vary from large regions such as the Riverina that produces large volumes of wine for commercial (and other) wine companies to small regions such as Tumbarumba with a focus on premium wine production. Exports of NSW wines totals more than $520m, which makes it NSW's 4th largest primary industry. Australian wine exports in 2020 are shown in Table 17.

Table 17 - Australian Wine Exports – 2020 - $Millions

China	$1,071	37.6%
USA	$445	15.6%
Great Britain	$409	14.4%
World Total	$2,847	100%

Source: Statista 2021

In 2019-20, NSW timber product exports were $181.4 million, up 9% year-on-year. China was the largest destination, with exports valued at $158.3 million (up 12%), followed by Taiwan ($9.4 million, up 13%) and South Korea ($5.5 million, up 11%)[1].

[1] NSW Department of Primary Industries

2.3 Socioeconomic forecasts

The population forecasts are based on several sources and reflect several influences on growth. Table 18 provides several key NSW forecast indicators.

Table 18 - Key NSW Forecast Indicators

Year	2018-19	2030-31	2040-41	2050-51
Population '000	8,087	8,960	9,835	10,688
% 65 and Over	16.3%	20.3%	22.0%	23.3%
% Employed	50.4%	50.4%	50.7%	50.2%
GSP Billion	$ 629	$ 984	$ 1,566	$ 2,430
GSP/Capita	$ 77,779	$ 109,821	$ 159,227	$ 227,358

Source: NSW Intergenerational Report 2021-22

The COVID pandemic has resulted in substantial revisions to population forecasts. For instance Major regional cities population forecasts are affected by[2]:-

- **International student intake** - effects major regional cities with tertiary campuses.
- **Restrictions on in-migration** - Typically, major regional cities attract large numbers of new residents from other areas within the State, particularly from metropolitan capital cities. Levels of net in-migration could increase, particularly for major regional cities in proximity to metropolitan capital cities because a high proportion of overseas born residents move to major regional cities only after having already lived in metropolitan capital cities.
- **Natural increase** - Fewer births in the short-term as fertility typically declines in times of economic uncertainty. Major regional cities with current high levels of fertility, coupled with the loss of family-making age groups through less migration, will be impacted more severely than other areas.
- At the small area level, the key factors of population change are the age structure of the existing population. Migration is also one of the most important factors and is volatile, often changing due to housing market preferences, economic opportunities and changing household circumstances.

Increasing housing prices in the larger cities, especially Canberra, have induced a shift in population to rural towns and this has accelerated during the COVID pandemic. 2020 figures show accelerating net movement from Sydney to regional areas. However the more remote towns continue to lose their younger members so that, throughout the whole catchment area the smaller towns have been losing population while the larger ones having been growing faster than the State population as illustrated in Table 19.

Table 19 - Growth Rates by Town Size – Catchment Area – 2018 to 2021

Town Population	Growth Rate
< 3,000	-2.50%
3,000-6,000	-2.24%
6,000-9,000	-1.66%
9,000-12,000	-0.26%
12,000-20,000	1.27%
20,000-35,000	0.71%
> 35,000	1.93%

Many areas of rural New South Wales have older populations than the NSW average and are growing older faster than the average, not just the many coastal towns that have growing numbers of retired persons but, as

[2] Id informed decisions – demographic centre

illustrated in Table 20, it is also true of areas in the Riverina. Similarly, employment opportunities and household incomes vary considerably throughout the catchment area as illustrated in Table 21.

Table 20 - Ageing in the Riverina

Local Govt Area	Age compared to NSW Ave.	Growth Rate
Cobar	94.3%	1.6%
Dubbo	95.1%	1.1%
Balranald	103.0%	1.6%
Carrathool	104.3%	1.9%
Central Darling	104.6%	2.0%
Hay	106.0%	1.3%
Narrandera	112.5%	1.4%
New South Wales	100.0%	0.5%

Source: HealthStats NSW

Table 21 - Local Government Employment and Relative Household Income – Riverina - 2008

Local Govt Area	% Employed	Income cf State Average
Cobar (A)	44%	+22%
Dubbo (C)	45%	+6%
Central Darling (A)	37%	+2%
Bourke (A)	39%	About equal
Narrandera (A)	34%	-5%
Carrathool (A)	43%	-7%
Hay (A)	39%	-10%
Balranald (A)	38%	-11%

Source:- BTIRE Industry Structure Database

Overall the Intergenerational Report forecasts that Australia's population will grow more slowly and age faster than previously expected.

2.4 Rural industry forecasts

Table 22 provides forecasts for various rural commodities produced in New South Wales.

Table 22 - Regional NSW Freight commodity demand forecasts, 2016-2056, mtpa

Commodity	2016	2036	2056	Growth Rate	Total Increase
Grains	8.4	10.6	12.9	1.1%	54%
Oilseeds	1.3	1.7	2.1	1.2%	62%
Edible oils	0.2	0.3	0.4	1.7%	100%
Livestock meals	0.5	0.7	0.9	1.5%	80%
Livestock	1.4	3.1	3.9	2.6%	179%
Red meat	0.6	1.3	1.6	2.5%	167%
Horticulture	1.5	1.8	2.2	1.0%	47%
Forestry	3.2	3.4	3.2	0.0%	0%
Cotton lint	0.4	0.5	0.7	1.4%	76%
Dairy	2.2	2.8	3.5	1.2%	60%
Grapes and wine	0.8	0.9	1.1	0.8%	38%

Source: TfNSW Freight Commodity Forecasts – 2016-2056

Some of this production is consumed domestically. For instance some grains are fed to cattle in feedlots and some is used by consumers at home. Table 23 provides some guidance on domestic consumption and the transportation method for NSW Grains.

