



Ray Smith
General Manager
Bland Shire Council
PO Box 21
WEST WYALONG NSW 2671

Jeff Stien
Senior Economic Development & Tourism Advisor
Bland Shire Council
PO Box 21
WEST WYALONG NSW 2671

18 September 2017

The Chairperson
Freight and Supply Chain Priorities
Department of Infrastructure and Regional Development
GPO Box 594
CANBERRA CITY ACT 2601
Email: freightstrategy@infrastructure.gov.au

Dear Sir / Madam

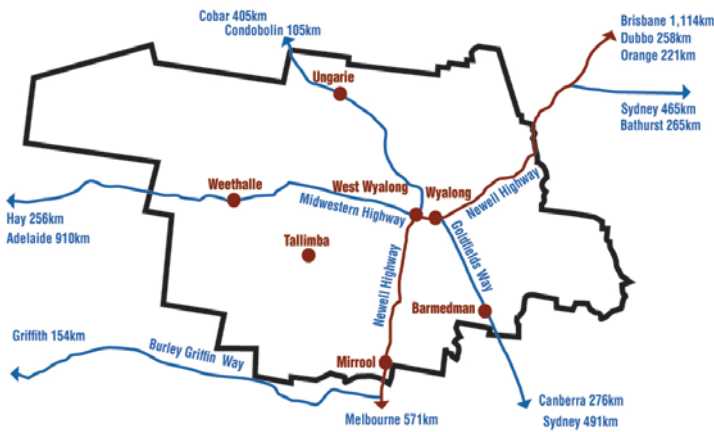
Thank you for the opportunity for Bland Shire Council to provide a brief submission to the Inquiry into National Freight and Supply Chain Priorities. The Bland Shire, West Wyalong is centrally located in regional New South Wales at the junction of the Newell and Mid Western Highways and Goldfields Way. The Newell Highway is the third largest freight corridor in New South Wales.

Economic growth in regional New South Wales relies on the movement of goods through efficient and effective transport networks. The ability of New South Wales producers to move agriculture, industrial products and natural resources to domestic and export markets in a timely and efficient manner directly impacts on productivity and competitiveness – and hence the economic performance of regional New South Wales and the Bland Shire. An efficient and effective freight network is the cornerstone of economic productivity and growth. It reduces the cost of everyday goods and services, underpins the strength of our economies, and generates vital employment. Freight matters to every person in the State.

Bland Shire Council extends an invitation for the Committee to visit the Bland Shire to see firsthand the current and future freight task of the Bland Shire and the improvements required to improve the freight and supply chain efficiency and capacity and to reduce the costs of transporting goods in the Bland Shire and to the major national container ports, airports and intermodal terminals.

Background

The Bland Shire was proclaimed on 6 March 1906 and at the 2011 Census had a population of 5,865 and covers an area of 8,558 square kilometres. Bland Shire Council has one of the largest New South Wales Local Government road networks of 3,248 kilometres which is made up of 879 kilometres of sealed roads, 2,369 kilometres of unsealed roads. Towns and villages in the Bland Shire include West Wyalong, Wyalong, Barmedman, Mirrool, Naradhan, Tallimba, Kikiora, Ungarie and Weethalle.



The Bland Shire is surrounded by the Shires of Lachlan, Forbes, Weddin, Hilltops, Temora, Coolamon, Narrandera and Carrathool.



Some of the major employers include:

- Bland Shire Council
- Evolution Cowal Gold Mine
- Pace Farms
- GrainFlow and GrainCorp
- Royal Freemasons Benevolent Institution
- NSW Department of Education
- John Holland
- Millers Metals

Occupation sectors:

- Sheep, Beef Cattle and Grain Farming 24.5%
- Metal Ore Mining 8.2%
- School Education 5.6%
- Local Government Administration 4.6%
- Road Freight Transport 2.5%

The Bland Shire's history is deeply engrained in agriculture and gold production and exploration which continues through to today. The Barrick Cowl Gold Mine commenced construction in 2004 with gold production in 2006. In 2015 the Barrick Gold Corporation sold the Barrick Cowl Gold mine to Evolution Mining and the Evolution Cowl gold operation is forecast to produce between 215,000oz and 240,000oz in FY16. The following photo is the Evolution Cowl Gold Mine in the Bland Shire at West Wyalong:



Mining and exploration companies that are currently undertaking activities in the Bland Shire include:

- Evolution Mining - <http://evolutionmining.com.au/>
- Argent Minerals - <http://www.argentminerals.com.au/>
- Thomson Resources - <https://www.thomsonresources.com.au/>
- Sandfire Resources - <http://www.sandfire.com.au/>
- St Barbara Limited - <http://www.stbarbara.com.au/>

The exploration activities may lead to other mines being established in the Bland Shire. Should this eventuate, it will place additional pressures on the transport infrastructure in the Bland Shire and New South Wales.

The Bland Shire is one of New South Wales largest cereal-growing areas producing wheat, barley, oats, triticale, cereal rye, chickpeas, field peas, lupins, canola and sorghum. Agriculture is the major economic driver in the Murray-Murrumbidgee and Central West and Orana regions.

The following table provides the 2011 Gross Value of Agricultural Production (GVAP) from the Murray-Murrumbidgee (MM) <http://www.planning.nsw.gov.au/Plans-for-your-area/Regional-Plans/Riverina-Murray/Resources>, and Central West and Orana (CW&O) regions <http://www.planning.nsw.gov.au/Plans-for-your-area/Regional-Plans/Central-West-and-Orana/Resources>, with the Bland Shire being the most productive with a GVAP of \$328 million \$47 million more than Griffith:

LGA	Area sq KM	2011 Census	GVAP Millions	Region
Bland	8,560	5,865	328	Murray- Murrumbidgee
Griffith	1,640	24,364	281	Murray- Murrumbidgee
Carrathool	18,933	2,587	276	Murray- Murrumbidgee
Lachlan	14,965	6,476	260	Central West & Orana
Narromine	5,260	6,585	216	Central West & Orana
Greater Hume	5,749	9,815	194	Murray- Murrumbidgee
Berrigan	2,066	8,066	187	Murray- Murrumbidgee
Cabonne	6,024	12,821	178	Central West & Orana
Parkes	5,955	14,592	173	Central West & Orana
Forbes	4,718	9,170	172	Central West & Orana
Narrandera	4,116	5,902	169	Murray- Murrumbidgee
Wakool	7,521	3,692	164	Murray- Murrumbidgee
Corowa	2,329	11,000	161	Murray- Murrumbidgee
Coonamble	9,916	4,030	152	Central West & Orana
Wagga Wagga	4,826	59,458	150	Murray- Murrumbidgee
Warren	10,754	2,758	149	Central West & Orana
Temora	2,802	5,776	147	Murray- Murrumbidgee
Weddin	3,409	3,665	134	Central West & Orana
Coolamon	2,431	4,099	126	Murray- Murrumbidgee
Lockhart	2,896	2,998	120	Murray- Murrumbidgee
Urana	3,356	1,159	115	Murray- Murrumbidgee
Warrumbungle	12,371	9,588	113	Central West & Orana
Jerilderie	3,373	1,496	112	Murray- Murrumbidgee
Murray	4,344	6,957	104	Murray- Murrumbidgee
Conargo	8,738	1,540	102	Murray- Murrumbidgee
Murrumbidgee	3,507	2,261	99	Murray- Murrumbidgee
Juneec	2,030	5,878	95	Murray- Murrumbidgee
Bogan	14,601	2,900	94	Central West & Orana
Leeton	1,167	11,037	91	Murray- Murrumbidgee
Cowra	2,809	12,147	86	Central West & Orana
Gilgandra	4,832	4,368	86	Central West & Orana
Hay	11,326	2,956	84	Murray- Murrumbidgee
Tumut	4,567	10,934	80	Murray- Murrumbidgee
Wellington	4,110	8,493	72	Central West & Orana
Mid Western	8,753	22,318	63	Central West & Orana
Cootamundra	1,524	7,334	61	Murray- Murrumbidgee

Some recent investments in the Bland Shire that will impact the National Freight and Supply Chain include:

In 2015 Hanlon Enterprises made the decision to invest \$1.1 million to establish a grain receival and storage facility at Ungarie in the Bland Shire:

Getting down to business with Council

Bland Shire Council has put its money where its mouth is when it comes to supporting business after two local start-ups received significant cash contributions under the Business Incentive grants.

Hanlon Enterprises recently purchased a grain storage site at Ungarie and is now looking to extend the current facilities.

Council will contribute \$10,000 to the project which will see Hanlon's expand their ability to cater to Bland Shire customers.

The money was approved by Council during the closed section of the May general meeting.

Also benefiting from a grant is a new Bypass Road, tyre and auto repair business, Donaldson's Industries.

At the May meeting, Council approved an \$18,000 grant to help the new enterprise get underway.

General Manager, Ray Smith presented the cheques to representatives from both businesses last Wednesday.

He said Council was pleased to be supporting local business in the Bland Shire.

Under the business grant guidelines, half the money is presented when proof of a tax invoice is provided to Council.

The other half is handed over after 12 months of operating to ensure Council is investing in a successful business.

Mr Smith said the proposals were discussed in the closed section of Council because businesses applying for the grants had to provide detailed records of costs and their financial records, which if made public could help their competitors.



HANLON Enterprises representatives Peter and Josh Hanlon are pictured being presented with their business grant by Bland Shire Council General Manager, Ray Smith.

GrainFlow operates a 220,000 tonne grain receival and storage site at West Wyalong and in 2015 invested \$4 million to upgrade and improve the efficiency and productivity at this site.

UPGRADE: \$4 MILLION SPENT ON GRAIN SITE

FAST LANE

By NIKKI REYNOLDS

FASTER delivery speeds and better access to export markets is the impetus behind a \$4 million upgrade of the GrainFlow site at West Wyalong.

The site, with a 210,000 tonne capacity, is owned by Cargill AWB and is one of the largest receival depots in southern NSW.

AWB farm marketer Darren Patterson from Wagga said the site had been at West Wyalong for 12 years and the capital works were about improving the overall efficiency.

Additional testing lanes, which double the speed of delivery, and state-of-the-art

bunker systems allow for fast turnaround times.

"This is about improving the level of service to the growers," Mr Patterson said.

Despite the major upgrade, Mr Patterson said he wasn't expecting a bumper crop to be delivered this year.

He said the seasonal conditions had dried off and many crops were affected by frost.

The first trucks are expected to roll into the site later this month and the facility can cater for wheat, barley, malt barley, and canola. "West Wyalong is a significant grain-growing region in southern NSW and location wise, we are able to send grain out by

train to Port Kemble with a short turnaround time," Mr Patterson said.

Capital upgrades to the West Wyalong GrainFlow site include:

- An additional double sided sample stand allowing for quicker sampling resulting in faster truck turnaround times and safer handling due to less congestion.
- Additional permanent receival grid and open belt conveyor system.
- Bunker upgrades facilitating better receival and out turn capability (quick recovery time from rain events) and the ability to handle multiple wheat, barley and canola segregation.

GrainCorp currently operates five grain receipt and storage facilities in the Bland Shire at Barmedman, West Wyalong, Calleen, Kikoira and Naradhan. In 2015 GrainCorp invested \$14 million to establish the Calleen grain receipt and storage site.

