Northern Rivers NSW Freight Scoping Study

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Cover image: Rail Yard (Echo Net Daily, 2015)

EXECUTIVE SUMMARY

This scoping study report details a methodology and process for a study on the freight network and supply chain requirements for the Northern Rivers NSW. It has been prepared in response to the identification, by Regional Development Australia - Northern Rivers (RDA-NR), of a need for a strategy to improve the efficiency of freight movements across the region to assist local industry and other stakeholders improve the economic potential of the region.


Source: ABC, 2014

The objective of the proposed study is therefore to understand and quantify the impediments and supply chain restrictions of the regions freight network and develop strategies to facilitate the efficient and effective movement of freight, to and from the Northern Rivers region. As a good quality transportation network is vital to a region achieving its economic growth potential, this would enable regional development.

The scoping study has focused on developing a suitable methodology to understand the supply needs of the Northern Rivers area and has been developed based on extensive reviewing of similar studies, best practice guidelines and other relevant documentation. A four step process is proposed, for which the first step is to conduct in depth consultation with stakeholders to identify network and system deficiencies.

Stakeholder engagement is critical to the success of the proposed study. A number of stakeholders within industry and local governments have already pledged support for participation in a larger study. This list is not exhaustive, however, and the larger study would expand on these stakeholders to ensure the needs of smaller operators are considered when determining the requirements for the region. The extensive consultation process would give an enhanced appreciation of the influences on the freight task, and provide a mechanism by which business and industry in the region can have direct input into the formulation of a freight network strategy.

The proposed process assesses the strategic and economic importance of the projects in the appraisal process and weighting criteria, so that the study achieves the project objectives of enabling regional growth and development.

The study would result in an *identification of projects* and a *quantification of benefits*, with the potential to inform future network improvements and initiatives. It would provide a basis for investment in the freight network, improving the regions' capacity for growth and enabling business development.

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BACKGROUND

FREIGHT PLANNING IN AUSTRALIA

In 2011–12, the domestic freight task in Australia was almost 600 billion tonne kilometres, which is equivalent to approximately 26,000 tonne kilometres of freight moved for every person in Australia (Bureau of Infrastructure, Transport and Regional Economics, 2014). The major freight movements in Australia 2011-12 are shown in Figure 1. These total freight volumes have quadrupled over past four decades, predominantly due to significant growth in road freight and strong growth in mining-related rail freight volumes.

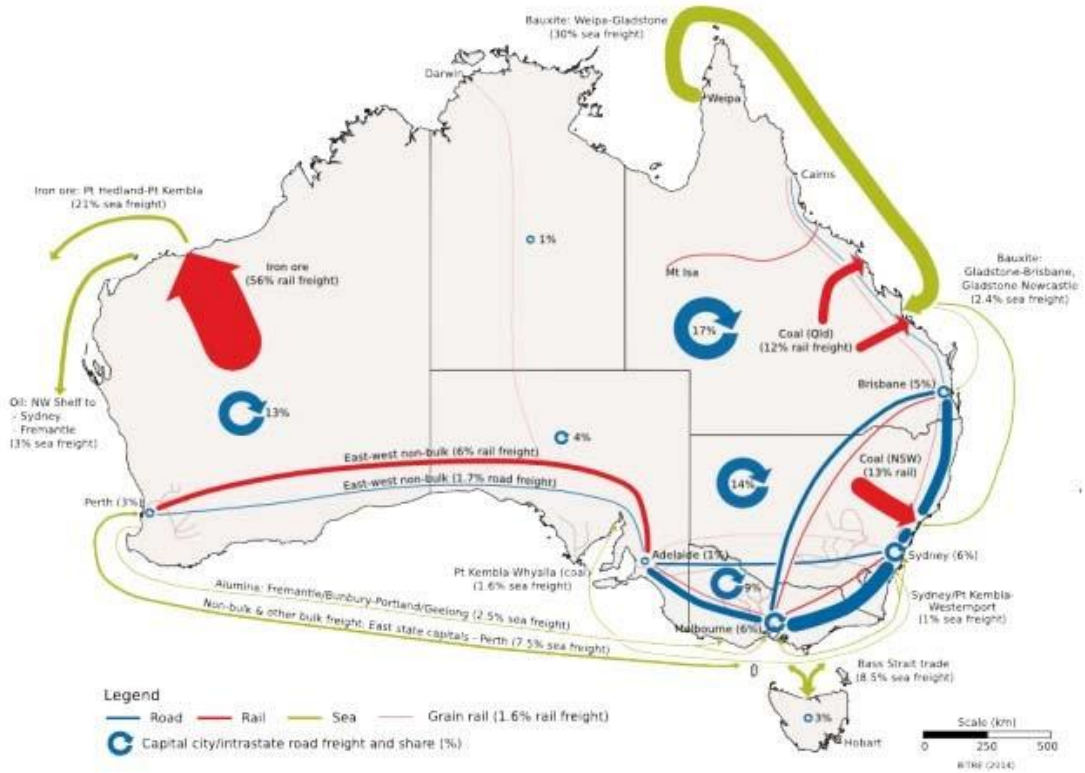


Figure 1: Major Freight Movements in Australia 2011-12

Source: Bureau of Infrastructure, Transport and Regional Economics, 2014

While rail carries a larger volume of freight overall, road transport is the main mode of transport for the majority of commodities produced and/or consumed in Australia (Bureau of Infrastructure, Transport and Regional Economics, 2014). The road freight volumes in Australia are shown in Figure 2.

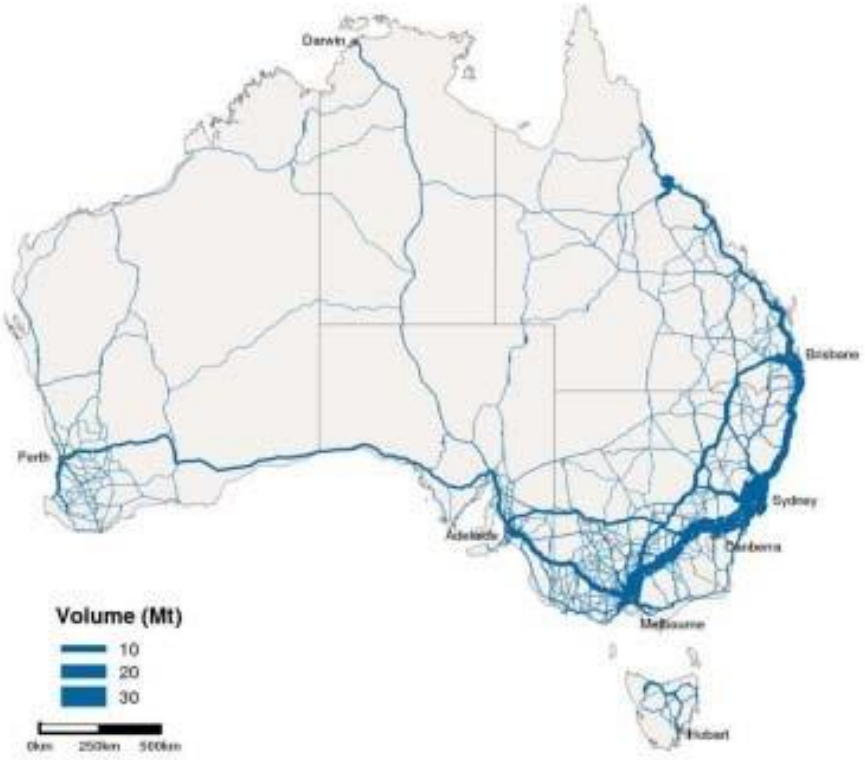


Figure 2: Road Freight Volumes in Australia 2011–12

Source: Bureau of Infrastructure, Transport and Regional Economics (2014).

It is recognised that freight and logistics are a vital component of economic activity. The contribution to the economy is often quantified, however, Transport for NSW (2013a, pg 7) argue that "an estimate of the proportion of Gross State Product (GSP) attributable to logistics significantly understates its contribution to the whole economy, as logistics is a facilitator or enabler of almost all economic activity." So while the direct contribution of is often quantified, it is only a fraction of the entire logistics sector. While acknowledging that direct measures of how logistics contributes to the economy are difficult to determine, Transport for NSW (2013a) estimate that:

- Gross Value Added (GVA) for freight and logistics in NSW was 13.8% of Gross State Product (GSP) or $58 billion in 2011.
- The number of people working in logistics in NSW is 500,000, or almost 14% of NSW employment.

The development of existing and new industries is dependent upon the availability of efficient and low cost transport, and improved logistics and supply chain networks can transform the economy of regional and urban areas. Transport for NSW (2013a) has forecast the NSW freight task to almost double by 2031, with the volume of freight moved on the NSW transport network increasing from 409 million tonnes in 2011 to an estimated 794 million tonnes in 2031. Figure 1 details the estimated increases by commodity.

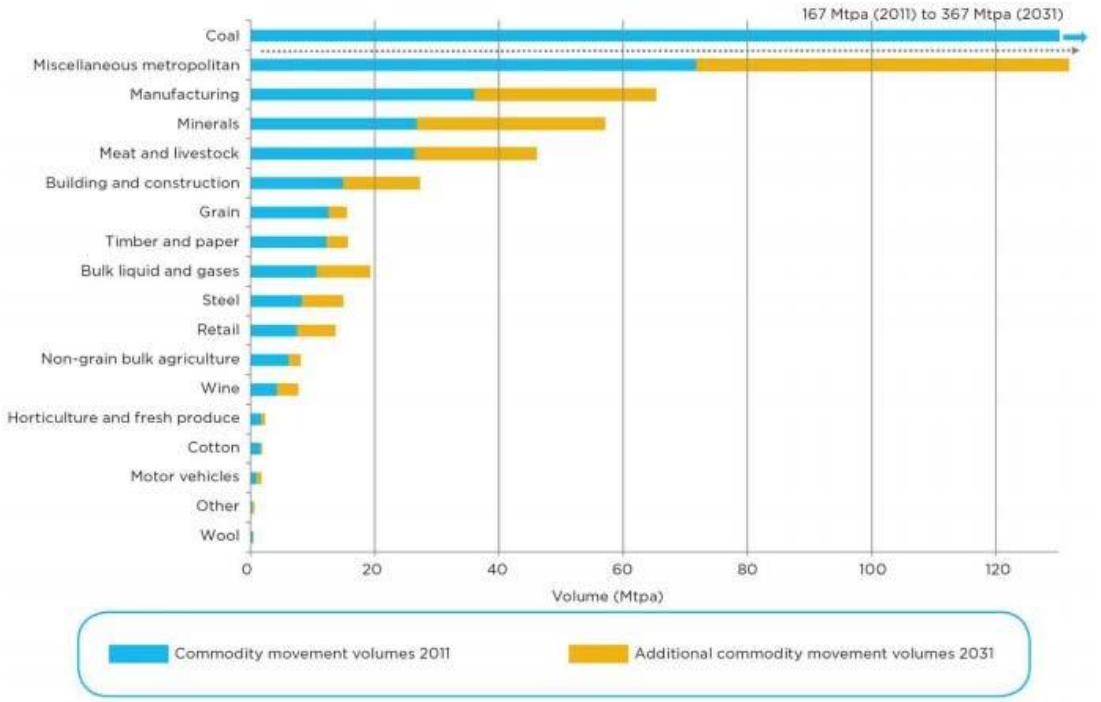


Figure 3: NSW Commodity Movements 2011-2031

Source: Transport for NSW, 2013a

This expected dramatic increase in the freight task has significant implications for the existing freight network. Primary industries, concentrated in regional Australia, make up almost twothirds of our merchandise exports (Department of Infrastructure and Regional Development, 2014).

The Standing Council on Transport and Infrastructure identified the following long term Challenges influencing the land freight task in Australia (Standing Council on Transport and Infrastructure, 2013, pg 10):

- An increase demand for Australian commodities from fast growing economies in Asia. The Department of Infrastructure and Regional Development reported (2014) that global food demand expected to rise by around 77% to 2050 from 2007 levels, with most demand coming from Asia.
- Ongoing demand for agricultural products expected to generate significant export earnings (almost $30 billion for farm commodities in financial year 2010–11).
- Depleting local oil reserves, and volatile price of oil resulting in short term business risks and long term energy sourcing challenges.
- Changing climatic conditions estimated to cause a further temperature increase of 1°C and up to a 24% increase in days of extreme weather by 2030, which can hinder the movement of freight by compromising critical infrastructure.
- Concerns about environmental issues.
- Australia's population is estimated to reach almost 30 million by 2030, which has implications both for the freight task and the efficiency with which freight can be moved through urban areas.

- Fiscal constraints create pressure on budgets as government revenues fall relative to expenditure.
- Technological developments continue to create opportunities to drive growth in the efficiency and productivity of freight movements.

Combined with the scope and importance of the current freight task in Australia, these factors underpin the case for priority attention and focus to the national, and regional, freight task.

NORTHERN RIVERS NSW

GEOGRAPHICAL LOCATION

The Northern Rivers region is located in north-eastern New South Wales, covering an area of 20,706 square kilometres. As shown in Figure 4, the region is bounded by the NSW state border to the north, the Great Dividing Range to the west, coastline to the east, and the mid-north coast region to the south. It has a population of almost 300,000 people and comprises the areas of Tweed, Byron, Kyogle, Lismore, Ballina, Richmond Valley and Clarence Valley. The region is characterised by a unique sub-tropical climate, diversity of soils (e.g. alluvial, volcanic), rolling hills and valleys, coastal hinterlands, rivers and streams and a variety of pasture types.

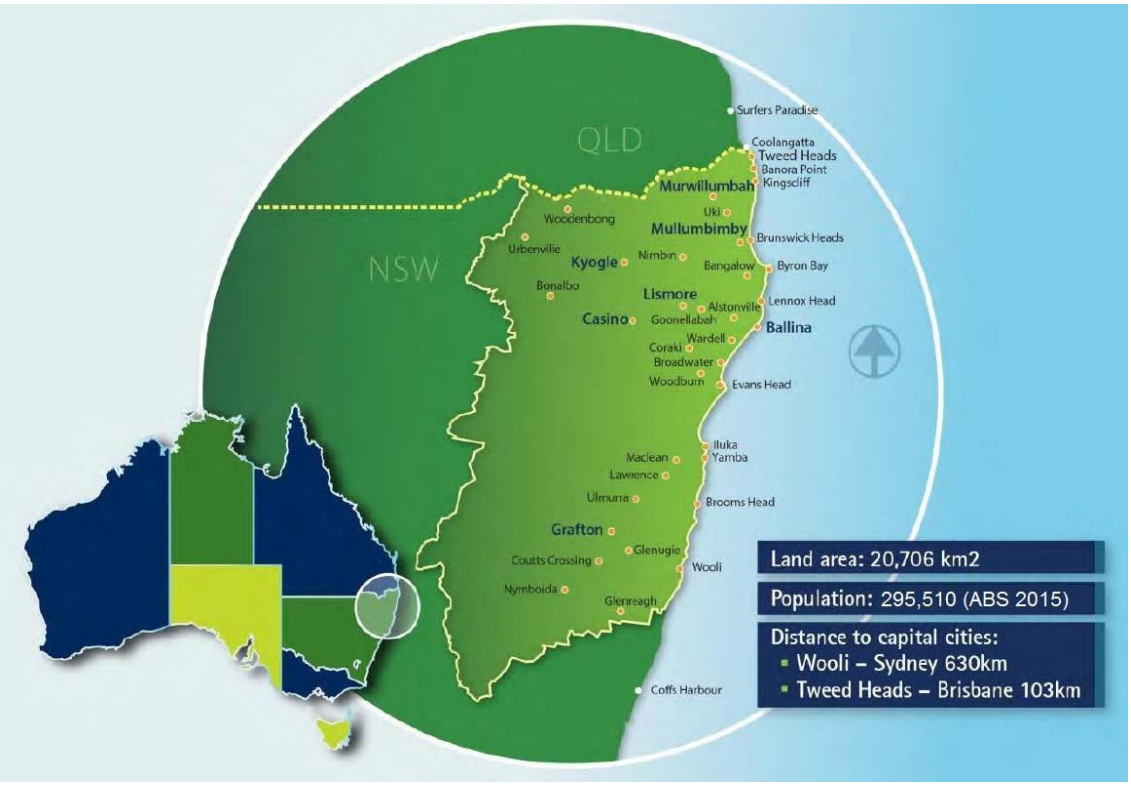


Figure 4: Northern Rivers Region

Source: Regional Development Australia 2013a

INDUSTRY OVERVIEW

The diversity of the Northern Rivers regions supports the production of a large variety of food and forestry products, including: gourmet foods, meat and dairy products, sugar, coffee, tea,

fruits, vegetables and numerous animal crops. Agriculture and horticulture, alongside manufacturing through the diversification of value-added items, are important industries in contributing to the ongoing economic vitality and development of the region. At the same time, these represent the industry sectors most affected by freight network and supply chain requirements.