Table 23 - Forecast of Consumption and Transportation for New South Wales Grains - mtpa

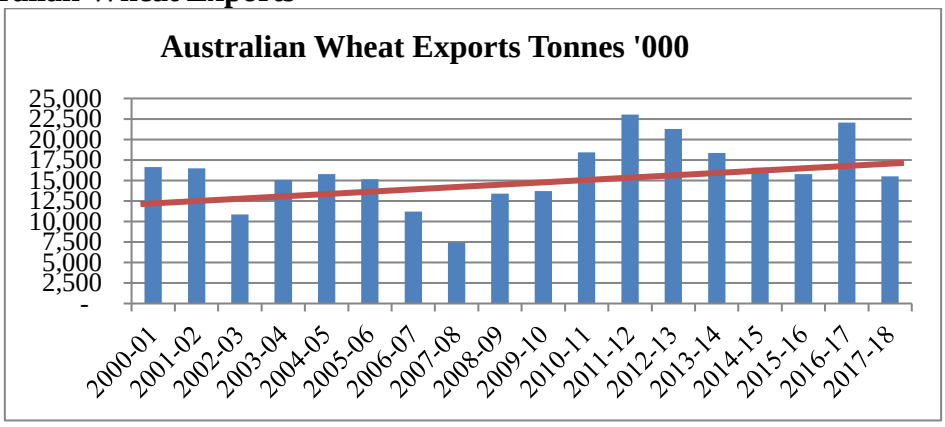
Transportation	User	2016	2036	2056	Growth Rate	Overall Growth
Bulk	Domestic	4.6	6.2	7.6	1.26%	65.2%
	Export	2.6	2.7	3.2	0.52%	23.1%
Container		1.1	1.7	2.2	1.75%	100.0%
	Total	8.3	10.6	13.0	1.13%	56.6%
% Exported		45%	42%	42%		

Source: TfNSW Freight Commodity Forecasts – 2016-2056

It is important to know the proportion of each rural produce commodity which is to be exported, for predicting the port from which it will be shipped. Part of each consignment may be by road transport and then by rail. Conversely, fuel may be railed in bulk from a port to a fuel depot and then delivered by road tanker.

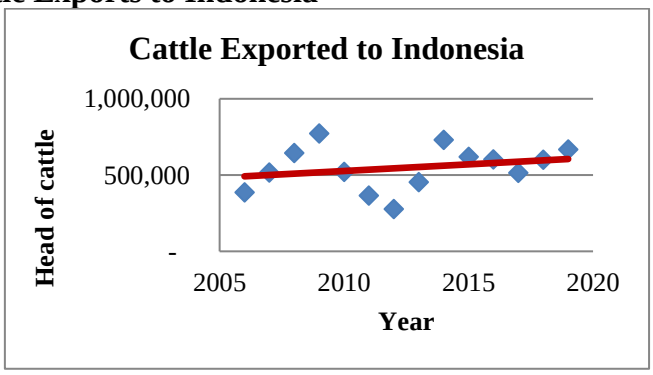
Rural industry forecasts for the probable catchment area are fraught with difficulties. For instance, wheat contributes the greatest value of the Riverina's export commodities but is highly volatile both in volume and price as shown in Figure 11. Cattle exports are also volatile as illustrated in Figure 12.

Figure 11 - Australian Wheat Exports



Source: ABARES - Research report 19.7 May 2019

Figure 12 - Australian Cattle Exports to Indonesia



Source: Reportlinker

The climate and labour factors creating forecast uncertainty include:-

- Droughts in recent years, so that less wool, livestock and grain is carted to markets and abattoirs, while stocks are rebuilding,
- Bushfires and flooding,
- Yields are down for all crops,
- There have been shortages of seasonal labour,
- There have been problems with live cattle exports,
- Diplomatic relations have affected trade agreements.

In addition several pricing factors have affected the costs of production:-

- The price of fuel has risen sharply during the past few years,
- Freight vehicles are now carrying heavier loads as more roads are designated for B-Doubles, which has resulted in reduced freight prices, and
- The value of the Australian Dollar has affected export and import prices.

2.5 Australian Capital Territory and Urban Imports and Exports

The rail proposal includes the provision of a multi-modal transfer terminal in the Australian Capital Territory. It is anticipated that this would attract rail traffic from Sydney and other parts of New South Wales that provide, or depend on, goods and services from Canberra. While this trade is of little relevance to the rail proposal, except insofar that these goods and services derive from or to the Monaro region, it nevertheless means that this suggested multi-modal terminal need not be fully costed into the rail proposal.

Apart from the freight carried into and from Canberra from Sydney and other parts of New South Wales, the ACT is involved in active international trade as shown in Table 24. This trade is of direct relevance to the rail proposal in that a substantial portion could be directed through Port Eden.