Receipt revamp at Calleen

By SIMONE NORRIE

GRAINCORP'S new \$14 million, 230,000 tonne site at Calleen in southern NSW is set to be ready for receipts by harvest time.

The 70-hectare greenfield site is located 23 kilometres from West Wyalong on the Condobolin Road.

The company admitted it would be a "dead heat" for Calleen to be finished in time for harvest, but nevertheless remained confident it would be ready in time.

GrainCorp has even issued forward contracts to growers.

The rail infrastructure, however, is not expected to be finished until February 2016.

Calleen forms part of GrainCorp's \$200m Project Regeneration storage and infrastructure program announced last year.

To date, \$61m had been committed to infrastructure development in 2015 and the remainder is set to be rolled out across the next two years, with rail upgrades on the cards.

Southern NSW will receive \$21 million investment in 2015, including the Calleen site.

GrainCorp had previously upgraded its Ardlethan site, Junee is set to gain a second receipt point, and Red Bend's capacity would be almost doubled to total 200,000t.

Calleen was one of three sites considered for development.

It is located on the existing Lake Cargelligo branch line which was the deciding factor.

"It sits right on the fringe of a 36-hour cycle time to Port Kembla,



Project manager Tyler Cleary; regional manager for southern NSW Sarah Roche, and operations manager for southern NSW Warwick Smith, at the new GrainCorp site at Calleen near West Wyalong.

that was the crucial factor," said GrainCorp operations manager southern NSW Warwick Smith.

"Our big export program fires up in February and March so it will be good timing for us to finish the rail by then."

GrainCorp's existing Ungarie and Wyalong sites, both with 70,000t capacity, would remain open, he said. Calleen will have nine bunkers in

total, which will be accessed from either side, and the weighbridges will be 54 metres long, GrainCorp regional manager for southern NSW Sarah Roche said.

Ten truck lanes which will merge into two by the sampling stand, before becoming a single lane onto the weighbridge.

Ms Roche said the traditional sampling method would be used for the 2015 harvest, but an

Australian-first auto-sampling system is on the cards for the future.

Last week more than 20 growers from the region visited the new site which had just started to take shape and were briefed on the projects status.

One weighbridge had been installed and it is expected more than 100,000t of gravel would have to come onto the site in coming months.

The following photo is of GrainCorps flagship grain handling facility at Calleen in the Bland Shire:



Bland Shire Council is also working with another company to establish an agricultural entity in the Bland and surrounding Shires that will have an impact on the domestic and international freight task.

Another factor to consider is that on-farm grain storage has increased and larger corporate farmers are trading their grain independently and shipping the bulk grain inter and intrastate by road freight.

To improve the efficiency and productivity of the grain receipt and storage facilities in the Bland Shire (Barmedman, West Wyalong, Calleen, Naradhan and Kikoira), investment will be required in the local (Bland Shire), regional and state road network to accommodate Higher Mass Limits (HML) and High Productivity Vehicles (HPV). We have attached a schematic at the end of this submission that shows the grain receipt and storage facilities in the Bland Shire. The following Bland Shire local roads have been identified as the best routes for HML's and HPV's but are currently substandard and require investigation and investment to accommodate the HML's and HPV's:

- Ungarie to Naradhan
- Rankins Springs to Lake Cargelligo
- Dundas
- Crown Camp Road
- Kolkilbertoo
- West Wyalong to Lake Cargelligo
- West Wyalong to Condobolin
- Blow Clear
- Clear Ridge
- Wamboyne
- Quandialla
- Mary Gilmore Way
- Tallimba
- Boreamble
- Girral

Investment in the New South Wales rail network is required to improve efficiency and productivity so that the rail network from Sydney, Port Botany, Port Kembla, Newcastle to West Wyalong and West Wyalong to Ungarie, Kikoira and Naradhan can handle longer and higher mass wagons and trains.

Both the road and rail networks in Sydney, Newcastle, Port Botany and Port Kembla need to be improved to reduce congestion and improve efficiency and productivity. The Bureau of Infrastructure, Transport & Regional Economics (BITRE) has estimated that, without action, congestion on urban roads alone will restrict the mobility of people and freight and cost the economy a forecast \$20 billion a year by 2020. This will impact on both commuters and freight operators, forcing transport and goods and services prices up.

As stated in the Australian Infrastructure Audit Report, published in April 2015, productive, sustainable infrastructure is essential to driving economic growth, increasing employment and enhancing the quality of life of all Australians.

New South Wales has suffered from under investment in transport infrastructure, including rail, for the freight task. While a number of rail infrastructure projects have occurred in the last 10 years, the focus has been on coal (driven by concentrated customer demand) and passenger transport (driven by government commitments). In 2011, the New South Wales rail network carried 136

million tonnes of freight (33 per cent of the total State freight task). The movement of coal in the Hunter Valley dominates rail freight activity in New South Wales. In comparison, other rail corridors carry relatively small freight volumes. Similar to the road network, significant growth is projected across all key New South Wales rail corridors over the next 20 years.

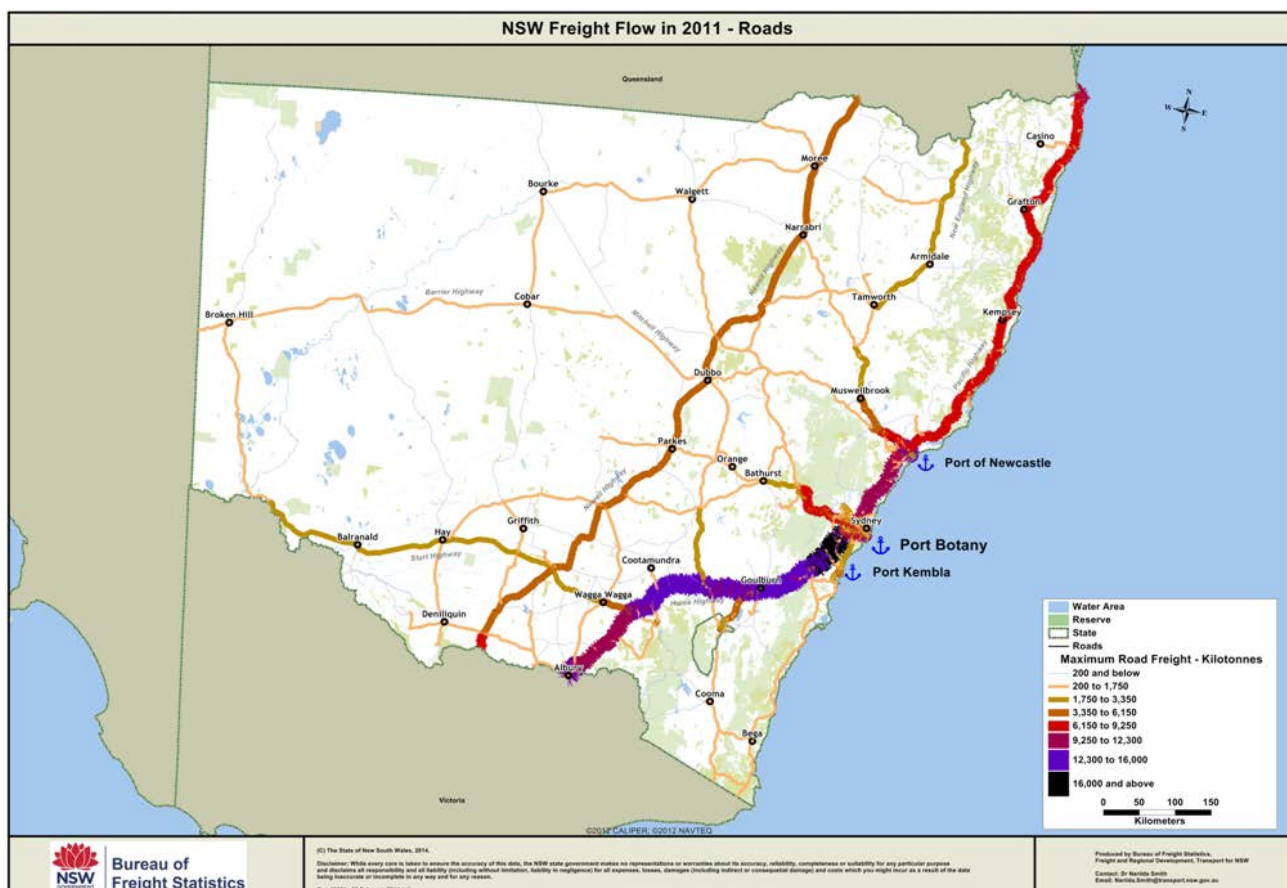
In 2011 the volume of freight moved on the New South Wales transport network was 409 million tonnes and by 2031 the volume to be moved is forecast to grow to 794 million tonnes. The New South Wales road network carried 63 per cent of the total freight task in 2011, or around 256 million tonnes of freight. As the freight task continues to grow, the capacity of existing roads to support this growth, as part of overall traffic demand, is a distinct challenge.

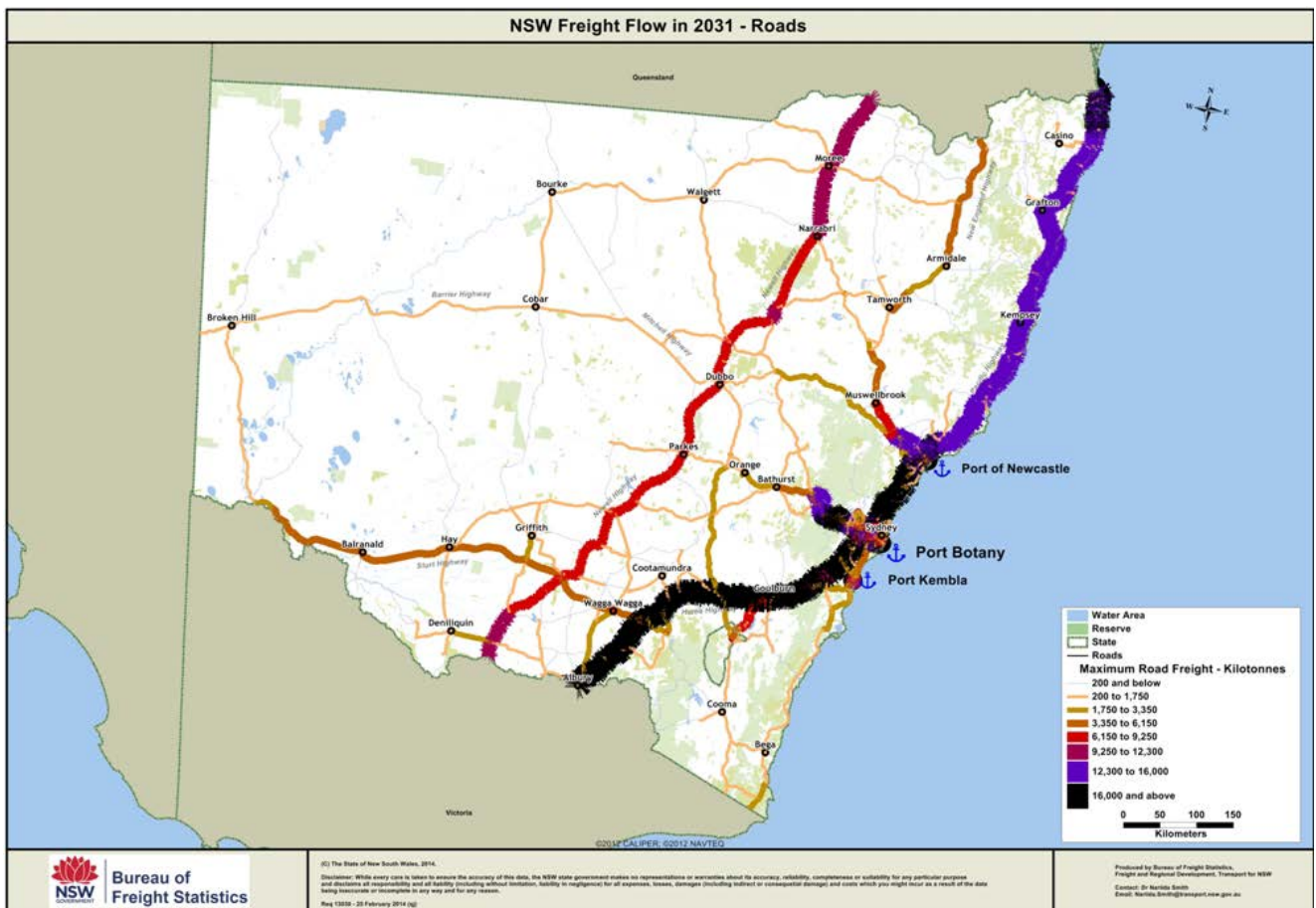
Promoting freight productivity is vital to New South Wales economic performance and substantial investment is required in road and rail freight and intermodal infrastructure in New South Wales in order to meet the increasing freight task, reduce bottlenecks and deficiencies, and improve network efficiency.