The Northern Rivers region is a base for 7,710 agricultural businesses (17.5% of those in NSW or 5.7% of those in Australia), employing 4,526 people, which represents 5.2% of the region's workforce (Regional Development Australia – Northern Rivers, 2013b). In Kyogle agriculture, forestry and fishing account for 22% of employment, while in the Richmond Valley, where the Casino meatworks is a large employer, manufacturing accounts for 20% of total employment, of which 75% is attributed to food manufacturing. The region also has a strong agriculture and food production sector, which provides employment for 2,648 people (Regional Development Australia – Northern Rivers, 2013b).

Regional Australia Institute (RAI) (n.d.) developed the [In]Sight framework, which provides a measure of the competitiveness of each Australian region, with the competitive advantage of the Northern Rivers is ranked as the second highest in Australia for 'Net Primary Productivity'.

As a measure of the economic contribution of each industry to the Northern Rivers region, regional economic contribution is an indicative measure of the economic size of an industry sector. It is representative of the value of sales generated by each industry, minus the cost of its inputs to production. These include the cost of labour, materials, services purchased, depreciation and other costs (National Institute of Economic and industry Research (NIEIR), 2016). Figure 5 gives the regional economic contribution of all industry sector sales in the Northern Rivers region.

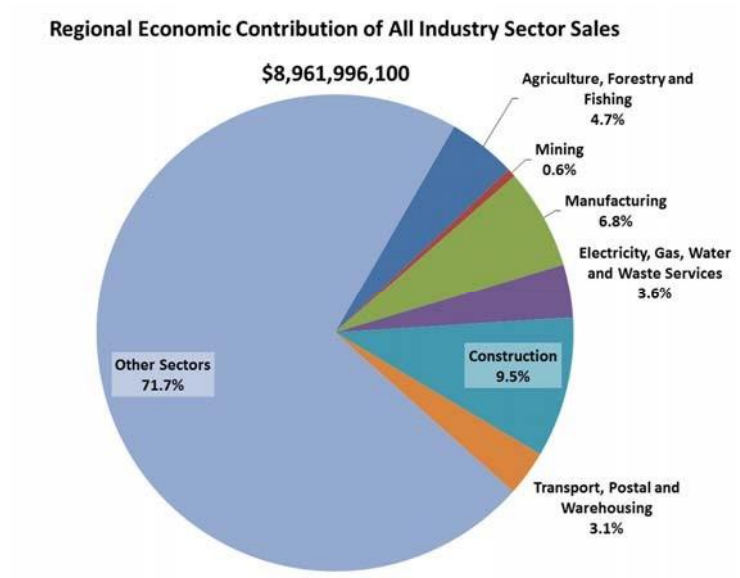


FIGURE 5: REGIONAL ECONOMIC CONTRIBUTION OF ALL INDUSTRY SECTOR SALES, NORTHERN RIVERS REGION, 2014-15

Source: http://economy.id.com.au/rda-northern-rivers/industry-sector-analysis?IndkeyNieir=23200&BMID=20

The extent of the freight and logistics task within the region is partially indicated by the gross value of imports and exports from industry sectors which contribute most heavily to it, as shown in Figure 6

and Figure 7. Of the industries listed this represents $7.1 billion in gross value of commodities moved.

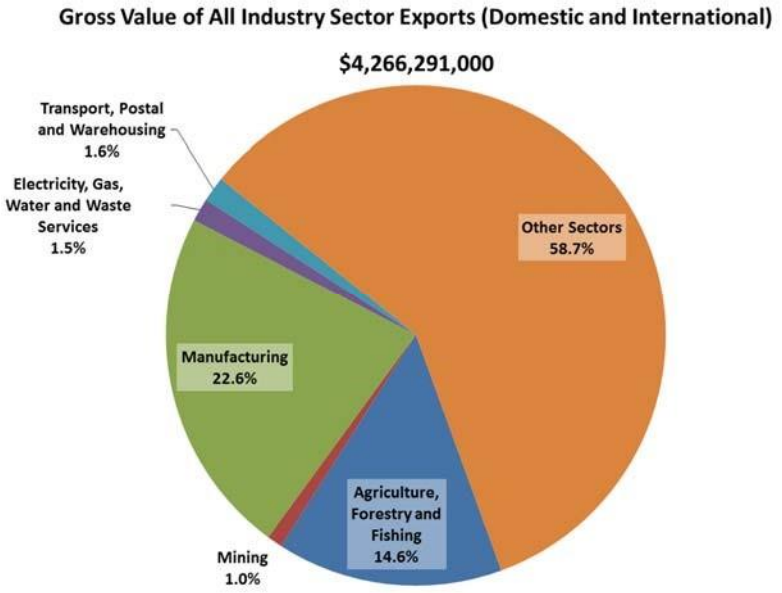


FIGURE 6: GROSS VALUE OF ALL INDUSTRY SECTOR EXPORTS, NORTHERN RIVERS REGION, 2014-15

Source: http://economy.id.com.au/rda-northern-rivers/industry-sector-analysis?IndkeyNieir=23200&BMID=20

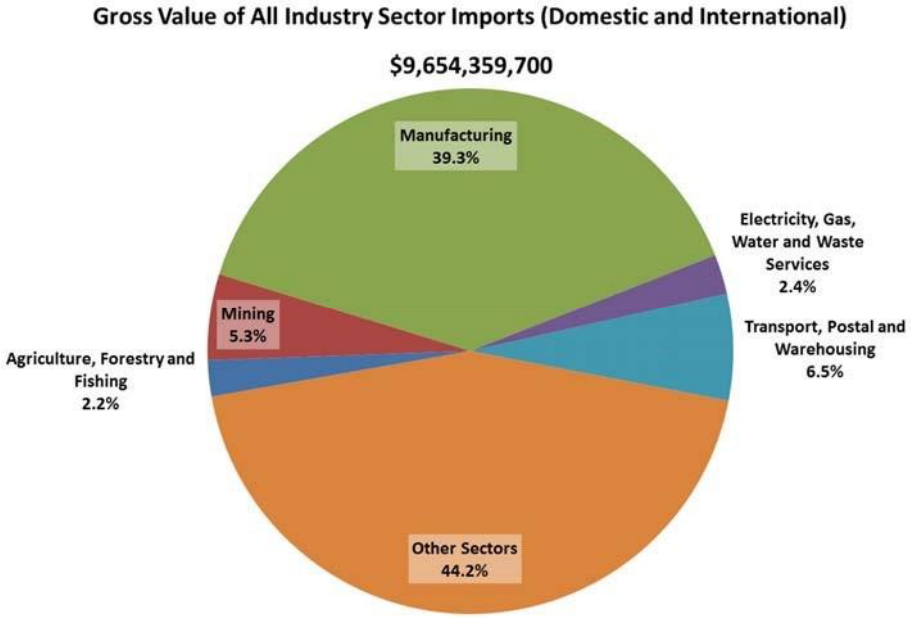


Figure 7: Gross Value of All Industry Sector Imports, Northern Rivers Region, 2014-15

Source: http://economy.id.com.au/rda-northern-rivers/industry-sector-analysis?IndkeyNieir=23200&BMID=20

AGRICULTURE PRODUCTS

In 2014-15, the agriculture, forestry and fishing industry represented $417 million to the regional economy, as shown in Figure 8. As a subset, agricultural products represented the single most valuable sector at $354 million.

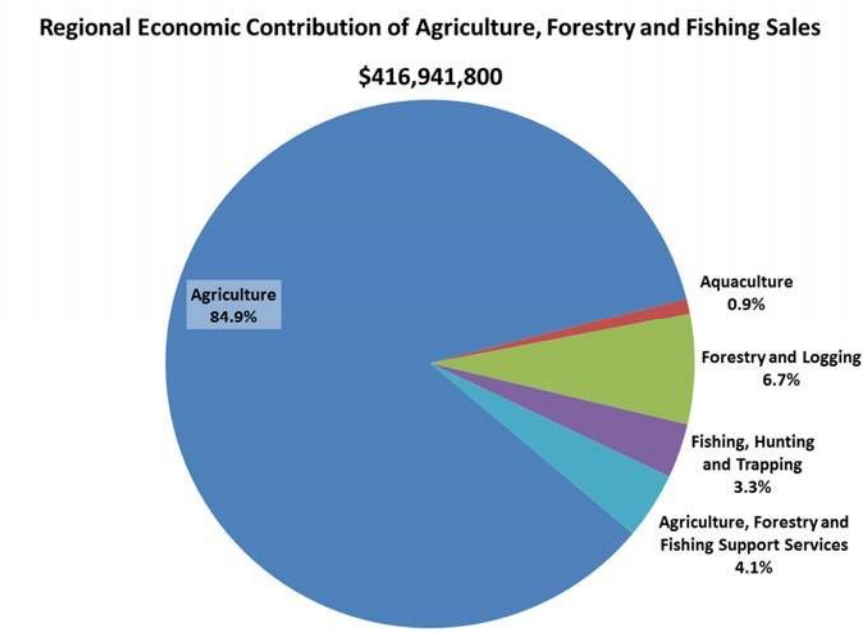


FIGURE 8: REGIONAL ECONOMIC CONTRIBUTION OF AGRICULTURE, FORESTRY AND FISHING SALES, NORTHERN RIVERS REGION, 2014-15

Source: http://economy.id.com.au/rda-northern-rivers/industry-sector-analysis?IndkeyNieir=23200&BMID=20

The major agriculture production activities within the Northern Rivers region can be broken down into a number of categories by production type. This includes broadacre crops, fruit and nuts, livestock and vegetables. In 2014-15, the single largest gross value category was livestock for slaughter and other disposals, followed by fruit and nuts as well as livestock products and broadacre crops, as shown in Figure 9.

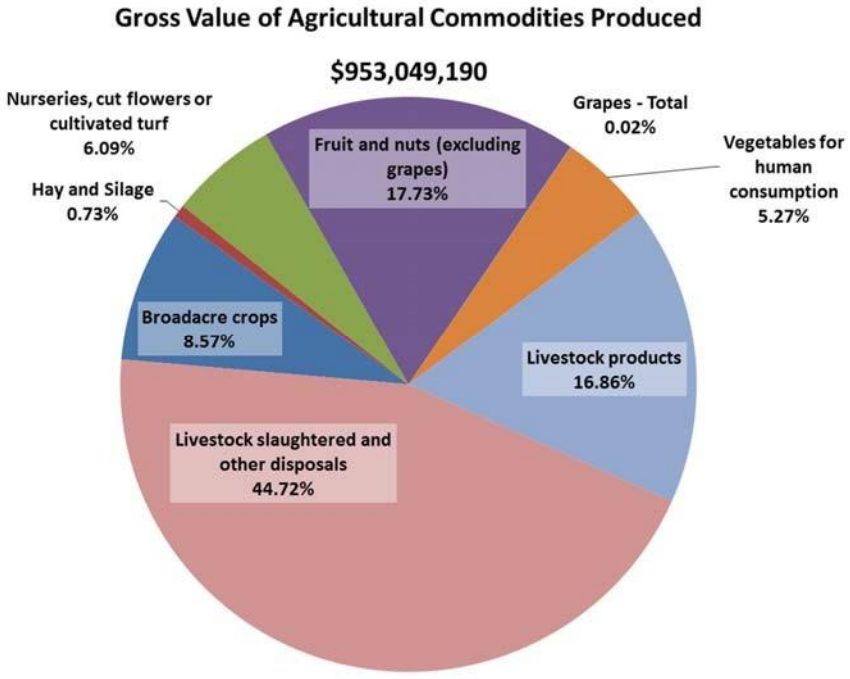


Figure 9: Gross Value of Agricultural Commodities Produced, Northern Rivers Region, 2014-15 Source: Australian Bureau of Statistics, 2016

Broadacre Crops

The region produces a number of broadacre crops, as shown in Figure 10 and Figure 11. This includes wheat, barley, grain sorghum, maize, triticale, oilseeds and sugar cane. Of these crops, sugar cane is a major land use and landscape feature in the Northern Rivers region. Sunshine Sugar is the trading name for the NSW Sugar Milling Co-operative Limited which operates three sugar mills in the Northern Rivers (at Condong, Broadwater and Harwood) as well as a refinery at Harwood. The NSW sugar industry occupies approximately 34,000 hectares of the Northern Rivers region. At the end of 2015, the NSW Sugar Milling Co-operative Limited crushed over 2.1 million tonnes of sugar cane, producing 254,877 tonnes of sugar (Australian Sugar Milling Council

(ASMC), 2016).

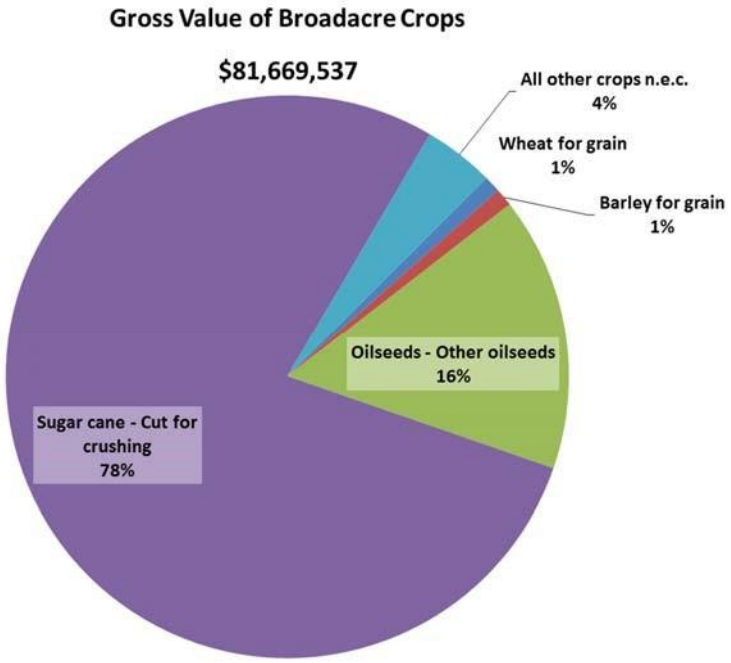


FIGURE 10: GROSS VALUE OF SELECTED BROADACRE CROPS, NORTHERN RIVERS REGION, 2014-15 SOURCE: AUSTRALIAN BUREAU OF STATISTICS, 2016

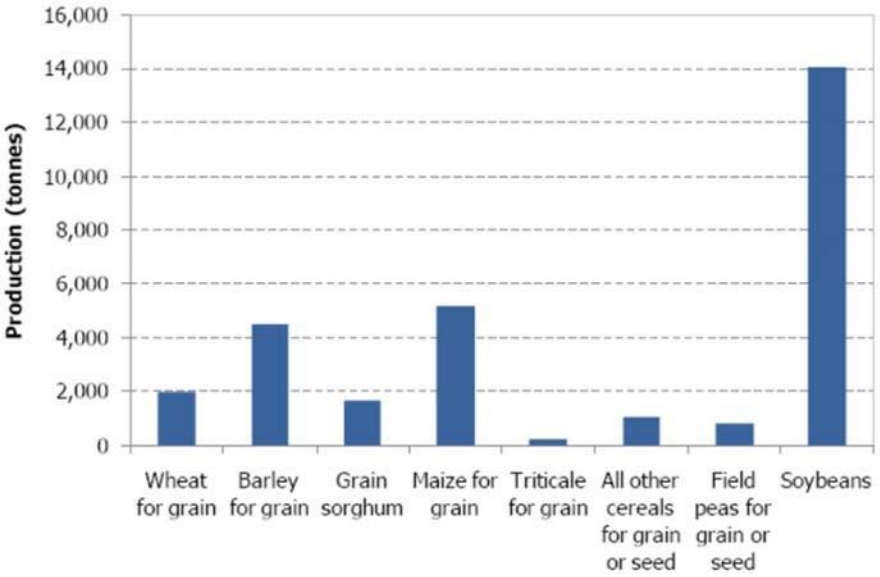


FIGURE 11: SELECTED CROP PRODUCTION, NORTHERN RIVERS REGION, 2008-09

Source: Regional Development Australia - Northern Rivers, 2011

It is estimated that there are 500 ha of coffee grown in the Northern Rivers region. The region's cool sub-tropical climate provides unique growing conditions for coffee beans, which are not affected by pests and can be allowed to grow naturally. The region is home to numerous brands of coffee including Zentvelds Coffee, Tuntable Estate Organic Coffee, Mackellar Range Coffee, Zoom Coffee and others. Madura and Koala Tea companies are also well established, and a number of boutique tea producers are emerging with an emphasis on health or specialty teas. English Breakfast, Earl Grey, spiced teas, herbed teas and special blends are all produced in the region.