Table 24 - Australian Capital Territory imports and Exports – 2020 $'000

International Exports		**International Imports**	
Mining	$ 3,382	Manufactures	$ 786
Manufactures	$ 6,496	Household goods	$ 267
Arms & Ammunition	$ 12,365	Instruments	$ 1,455
Coins	$ 829	Other	$ 1,149
Other	$ 29,042		
Total	**$ 52,114**	**Total**	**$ 3,657**

Source: ACT Economic Indicators

3. Passenger and Freight Demand Modelling

3.1 Freight movement

Three different forms of freight movement are considered, namely:

- the movement of agricultural goods from each rural zone to its nearest market or processing zone and then, after allowing for local consumption, the movement of processed farm produce to the nearest port for export. The freight tonnage moved from farm to market is reduced to allow for weight loss due to processing for export before it is moved from the processing zone to port. Agricultural freight tonnage accounts for a large proportion of rail freight movement in this area,
- the reverse movement of imported goods, such as fuels and oils, fertilizers, steel for construction and general supermarket or packaged goods, from the ports in New South Wales to the inland population centres, distributed through the main business zones, and
- the movement of locally produced goods from the manufacturing centres to other population centres.

3.2 Road / Rail competition

The extent of road / rail competition is estimated by comparing the pricing of road and rail freight movements. Elasticity data is then applied to assess the degree to which reductions in the price of one mode affects the freight shifted from the other mode. Pricing includes the estimated value of delays and loss or damage to freight as well as the actual loading and carriage charges. Choice for freight travel is partly determined by the availability of loading/unloading and storage facilities and charges, delivery time and costs, potential risk of breakages or loss and the reliability of services.

Table 25 shows the cross freight elasticity values which are used to assess the degree to which changes in the perceived rail prices would lead to transfer of freight from road to rail over various distances.

Table 25 - Long-run Road/Rail Freight Cross-elasticity

	Short-distance		Medium-distance		Long-distance		All corridors	
Mode	Road	Rail	Road	Rail	Road	Rail	Road	Rail
Road	–0.36	0.35	–0.43	0.33	–1.08	0.66	–0.46	0.58
Rail	0.88	–0.93	1.08	–1.15	0.42	–0.78	1.04	–1.66

Source: BITRE estimates.

Rail plays a specialised role in servicing ports and other dedicated facilities. These pricing components vary between commodities and whether they are forwarded as container, bulk or general cargoes.

Similarly, the choice of mode for container or bulk freight is different from perishable or refrigerated freight, where access and travel times are dominant. Each commodity group is priced for both freight modes.

Most commodities are initially carried by truck and may involve intermodal handling. Two-stage consignment from mode to mode is provided for. Of the export commodities grown in the catchment area, food grains (wheat, barley, maize etc), timber (woodchips, logs etc), cotton and wool are usually bulk cargoes but dairy products, wines[3], canned vegetables and meat products (with the exception of live cattle) are carried in containers.

All of these commodities may be initially carried by truck but are potential rail freight markets, although live cattle and woodchips may be loaded directly onto railcars. Some then go to a silo or railhead.

[3] McWilliams wines in Griffith ship grape juice by rail to Sydney for bottling before exporting.

Rail freight is suited to high-volume, container-packed or bulk commodities over both long and short distances. Accordingly, rail has traditionally dominated the freight market for bulk agricultural and mining commodities.

3.3 Rail freight to Port Eden or other Ports

The degree to which Port Eden attracts freight traffic from other Ports is estimated by comparing the freight pricing from its origin to other ports. The "price" perceived by forwarders includes not only the estimates of direct access, loading, insurance, rail and port charges but also weighting for uncertainty, delays and damage to goods. Elasticity data is then applied to assess the degree to which reductions in the price of each port affects the freight shifted from another port to Port Eden.

Truck and freight movement is predicted quite separately from passenger travel, which is predicted from each zone to every other and depends on its population, its vehicle ownership rate, the employment available at the destination zone and the perceived travel price between them.

Table 26 lists some of the average annual daily traffic counts in 2021.

Table 26 - Traffic counts on Selected Highways - 2021 AADT

Highway	AADT
Monaro Highway	1,178
" " " "	4,900
" " " "	5,033
Snowy Mountains Highway	4,522
" " " "	3,662
" " " "	8,802
" " " "	1,810
Hume Highway	20,531
" " " "	8,596
" " " "	11,083
" " " "	16,018
Newell Highway	1,846
Sturt Highway	1,306
" " " "	1,163
Federal Highway	15,320
Kings Highway	5,071
Princes Highway	7,150
" " " "	9,484

Source: NSW Traffic viewer

Of particular interest is the traffic to the various New South Wales ports. This is shown in Table 27. In view of the uncertain future for coal mining, coal exports from Newcastle have been omitted.

Table 27 - Port Average Annual Tonnages - '000

Port	Actual 2018-19	Estimated 2021	
Botany	25,079	25,230	
Newcastle	10,840*	9,470*	
Kembla	16,232	17,896	
Eden	263	284	

Source: TfNSW Note: *excludes coal exports

3.4 Recent Freight and Passenger Data in the Corridor

The current road traffic on the Monaro Highway, which parallels the rail line, is of obvious interest. Table 28 shows that heavy vehicle traffic on the Monaro highway at Bredbo is increasing rapidly.