Efficient and cost-effective transport infrastructure is vital to the competitiveness of the agriculture sector. The relationship between freight infrastructure and economic growth is one of interdependence. Economic growth increases the demand for freight infrastructure. Equally, freight infrastructure allows and supports economic growth.

Constraints around heavy vehicle use, particularly on local and regional roads, impact on the efficiency of the road freight task.

The Newell Highway is an extremely important transport and freight corridor and the following New South Wales Government Bureau of Freight Statistics 2011 and 2031 schematics indicate that the Newell Highway is the third largest freight corridor in New South Wales:





The Newell Highway must be included as a high priority in the National Freight and Supply Chain Priorities due to its importance in relation to the national freight task. We have attached a copy of the recently completed report on the flooding of the Newell Highway between West Wyalong and Forbes. As mentioned earlier and can be seen by the schematics above, the Newell Highway has the third largest freight flow in NSW yet in 2016 it was closed for six weeks between West Wyalong and Forbes due to flooding.

The attached final report shows the total impact of this closure in terms of lost total gross regional product (GRP), in terms of the flow-on impact for lost increases and household consumption expenditure on the economy, is modelled at minimum \$_{CVM}138 million, up to \$_{CVM}153 million and the loss of two million hours of work with the contribution of some loss of employment, but most likely under-employment, of a conservative 5194 workers.

The Newell Highway has been flooded and or closed between West Wyalong and Forbes in 1950, 1952, 1956, 1962, 1974, 1983, 1990 for twelve weeks, and 2012 and in 2016 for six weeks.

The New South Wales Freight and Ports Strategy mentions that there is approximately 9,400 kilometres of nominal route standard gauge rail across New South Wales, of which around 6,400 kilometres is operational and 3,000 kilometres is non-operational

In total, on the Country Rail Network (CRN) there are approximately:

- 506 kilometres of Class 1 track, with a 25 tonne axle load and 80 kilometres per hour maximum speed for freight
- 420 kilometres of Class 2 track, with a 21 tonne axle load and 80 kilometres per hour maximum speed for freight

- 734 kilometres of Class 3 track, with a 19 tonne axle load and 70 kilometres per hour maximum speed for freight
- 727 kilometres of Class 5 track, with a 19 tonne axle load and 50 kilometres per hour maximum speed for freight.
- Most of the grain line network is Class 5, although some sections are Class 3.

Whilst there has been some much needed investment in upgrading the regional rail network to improve the efficiency and productivity, further investment of the rail network is required from Sydney, Port Botany, Port Kembla, Newcastle to West Wyalong and West Wyalong to Ungarie, Kikoira and Naradhan so that the rail network can handle longer and higher mass wagons and trains.

The 2016 Australian Infrastructure Plan mentions that Australia's regions contribute substantially to the nation's growth and prosperity. Regional Australia produces many of our key exports – such as minerals, energy, agriculture and tourism. It is also home to around a quarter of our population.

The booming economies of south-east Asia and China will boost demand for our resources, services, produce and tourism. Efficient and reliable regional infrastructure will help us take advantage of this opportunity for growth.

There is a rationale for investing in slower growing regions based on social reasons or to unlock potential opportunities. Our slower growing regions should have access to vital services such as schools, hospitals, transport and other community facilities. Such regions will still be great places to live, and may score more highly than larger cities on measures of well-being and social connection. Over the longer term, as regional hubs expand and technology continues to connect our regions, these areas could become even more attractive places to live and work.

Many regional industries rely upon freight supply chains to transport their goods to market. Clearance of containers can be delayed through some regional ports, while many regional roads cannot handle heavier, more productive vehicles.

Australia's key freight routes need attention. First and last mile issues, bottlenecks and pinch points, increase the time it takes for freight to travel from sender to receiver. These issues will be further exacerbated by population growth.

The Bureau of Infrastructure, Transport & Regional Economics (BITRE) has estimated that, without action, congestion on urban roads alone will restrict the mobility of people and freight and cost the economy a forecast \$20 billion a year by 2020. This will impact on both commuters and freight operators, forcing transport and goods and services prices up.

As mentioned in the New South Wales Freight and Ports Strategy, the scale of the freight task over the next 20 years warrants decisive action by government. The expected doubling of freight volumes through New South Wales to nearly 800 million tonnes by 2031 requires a strategic focus to ensure policy, infrastructure and land-planning initiatives deliver a freight network where capacity and performance can meet demand.

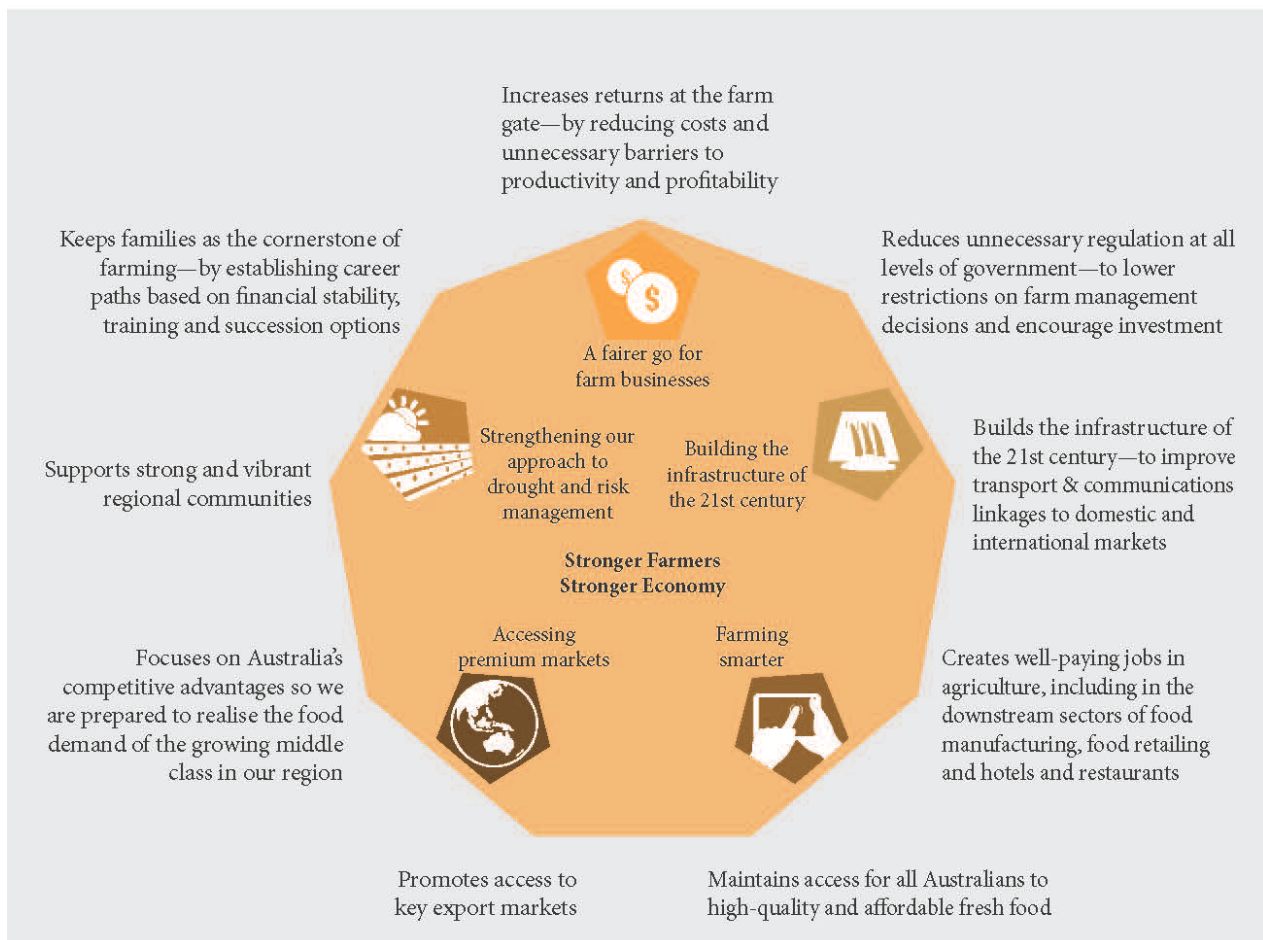
An efficient and effective freight network is the cornerstone of economic productivity and growth. It reduces the cost of everyday goods and services, underpins the strength of our economies, and generates vital employment. Freight matters to every person in the State.

Freight and logistics are an indispensable component of economic activity and improvements in logistics have enabled increases in both the value and volume of freight transported. Lower costs

have enabled new online markets to develop and greatly increased the output in others that rely upon improvements in coordination for just-in-time delivery.

The following schematic has been extracted from the Federal Governments Agricultural White Paper and also mentions that Agriculture is at the heart of the Australian identity. Our history and economy was ‘built on the sheep’s back’. Today agriculture continues to play a pivotal role in building the wealth of Australia; this is why the sector is one of the five pillars of the Australian economy and why the Government has made agriculture a priority:

Figure 1 Australian Government agriculture policy principles and priorities



The Government will improve New South Wales economic future and living standards by investing in the States transport infrastructure. Infrastructure investment will improve the reliability, efficiency and accessibility of transport that underpins New South Wales competitive, regionally-based and export-orientated agriculture industries.

Besides what we have mentioned previously, some other initiatives that the State Government may undertake to enhance the cargo movement in regional New South Wales include:

- Increase the speed limits on the Mid Western Highway to 110 kilometres from Grenfell through to Hay.
- Continued investment in the Newell Highway, Goldfields Way and Mid Western Highway.
- The regional road network should become a State Government Asset and under their control and maintenance.
- The State road network should return to the State Government.