Livestock and Livestock Products

Poultry (for eggs and meat), dairy cattle and meat cattle are the favoured types of livestock in the Northern Rivers region, as shown in Figure 12 and Figure 13. The dominance in value of beef production over other forms of livestock production sees the Northern Rivers region produce a significant amount of livestock products, such as beef and milk. The Northern Co-operative Meat Company has a large beef facility in Casino and a pork facility in Booyong, with pigs also representing a growing livestock category within the region. This processing company produces beef and pork products, primarily for export to Asia, Europe and the United States.

The Northern Rivers dairy industry is well supported by the high rainfall and lush pastures, which are a key factor in production of high quality milk and dairy products. A number of key dairy factories reside within the region and produce high quality milk products. Milk and ice cream production take place in the Northern Rivers region and produced 147 million litres of milk and 36 million litres of ice cream in 2009-10. Major customers include Fonterra, Parmalat, National

Foods as well as Coles, Sara Lee, Aldi, Woolworths and export customers.

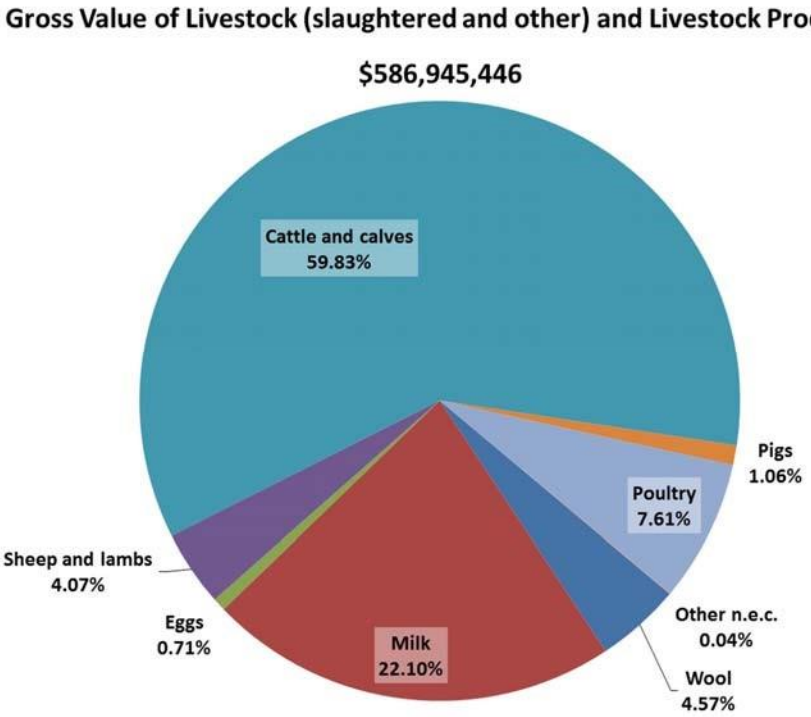


FIGURE 12: GROSS VALUE OF LIVESTOCK (SLAUGHTERED AND OTHER PURPOSES) AND LIVESTOCK PRODUCTS, NORTHERN RIVERS REGION, 2014-15

Source: Australian Bureau of Statistics, 2016

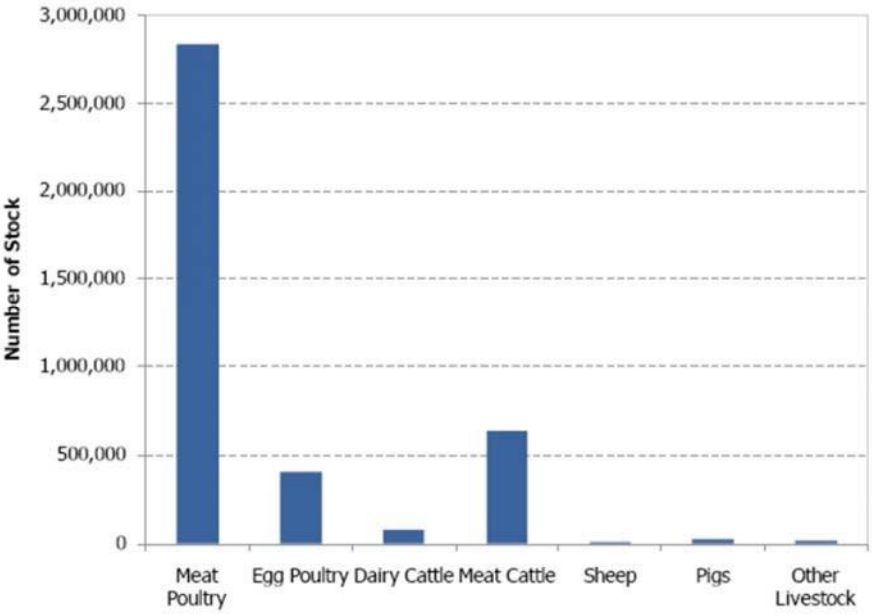


Figure 13: Livestock Numbers, Northern Rivers Region, 2008-09

Source: Regional Development Australia – Northern Rivers, 2011

Vegetables

The Northern Rivers is a major region for several vegetable crops. Nearly all of NSW's sweet potatoes, peas and ginger are produced within the region, as shown in Figure 14 and Figure 15. In addition, the region sees significant quantities of lettuce, tomatoes, beans, chillies, garlic, cucumber and herbs. The majority of products are export from the region or value-added locally.

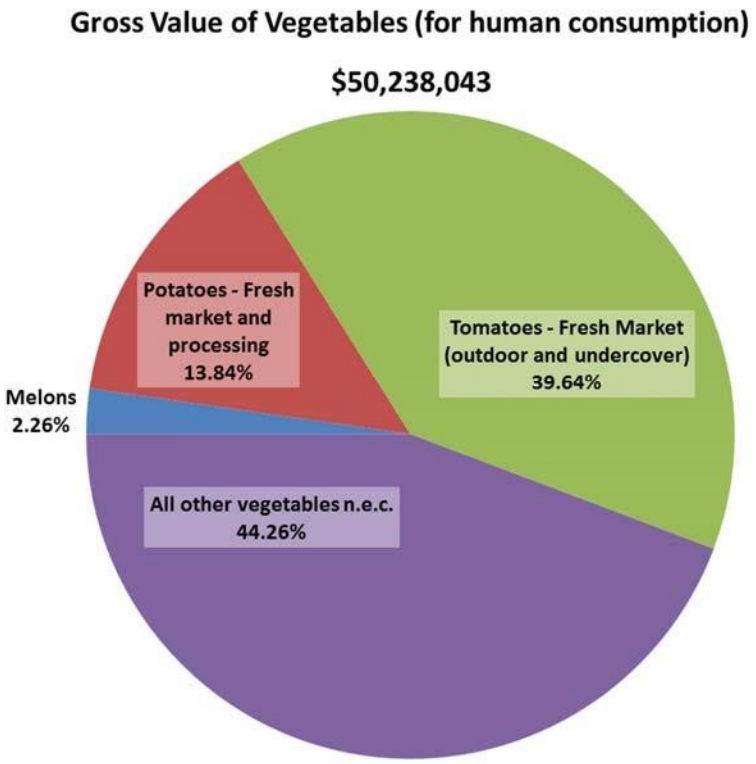


FIGURE 14: GROSS VALUE OF VEGETABLES (FOR HUMAN CONSUMPTION), NORTHERN RIVERS REGION, 2014-15

Source: Australian Bureau of Statistics, 2016

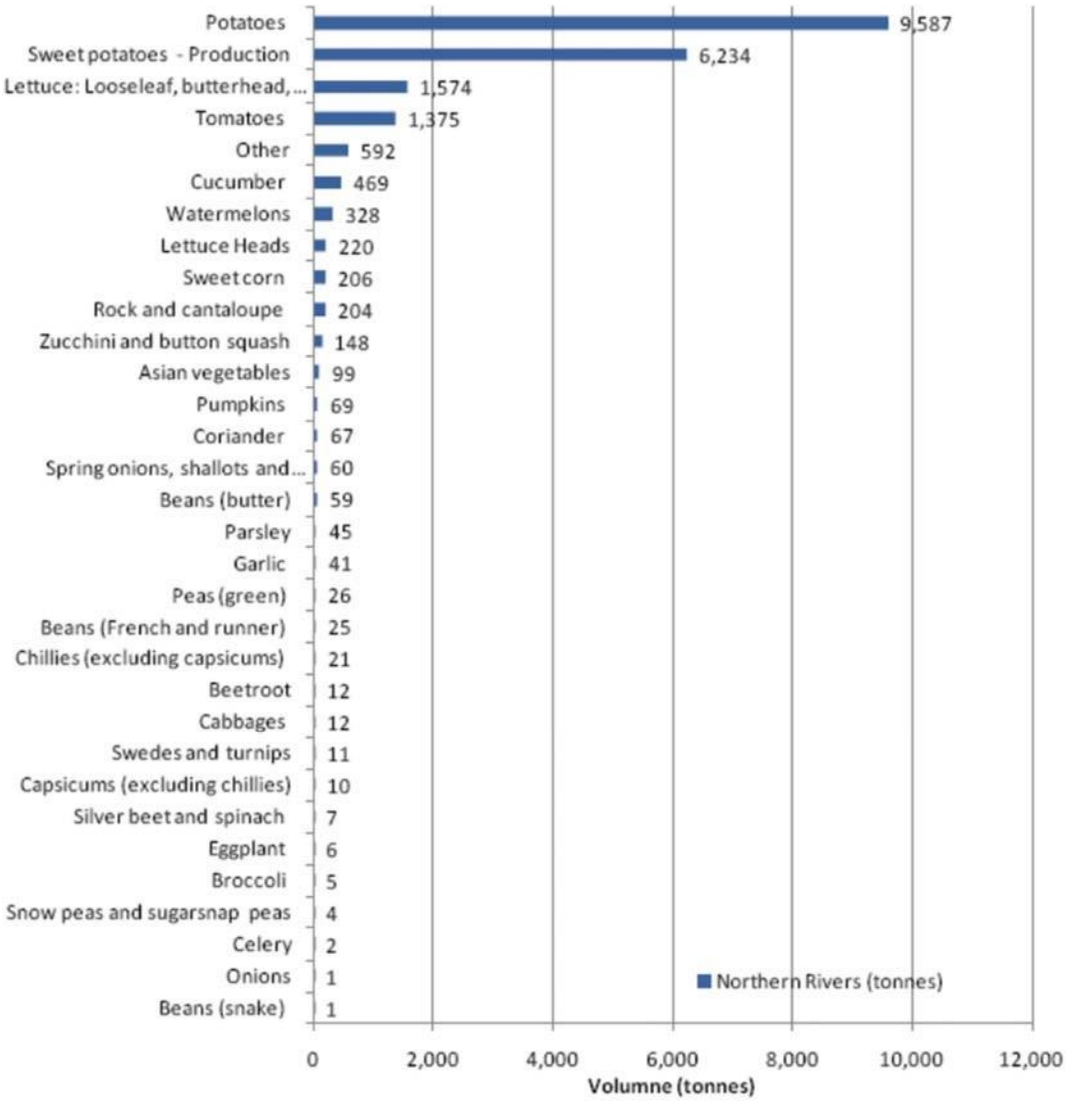


Figure 15: Vegetables for General Consumption, Northern Rivers Region, 2008-09

Source: Regional Development Australia - Northern Rivers, 2011

Fruits & Nuts

The Northern Rivers region is nationally significant for the production of several fruit and nut crops. The largest majority of macadamia nuts, blueberries and guavas produced in Australia are sourced from the Northern Rivers region, as shown in Figure 16 and Figure 17. In 2012, macadamia production reached 20,143 tonnes, a total economic value for the region of $193.5 million (Australian Macadamia Industry (AMS), 2012). The Northern Rivers region has five processing plants at Agrimac Macadamias and Macaz International both at Alstonville, Macadamias International Australia P/L at Dunoon, MPC (Macadamia Processing Company) at Alphadale and Pacific Farm Services at Brooklet. In addition, significant quantities of bananas, avocados, orchard fruits and berries are produced in the region, which is home to very unique products, such as finger limes, which cannot be grown in any other parts of Australia.

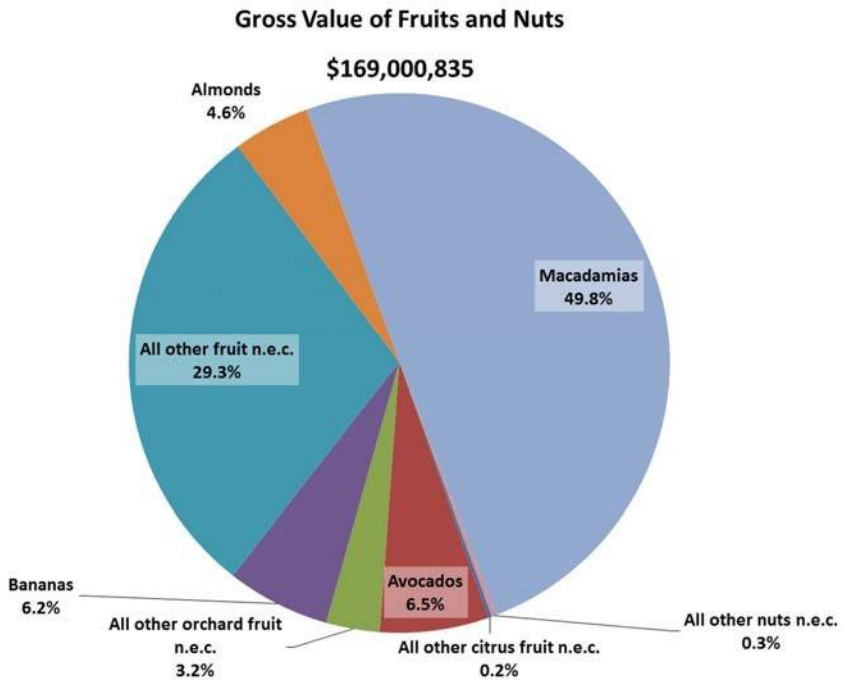


FIGURE 16: GROSS VALUE OF FRUITS AND NUTS, NORTHERN RIVERS REGION, 2014-15

Source: Australian Bureau of Statistics, 2016

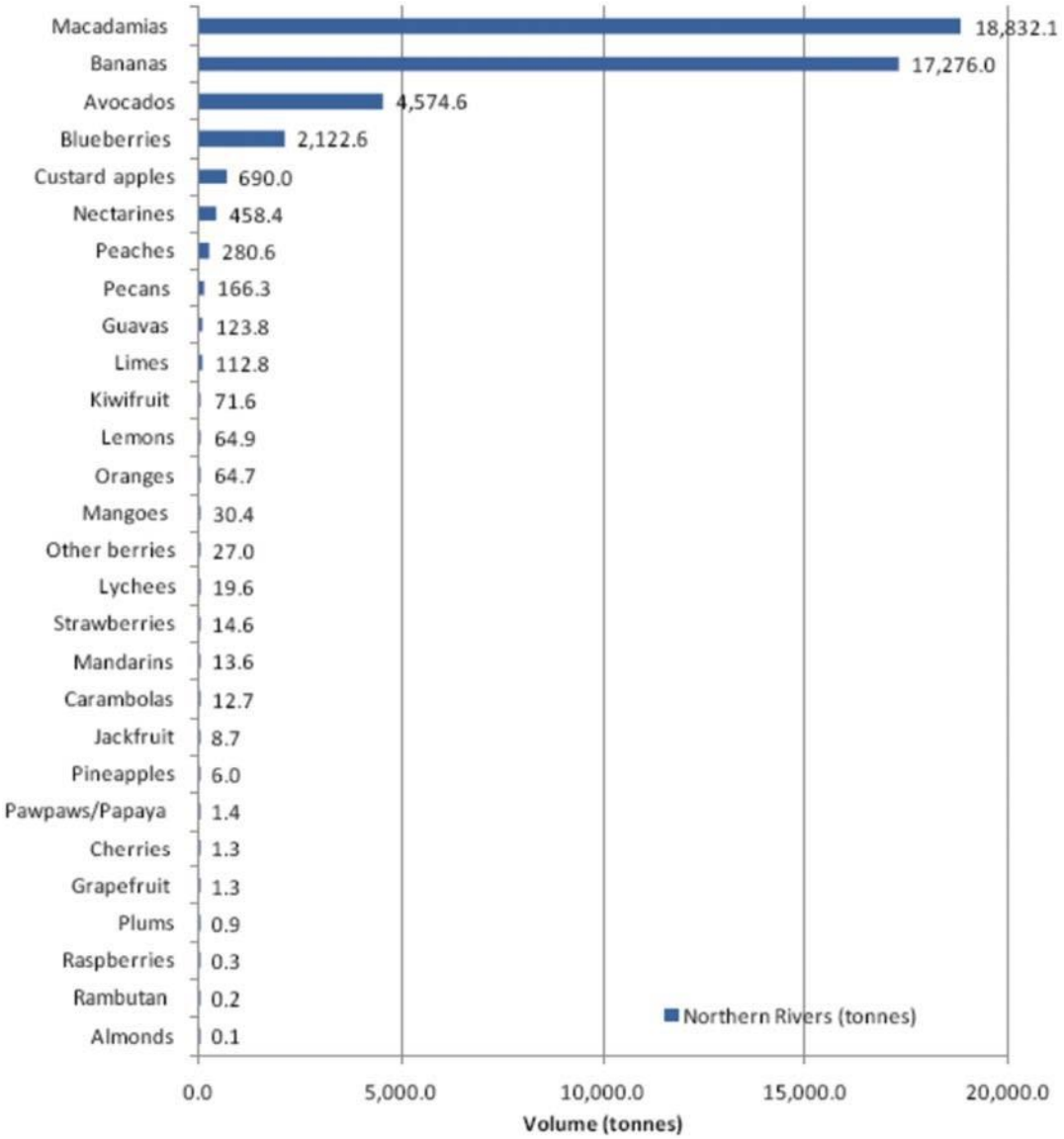


Figure 17: Fruit & Nut Production, Northern Rivers, 2008-09

Source: Regional Development Australia - Northern Rivers, 2011

MANUFACTURING PRODUCTS

In 2014-15, the manufacturing industry represented $611 million to the regional economy, as shown in Figure 18. Manufacturing activities include the processing of materials, substances or components into new products, whether self-produced or purchased. The materials, substances or components processed are raw materials that are products of agriculture, forestry, fishing and mining, or products of other manufacturing activities. This includes milk bottling and pasteurising, processing and canning or bottling, fresh fish packaging, leather tanning and dressing, wood preserving and treatment, and other textile manufacturing. As a subset, food and beverage products represented the single most valuable sector at $265 million, almost 44% of all manufacturing activity in the region.