Table 28 - Average Daily Two-way Traffic on Monaro Highway at Bredbo

Year / Growth %	2017	2015-17	2021	2017-21
All Vehicles	4,857	0.82%	4,900	0.22%
Heavy Vehicles	550	2.87%	833	10.94%

Source; TfNSW traffic counts

About 7,000 people travelled in light vehicles through this count station each day and about another 170 travelled in buses. The average car-occupancy was 1.72 as shown in Table 29.

Table 29 - Car-occupancy at Bredbo

Car Occupancy	%
1	35.9%
2	57.0%
3	5.5%
4 or more	1.6%
Total	100.0%
Average Occupancy	1.72

Source: Counts during this study

The traffic counts at Bredbo also show that approximately 12 thousand tonnes of freight was carried by road that day or about 3.4 million tonnes per annum as shown in Table 30.

Table 30 - Truck Loads at Bredbo Count Station

Truck Tare	%	Tonnes
Empty/Near empty	10.0%	166
5-8 Tonnes	10.0%	581
8-12 Tonnes	13.9%	1,154
12 tonnes & over	66.2%	9,931
Total	100.0%	11,831

Source: Counts during this study

Table 31 shows the type of freight carried in trucks past the station at Bredbo. Many of the empty trucks were returning for quarried stone and gravel loads. Most of the trucks of greater than 12 tonne tare were B-Doubles and sand, stone and gravel bound for Canberra accounted for about 0.6 Million tonnes per annum.

Table 31 - Freight Types carried past Bredbo Count Station

Freight Type	%
General freight/ Bulk	38.7%
Stone, Gravel Building Materials	21.3%
Fuel, Gas	7.1%
Machinery, Vehicles	7.1%
Containers	3.9%
Livestock, Hay	3.2%
Passenger Coaches	2.6%
Timber	1.3%
Empty, Part empty	14.8%
Total	100.0%

Source: Counts during this study

4. Validating of Passenger and Freight Forecasts

Forecast socio-economic conditions and forecasts for agricultural and other rural production involve a large number of assumptions. This leads to some risk in trusting forecasts.

In addition, forecasting assumes that all passengers and freight forwarders behave according to defined economic principles. In practice there are a variety of reasons why some people behave differently. Similarly, forecasting parameters involve estimates and risks which create variability throughout a whole analysis. In addition, passenger and freight movement forecasts, in particular, are influenced by uncertainty, which is difficult to forecast.

Accordingly an extensive series of field interviews was conducted, with freight producers, freight forwarders, freight carriers and stevedoring companies. These concerned rail operations, pricing, transit time, frequency and other service characteristics such as reliability, as well as testing their potential responses to the benefits that the network improvements are intended to provide to them.

A number of interviews were conducted throughout the catchment area. Thirty stakeholders were visited where interviews took place. Initially these visits usually were with Local Government Officials who helped to identify people with freight interests and who could provide information about their Council's attitudes. Invariably these Council officers were very helpful and voiced strong support for improved rail services in rural New South Wales.

The intention of the interview series included the validation of assumptions for simulating existing freight logistic chains. For instance, the interviews confirmed that

- Graincorp Ltd carries most of the exported Wheat, Darum, Barley, Canola, Sorghum, Pulses and Maize from the Riverina by rail to Port Kembla;
- Some of the wine from the Riverina is currently railed in bulk to Sydney although Casella Wines in Griffith send their wine by rail to Melbourne for export, and
- Rice, cotton and nuts grown in the Riverina and Murray areas are railed to Victoria and, unless a rail service is extended to Hay and beyond, they will continue to do so.

The interviews also sought to confirm, or otherwise, assumptions regarding the potential growth in rural production and assumptions for perceived freight pricing. They also recognised that freight forecasts are largely dependent on the ability of the proposed rail line to induce commodity exporters to either;-

- transfer from truck haulage, or
- transfer exports/imports from other ports to Port Eden or
- Produce more goods for export.

Therefore the interviews, although informal, usually included the following questions:-

- What factors would induce freight generating firms to transfer to rail?
- Why and how should a port at Eden successfully compete with Port Botany and Port Kembla?
- What advantages would an expanded port at Eden offer to induce freight generating firms to take advantage of the additional access to the port?
- What is the potential in the export market for commodity growers in the catchment area to expand their production?
- Would commodity growers take advantage of this potential to expand their production?

4.1 Lessons from the freight industry interview surveys

4.1.1. Rail operations in the Riverina

Griffith is the hub for rail freight from the Riverina area.

Bulk Freight - Both FreightCorp and Freight Australia provide the bulk haul service from Tabitta [30 km north-west from Griffith]. The 5-6 trains required for the operation are focused the over a two-week period. From Tabitta, the grain is hauled by a 48 Class locomotive as far as Griffith[4]. In Griffith Yard the locomotive is exchanged for an 81 Class locomotive for the rest of the journey to the seaport.