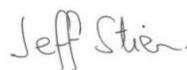
- A study should be undertaken to determine the capacity of the local, regional and state road networks so that they can handle the HMLs and HPVs. Once the deficiencies in the road network have been determined then funding needs to be allocated to these identified deficiencies. The following Bland Shire local roads have been identified as the best routes for HML's and HPV's but are currently substandard and require investigation and investment to accommodate the HML's and HPV's::
 - Ungarie to Naradhan
 - Rankins Springs to Lake Cargelligo
 - Dundas
 - Crown Camp Road
 - Kolkilbertoo
 - West Wyalong to Lake Cargelligo
 - West Wyalong to Condobolin
 - Blow Clear
 - Clear Ridge
 - Wamboyne
 - Quandialla
 - Mary Gilmore Way
 - Tallimba
 - Boreamble
 - Girral
- Improvements to the road freight and rail networks from Sydney, Port Botany, Port Kembla, Newcastle to West Wyalong and West Wyalong to Ungarie, Kikoira and Naradhan so that the rail network can handle longer and higher mass wagons and trains.
- Unfreeze and review the FAGS distribution between metropolitan and rural councils.
- Local Government is responsible for almost 80% of the total road network of 900,083 kilometres across Australia, with the Bland Shire Council maintaining 3,248 kilometres. The States and Commonwealth raise approximately \$18.4 billion in road related taxes each year, and the Commonwealth provides approximately \$1.2 billion annually in road funding to local councils. The States and Commonwealth should allocate more of the \$18.4 billion to road funding for the local councils.
- Eliminating the mobile phone black spots in regional New South Wales will improve the productivity and efficiency of the transport and other sectors in regional New South Wales.

Once again Bland Shire Council thanks you for the opportunity to provide a submission to the Inquiry into National Freight and Supply Chain Priorities and should you require additional information then please do not hesitate to contact either Ray Smith on (02) 6972 2266 or rsmith@blandshire.nsw.gov.au or Jeff Stien on (02) 6979 0244 or jstien@blandshire.nsw.gov.au.

Yours sincerely



Ray Smith
General Manager



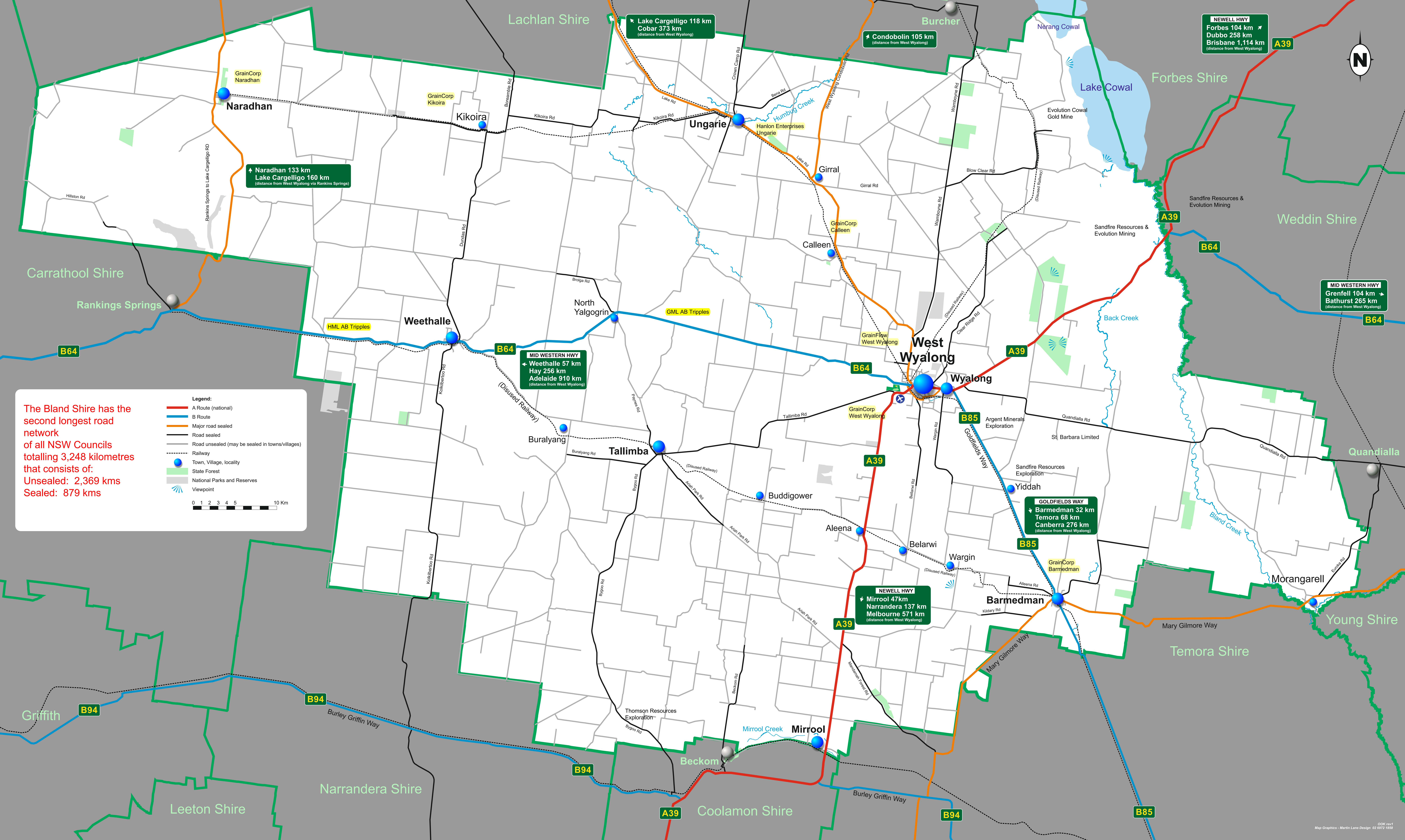
Jeff Stien
Senior Economic Development & Tourism Advisor

The Bland Shire has the second longest road network of all NSW Councils totalling 3,248 kilometres that consists of:
 Unsealed: 2,369 kms
 Sealed: 879 kms

Legend:

- A Route (national)
- B Route
- Major road sealed
- Road sealed
- Road unsealed (may be sealed in towns/villages)
- - - Railway
- Town, Village, locality
- State Forest
- National Parks and Reserves
- ▲ Viewpoint

0 1 2 3 4 5 10 Km



The Newell Highway closure in 2016 from flooding: The direct and indirect effects



A report for
THE NEWELL HIGHWAY TASK FORCE, GOVERNMENT,
PRIMARY PRODUCERS & TRANSPORT ORGANISATIONS

Prepared by the
National Institute of Economic and Industry Research (NIEIR)
ABN: 72 006 234 626
416 Queens Parade, Clifton Hill, Victoria, 3068
Telephone: (03) 9488 8444; Facsimile: (03) 9482 3262
Email: admin@nieir.com.au

August 2017

While the National Institute endeavours to provide reliable forecasts and believes the material is accurate it will not be liable for any claim by any party acting on such information.

Summary of study findings

This study provides estimates of the direct and indirect cost of the closure of the Newell Highway between 23 September and 4 November 2016.

The total direct gross cost from the national perspective is estimated at \$_{CVM}112 million¹. The \$_{CVM} price year is 2014-15.

The components of the cost include:

- (i) \$23.5 million for increased road freight transport costs;
- (ii) from the national perspective it has been assumed that there is no loss in tourism expenditures. However, for the LGAs most impacted by the closure this is estimated at \$_{CVM}14 million;
- (iii) \$_{CVM}16 million from the loss of nearby service exports from the LGAs in the broader Bland Creek catchment;
- (iv) loss of agriculture production of \$_{CVM}20 million, compared to the case of an upgraded highway with best practice drainage facilities;
- (v) loss of production of \$46 million from supply chain disruption elsewhere in Australia; and
- (vi) \$6.7 million from increased road maintenance expenditure.

The total impact in terms of lost total gross regional product (GRP), in terms of the flow-on impact for lost increases and household consumption expenditure on the economy, is modelled at minimum \$_{CVM}138 million, up to \$_{CVM}153 million and the loss of two million hours of work with the contribution of some loss of employment, but most likely under-employment, of a conservative 5194 workers.

The loss of GRP in the LGAs most impacted on within the Bland Creek Catchment was of the order of a conservative \$_{CVM}36 million.

In terms of the LGAs within the catchment, the majority of the catchment cost is attributed to Bland and Forbes.

This study could not have been done without the invaluable assistance from Bland Shire Council and feedback from the local community, business and government organisations in the Bland Catchment region and the National freight companies that provided detailed information on the impact of the Newell Highway closure on their operations. NSW Transport: Roads and Marine Services also provided important comments.

¹ \$_{CVM} = \$ chain volume measure million, which is flows of constant 2014-15 value converted from current values by the ABS using their chain volume methodology.

The direct and indirect cost of the Newell Highway closure

The study objective is to quantify the direct and indirect economic costs of the flooding in the Bland Creek catchment which led to the closure of the Newell Highway between West Wyalong and Forbes. The road was closed on 23 September 2016 and reopened on 4 November 2016. A total of 43 days. However, the study assumes a 44 day closure to allow for lags in the adjustment of behaviour. **This estimate is conservative.** The effective impact on truck routes may well have occurred before 23 September while the lagged adjustment to the road opening would have been certainly greater than one day.

Hereinafter the event is referred to as the 'road closure'.

1. Study information sources

The information sources on which this report was based were:

- community and LGA consultation;
- survey of freight transport organisations;
- Tourism Research Australia data series; and
- the NIEIR LGA data base.

The survey of freight transport organisations involved nine organisations. These organisations provided, on a strictly confidential basis, detailed information of freight transport economics along the Newell catchment area and the impact on the economics due to the road closure.

As will be seen below, Tourism Research Australia data was also an important input. However, the data had to be seasonally adjusted and greatly filtered to remove underlying instability caused by small sample sizes for some of the SA2 regions. For most of the Bland Creek Catchment LGAs the tourism data for the last two quarters of 2016 was in accordance with community assessment. This was not the case for West Wyalong which was assumed to follow the same outcome as the Forbes SA2 adjusted from community assessment feedback.