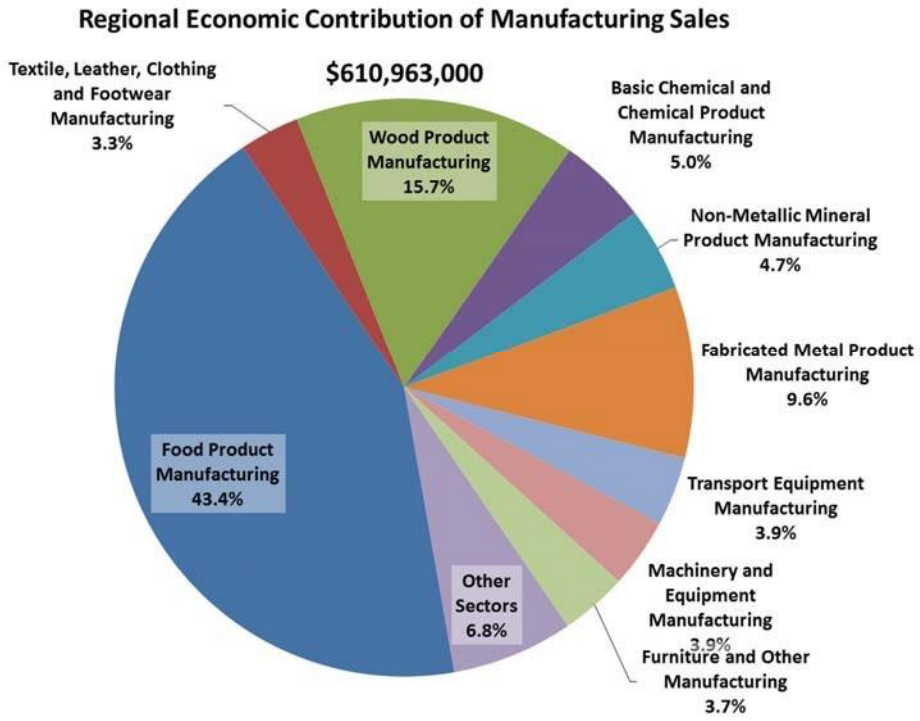
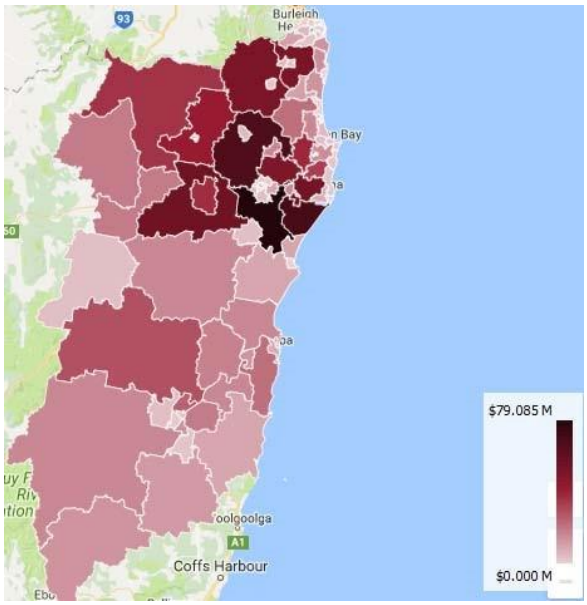


Figure 18: Regional Economic Contribution of Manufacturing Sales, Northern Rivers Region, 2014-15

Source: http://economy.id.com.au/rda-northern-rivers/industry-sector-analysis?IndkeyNieir=23200&BMID=20

INDUSTRY SPATIAL DISTRIBUTION

By virtue of gross revenue generated per sub-region, the greatest activity in the agriculture, forestry and fishing industries takes place in the northern areas of the region, as shown in Figure 19. This activity includes horticulture, livestock production, aquaculture, forestry and logging, and harvesting fish and other animals from farms or their natural habitats.



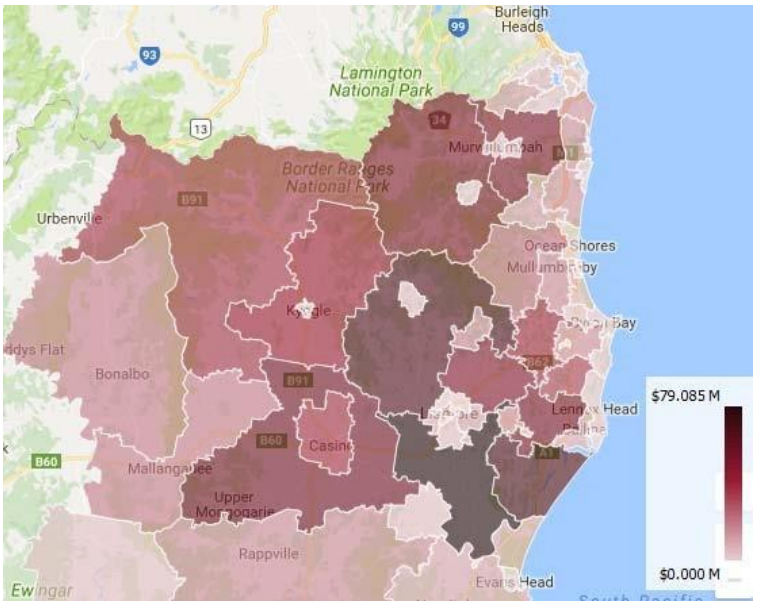


FIGURE 19: NORTHERN RIVERS REGION GROSS REVENUE GENERATED (AGRICULTURE, FORESTRY AND FISHING), 2015

Source: http://www.economicprofile.com.au/northernrivers/economy/output#geography

The greatest activity in manufacturing is largely centred in the vicinity of larger regional centres, as shown in Figure 20. Activity includes all forms of manufacturing outlined above.

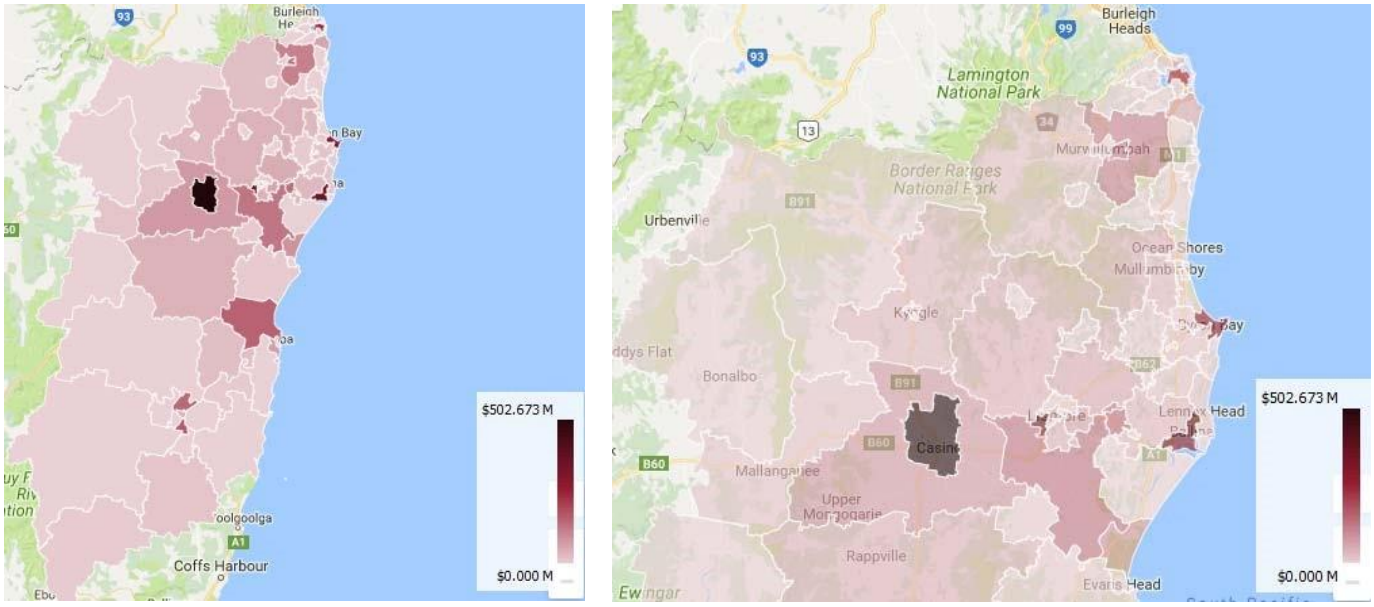


Figure 20: Northern Rivers Region Gross Revenue Generated (Manufacturing), 2015

Source: http://www.economicprofile.com.au/northernrivers/economy/output#geography

FREIGHT NETWORK OVERVIEW

Within the region are four major road corridors, two north-south links and two east-west links, as well as the main north-south rail corridor from Brisbane to Sydney/Melbourne, as shown in Figure 21. Any existing transport limitations would challenge industries in the region, affecting the delivery of raw materials and the export of finished products, particularly to markets and gateways in south-east Queensland.

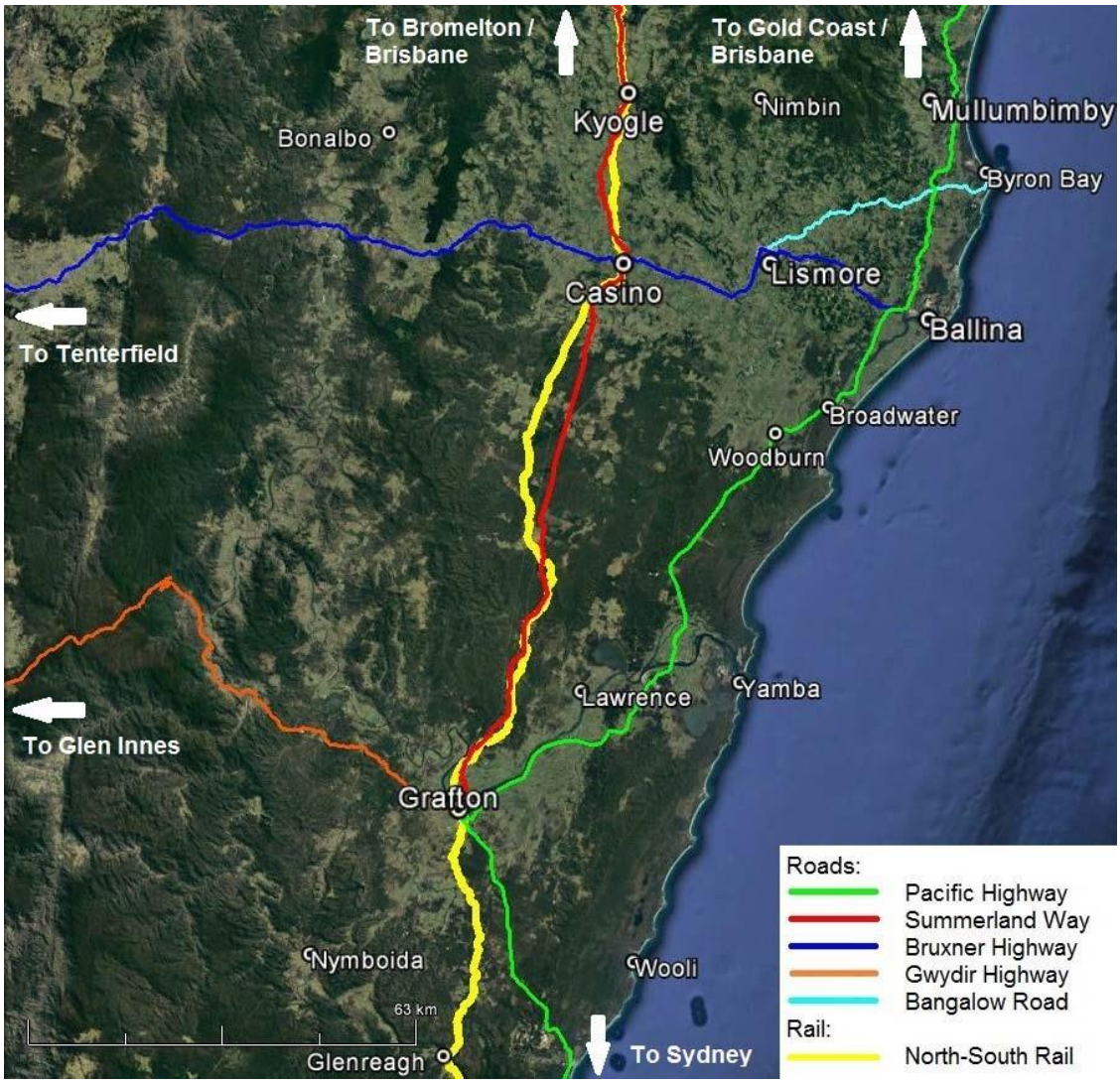


Figure 21: Northern Rivers Region major road and rail corridors

Source: Google Maps

ROADS

East-West Corridors

The main east-west links are the Bruxner Highway and the Gwydir Highway. The Bruxner Highway runs in the north of the region through Lismore and Casino to Tenterfield. It links the Pacific Highway near Ballina to Casino, after which it continues to the New England Highway at Tenterfield and further west to Boggabilla. The Lismore to Bangalow Road connects Lismore

with the Pacific Highway as an alternative to the Bruxner Highway, while at Casino the Summerland Way provides a connecting route to Grafton to the south and to the Queensland border and Brisbane via Kyogle to the north. The Gwydir Highway in the south of the region runs from Grafton to Glen Innes, Inverell and Moree. It links with the Pacific Highway and Summerland Way near South Grafton, after which it continues to the New England Highway at Glen Innes and further west through Moree. While both corridors play important roles as east–west regional freight routes, of the two links only the Gwydir Highway accepts up to 26 metre B-doubles on its full length between the New England Highway and the Pacific Highway (RMS 2009). This is due to mountainous terrain, steep grades, narrow pavements and the low speed, limited capacity single lane Tabulam Bridge on the Bruxner Highway west of Casino proving unsuitable for larger heavy vehicles. As a result, heavy vehicle traffic remains highest on the sections of the Bruxner highway between Casino and the Pacific Highway, reflecting the corridor's function of providing access to regional centres rather than serving as an inter-regional freight route. Therefore, the Gwydir Highway serves as the main freight B-double connection between the Pacific and New England Highways.

North-South Corridors

The main north-south road corridors are the Pacific Highway and the Summerland Way. The Pacific Highway runs in the east, largely parallel to the coastline, connecting Brisbane and Sydney through Grafton and Ballina. This is one of the busiest road corridors in Australia and the busiest within the region. It is currently undergoing major upgrade works aimed at increasing capacity from a two lane highway to a four lane divided road along the entire length of the highway. As of 31 May 2016, major sections between Woolgoolga and Ballina are either under construction or being prepared for construction (RMS 2016). The Summerland Way corridor, running in parallel and in-between the Pacific and New England Highways, extends from the Gwydir Highway and existing Pacific Highway at South Grafton to the Queensland border north of Woodenbong. As outlined above, this corridor provides important cross connectivity between the Pacific/Gwydir Highways at Grafton and the Bruxner Highway at Casino, giving a more direct southern connection to the Casino region and serving as an important detour route when the Pacific Highway is closed between Grafton and Ballina. While both the Pacific Highway and Summerland Way corridors play important roles as north–south regional freight routes, only the Pacific Highway accepts up to 26 metre B-doubles along the full length of its corridor, Summerland Way only accepting 26 metre B-doubles south of Kyogle. In conjunction with a lack of a viable east-west corridor for larger heavy vehicles west of Casino, this sees the Pacific Highway as the only feeder for heavy vehicles into the South-East Queensland growth areas from much of the Northern Rivers Region.