FreightCorp and Freight Australia also provide bulk grain rail services to the area, with the latter focussing on services to Goolgowi. Ricegrowers Co-operative has also been a major user of freight transport services in the region. The movement of wheat and barley within the Lower Murrumbidgee region (Leeton, Narrandera and Hillston) typically requires 5-6 trains in a fortnightly period.

Container Freight – Freight to/from Hillston, Leeton and Yenda is hauled by rail to Griffith. The rail wagons generally carry three containers (TEUs – Twenty foot Equivalent Units) for hauling to Cootamundra. The Riverina Freight Terminal is used to transfer containers from road to rail vehicles.

In addition to the bulk grain movements, export grain is also packed into shipping containers from Tabbita. Export rice is loaded into containers and onto rail at the Leeton mill and a proportion of export rice is despatched by road from the Coleambally mill to the Riverina Freight Terminal at Griffith, bound for Sydney Ports.

4.1.2. Increased production due to transport improvements

As an overall indication of the value of transport improvements in helping industry to grow, freight producing businesses earlier surveyed in Griffith reported that freight damage or delay caused total losses of about 2% of their annual turnover. The local freight industry's turnover was just under 6% of the annual turnover of these businesses. The businesses interviewed estimated that, if freight cost, delays and damage could be reduced by 20%, they would be able to expand their business turnover by almost 3% more than their current marketing plans. This value of this induced production would be 2.4 times the cost of the improvements in transport services. Producers clearly would respond to improved freight services.

It was also reported that those rice, cotton and nuts growers in Murray Shire and the lower Riverina were seriously restricted through the lack of rail services and currently trucked their produce to rail services in Victoria.

4.1.3 Road versus rail transport

The respondents to the Griffith surveys were primarily non-agricultural freight producers or consumers and they mostly responded in terms of their use of road transport. Most were more interested in improving road transport than thinking about changing their freight to rail.

The outbound flows of freight from the Griffith region and its surrounding areas are predominantly to Sydney and Melbourne (70%). Except for the export movements to port, all other movements are typically by road. The following operational and infrastructure factors were voiced as the reasons for this.

- Customers' schedules do not match rail timetables;
- Perishable products are not suitable for rail transport, including fresh horticulture and chicken products;
- Elapsed time for road movements to Sydney is 6-7 hours and Melbourne is 4-5 hours, direct to door. Rail is in excess of 12 hours [CMPA observes that TfNSW satisfaction with a rail freight speed of 80 km/hr could be reviewed];

[4] Griffith Road Rail Interchange Report – Maunsell - 2002

- Rail linkages to Melbourne and Adelaide are not direct, so domestic movements are at a price and time disadvantage;
- The movement of consumable products for the Griffith and surrounding areas are smaller consignments. This provides "back-loading" opportunities with which rail cannot compete, and
- Farm despatches of horticulture products for Melbourne and Sydney markets are too late. Road vehicles need to be despatched in the early evening for arrival at the market by 2am the next morning. Market sales commence around 4am.

Rail market share is less than 10% of domestic wine freight movements, which are carried by tanker from Yenda to McWilliams at Chullora in Sydney.

The comparative advantage for rail for export supply chains is its ability to achieve direct accessibility to port terminals and therefore close proximity to ship. Export commodities, such as rice and packaged wine, move in greater volumes, which allows for a lower unit operating cost for rail over road, where the latter is limited to 25 tonnes per journey.

Rail dominates the export freight market and its market share is about 80%. Most of the exporters in Griffith used rail and reported that they were satisfied with their service. They included grain and wine producers and some manufacturing firms.

In summary, road transport has about a 17% cost advantage over rail for domestic freight in the region but rail has about a 7-8% cost advantage over trucks for the export market. It is estimated that the rail advantage for exports could increase to a minimum of about 9.5% for shipment at Port Eden.

4.1.4. Current restrictions on industry due to transport problems

Road Users - Almost all respondents commented on the state of the roads. Some drew attention to the lack of B-Double routes. Many commented on the road width and lack of passing lanes on the roads. Some referred to the condition of the roads during roadworks being particularly difficult for trucks. The diesel fuel levee was mentioned and lack of EPA credits for responsible fleet management. The need for uniform road rules was mentioned. Several asked for Government assistance to get Insurance Company acceptance of safety accreditation and general recognition of Quality Assurance accreditation. Safety training was considered by several respondents to be of paramount importance.

Rail Users - Several rail users complained about the lack of flexibility due to the short windows of access to Port Botany. This is exacerbated by traffic congestion through Metropolitan Sydney on route to the Port. There were frequent mentions of their complete dependence on Port Botany for container export and the lack of choice and strategic resilience when incidents happened at that port.

4.1.6. Potential for freight transfer from other ports to Port Eden

As Graincorp carries a high percentage of the grain crop in the catchment area by rail to Port Kembla, their possible interest in transferring business to Port Eden was sought. They did not wish to be interviewed. Similarly the Australian Farmers Federation did not wish to be interviewed.

The Queanbeyan-Palerang Council reported that their agricultural, mining and manufacturing industries produced $227 Million of international exports in 2019-2020. Similarly, the Comma Monaro Shire's international exports are estimated to be approximately $170 Million and those for Bega Valley Shire are assessed at over $300 Million. Eurobodella Shire exported about $120 Million.