2. The Bland Creek Catchment

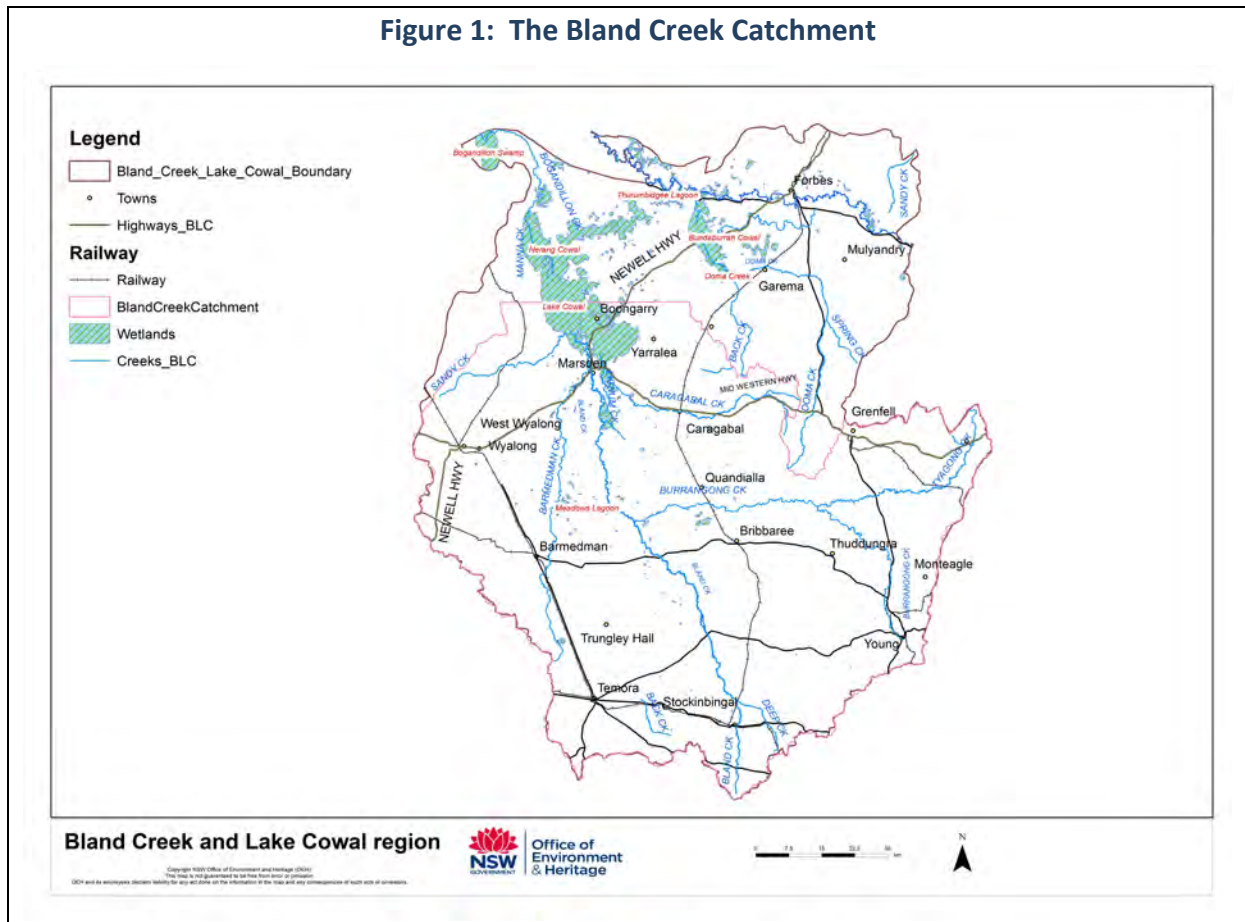
The Newell Highway was closed because of flooding in the Bland Creek catchment shown in Figure 1.

The Bland Creek in central New South Wales rises near Twins Range (elevation 390m) around 15kms west of Cootamundra. It drops around 185m over its 173km length, where it eventually flows into Lake Cowal (elevation 208m).

The following seven creeks flow into the Bland Creek: Berthong, Rushy, Meedallion, Bribbaree, Narraburra, Burrangong, and Barmedman Creeks.

The Bland Creek Catchment, which covers an approximate area of 940,950 hectares, has been divided into six sub-catchments: Barmedman, Burrangong/Tyagong, Caragabal, Lower Burrangong, Narraburra/Duck Creek, and Upper Bland.

Figure 1: The Bland Creek Catchment



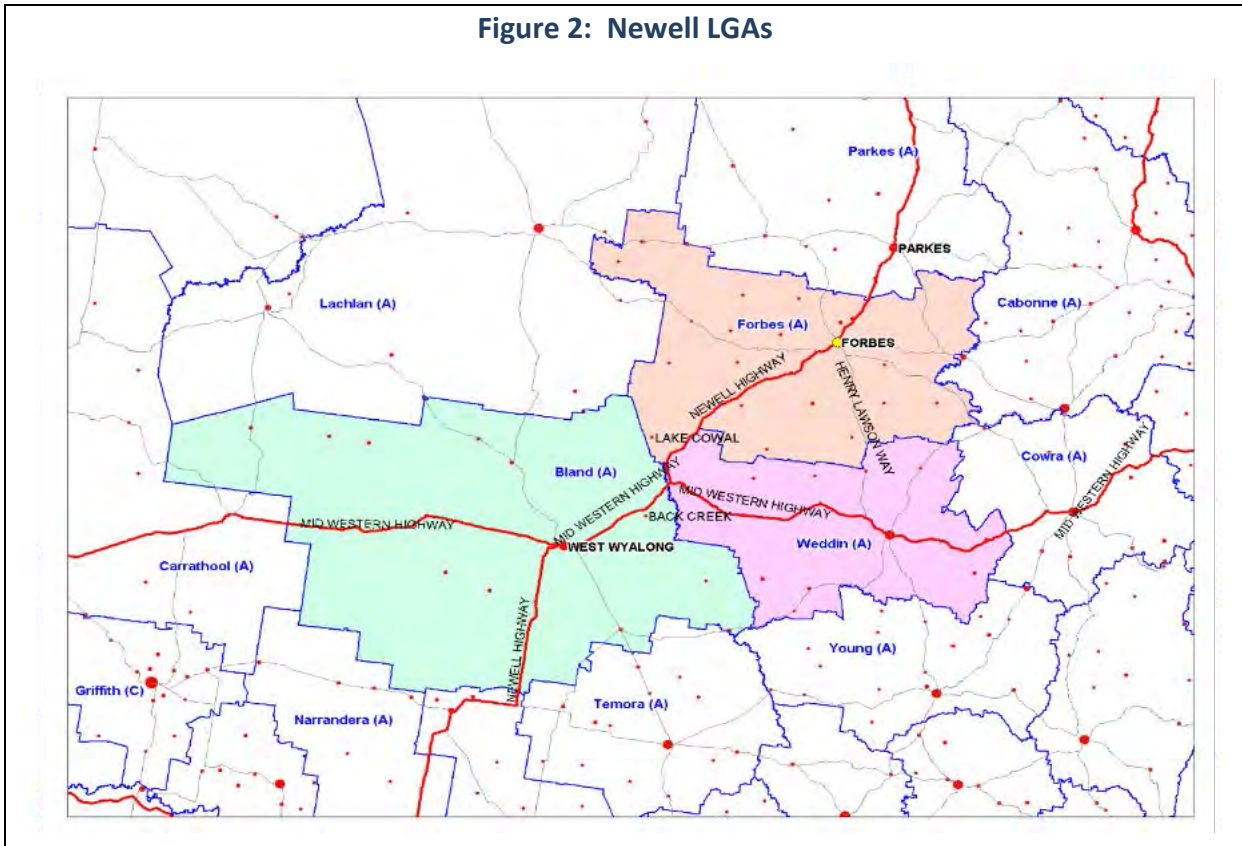
3. The regional segmentation

The data is generally applied at the Local Government Area (LGA) level. The tourism data is obtained at the SA2 level and then aggregated into LGAs when an LGA has two or more SA2s.

Figure 2 shows the LGAs in the wider Bland Creek Catchment. For the purposes of this report the narrow catchment consists of the LGAs of Bland, Cabonne, Cowra, Forbes, Parkes, Temora and Weddin.

	Gross regional product (\$CVM million)	Household disposable income (\$CVM million)	Resident employment ('000)
Bland	383	377	2.8
Cabonne	912	711	6.8
Cowra	503	555	5.4
Forbes	443	494	4.5
Parkes	798	671	7.0
Temora	243	278	2.6
Weddin	132	204	1.6

Figure 2: Newell LGAs



4. The heavy vehicle diversion impact

The assumption of this report is that one way 400 heavy vehicles per day were diverted to either the official diversion route or via Sydney or Broken Hill.

From Table 2, the October 2016 data showed 56 heavy vehicles per day southbound on the Newell Highway between Forbes and West Wyalong compared to 439 per day for October 2015. Presumably this would also capture trucks using part of the closed Highway for east-west routes. Therefore, the key estimate of this report that there was a diversion of 400 heavy vehicles per day southbound. This estimate can also be justified on the grounds that there is likely to have been an underlying growth in trucks using the Newell between October 2015 and October 2016 and/or alternatively includes a small estimate for smaller vehicles that were also been diverted. On the assumption of the same number of diversions northbound giving a total reduction of 800 heavy vehicles trips in both directions. This is probably a conservative estimate, NSW Transport: Roads and marine services in correspondence to NIEIR estimated the reduction as 880 heavy vehicles or ten percent more than what has been allowed for in this report.

Figures 3(a) and 3(b) shows the “official” diversion route although the data in Table 1 indicates the route via Sydney was perhaps the more important alternative. Figure 4 shows the role of the Newell Highway in the East Coast road freight transport task. There was also a diversion of heavy vehicles via Broken Hill to South Australia. Heavy vehicles travelling from Adelaide to Sydney and or Brisbane via the Mid Western Highways were also diverted to alternate routes via Broken Hill or Sydney.

Table 2 Heavy vehicle traffic – vehicles per day	
	Difference between October 2016 and October 2015 – south bound
Newell Highway between West Wyalong and Forbes	-383
Newell Highway north of flood area (Tomingley – north of Parkes)	-329
Hume Highway near Albury	+151
Mitchell Highway (between Molong and Dubbo)	+72

Source: Roads and Maritime Services: [publications/statistics/traffic volumes/](http://publications/statistics/traffic-volumes/).