Traffic Volumes

The NSW Roads and Maritime Services collect traffic volume information from roadside traffic collection devices across the Northern Rivers region. This is shown in Table 1.

Table 1: Select Average Daily Traffic Counts (AADT), 2011

Highway	Location	Annual Average Daily Traffic (AADT)	Average Light Vehicles (AADT)	Percentage Light Vehicles	Average Heavy Vehicles (AADT)	Percentage Heavy Vehicles
Bangalow Road	South of Withers Street, Bexhill	8,686	8,078	93%	608	7%
Bruxner Highway	East of Bruxner Crescent, Goonellabah	27,611	26,507	96%	1,104	4%
	North of Schneiders Lane, Mckees Hill	5,640	5,132	91%	508	9%
	South of Bruxner Road, Tabulam	858	772	90%	86	10%
Gwydir Highway	East of Old Glen Innes Road, Waterview Heights	2,083	1,896	91%	187	9%
	North of Bristol Arms Road, Ramornie	806	669	83%	137	17%
Pacific Highway	East of Clarence Street, Cowper	7,784	6,072	78%	1,712	22%
	North of Banana Road, Woombah	7,657	5,972	78%	1,685	22%
	West of Plantation Drive, Ewingsdale	18,553	16,327	88%	2,226	12%
	South of Heritage Street, Chinderah	29,051	25,855	89%	3,196	11%
	North of Turf Street, Grafton	6,405	5,957	93%	448	7%
Summerland Way	South of Griffiths Avenue, Casino	3,433	3,021	88%	412	12%
	North of Omagh Road, Cedar Point	3,419	3,111	91%	308	9%
	South of Kunghur Street, Wiangaree	1,458	1,298	89%	160	11%

*All Days (AADT) - This includes volume from all days of the week with no exclusions for public holidays or weekends.

Source: http://www.rms.nsw.gov.au/about/corporate-publications/statistics/traffic-volumes/index.html

The high volumes of traffic on the northern end of the Pacific Highway points to the increasing congestion issues that are emerging in the Gold Coast portion of the corridor. The Gold Coast

corridor has been identified as one of the highest volumes of heavy vehicle and overall traffic in the national highway audits, as demonstrated in Figure 22 (Acil Allen Consulting, 2014).

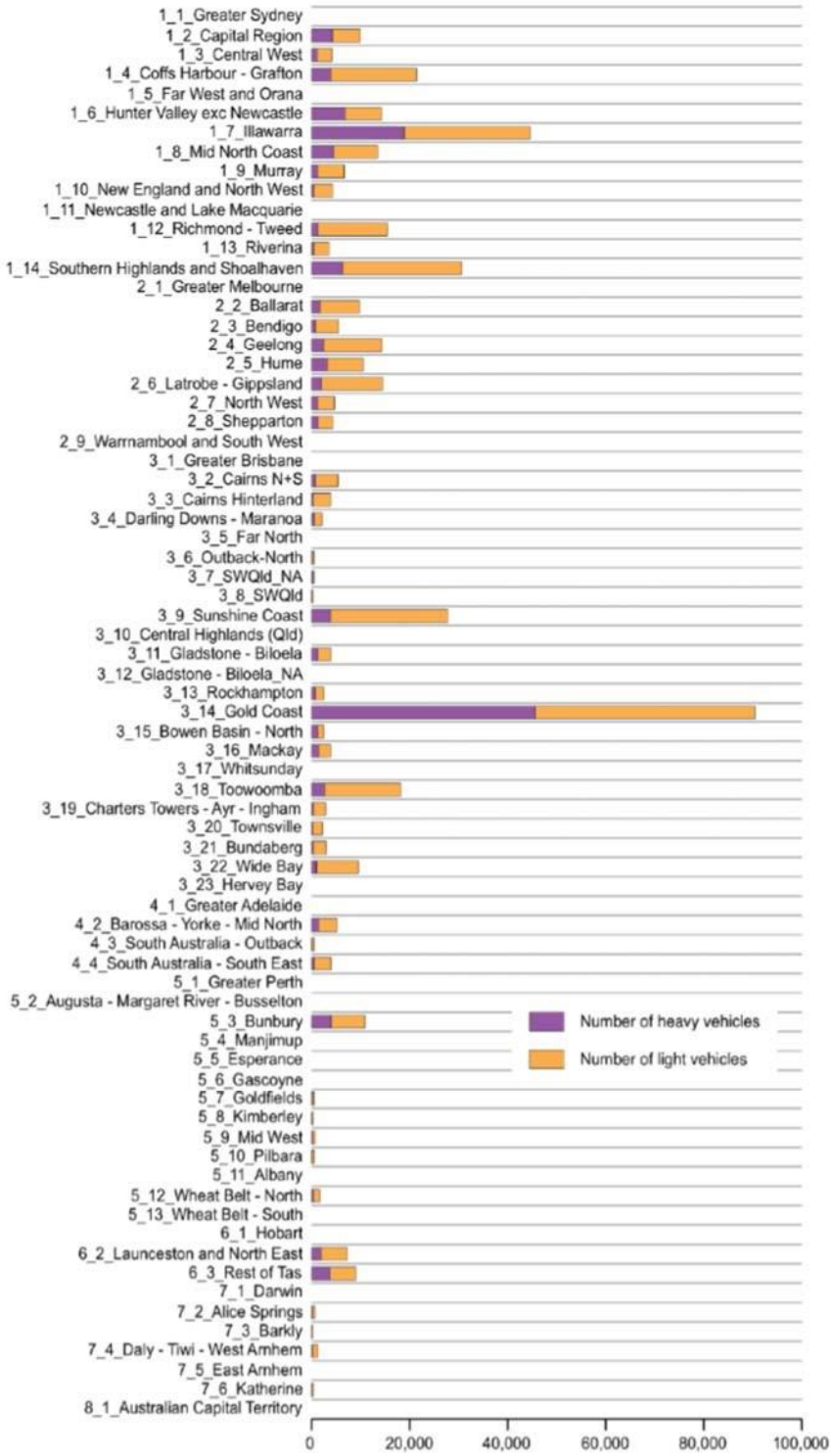


Figure 22: Number of vehicles per kilometre for the National Highway by audit region in 2010-11

Source: Acil Allen Consulting, 2014

RAIL

The main north-south rail corridor between Sydney and Brisbane runs through the Northern Rivers Region. The alignment of this corridor passes through Grafton, Casino and other towns such as Glenreagh and Kyogle. In 2005, 7 million tonnes of goods was estimated to traverse the corridor between Brisbane and Sydney (Australian Rail Track Corporation (ARTC), 2007). This standard gauge corridor is largely single track with multiple stations, passing loops, private sidings and support sidings between Glenreagh and the Queensland border. Due to corridor conditions, such as difficulty in gaining reliable train paths through metropolitan Sydney on the passenger network, trains using this alignment are limited to lengths of 1500 metres. The Northern Sydney Freight Corridor will improve access from Gosford to North Strathfield, but not increase the train length capability beyond 1500 metres.

In NSW there are six metropolitan intermodal terminals and 22 regional intermodal terminals (Transport for NSW, 2013a). Figure 23 shows the intermodal terminals in NSW, with the only designated intermodal terminal in the Northern Rivers being at Casino. This is a key intermodal terminal, providing the only facilities in the Northern Rivers in close proximity to Queensland, suitable for loading and unloading freight between road and rail. The terminal is shown in Figure 24. As of 2016, there are no existing operating intermodal terminals of any kind (bulk or containers) within 100 km of Casino (Casino Rail Freight Terminal Pty Ltd (CRFT), 2016).

Figure 23: Intermodal Terminals in NSW

Source: Transport for NSW, 2013a

Figure 24: Casino Intermodal Terminal

Source: Casino Rail Freight Terminal Pty Ltd (CRFT), 2016

The north south rail corridor into Queensland connects the Northern Rivers Region with the significant rail supply chain network in Brisbane and its western and southwestern hinterland, known as the scenic rim. Presently, the major intermodal terminal in Brisbane is Acacia Ridge, to

the south of Brisbane CBD and a key terminating point for the north south rail services from Sydney and Melbourne. Acacia Ridge is also connected to the Brisbane Multimodal Terminal at the Port of Brisbane via a dual standard and narrow gauge corridor which enables inbound containers to be sent by rail through to Sydney and Melbourne and outbound containers to be shipped from the Port of Brisbane. A shuttle service is planned to operate between the Port of Brisbane and Acacia Ridge to increase the mode share by rail into and out of the port.

While the Acacia Ridge terminal has sufficient capacity at present for both its interstate and intrastate freight task, increasing growth in freight volumes by rail and increasing congestion in the inner Brisbane region is beginning to shift longer term planning towards additional terminals in the west and southwest of Brisbane. An emerging intermodal terminal in this area that has close proximity with the Northern Rivers Region is at Bromelton, to the west of Beaudesert. The Bromelton Intermodal Terminal and industrial site is now a designated State Development Area (Figure 25) and is shaping to play an increasing role strategically in the southern Queensland freight distribution network. The terminal is located on the north south rail corridor from Sydney and in close proximity to the proposed inland rail corridor (Department of Transport and Main Roads, 2013). More recently, freight operator SCT has established an intermodal terminal to commence operation in 2017 and are considering utilising shuttle trains between the Port of Brisbane and Bromelton as a strategic addition to their current rail operation based within Brisbane.

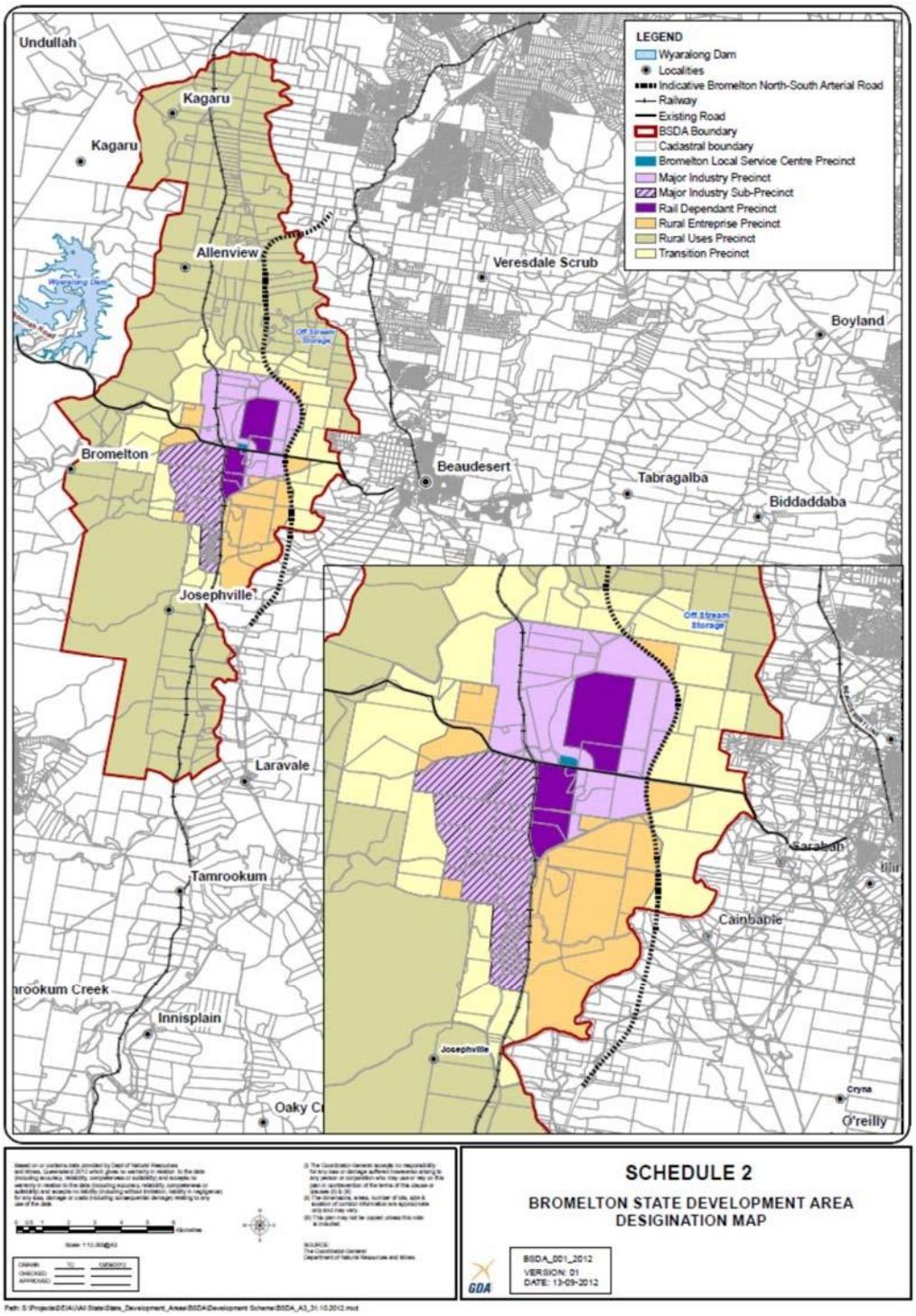


Figure 25: Bromelton State Development Area

Source: http://www.statedevelopment.qld.gov.au/coordinator-general/bromelton-sda-maps-and-precincts.html

EXPORT GATEWAYS

The Northern Rivers Region has access to a number of export gateways providing supply chain links beyond the states of NSW and Queensland and too overseas destinations. Amongst these are several important sea and airport facilities.

Sea Ports

Two sea ports are in reach of the Northern Rivers Region. The major seaport of Brisbane and the regional seaport of Yamba.

The Port of Brisbane is the third largest seaport in Australia, importing containers and exporting both bulk and containers, with the layout shown in Figure 26. In 2012 more than a million containers passed through the Port. Of these 1.5% of the containers exported via the Port originated from the Northern Rivers Region (Port of Brisbane, 2013), which in 2012 equated to 4656 standard twenty foot shipping containers (TEUs). Of these up to 10 TEUs of beef meat are transported daily from Casino's Northern Co-operative Meat Company Ltd to the Port of Brisbane for export.

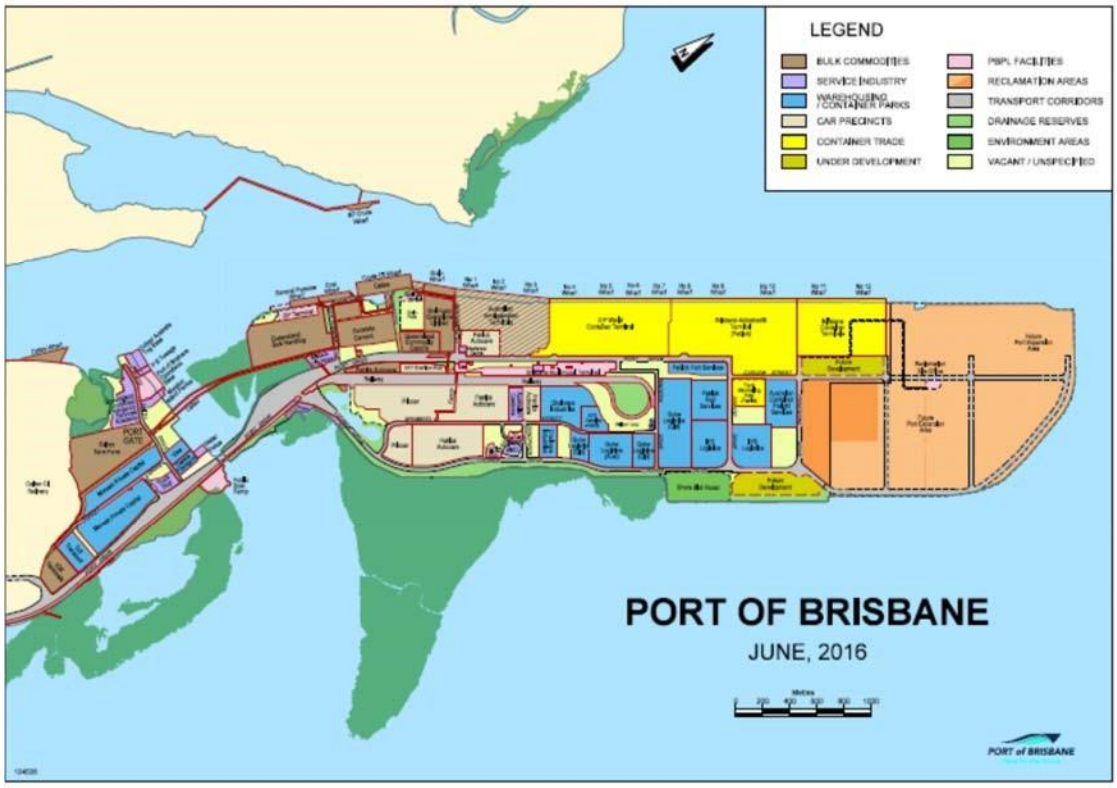


FIGURE 26: PORT OF BRISBANE LAYOUT

Source: Port of Brisbane, 2013

In the order of 95% of the container movements to and from the port are by road with 75% of the export containers packed within 100 kms of the port. The Port of Brisbane and Acacia Ridge

Intermodal Terminal in relation to rail and road network are shown in Figure 27.