While it is unlikely that their domestic freight would divert through Port Eden, there is a strong potential for some of their international exports to do so.

There is a substantial difference between the domestic freight loaded at NSW ports and that discharged in NSW as shown in Table 32.

Port Eden may well be able to alleviate some of this imbalance by accepting inbound coastal shipping freight otherwise bound for Port Botany.

Table 32 - Coastal Shipping Freight Loads – 2018-19 – Millions of Tonnes

State	Loaded	Discharged
NSW	1.7	10.4
Vic	4.7	8.8
Qld	19.0	22.5
SA	7.9	5.0
WA	9.9	2.9
Tas	5.6	4.7
NT	5.3	0.1

Source: BITRE – Australian Sea Freight 2018-19

Further, The Government inquiry into Freight and Supply Chain Priorities reported that "With a relaxation of coastal sea freight restrictions and/or the introduction of autonomous ships, coastal shipping could offer an attractive option for inter- or intra- state logistics" Coastal shipping only carries about 17% of Australia's freight task and is dominated by bulk cargo (87%).

4.1.5. Reported potential for export growth

Excello, Nugan Quality Foods and Parle Foods use rail for export and reported that they have plans for growth in their export markets.

Logs wood chips are shipped from the ANWE wharves at Port Eden. A representative of the timber industry confirmed that supplies were devastated by the 2019-20 bushfire season, with more than 50,000 hectares of the state's pine plantations burnt. Regrowing has commenced with more than 14.5 million trees to be replanted yearly across the State from 2021[5]. The industry was modelling the potential for premature harvesting of softwood plantations. Difficulties with specifications imposed by China have limited the potential exports of hardwood from natural forests.

Figure 13 - Logs awaiting shipment at Port Eden

Supplying the domestic market will mean depleted export sales in the short term however there is a world shortage of timber products so the longer term export market is strong.

China's actions to refuse to accept Australian woodchips has been easily replaced by markets in Korea and India. Wood chips are being replaced by wood fibres used to replace plastics so their supply for the export market may diminish in favour of fibre.

[5] Minister Barilaro press statement

Easy rail and port access may lead to growth potential from the timber forests near Bombala to replenish supplies for the international market.

4.1.7. Preparedness for Growth

Interviews with the Eden Harbourmaster and others using the port confirmed after inspection that the harbour could be expanded with adequate draft and wharf space to accommodate the largest expected ships. At present ships up to 50,000 tons use the Port. Some further break-water works may be required as well as wharf extensions, handling facilities and storage areas and eventual seabed excavation.

Interviews with Eden Chamber of Commerce people confirmed that the town of Eden is willing and able to accommodate an expanding workforce and, although there is currently a housing shortage, there is ample land available for development at Boyd town and Two-fold bay. The town's retail and other facilities currently accommodates up to 2,000 cruise ship passengers on shore trips.

It became clear during these interviews that, until sufficient liner shipping with diverse destinations called at Port Eden the shipping of containers might be restricted to deck cargo on bulk carriers. However, as bulk loads have a uniform composition and a single destination, shipping schedules are not limitations on bulk loads being forwarded from the Eden harbour.

Pentarch Stevedoring manages the stevedoring requirements for Pentarch Forestry and provides bulk shipping stevedoring services at Eden for third parties as required. It is understood that stevedoring is not usually required at Snug Cove, that Pentarch provides services at the woodchip wharf and that other stevedores could be used elsewhere in the Port if engaged.

4.1.8. Potential for induced growth in production

The existing gold mine operated by Evolution Mining near West Wyalong is currently an open cut operation but underground mining is being contemplated. There is also optimism about exploration activities between West Wyalong and Temora coupled with recent shareholder expansion. Improved access to port services would materially enhance their probable expansion.

Several freight consumers and producers expressed their enthusiasm and willingness to cooperate if a multimodal terminal were developed in Canberra. The greater freight tonnage to be handled at such a terminal would primarily be freight imported to Canberra by rail from Sydney but there is also a quantity of export freight from Canberra which could be attracted to the rail access to Port Eden.

5. Benefits and Costs

5.1 Benefits from the Project

Personal travel benefits - A proportion of the transport task is the transportation of people - tourists, local people or business visitors. The logic for valuing personal travel consumption benefits is that travel is a necessary, if unwanted, ingredient in economic and social participation in tourism, business, school, market, shopping and social or sporting activities and in the delivery of education, health, security and other social services. It is valued at the perceived price paid for it, with consumer surplus included. It follows that suppression of personal travel due to factors such as excess delays or uncertainty must lead to diminished opportunities for regional economic and social development.

Induced residential relocation benefits – There is an existing trend for people to relocate out from the major cities due to the high prices of housing, accelerated by the Corona Virus. These movements do not create added benefits for the project other than their use of passenger rail services. However, the increased accessibility created by the project will induce more people to relocate. Their relocation benefit must be at least equal to their perceived cost of the added travel they incur.

Freight movement benefits - The transporters of general freight and supplies benefit through transport improvements. This mechanism involves reduced perceived transport costs for freight carriers through a reduction in delivery times, portage, improved reliability and reduced damage to goods, or the ability to gain greater vehicle fleet utilisation through reduced travel times or down-time.