Figure 3(a): The official alternative heavy vehicle route

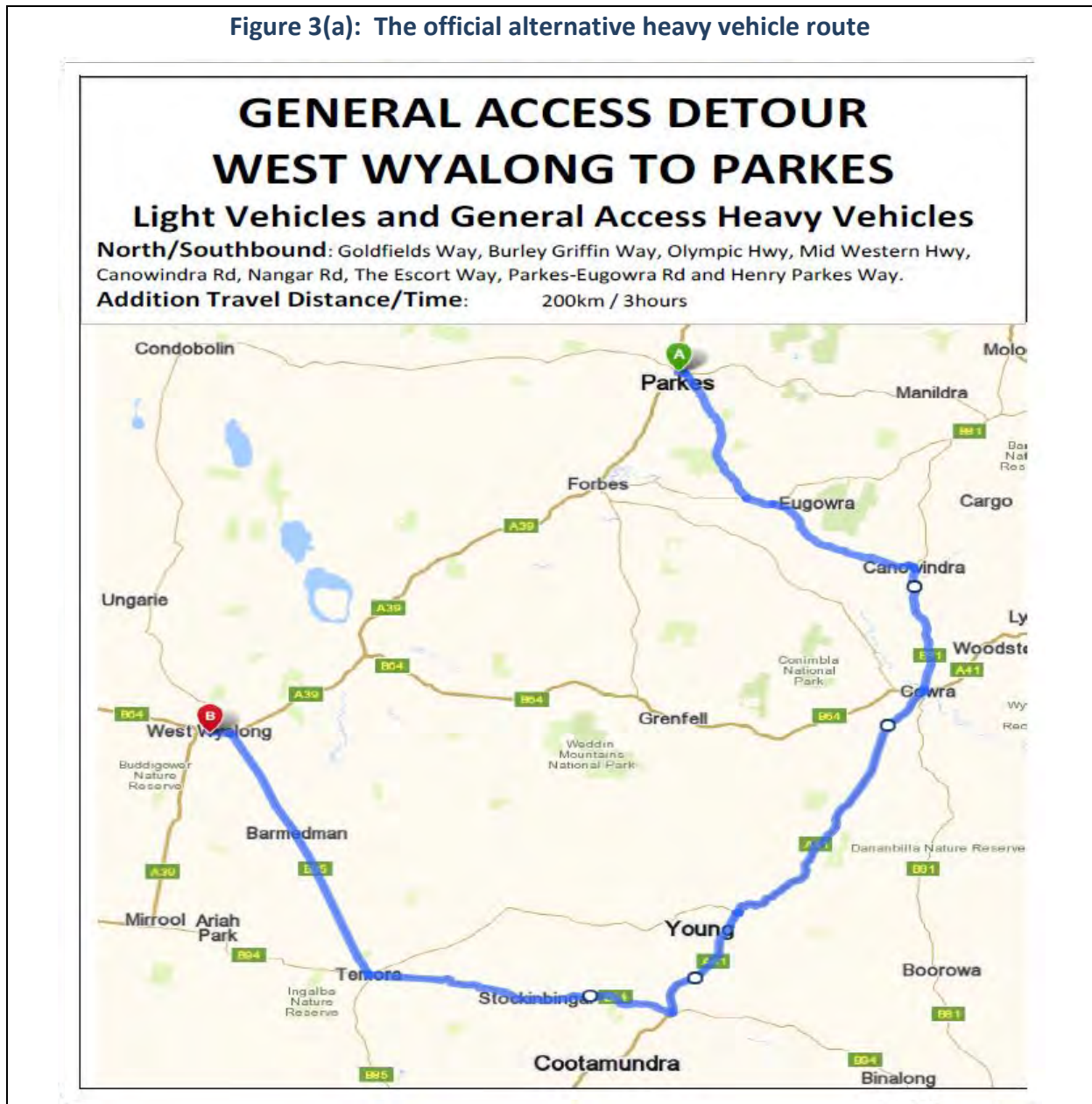


Figure 3(b): The official alternative heavy vehicle route

RESTRICTED ACCESS DETOUR CANOWINDRA TO PARKES

Restricted Access up to 26m B-double at HML &
NSW Class 1 Load Carrying Notice

North/Southbound: Goldfields Way, Burley Griffin Way, Olympic Hwy, Mid Western Hwy,
Canowindra Rd, The Escort Way and Henry Parkes Way.

Addition Travel Distance/Time: 240km / 3.5hours

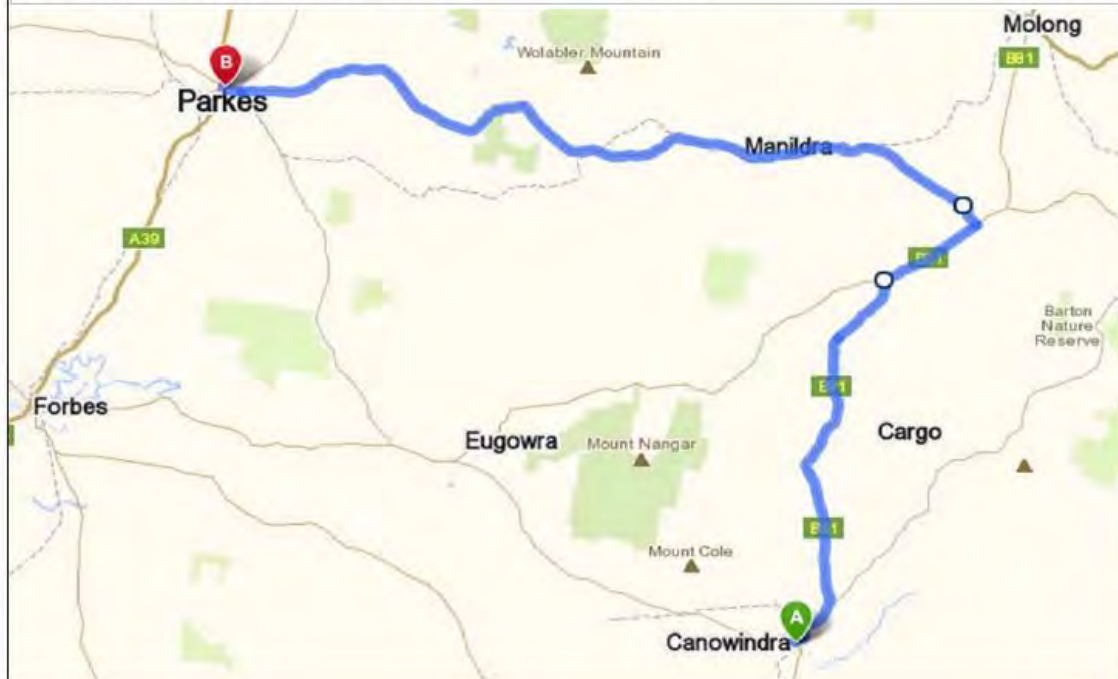
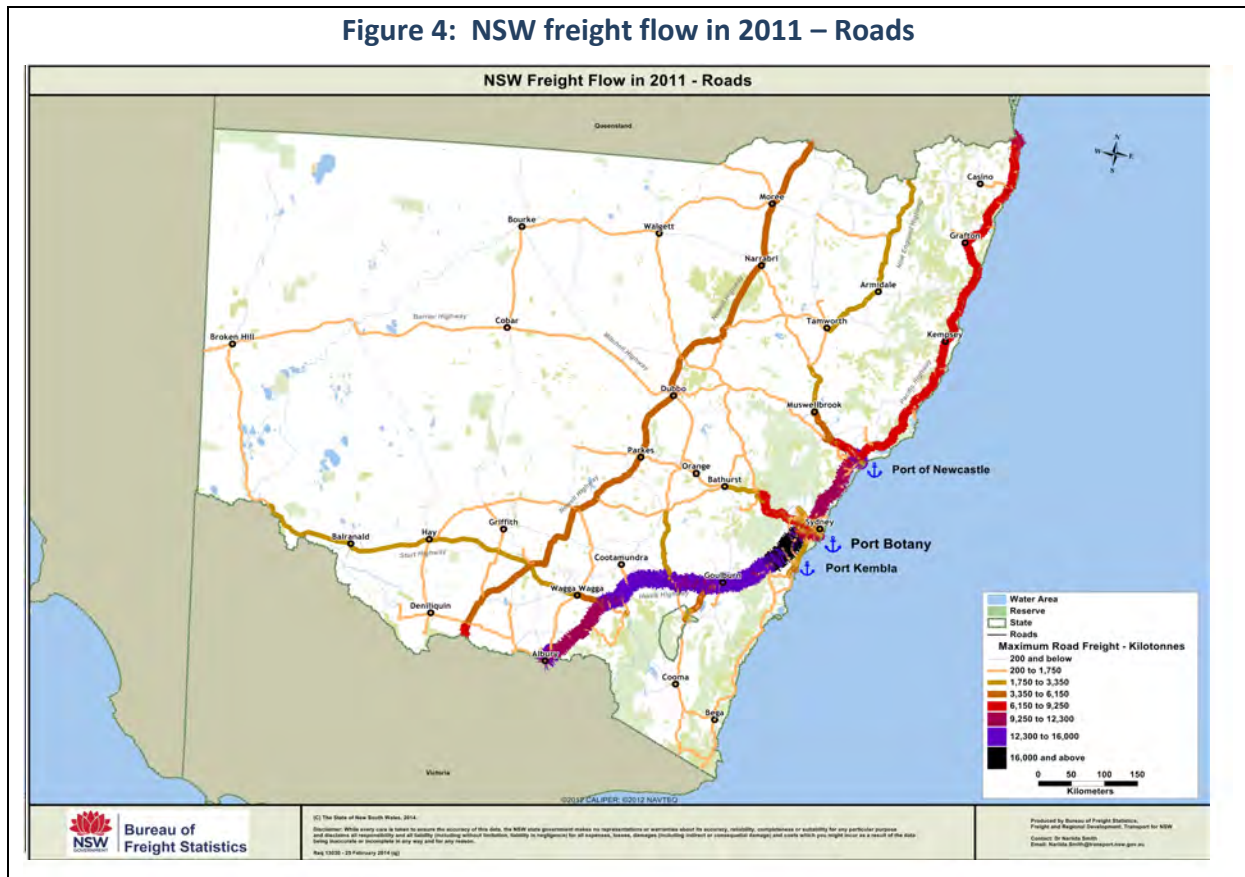


Figure 4: NSW freight flow in 2011 – Roads



5. The impact of the road closure on the road freight transport industry: The survey results

The long haul core routes impacted by the flooding were Brisbane-Melbourne, Brisbane-Adelaide and Adelaide-Sydney routes which would also include the freight to and from Tasmania. Minor routes impacted would have been the connections of centres in South Australia and Victoria and centres North of the flood area in New South Wales and Queensland and vice versa. The impact of the flooding however would be similar for nearly all routes and therefore can be quantified in terms of the impact on two core routes.

In order to accurately assess the impact of the closure a data base of all the possible routes would have to be developed and the number of vehicles diverted from the new highway to these routes estimated. A weighted average estimate would then be calculated. In the absence this information the freight companies were approached to provide to this study a weighted average estimate in their view of the impact of the closure. That is the organisations which know the “weighted average” impact were approached for the necessary information.

The answer back from these organisations was that the average additional kilometres for costing purposes will be based on 275 additional kilometres. This was a strong response in that the standard deviation of the company responses from the mean was small.

This does not mean that technically shorter options were not available. For example new or was used then the appropriate diversion would be the Dubbo-Cowra-Temora diversion a distance of 110 km. Some of the diversions via Sydney would also have added less than 275 km. The freight companies went to great pains to stress that the weighted average impact incorporated many factors. Some routes were not employed because of inferior roads resulting in greater wear and tear on trucks and increased travel times. Even if the shorter routes were employed the freight companies took this into account by estimating the travel length equivalent which captured the increased costs. The same is true of diversion routes via Sydney where the increased congestion costs of higher truck running cross per kilometre and increased travel times from congestion were also taken into account by deriving a weighted average effective travel distance to version.

The B-double is the largest vehicle allowed on the Newell Highway with a maximum load of 36 tonnes and higher for other vehicle types. The average load from the freight company survey is approximately 33 tonnes though back fill loads will in general be considerable less. Hence the 20 tonne average per trip in Table 4.

The average fuel efficiency of a loaded B-double is 1.6 to 1.8 kilometres per litre. However all survey respondents noted that fuel efficiency would have declined because of the flooding due to:

- more hills for the alternative routes East of the Newell Highway;
- to reach maximum fuel efficiency standards driver specialise in routes. The flooding forced drivers into unfamiliar routes.

Therefore a fuel efficiency average standard of 1.6 kilometres is adopted for this report.

The average extra time for a trip was placed by the survey respondents at between three and five hours. The Sydney diversion incurred additional time delays from congestion. The average extra time adopted in this report is, therefore, four hours.

Given the survey information and cost data from other sources the cost of the road closure on the road freight industry is developed in Table 4. The costings are self-explanatory except for the opportunity cost component. The survey respondents stressed the costs of events where late arrival resulted in loss of delivery slots forcing an overnight wait in waiting for a new slot. In this case the substitute costs to cover other committed tasks is assumed to be the full daily costs of a heavy vehicle.