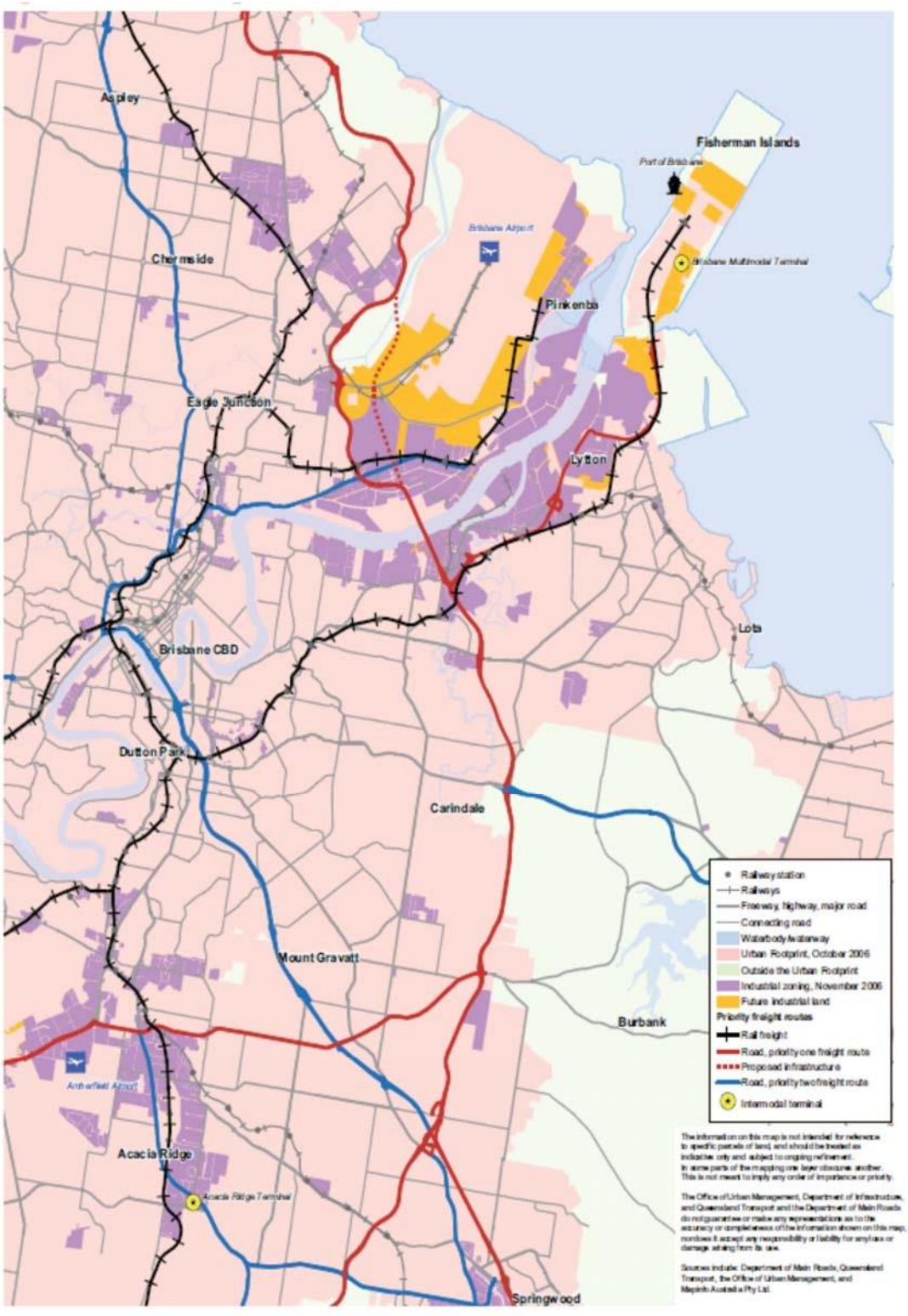


FIGURE 27: PORT OF BRISBANE AND ACACIA RIDGE INTERMODAL TERMINAL IN RELATION TO RAIL AND ROAD NETWORK SOURCE: QUEENSLAND TRANSPORT, 2009

However, there are a number of impediments and blockages in the Port's logistics chains, in particular road congestion and rail infrastructure connectivity within Brisbane, as demonstrated in Figure 28.

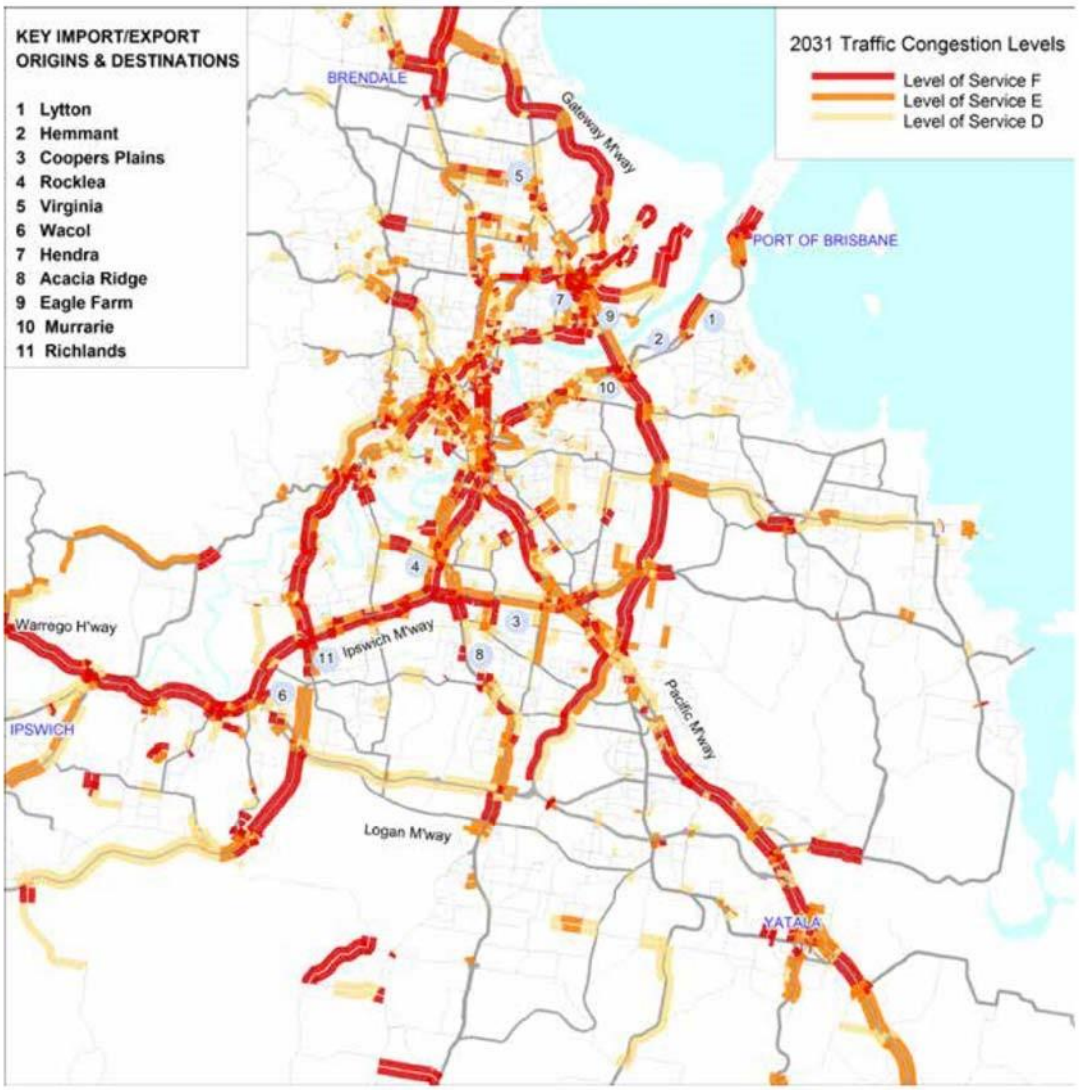


FIGURE 28: ACCESS TO PORT OF BRISBANE: ESTIMATED LEVEL OF SERVICE FOR BRISBANE AND ADJACENT REGIONS FOR 2031 SOURCE: PORT OF BRISBANE, 2013

The Port at Yamba, shown in Figure 29, handles approximately 12,000 tonnes of cargo per annum. Typically this is break bulk, exports consisting of timber (hardwood logs), treated poles, live animals, manufactured items, vehicles, kit houses, boats, explosives and general cargo; and imports consisting of timber products, kentia palm and baggage (Port of Yamba, 2016). There have been a number of proposals to expand the port, but these are not under consideration at this time.

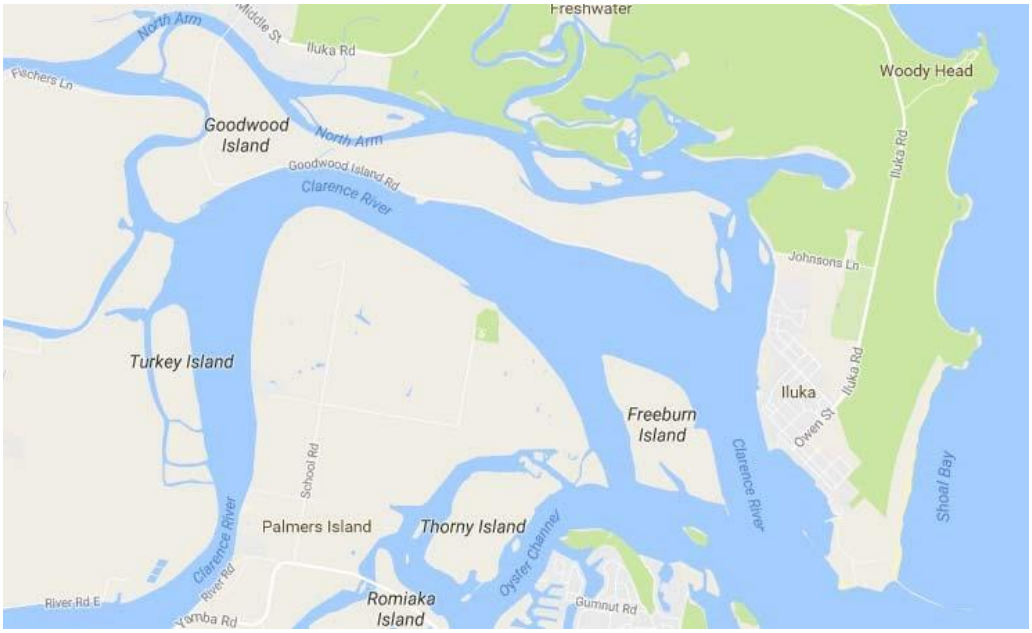


Figure 29: Port of Yamba

Source: Google maps

Airports

Major airport facilities with international reach are located at Brisbane, the Gold Coast and Wellcamp, as shown in Figure 30. Of these Wellcamp airport is the most recently development, situated to the west of Toowoomba, which is a privately developed airport that is now seeing regular weekly international freight services in wide bodied aircraft.

FIGURE 30: AIRPORTS WITH INTERNATIONAL CONNECTIONS

Source: Google Maps

Gold Coast Airport (GCA) patronage is growing at a significant rate, as demonstrated by Figure 31, though currently aircraft do not carry significant amounts of airfreight. The airport is beginning an expansion in its on ground operational capacity to enable a greater number of aircraft movements.

Patronage and economic benefit (NSI 2014) has been projected to double by 2030, however projections by the GCA operators anticipate patronage to increase almost three fold to 16 million passengers annually by 2031. The GCA master plan (GCAMP 2011) foreshadows the potential for growth in international freight as a spinoff of growing patronage from low cost carrier airlines, with wide bodied aircraft having the capacity to include freight to enhance their commercial returns. Figure 32 gives the projected increase in Direct Economic Contribution.

Figure 31: Fastest growing airports in Australia between 2010-11 and 2030-31 by total passenger movements (Source: Acil Allen Consulting, 2014)

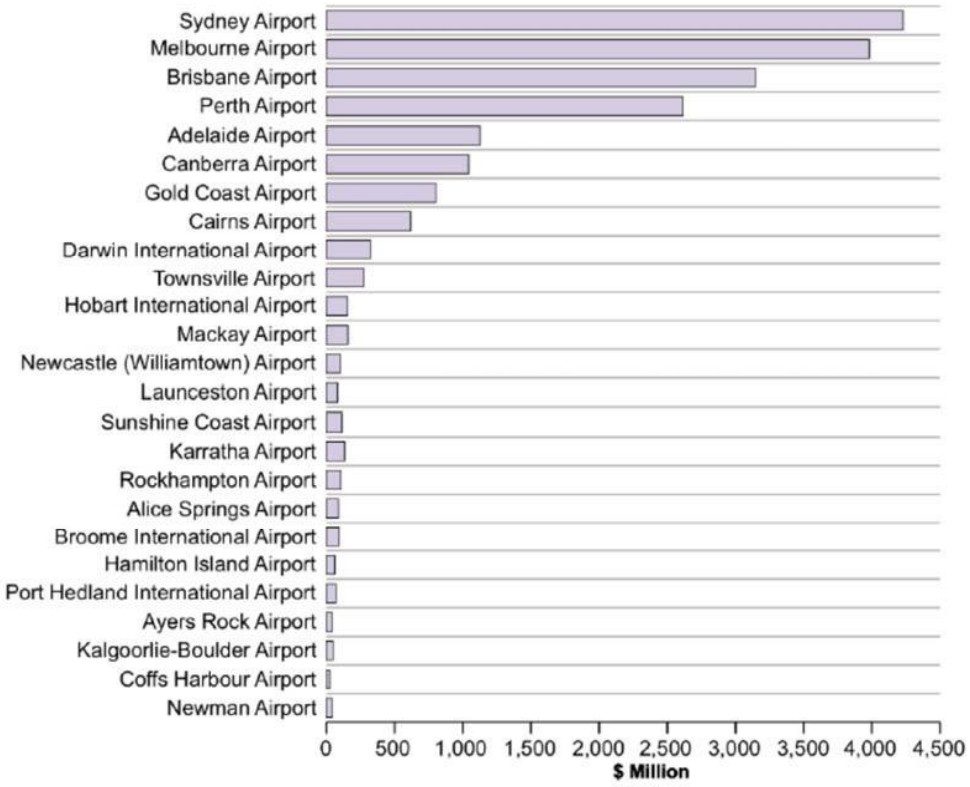


Figure 32: Projected increase in Direct Economic Contribution (DEC) between 2010-11 and 2030-31 for the 25 airports with the highest DEC in 2030-31 ($ millions, 2010-11 dollars)

(Source: Acil Allen Consulting, 2014)

SUPPLY CHAIN CHALLENGES, UPGRADES AND FUTURE OPPORTUNITIES

The transport network should be seamless, that is, it does not stop at local Council or state borders. This study therefore considers the linkages from the Northern Rivers region to South East Queensland, in addition to other locations with NSW, and international markets. Due to the location of the region, the shortest distance to ports and airports to export goods overseas is via Queensland. One of the specific actions for the Northern Rivers Region listed by Transport for NSW in their Northern Rivers Regional Transport Plan (Transport for NSW, 2013b) is that they will work with the Queensland Government on cross-border issues that relate to transport regulation and infrastructure that supports travel into South East Queensland.

The predicted future growth of the Gold Coast and its hinterland will likely impact on the ability for road freight to traverse the Pacific Highway into Brisbane distribution centres and further north, placing greater pressure on the Summerland Way and other routes as reliable alternate corridors for freight movements by road.

The Bridges for the Bush program is funding the replacement of the Tabulam Bridge increasing the capacity of the Bruxner Highway connecting to the New England, an important connection for the cattle being processed at the Casino meatworks. However, this route remains constrained by the tight curves on the Great Dividing Range.