Induced rural industry production benefits - If the price or uncertainty of freight movement can be reduced, then people will be induced to produce more. These cost reductions are partly passed on to consumers in the form of lower freight prices and, if this is so, this can result in higher rates of general consumption for these goods. The freight industry is sufficiently competitive that cost reductions normally translate into freight price reductions. This form of evaluation estimates the marginal additional production induced by reduced farm-gate prices for freight due to transport improvements. The basis for assessing agricultural production benefits is that lower transport prices will induce an increase in agricultural production, the net value of which can be attributed as a benefit to the rail improvement project. Rural production is valued at its export price (fob) less the domestic costs incurred in transporting it to port. Thus any reduction in transport prices is the equivalent of an increase in the "farm-gate" price offered to the agricultural producer, provided it is passed on by the freight carriers. Additional production induced by this increased farm-gate price is assessed using estimates of production price elasticity for each crop or produce. These long term elasticities need to embrace changes in technology, replanting, bad seasons and other agricultural risk variables and therefore are averaged over a long period[6].

Induced export or import replacement benefits – Part of this increased rural production is exported and, as this adds to the general national wealth creation, and does not displace production in other areas, an additional benefit can be attributed to the project. This is valued at the ex-port net value at export prices less all production and transport costs. The elasticity of the production function is usually taken to be the long-term export price elasticity. These induced rural industry benefits are a very important part of economic evaluation. This also applies to import replacement consumption.

Improved environmental conditions – Inducing more passengers and freight to be moved by rail instead of by road transport reduces fuel and greenhouse emissions.

There are other minor benefits from the project. For instance, at present the rail freight moving south to Victoria is three times that moving north from Victoria into New South Wales. Adding northbound freight to the rail service could increase efficiency through potential back-loading of existing services. It should be

[6] The methodology for the economic evaluation of induced agricultural production (called the producer surplus approach) was clearly set out in the WORLD BANK Technical Bulletin No. 241.

noted that improved land prices beside the rail alignment are not generally recognised as a benefit to the project although there is some evidence that they occur.

5.2 Costs

The cost estimates for the project are contained in a report entitled "*Concept plan for Canberra to Eden railway Part 2 - Preliminary estimate of construction costs"*.

The actual construction cost includes track, signalling, earthworks, bridges, tunnels, land acquisitions, stations and other civil works, including a part of the cost of the port improvements.

This overall cost is called the financial cost and this is the amount actually paid for the work. The financial price, however, does not properly represent the economic cost of the work. This is because the price may include taxes, tariffs, GST, or duties on imported items, or on the 'profit' of the contractor. It may contain many forms of subsidised prices.

The effect of these taxes and subsidies must be removed to establish the 'economic' cost of the work. They have been calculated to be about 15%-18% of the financial price of the project. Similarly contingency estimates are omitted to form the economic price but these are dealt with in risk assessment.

Other rail costs include rail rolling stock, track maintenance and train operating costs, which have been adopted from the concept plan reports. These costs have also been adjusted to remove taxes etc. Rail rolling stock and operating costs take into account that some trains are privately operated.

The financial and economic prices are shown in Table 33.

Table 33 - Financial and Economic Costs ($Millions)

Rail cost item	Implementation	Rolling Stock	Operating Costs	Maintenance
Financial price	$ 2,540	$ 2.800	$ 7.980	$ 7.662
Contingency (P50)	$ 272	$ -	$ -	$ -
Taxes etc	$ 395	$ 0.336	$ 0.718	$ 0.996
Economic price	$ 1,873	$ 2.464	$ 7.262	$ 6.666

As the project causes some transfer of passengers and freight from car or truck to rail, there are savings in resources due to savings in road maintenance costs, road accidents and road vehicle operating costs.

In addition there are savings in green-house emissions. Also passengers save time in travelling as the facilities improve. These savings will be partly offset by induced travel and freight haulage by road or rail.

5.3 Risk analysis

While analysis has adopted conservative unit rates for pricing, nevertheless the analytical process involves a number of assumptions and is subject, as in all forecasts, to many future unknowns. Risk analysis recognises these potentials for variability. For instance the COVID pandemic substantially affects socioeconomic forecasts and, at present, there is no consensus on these forecasts. Forecasts for rural produce, such as Wheat and Cattle, are normally volatile as they depend on drought, bushfires and numerous other conditions. Similarly the closed borders affect tourism and foreign trade and increase the volatility of the export market for produce generated in New South Wales. The time taken to regenerate this export trade is unknown. Therefore forecasts lack the normal reliability.

In particular, forecasts rely heavily on assumptions regarding the economic growth of Australia's trading partners, particularly China[7]. China features prominently in non-containerised exports, with 43.65% of Australian non-containerised exports[8] but current trade and diplomatic relations with China add another layer of uncertainty.

5.4 Other Negative Risk Issues

Risk analysis usually includes discussion and assessment of external issues over which the stakeholders have little or no control, such as the general economy, and discussing those factors which could not be included in the forecasting process.

For instance, there is some uncertainty arising from another plan for the use of the rail corridor as a walk and bike path from Queanbeyan to Bombala. There are discussions about the feasibility of the bike path being beside the railway in accordance with the rail concept plan.