Table 3 Heavy vehicle – operating costs	
Diesel \$/kilometre with rebate	1.30
Driver wage costs – \$/hour	63.0
Service costs – \$/kilometre	0.051
Maintenance costs –\$/kilometre	0.094
Tyre costs – \$/kilometre	0.115
Travel opportunity cost –\$/day	2,100

Note: Wage cost in Newell Highway minimum of \$36 an hour plus 15 per cent for superannuation and work cover, plus another 30 per cent per shift work allowances, food and other work related expenses. In addition a 20 per cent allowance is made for over-time allowances and a fixed 10 per cent per living away from home allowance. The data is the average of a single truck and B-double.

Source: www.freightmetric.com.au.

Table 4 Road closure formation of additional freight transport costs	
Trips – per day	800
Additional kilometres travelled – number	275
Additional drive hours per trip	4.0
Total additional kilometres – million	9.9
Average tonnage per trip – number	20
Additional litres of fuel – million	6.2
Additional driver costs – \$m	9.1
Additional vehicle total service costs – \$m	2.6
Opportunity cost of late delivery – \$m	3.8 ^(a)
Total additional freight delay costs – \$m	23.5
Average tonnes per trip	20
Tonne kilometres – million	198
Total value of freight – \$m	4,270

Note: (a) Assumed to occur for 5 per cent of trips.

6. Road system recovery costs

The extra kilometres will impose additional maintenance costs on the New South Wales road system. The road system cost is taken from Phillip Laird, *“Freight transport cost recovery in Australia”*, University of Wollongong, Research and Online, 2006.

The estimate updated to $\$_{CVM}$ is 0.017 per tonne kilometre. That is the 2006 estimate has been updated to current costs using the appropriate cost indexes. The total number of tonne kilometres imposed on the road system because of the road closure is 198 million, giving a total road recovery cost of $\$_{CVM}$ 3.3 million. However, because trucks were forced onto less suitable roads the cost is increased to $\$_{CVM}$ 6.7 million. This estimate represents a very conservative additional cost to councils as of trucks using inappropriate local roads. Local councils viewed these costs as considerable. Thus when the road authorities receive the estimates of the total cost of repairing roads from the Newell Highway closure they are likely to find that the costs are considerably greater.

The additional costs are assumed to be levied on New South Wales households on a uniform per capita basis.



7. Overnight tourism: Narrow Bland Creek Catchment

The starting point for the impact of overnight tourism is the NIEIR estimates of the export of accommodation services for both domestic and international visitors for the LGAs in the narrow Bland Creek Catchment. For the LGAs in the narrow Bland Creek Catchment the average quarterly estimates, in \$_{CVM} million, for 2015-16 are:

Bland	2.9
Cabonne	2.8
Cowra	9.1
Forbes	6.1
Parkes	8.5
Temora	1.2
Weddin	1.6

Next, to this estimate is applied the ratio of other tourism related expenditures (food. Fuel etc.) compared to the accommodation expenditures from the Australian Bureau of Statistics, “*Tourism Statistics Accounts*” for 2015-16 are applied to the LGA accommodation export estimates.

The Tourism Research Australia data series is then used, after adjustment as outlined above, to estimate the impact on overnight tourism for the December quarter 2016 as a result of the road closure. The Parkes estimate is based on information supplied by the Local Authority.

The results are given in Table 5.

Region	Accommodation	Cafes and restaurants	Sport and recreation	Fuel	Food retailing	Total
Bland (A)	-0.47	-0.59	-0.15	-0.03	-0.31	-1.53
Cabonne (A)	-0.83	-1.04	-0.27	-0.05	-0.55	-2.73
Cowra (A)	-1.10	-1.39	-0.35	-0.06	-0.72	-3.63
Forbes (A)	-0.93	-1.17	-0.30	-0.05	-0.61	-3.07
Parkes (A)	-1.21	-1.51	-0.40	-0.07	-0.79	-3.99
Temora (A)	0.43	0.54	0.14	0.02	0.28	1.41
Weddin (A)	-0.03	-0.04	-0.01	0.00	-0.02	-0.11
Other NSW	1.40	1.76	0.45	0.08	0.92	4.61

8. The loss of exports

Goods exports, whether international or domestic, are unlikely to involve a permanent loss of exports. In the worst case it can be stockpiled until an opportunity arises for delivery. The exception to this is where late delivery causes permanent production losses in downstream supply chains or at the very least permanent loss of sales for the late delivered product. This case is addressed in Section 10 below.

Hence, the focus here is on mainly service exports from an LGA to a nearby LGA. Difficulties in obtaining services are likely to result in a change in scheduling or the cancellation of the service. Table 6 shows the level of inter-regional exports for 2016 for the LGAs in the wider Bland Creek catchment. Thus, the rate of inter-regional exports from the Bland LGA is \$_{CVM}0.9 million per day.

The next step is to extract from the inter-regional exports from an LGA those exports where the delivery route would be significantly disrupted by the road closure. For Bland LGA, this would involve those exports which would have been delivered along the closed section of the Newell Highway. That is, LGAs to the north of Forbes LGA. These estimates are shown in the second column of Table 6. For Bland the result is a net export level of \$_{CVM}0.3 million per day.

The next step is to obtain a realistic adjustment factor which, when applied to column two in Table 6, that would deliver a plausible estimate of the loss in exports and in particular the export of services. A guide to appropriate adjustment factor can be obtained from Tourism Research Australia's estimates of expenditures at distinction of trip expenditures. For Forbes this revealed a drop of expenditures for the December 2016 quarter of \$3.2 million. For Cowra a decline in expenditure compared to the same quarter a year earlier of \$1.0 million. For Parkes the decline in day trip expenditure was \$1.3 million. The actual loss of export estimates in column three of Table 6 are derived on the assumption that, for those LGAs where the daily trip expenditure is reliable, the actual export loss will at least equal the daily trip expenditure chain, but would most likely be greater. For the other LGAs the same relativities are maintained for the ratio of actual export losses to potential export losses.

Table 6 Inter-regional exports			
	Total inter-regional exports (\$m per day)	Total inter-regional exports at risk (\$m per day)	Change in inter-regional exports from road closure (\$m)
Bland (A)	0.9	0.3	-3.4
Cabonne (A)	2.7	0.1	-1.3
Carrathool (A)	0.3	0.0	-0.2
Cowra (A)	0.6	0.1	-0.7
Forbes (A)	0.6	0.4	-4.8
Griffith (C)	1.8	0.1	-1.2
Lachlan (A)	0.5	0.0	-0.1
Narrandera (A)	0.3	0.0	-0.2
Parkes (A)	1.5	0.2	-3.2
Temora (A)	0.4	0.0	-0.2
Weddin (A)	0.3	0.0	-0.1
Young (A)	0.9	0.0	-0.4

9. The highway impact on agricultural costs

An allowance is made from the claims that the current highway design aggravates the flood damage on agriculture. The reasoning is that lack of suitable drainage infrastructure increases the height of the flood in certain locations. An up graded highway with suitable drainage facilities would reduce the flood damage. That is, reduce the losses in agriculture. The savings are set at 5 per cent of agriculture production in Bland, Weddin and Forbes. This comes to a total cost of \$_{CVM}20 million. Certainly the community feedback from the farmers who considered themselves directly impacted from increased flooding from the current Newell highway design considered the cost to them to be considerable. Whether or not this proves to be the case can only be assessed by the appropriate detailed and extensive hydrology studies. Comments on the draft by the Parkes Shire Council, inter alia, included:

The report also shows that the road closure as a result of the flood bore no impact on agriculture in Parkes Shire (Table 8). However in speaking with industry leaders, that is not the case and the closure did in fact negatively impact the agricultural sector significantly through various means including:

- *Inability to conduct southern grain movements to local buyers.*
- *Other local infrastructure was impacted by the Newell closure (particularly the Parkes-Eugowra Road) with increased traffic making wide-load and regular machinery movements difficult due to traffic volume and damage to road edges and narrowing of roads.*
- *Inability to have critical supplies delivered from regional agricultural suppliers resulting in timeliness costs and reduced competition at a critical point of the season where there was a narrow window for applications due to the weather and crop stage.*
- *Increased time for delivery of spare parts from the south at a critical point of the season resulting in production downtime.*
- *Deliveries of triticale to dairies were impacted as Parkes district farmers require the Newell Highway for B-double access to the farm to service farms at Eugowra.*
- *Cash flow was significantly impacted in local farming operations as grains were held over for long periods until roads were re-opened and transport operators had B-Double truck availability following long hold-ups.*

This is an important comment because it can be used to clarify the status of the agriculture sector in this report. The comments are of course accurate and indisputable. But are not directly appropriate to this report. The reason is that this report is not about flood damage per se but about those current design features of the Newell Highway that contributed to additional flooding costs that could otherwise been avoided with a better Highway design. This restricts the focus to those properties linked to the Bland Creek Catchment. The indirect cost of the relevant \$_{CVM}20 million damage on Parkes will be captured through the modelling evaluation framework.



10. The cost of supply chain disruption

Community consultations indicated that there was likely to be not insignificant supply chain disruption in Australia because of the road closure. That is, production losses because of the late delivery of imports.

From Table 4, the estimate of the value of freight diverted over the period of the road closure was \$_{CVM}4.3 billion. The supply chain disruption cost is estimated at \$_{CVM}46 million based on the assumption of 5 per cent of the value of freight diverted would have involved some supply chain disruption costs and the value of supply chain imports from the freight diverted would have impacted 50 per cent of the value of the supply chain output. Feedback from those freight companies willing to provide investment considered the 5 per cent benchmark is reasonable.

11. The modelling framework

In order to access the impact of the direct costs on the economy of the road closure a regional econometric model is required. This modelling framework is based on NIEIR's Local Government Area (LGA) based inter-regional input-output model of the Australian economy. Each of the 567 LGAs has its own input-output sub-model at the 86 industry 2-digit level. The industries are defined in the attached table. Each industry in a given LGA is linked to the same industry in any other LGA by a 567 by 567 inter-regional trade flow matrix.

Previous multiplier analysis using the model used behavioural functions in the model for household consumption expenditures, hours demanded, etc. This study imposes the structure of the economy as prevailing exactly at 2016 on the model so that the multiplier results are closer to the "pure" textbook input-output inter-regional multipliers. That is, the following parameter settings are imposed on the model for 2016:

- (i) the prevailing consumption to disposable income ratio by LGA;
- (ii) consumption expenditure share at 2-digit ANZSIC industry by LGA;
- (iii) hours demanded per \$m of output by 2-digit ANZSIC industry by LGA;
- (iv) employment in numbers demanded for 1,000 hours worked by 2-digit ANZSIC industry by LGA;
- (v) \$/hour by 2-digit ANZSIC industry by LGA;
- (vi) International imports per \$m of demand by 2-digit ANZSIC industry by LGA; and
- (vii) The inter-regional trade flow matrix fixed at average 2015 values by 2-digit industries by 567 LGAs.

The data base has been updated to the September quarter 2016. With a further partial update to March quarter 2017 for the 2017-18 NIEIR/ALGA "State of the Regions" report of June 2018.

12. The flow-on macroeconomic implications

Using the modelling framework outlined above, Table 7 shows the impact on the regional economic aggregates with a national loss in gross product of \$_{CVM}138 million. In the main the employment loss would represent under-employment rather than outright loss of employment.

Table 8 shows the impact on industry output at the 2-digit ANZSIC level for the narrow Bland Creek Catchment LGAs. The total loss of the value of production is \$_{CVM}74 million. However, this estimate includes double counting with the net cost measured by the decline in gross regional product of \$_{CVM}36 million.