Within and around the Northern Rivers region there exist a number of infrastructure improvements possibilities which can contribute to strengthening freight supply chains within the area, leading to an increase in both the volume and value of products produced through improved access to future and as yet currently untapped market demand.

The construction of the new intermodal terminal at Bromelton, within the scenic rim of Brisbane's southwest, provides an opportunity for the Northern Rivers region. Its location along the northsouth corridor connecting Sydney and Brisbane together with its status as one of South East Queensland's strategically located distribution and logistics centres gives Bromelton access to both the Brisbane market but also other intrastate, interstate and international markets. The gateways of Wellcamp Airport, Brisbane Airport, the Port of Brisbane as well as connection to the proposed inland rail corridor, which is shown in Figure 33Figure 33: , are key connections of importance to the Northern Rivers supply chain.

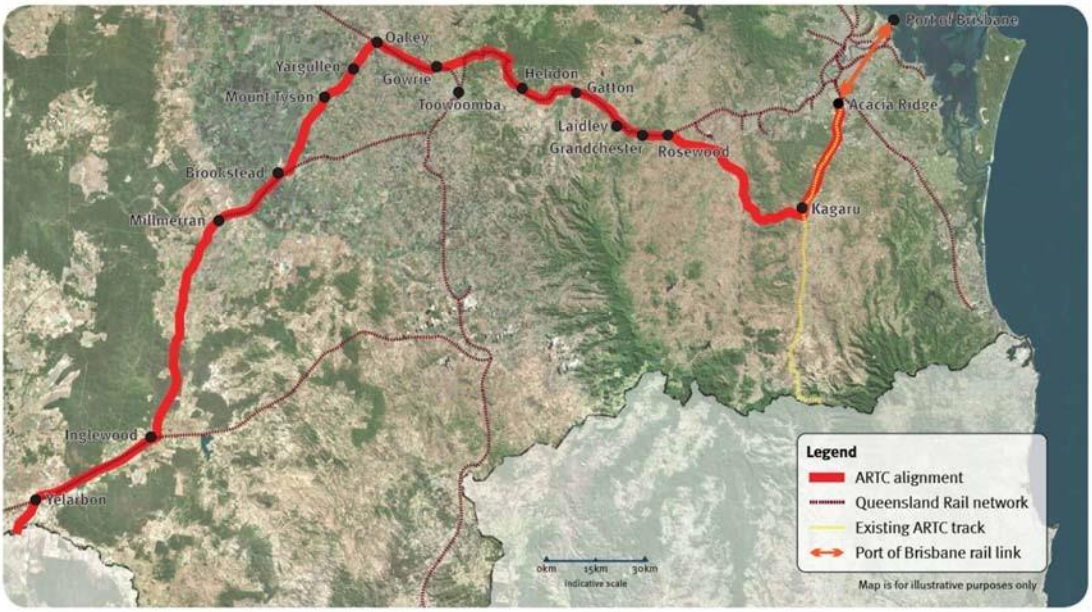


Figure 33: Indicative Inland Rail Alignment

Source: Department of Transport and Main Roads, 2013

The potential to operate a rail shuttle between the developing Casino intermodal terminal and the Bromelton intermodal terminal, providing a staging point for goods, enabling them to reach into the Brisbane and wider distribution freight networks, may provide an effective and realistic supply chain improvement option, given the difficult terrain in the Mt Lindsay area for improvements on the Summerland Way.

Within the Northern Rivers Region, improvements to local supply chain infrastructure to feed into the major trunk supply chain routes which connect to the Queensland and NSW markets requires

continuing improvement. As the supply of product increases with the demand, local roads are likely to become stretched in both durability and capacity. Innovative options are needed for ensuring effective and efficient supply chain from farm and manufacturing facility to reach the trunk supply chain nodes such as the Casino Intermodal Terminal.

A recent trend that provides an opportunity for the Northern Rivers Region is the significant growth in demand for shelf ready products in key international markets such as China. For agricultural products produced in the Northern Rivers to capture a greater share of these markets, this will likely require packaging within the region and quick transit for freight and export. The airport at Wellcamp, in part expected to serve as a major air freight hub for locally produced products such as chilled beef and other perishables, represents one of the first forays into facilitating a rapid supply chain for industries within surrounding regional areas, including the Northern Rivers.

As industries grow over time to meet this demand, it is anticipated that there will be greater demand and opportunity for utilising cargo capacity on international passenger flights at Gold Coast airport and Brisbane Airport to move goods rapidly to market. Within the Northern Rivers the potential for these type of rapid supply chain logistics operations could be a mix of all three gateways. This mix will be influenced by the supply chain effectiveness in reaching Wellcamp and Brisbane airport. Wellcamp appears to provide the best opportunity for shipping larger

quantities rapidly, whilst Brisbane and Gold Coast airports provide the opportunity for smaller consignments. Access to the Gold Coast Airport is less likely than Brisbane Airport to be hampered by congestion over the next 10 years, however any future improvements to Brisbane airport freight supply chains may reduce any reliability and time disadvantage.

OTHER FREIGHT STUDIES AND POLICY CONTEXT

The Northern Rivers region is at a significant disadvantage with regard to freight network planning and the associated economic impacts, as no freight study has been conducted for this region. A number of adjacent regions have already conducted freight studies, including Northern Inland Region NSW in November 2012, Central West in November 2014, and the Mid North Coast Region

NSW 2015-2016, all of which were for the Regional Development Australia (RDA).

Freight Studies reviewed in developing this scoping study report included, but was not limited to,:

- Northern Inland Region NSW: November 2012
- Mid North Coast Region NSW: 2015-2016
- Central West NSW: November 2014
- Riverina Region NSW: June 2014
- Gippsland Region Victoria: June 2013
- South East Queensland: January 2009
- Hume Region Victoria: April 2013
- Western Australian Regional Freight Transport Network Plan: 2012
- Casino Intermodal Submission: March 2016
- Containerised Cargo Demand Assessment Northern NSW: September 2015

The National Guidelines for Transport System Management in Australia (Australian Transport Council, 2006) provides an approach and national standard for strategic planning and appraisal of transport initiatives, and has therefore been utilised when developing the methodology for the larger study. In addition, relevant AUSTROADS guidelines and reports were consulted, such as Freight Task Industry Stakeholder Assessment (Austroads, 2009b), Identification of a Risk Indicator to Support 'Life Line' Freight Routes (Austroads, 2016) and the Guide to Project Evaluation (Austroads, 2009a).

Relevant local, state and national planning instruments that will be considered in the larger study include, but are not limited to:

- NSW 10 Year State Plan, NSW Government, 2011
- Rebuilding NSW: State Infrastructure Strategy, NSW Government, 2014
- NSW Long Term Transport Master Plan, Transport for NSW, 2012
- Northern Rivers Regional Transport Plan, Transport for NSW, 2013b
- NSW Freight and Port Strategy, Transport for NSW, 2013a

- National Land Freight Strategy, Standing Council on Transport and Infrastructure, 2012
- National Ports Strategy, National Transport Commission (NTC), 2010
- Infrastructure Report Card – NSW, Engineers Australia (EA), 2010
- Australian Infrastructure Audit, Infrastructure Australia, 2015
- NSW Economic Development Framework, NSW Department of Trade and Investment, 2014
- Economic Development Strategy for Regional NSW, NSW Department of Trade and Investment, 2015
- Northern Rivers Regional Action Plan (RAP), NSW Department of Premier and Cabinet, 2012
- Northern Rivers Regional Plan, Regional Development Australia - Northern Rivers, 2013

With respect to the Transport for NSW planning documents, NSW Long Term Transport Master Plan sets the strategic direction for transport in the state, while the Northern Rivers Regional Transport Plan provides more detail for the region. These link to other plans, including NSW 2021 and the Northern Rivers Regional Action Plan (RAP), as shown in Figure 34.

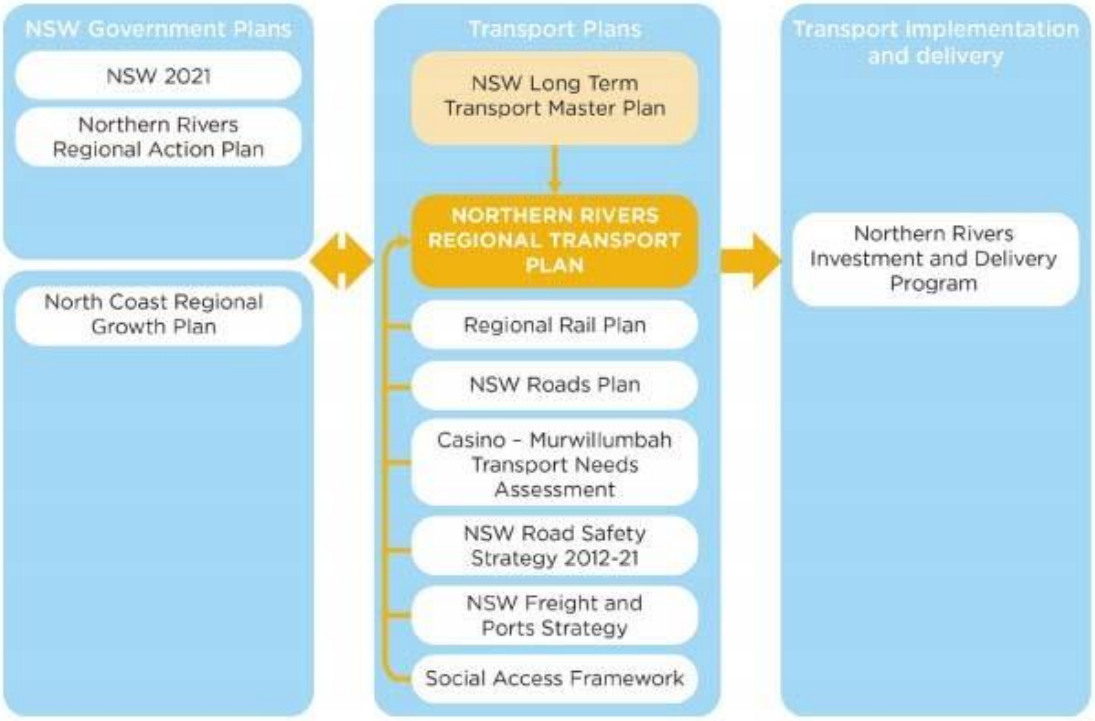


Figure 34: Interrelationship of Transport for NSW Plans

(Source: Transport for NSW, 2013b)

PROPOSED METHODOLOGY

PROCESS OUTLINE

The National Guidelines for Transport System Management in Australia (Australian Transport Council, 2006) detail the steps for a "top down" multi-phase strategic approach to transport system management to achieve desired transport system objectives. This approach is complemented by "bottom up" information and feedback, to ensure that strategic thinking is informed by practical lower level information. The broad steps in the Framework are shown in Figure 35.

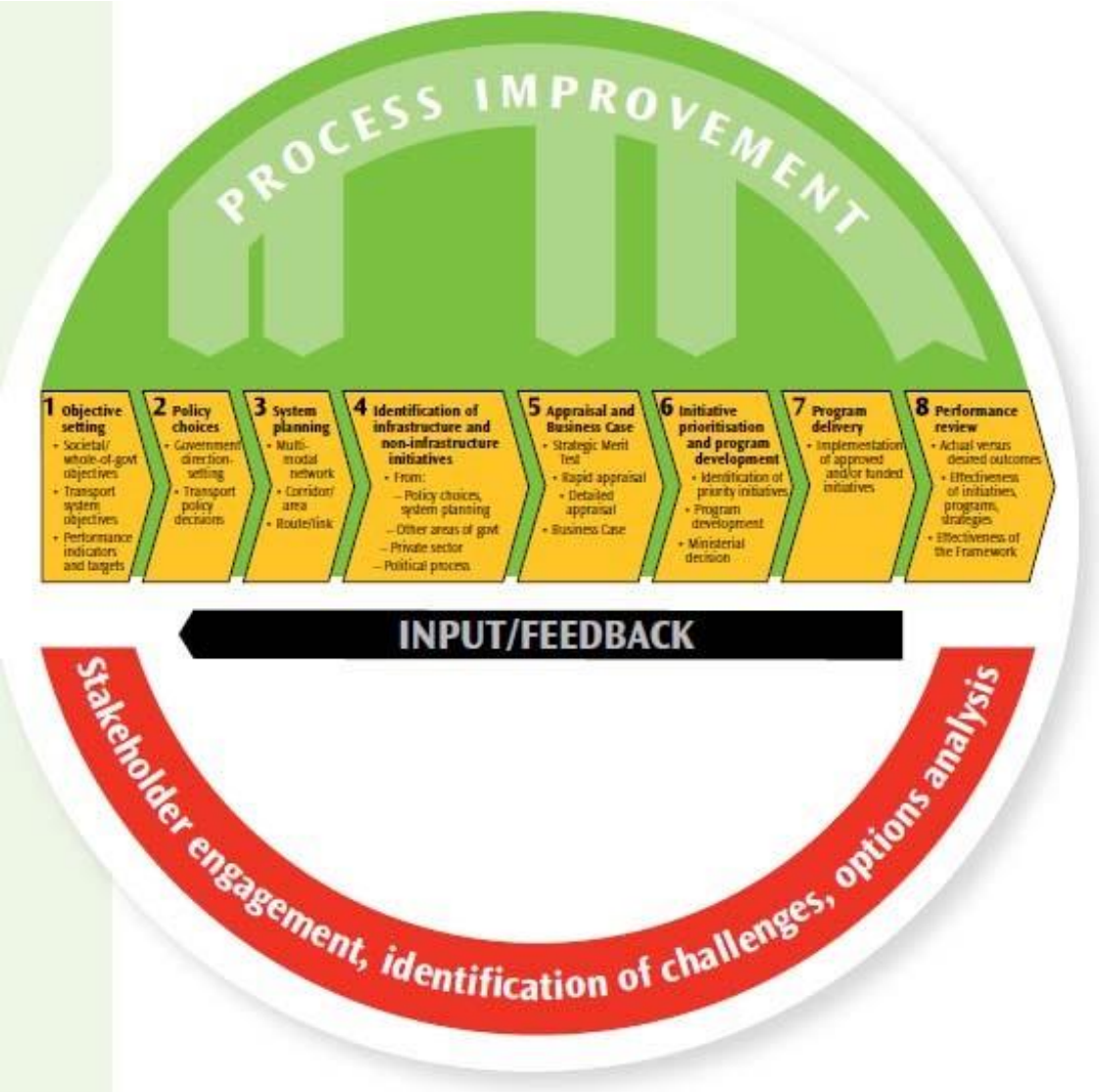


Figure 35: Transport System Management Framework

(Source: Australian Transport Council, 2006)

Stages 3 to 6 in the Transport System Management Framework in Figure 35 relate to the process to identify deficiencies in the network, develop initiatives, appraise these initiatives and prioritise the projects. These are the broad steps proposed for the larger study. The other stages in the Transport System Management Framework relate to the objectives, which have initiated the study, and the actual implementation of the selected projects, which would be undertaken by government, and is beyond the scope of the study.

Thus the basic process proposed for the larger study on the freight network in the Northern Rivers NSW is comprised of four steps:

1. Identify network and system deficiencies, including conduct in depth consultation with stakeholders
2. Determine a list of potential projects for the transportation network
3. Quantify the potential benefits and costs of the projects
4. Determine project priorities and rankings based on a weighted criteria

The outcome of Step 1 would be to conduct a network assessment and establish the deficiencies within the current freight network. The entire transportation network would be considered from a multi-modal perspective, including road, rail, airport and port connections. This assessment would be undertaken through a combination of studies and extensive stakeholder engagement. Data collection and analysis will be required to provide essential inputs into this stage.

Prior to deciding on potential improvements, it is essential that existing state of the network is understood, including:

- Current freight travel patterns and traffic conditions
- A physical inventory of the network
- Consultation with stakeholders
- An established the set of objectives, based on client and government aims

The consultation process would give an enhanced appreciation of the influences on the freight task, thus enabling Step 1 to guide the identification of individual initiatives in Step 2.

As part of identifying transportation network impediments to business and industry in the region, Step 1 would also involve supply chain mapping. Supply chain mapping is the process of accounting for the materials, processes and shipments involved in bringing goods to market. Supply chain mapping would ensure that the freight of raw materials and associated inputs to the production process of goods are considered, in addition to the freight associated with moving the assembled product to its destination. For example, considering the freight containing livestock entering a meat processing facility, as well as the freight leaving the facility with the products for market. Issues such as cold chains or cool chains, which are temperature-controlled supply chains, would be considered during this step.

Step 2 addresses the recognised network deficiencies from Step 1 by identifying potential solutions to these issues. There may be more than one solution to any particular issue, thus a list of potential projects which would improve the freight network to, from and within the Northern Rivers NSW will be developed. The outcome will be a range of initiatives that can

potentially address transport challenges and contribute to achieving transport system objectives. These initiatives would be considered as part of overall network strategies.