Of greater significance to the economic viability of the project is the fact that it depends to a substantial degree on the diversion of a proportion of the future growth in rail freight from Port Botany and Port Kembla to Port Eden. Forecasts rely on the fact that there is such congestion at the container wharves at Port Botany, both rail and road delivery services being affected by the delays being experienced in port handling. Whether all the reasons for these costs and delays can be overcome in future is questionable.

Similarly, while the NSW State Government's stated priority is given to new container facilities at Port Kembla, they have not yet eventuated and uncertainty exists as to whether this will proceed and, if so, when this will occur. Although it is presumed that, should this development go ahead, it will relieve the problems at Port Botany, they may well be of a nature that simply expanding the port facilities, will not solve the problems.

It is assumed that freight producers and forwarders are free to choose the various steps in their logistic chain to or from their international markets. However, NSW Ports, the long-term lessee port management agency for Sydney ports and Port Kembla, is privately owned and is responsible for managing land side tenant leases and port infrastructure.

The fact that these ports are privately owned by a single body implies that decisions regarding their development and also that decisions relating to the distribution of cargoes to and from these ports, may be subject to a degree of monopoly control, rather than to free-market choices by the wishes of the relevant freight producers and forwarders or by their arrangements with shipping lines. The privatisation of these ports is contentious. No doubt it has provided opportunities for improvement in economic efficiency and overall operational performance. However, ports in general do display natural monopoly characteristics raising the need to maintain adequate regulatory frameworks to clarify service goals and protect consumer interests.

Similarly, container freight forwarders need to rely on shipping lines that visit many international ports to ensure the wide distribution of their export produce to their relative markets and they want their goods delivered as fast as possible to avoid delivery delay penalties. So they look for shipping lines that visit a large number of international ports but do not stop too often thus causing delays to deliveries. Conversely the shipping lines need to fill their holds and stack their decks while limiting the number of their pickup ports to ensure the fastest delivery times for their clients.

5.5 Positive Risk Issues

As the container storage space at Port Botany becomes more congested in future, it is probable that preference will need to be given to the larger 40-foot containers because, at present, about 80% of all containerized

[7] Bureau of Infrastructure, Transport and Regional Economics (BITRE), 2010, Australian Maritime Activity to 2029–30
[8] Bureau of Infrastructure, Transport and Regional Economics (BITRE), 2010, Australian Maritime Activity to 2029–30

imports through Port Botany travel no more than 40Km from the port. They are mostly white goods and electronic equipment which typically are transported in 40-foot containers.

Grain, meat and dairy products, on the other hand, are dense cargoes and are more suited to 20 foot containers (with or without refrigeration). As congestion increases, these cargos are more likely to be diverted to Port Eden to relieve storage congestion at Port Botany, provided that the port provides appropriate loading facilities.

6. Conclusions

6.1 Introduction

Fundamental purposes of investment in transport are to foster economic growth through improved freight productivity and service quality (including improved reliability and resilience), to optimise environmental outcomes, and to assist regional social and economic development.

6.2 Issues underlying the Conclusions

While it is estimated that rail passenger services would attract many patrons, this alone would not economically justify the cost of the proposed rail improvements. The viability of the proposed railway and its services depends on attracting sufficient freight movements and on the further development at Port Eden.

Conversely, while developing Port Eden with handling facilities for more road freight is estimated to induce added export value, the port is unlikely to reach its full potential without the freight and passenger access provided by the railway. Therefore the Port Eden development and the Canberra to Eden rail proposal need to be treated as mutually dependant.

Set beside the risk issues is the commentary encountered in the validation interview surveys. All public projects are subject to community consultation, and, while the stakeholder interviews conducted during this study were not carried out in the formal manner normally required, they are certainly indicative of the degree of public support or opposition the project may encounter.

There was, of course, in some quarters, a degree of scepticism expressed at the probability of the rail proposal being implemented. However, the commentary very clearly indicated the frustration and cost penalties borne by freight producers and freight forwarders due to congestion and other problems at Port Botany, much of which could be resolved by increased port capacity, be it at Sydney or elsewhere. This is clearly limiting Australia's export market and its economy. The authors of some of the press reports previously quoted confirmed that these media quotes were accurate.

While most of these frustrations were aimed at problems at ports, there were few complaints about rail services excepting where they had been deemed to be not economically available. As early as 1989 a Parliamentary Committee noted that: "the plain fact is that a greatly increased amount of freight could be carried across the continent by rail more efficiently and with greater safety than it ever could be by road … rail has been starved of funds and rendered inefficient"[9]

These sentiments were widely expressed throughout the whole area surveyed during this study, where respondents to the interviews repeated expressed support for improved rail access. Many export producers indicated that they could and would expand their international markets and sales if they had access to improved rail services to ports. Where the data available allowed this to be measured it confirmed that the added value to the nation's economy far exceeded the costs of the required transport improvements.

Many of the problems facing those producers and freight forwarders interviewed, were not capable of being measured in terms that could be included in economic or financial computations and, in this respect, economic results should be considered to be conservative and not fully representative of the complete benefit spectrum available from the proposed rail and port developments.

[9] Cited in "A competitive interstate rail freight and passenger network" Conference on Railway Excellence, Laird P, University of Wollongong 2014.