The degree of uncertainty will vary across the various cost segments. Some are "hard", that is, have a small degree of uncertainty, while for others it would take considerable cost to finalise estimates. In this context, the costs that have been left out, in order to compensate for the degree of uncertainty surrounding some of the costs which have been included, should be noted. These include:

- (i) the disruption to intra LGA economic activity has not been fully captured in the costs;
- (ii) the costs of the Newell Highway repair, which would be avoided if the Highway was upgraded; and
- (iii) the disruption to regional freight routes because of limits on heavy truck usage on alternative routes and, therefore, the fact that freight had to be either cancelled or delayed.

Table 7 Direct and indirect impact of road closure: Regional macroeconomic indicators					
Region	Gross regional product (\$_{CVM} m)	Private consumption expenditure (\$_{CVM} m)	Hours of work industry ('000 hours)	Resident employment/increase in under-employment (number)	Exports (\$_{CVM} m)
Bland (A)	-8.8	-2.5	-197.4	-354.9	-11.7
Cabonne (A)	-3.5	-1.0	-79.8	-155.8	-4.2
Cowra (A)	-3.3	-1.4	-70.8	-189.1	-4.4
Forbes (A)	-12.1	-3.6	-271.5	-557.3	-17.8
Parkes (A)	-5.4	-1.9	-112.8	-302.2	-7.3
Temora (A)	0.9	0.2	29.7	69.3	1.1
Weddin (A)	-4.2	-1.4	-89.0	-171.6	-4.6
Total catchment	-36.2	-11.6	-791.6	-1661.6	-48.9
Rest of NSW	-18.6	-15.6	-247.8	-647.1	-19.9
Victoria	-44.1	-28.0	-649.7	-1534.5	-44.1
Queensland	-19.0	-12.3	-281.1	-629.5	-20.5
South Australia	-15.6	-12.5	-240.1	-596.8	-21.3
Western Australia	-2.8	-0.9	-30.3	-71.4	-4.0
Tasmania	-1.1	-0.3	-16.0	-39.5	-1.4
Northern Territory	-0.2	-0.1	-3.0	-6.4	-0.3
ACT	-0.2	-0.1	-2.0	-6.9	-0.2
Australia	-137.8	-81.3	-2261.5	-5193.8	-160.6

Table 8 Direct and indirect impact of road closure: Catchment LGAs gross output by industry (\$_{CVM} m)

	Bland (A)	Cabonne (A)	Cowra (A)	Forbes (A)	Parkes (A)	Temora (A)	Weddin (A)	Total
Agriculture	-7.4	-0.1	0.0	-10.2	-0.1	0.0	-4.7	-22.6
Aquaculture	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forestry & Logging	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fishing, Hunting & Trapping	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Agriculture, Forestry & Fishing Support Services	-0.1	0.0	0.0	-0.2	0.0	0.0	-0.4	-0.7
Coal Mining	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Oil & Gas Extraction	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Metal Ore Mining	-0.2	-0.1	0.0	-0.1	0.0	0.0	-0.1	-0.6
Non-Metallic Mineral Mining & Quarrying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Exploration & Other Mining Support Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Food Product Manufacturing	-0.1	-0.3	0.0	0.0	0.0	0.1	-0.3	-0.6
Beverage & Tobacco Product Manufacturing	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1
Textile, Leather, Clothing & Footwear Manuf.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood Product Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pulp, Paper & Converted Paper Product Manuf.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Printing (incl. the Reproduction of Recorded Media)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Petroleum & Coal Product Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Basic Chemical & Chemical Product Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Polymer Product & Rubber Product Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Non-Metallic Mineral Product Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Primary Metal & Metal Product Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fabricated Metal Product Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Transport Equipment Manufacturing	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.2
Machinery & Equipment Manufacturing	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1
Furniture & Other Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electricity Supply	-0.1	-0.2	0.0	-0.1	-0.1	0.0	-0.2	-0.6
Gas Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Supply, Sewerage & Drainage Services	-0.2	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.5
Waste Collection, Treatment & Disposal Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Building Construction	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.2
Heavy & Civil Engineering Construction	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1
Construction Services	0.0	-0.1	0.0	-0.1	-0.1	0.0	-0.2	-0.5
Basic Material Wholesaling	-0.1	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.3
Machinery & Equipment Wholesaling	-0.1	-0.1	-0.1	-0.2	-0.1	0.0	-0.1	-0.6
Motor Vehicle & Motor Vehicle Parts Wholesaling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Grocery, Liquor & Tobacco Product Wholesaling	0.0	0.0	0.0	-0.1	-0.1	0.0	-0.1	-0.3
Other Goods Wholesaling	-0.1	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.4
Commission-Based Wholesaling	0.0	0.0	-0.2	-0.7	0.0	0.0	0.0	-1.0
Motor Vehicle & Motor Vehicle Parts Retailing	0.0	0.0	0.0	-0.4	-0.1	0.0	0.0	-0.6
Fuel Retailing	-0.1	-0.1	-0.1	-0.1	-0.2	0.0	0.0	-0.4
Food Retailing	-0.4	-0.6	-0.7	-0.7	-0.9	0.3	-0.1	-3.0
Other Store-Based Retailing	-0.1	0.0	0.0	-0.3	0.0	0.0	-0.1	-0.5
Non-Store Retailing & Retail Commission Based Buying	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation	-0.9	-0.9	-1.2	-1.2	-1.5	0.4	-0.2	-5.4
Food & Beverage Services	-0.8	-1.1	-1.4	-1.7	-1.9	0.5	-0.1	-6.6

Table 8 Direct and indirect impact of road closure: Catchment LGAs gross output by industry (\$_{CVM} m) – continued

	Bland (A)	Cabonne (A)	Cowra (A)	Forbes (A)	Parkes (A)	Temora (A)	Weddin (A)	Total
Road Transport	-0.3	-0.1	-0.2	-0.4	-0.3	0.0	-0.1	-1.3
Rail Transport	0.0	0.0	0.0	0.0	-0.7	0.0	0.0	-0.8
Water Transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Air & Space Transport	-0.1	-0.2	0.0	-0.2	-0.1	0.0	-0.2	-0.9
Other Transport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Postal & Courier Pick-up & Delivery Services	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1
Transport Support Services	-0.2	0.0	0.0	-0.2	-0.1	0.0	-0.1	-0.6
Warehousing & Storage Services	-1.2	0.0	0.0	-0.1	-0.7	-0.1	-0.1	-2.3
Publishing (except Internet & Music Publishing)	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	-0.3
Motion Picture & Sound Recording Activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Broadcasting (except Internet)	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.3
Internet Publishing & Broadcasting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Telecommunications Services	-0.3	-0.1	0.0	-0.3	0.0	0.0	0.0	-0.8
Internet Service Providers, Web Search Portals & Data Processing Services	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	-0.2
Library & Other Information Services	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Finance	-0.5	-0.1	-0.2	-0.6	-0.3	0.0	-0.3	-2.0
Insurance & Superannuation Funds	-0.2	-0.1	-0.1	-0.2	0.0	0.0	-0.1	-0.6
Auxiliary Finance & Insurance Services	-0.4	-0.1	-0.1	-0.4	0.0	0.0	-0.2	-1.1
Rental & Hiring Services (except Real Estate)	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.3
Property Operators & Real Estate Services	-0.8	-0.2	-0.5	-0.2	-0.7	0.1	-0.4	-2.8
Professional, Scientific & Technical Services (Except Computer System Design & Related Services)	-0.9	-0.6	-0.3	-0.3	-0.1	0.0	-0.4	-2.4
Computer System Design & Related Services	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.4
Administrative Services	-0.4	-0.7	-0.2	0.0	-0.1	0.0	-0.2	-1.6
Building Cleaning, Pest Control & Other Support Services	0.0	-0.2	-0.1	-0.1	-0.1	0.0	0.0	-0.5
Public Administration	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.2
Defence	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Order, Safety & Regulatory Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Preschool & School Education	-0.9	0.0	-0.2	-1.7	-0.4	0.0	-0.1	-3.3
Tertiary Education	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.2
Adult, Community & Other Education	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Hospitals	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Medical & Other Health Care Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Residential Care Services	0.0	0.0	0.0	-0.2	-0.1	0.0	0.0	-0.4
Social Assistance Services	0.0	0.0	0.0	-0.2	-0.1	0.0	0.0	-0.4
Heritage Activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Creative & Performing Arts Activities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sports & Recreation Activities	-0.2	-0.3	-0.4	-0.4	-0.5	0.1	0.0	-1.8
Gambling Activities	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.2
Repair & Maintenance	-0.2	0.0	0.0	-0.5	-0.2	0.0	0.0	-0.9
Personal & Other Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Private Households Employing Staff & Undifferentiated Goods-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	-18.5	-7.3	-6.2	-23.8	-10.6	2.0	-9.9	-74.4

13. Newell Highway closure: Unaccounted costs

No account has been taken of intra LGA costs of the Newell highway closure. That is the cost to local businesses and residents of the inability of local workers to reach their places of employment or local residents to reach local businesses in terms retail and service expenditures. This is likely to impose a significant conservative estimate to the costs of the flooding event. The impact of intra LGAs and accessing normal services such as doctors, dentists, chemists, family and friends and emergency services. In addition the inter LGA export estimate appear conservative compared to the community feedback.

Accordingly an additional \$15m has been included as a contingency cost bring the total direct and indirect cost to \$_{CVM}0.153 billion

14. Newell Highway closure: Preliminary cost benefit

Cost benefit analysis of the level of Newell Highway upgrade costs to avoid or mitigate the impact of flooding that can be justified will be carried out by those best equipped for this task. However, some high level benefit numbers can be readily obtained from this analysis.

On the assumption that:

- (i) climate change results in a 1 in 20 year flood becoming a 1 in 15 year flood;
- (ii) on average every seven years there are minor flood events occurring to at half the cost of the 2016 event; and
- (iii) the growth in Newell Highway heavy vehicle traffic equals the real discount rate.

Then on the assumption that over a 50 years of the life of a Newell Highway upgrade that rendered the road flood-proof the discount net economic benefit would sum to five times the 2016 national economic costs, or \$_{CVM}0.8 billion. The next step would be to commission the Bureau of Meteorology to endorse or change these assumptions.

The next step in relation to validating or changing these costs would be for the appropriate transport authorities to estimate the impact of the proposed inland rail you route between Brisbane and Melbourne in terms of mitigating the costs of the closure of the Newell highway from future flood events.

However the most important next step would be to commission a study of what can be done to mitigate flooding damage generally in the Bland Creek catchment and how much the capital cost of these strategies would in effect also involve flood proofing the Newell highway. If future flood proofing of the region could be justified on economic grounds and a significant element of that was the upgrading of the Newell Highway then the benefits assessed in this report (less the flood damage costs) in cost-benefit terms would only have to be compared to the additional costs of flood proofing the Newell highway. That is those costs over and above the capital cost of changing the Newell highway design to mitigate regional flood damage costs.

The Newell Highway has been flooded and or closed between West Wyalong and Forbes in 1950, 1952, 1956, 1962, 1974, 1983, 1990 for twelve weeks, and 2012 and in 2016 for six weeks.

It could well prove that these costs are relatively small compared to the benefits (that is avoided costs) assessed for the national impact of avoiding Newell Highway closure from future flood events.