When developing the options, there are a number of ways of improving the network and dealing with a transport challenge. The infrastructure investment options are one of a number of different mechanisms by which improvements might be made. The process should consider the full range of potential solutions or options, beyond the narrow focus on infrastructure provision or a single mode (such as roads).

The Australian Transport Council (2006, Volume 1) lists the broad options as:

- Status quo: do nothing or no action required.
- Use existing transport system in a different way or more efficiently.
- Modify or add to existing transport system with new infrastructure, modified service or regulations.
- Alter proposed transport task in conjunction with another option.
- Technological solution.
- Organisational or process change.
- Education and information provision.

In Step 3, the benefits and costs of the identified potential projects are quantified. Benefits can include aspects such as time savings, reduced vehicle operating costs, environmental impacts and safety impacts. To enable an evaluation to consider as wider range of factors as possible, it should account for the 'triple bottom line' of social, environmental and economic factors. An evaluation should consider all relevant issues, not just those which are easily measured.

Both the Australian Transport Council (2006) and Austroads, in their Guide to Project Evaluation (Austroads, 2009a), recommend a 3 phase filtering system for the appraisal of identified transport initiatives:

- *Strategic Merit Test:* first-order determination of the 'strategic fit' of a proposed initiative with transport system objectives, to ensure alternatives assessed against project purpose and align with broader objectives and policies.
- *Rapid Appraisal:* broad-brush quantitative assessment to eliminate proposals. A preliminary comparative analysis of cost effectiveness based on preliminary concept level cost estimates, and initial assessment against project purpose and other criteria.
- *Detailed Appraisal:* comprehensive analysis of the impacts and overall merit. The preferred options(s) are subject to detailed evaluation based on benefits and costs and assessment of other potential project impacts. The results are presented in a business case for the recommended solution.

Benefit Cost Analysis (BCA) plays a key role in the appraisal system, however perceived limitations of BCA has led to the development of modified approaches such as complementary techniques, which facilitates better analysis and presentation of non-monetised information, and adjusted BCA, which extends conventional BCA by incorporating predetermined weights for objectives (Australian Transport Council, 2006).

As part of the process of quantifying the benefits of the options, the future transportation demand resulting from changes to the network would need to be predicted. The techniques for forecasting travel demand would be utilised. The four step process in shown in Figure 36.

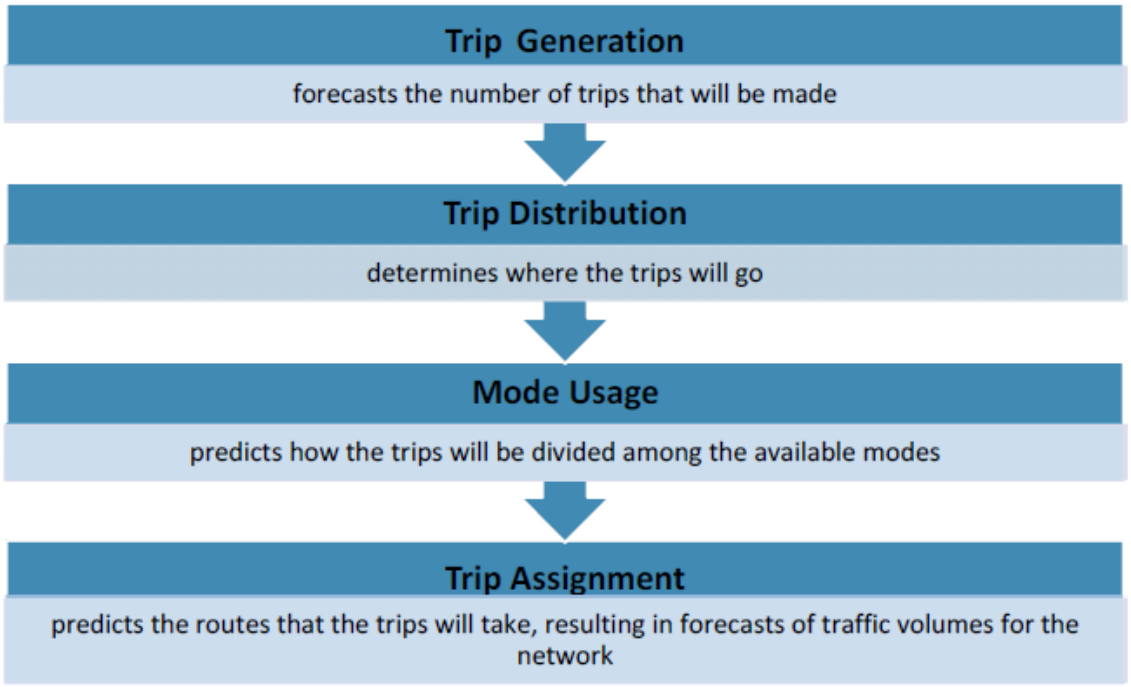


Figure 36: Four Step Process for Travel Demand Forecasting

This process could be used in conjunction with the stakeholder consultations to predict the future usage of the freight network by business and industry in the region after the implementation of identified options.

Step 4 is the prioritisation of the projects, with a weighted criteria used to as mechanism for ranking potential projects. This final stage would result in the information that the decision-maker requires for a fully informed decision on the network improvements represent the best investment. It enables a comparison of the projects, to provide a means by which prioritised initiatives can be converted into a potential program of projects that can be funded with the resources available. The study would not identify sources of potential funding, however the results from the study would inform decision making processes regarding the transportation network improvements.

Several aspects of these steps are discussed further in more detail in the following sections.

STAKEHOLDERS

As part of the study, substantial in depth consultation would be conducted with stakeholders. This includes industries within the region, Local Councils, and State Government agencies to identify deficiencies and potential improvements to the freight network, including road, rail, airport and port connections. The emphasis within this part of the process is on supply chain obstacles and corresponding solutions which would enable further development and expansion of the industries and businesses in the region. This would give an enhanced appreciation of the nature of the specific influences on the freight task in the region.

When conducting a stakeholder consolation process in the freight industry, Austroads (2009b) recommends mapping out the industries potentially involved and their likely decision makers, considering shippers and receivers as well as carrier views. Also recommended is that transport industry associations and freight councils provide a good initial contacts for identifying who should be consulted.

Therefore in addition to individual businesses, contacting organisations such as Northern Rivers Food would provide important opportunities to reach a large number of smaller businesses within the region. Northern Rivers Food is a group of growers, food artisans, manufacturers, restaurateurs, retailers and distributors who are working together to facilitate the development, growth and sustainability of the food businesses in the Northern Rivers. Members of Northern Rivers Food are food businesses which are primarily located in the Northern Rivers region.

Austroads (2009b) reports that a good stakeholder engagement processes should be based on continuity, targeting, appropriate timeliness, transparency, consistency and flexibility. The engagement strategy for the larger freight study would need to be designed and prepared at a detailed level to ensure it is the best way to engage with stakeholders and achieve the study's objectives. The right approach will be dependent on the specific stakeholders, and according to

Austroads (2009b):

- the strategic objectives
- the desired engagement approach
- maturity of the issue
- stakeholders' expectations
- the appropriate level of engagement (e.g. CEO level or technical policy input)
- available resources
- the magnitude of change being sought.

In this case the study could be of significant benefit to the industry stakeholders, as it would provide businesses in the region a mechanism by which they can have direct input into the formulation of a freight network, so it would be important to engage the representatives by conveying the benefits in their participation to them initially. It should be noted that individual businesses could be reluctant to provide data they feel is commercially sensitive. Assurances regarding maintaining confidentiality and aggregation of data would be important in this instance. There are three types of stakeholders identified by Austroads (2009b), as shown in Figure 37.

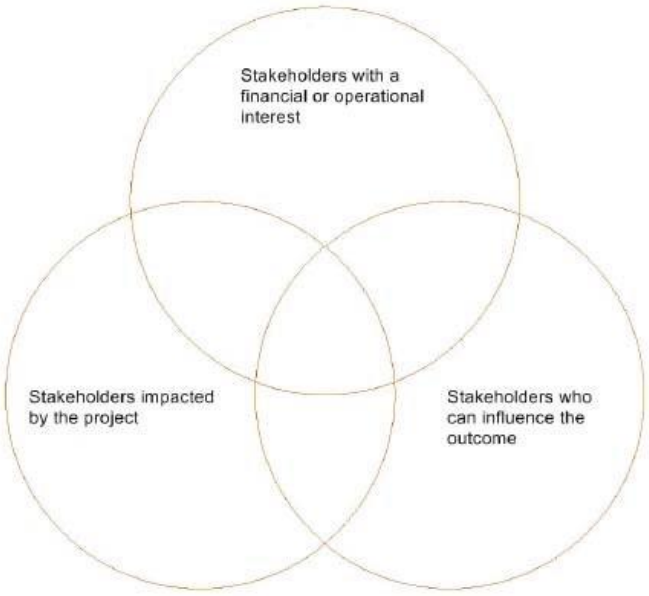


Figure 37: Types of Stakeholder

Source: Austroads (2009b)

As part of this scoping study, contact was been made with a number of the large freight users within the region. These initial industry contacts concentrated on those with a financial or operation interest, so it would be important to expand on the stakeholders in the larger study to include all the relevant stakeholders. The stakeholder base should be broad to ensure the needs of all the different stakeholders are included and the resulting assessment reflects accurately the needs of the region.

There was a widespread support for the freight and supply chain study within those contacted. This list of initial stakeholders is not exhaustive, and as discussed, the larger study would expand on the stakeholders to ensure the needs of smaller operators are considered when determining the requirements for the region. Support for the study and an agreement to participate has already been obtained from:

- Norco Co-operative Ltd (Milk Processor)
- Northern Co-operative Meat Co Ltd (Beef / Veal / Pig Abattoir)
- Macadamia Processing Co Ltd (Macadamia Industry)
- Ballina Fishermens Co-op Ltd (Fishing Co-op)
- Richmond Dairies

As the quantification of the use of the network and the costs and benefits of potential projects is important to the study outcomes, the availability of data was considered in the initial contact with stakeholders. The data that industry stakeholders have indicated they would be able to supply is further discussed in the next section.

There are seven local government areas within the Northern Rivers region, and these local governments would have substantial insight that would assist in understanding and assessing the needs of the region. These councils are:

- Ballina Shire Council
- Byron Shire Council
- Clarence Valley Council
- Richmond Valley Council
- Kyogle Council
- Lismore City Council
- Tweed Shire Council

The relevant managers at these Councils have been notified about the study, with a number already pledging their support. Several state and commonwealth government agencies would also have an interest in the freight network, in addition to insight into the industries within the Northern Rivers region. State and Commonwealth government agencies contacted as part of the scoping project, who have all pledged their support, include:

- NSW Department of Industry
- Department of Industry, Innovation and Science
- NSW Department of Primary Industries
- Local Land Services

In addition, as the mangers of road operations in NSW, Roads and Maritime Services (RMS) have been consulted.

DATA INPUTS

Data required for the region would relate to the current and future transportation task. There are two aspects related to transportation: the supply and the demand. Land uses directly relate to transport demand, as land use is one of the prime determinants of movement and activity, while the transportation system is the transport supply. The transport supply and demand are mutually interdependent (Khisty and Lall, 2002), which is why improvements to the transportation network will potentially have benefits to the land uses such as industry and business in the region, enabling economic growth.

Data regarding land uses in the region would be obtained as required, with potential sources including:

- Australian Bureau of Statistics (ABS) census, including population estimates by Local Government Areas (LGAs)
- ABS Agricultural Census, including data by type of agriculture
- Northern Rivers Organisation of Councils
- Regional Development Australia Northern Rivers
- NSW Department of Primary Industries (DPI) and former NSW Grains Reports
- NSW DPI Farm enterprise budget series
- Industry research
- Industry Yearbooks
- Meat and Livestock Australia (MLA) and Australian Lot Feeders' Association (ALFA)
- Forests NSW
- Transport for NSW
- NSW Trade and Investment

- NSW State and Regional Development

Information from some of these organisations has been utilised in the formation of this report.

The land uses identified would also inform the selection of stakeholders.

Detailed traffic volumes would be required for the major freight routes in the region. The key sources of data with respect to freight volumes would include each of the modes to be considered. The main source for road volumes would be Roads and Maritime Services (RMS) road traffic volumes, including vehicle classifications. The 12 category vehicle type classification data would be required to distinguish between the freight and non-freight vehicles usage. For rail volumes the main source would be Transport for NSW railway usage data, such as train data across the Country Regional Network, including includes origin destination, gross tonnage, commodity type and service. Airport and port information would also be sourced as required.

Vehicle numbers could be converted into approximate tonnage per annum for different modes as required. The data on the use of the transportation network would provide a basis for the quantification of the benefits of the potential projects.

A source of freight modelling in NSW is the NSW Strategic Freight Model (Transport for NSW, n.d.). This model was developed to inform the NSW Freight and Ports Strategy, in addition to establishing a consistent and reliable freight data resource to improve decision making on infrastructure investments. The model provides a strategic view of the NSW logistics task on road and rail networks. It was designed to reflect supply chains servicing four broad markets: international import and export; interstate; regional; and metropolitan. The Strategic Freight Model was used to produce forecasts of growth in the NSW freight task to 2031, from the base year of 2011, and is currently being updated in preparation for revising the NSW Freight and Ports Strategy.

The model was utilised for the North Coast Freight Study (Regional Development Australia - Mid

North Coast, n.d.). Its key uses listed by the Transport for NSW (n.d.) include:

- Determining freight capacity constraints by transport mode
- Providing inputs for cost benefit analysis and investment decision making
- Providing inputs for regional planning

Additional information regarding the freight on the network within the Northern Rivers region would be sourced from the stakeholders contacted. Several of the stakeholders within industry that have been contacted as part of this scoping study have indicated that they would be able to supply whatever data is required for the larger study with regard to their production and use of the freight network. Other stakeholders indicated the type of data what they would be able to supply, for example:

- Weekly statistics on freight vehicles by type entering and exiting facilities, such as 40 foot containers, 20 foot containers and refrigerated vans, in addition to estimations of freight vehicles inbound
- Individual freight movements, with date, quantities, product type (i.e. frozen or ambient temperature) and destination

The future time horizon to be considered for the larger study is to be a minimum of ten years. The time frame considered requires balancing between the time required for infrastructure improvements and industry forecasts. The time period needs to be long enough enable a comprehensive benefit cost analysis, while also short enough to have reliable business and industry production and freight forecasts. While ten years is short with respect to infrastructure improvements, it is a substantial period for the forward planning in business and industry. A longer term, such as 30 years, may need to be considered, however, due the time frames for construction of transportation infrastructure.

APPRAISAL PROCESS

The criteria used in the assessment of benefits and prioritisation of projects in Steps 3 and 4 needs to be carefully considered, as it will influence the initiatives that are potential funded. A number of other studies for adjacent regions including Northern Inland NSW, Mid North Coast NSW and NSW Central West, have been reviewed with regard to the methodology.

The specific purpose of Mid North Coast NSW study was to determine if there were sufficient volumes of freight to establish an intermodal terminal or road freight hub in the study area (Regional Development Australia - Mid North Coast, n.d.). The study used a framework to assess the viability of establishing a regional intermodal terminal form the Sea Freight Council of NSW, which had viability checklist criteria based on volume, distance, initial investment and terminal capacity, seasonality, competing channels and economic and social impact. The questions Regional Development Australia - Mid North Coast (n.d.) considered for the economic and social impact were:

- *"Do the local and regional community objectives align with the development objectives for the terminal?*
- *Does the new site enhance the economic performance of the NSW transport network and contribute to the State's competitiveness?"*

The Central West NSW Freight Study (Lycopodium, 2014) assessed a number of larger projects against the Strategic Merit Test, without a detailed cost benefit analysis. The Strategic Merit Test is the first phase of a 3 phase filtering system for the appraisal of identified transport initiatives as per the recommend by the Australian Transport Council (2006) and described in the Process Outline Section. The Northern Inland NSW Study (PEECE, 2012a) used three different assessment techniques for analysing projects: detailed assessment, minor assessment or desk-top assessment. For the detailed assessment, the cost saving benefits considered for each potential project were reducing road maintenance costs, vehicle operating costs, road user travel time costs and vehicle crash costs. Environmental benefits were considered to be small and were not included.

The road user cost savings benefits for Northern Inland NSW Study (PEECE, 2012a) were calculated based on estimates of the reduction in disruption time per year for the traffic stream (or certain vehicle types) and road user costs saved by not having to travel on alternative routes. These benefits were calculated for existing traffic, which is traffic which would use the road link with or without the proposed capital improvements, in addition to benefits for generated or diverted traffic attracted to specific road links due to perceived lower road user costs. It was noted that generated traffic benefits were only calculated where it was proposed to seal currently unsealed roads.

The final weighting for prioritisation in the Northern Inland Study (PEECE, 2012a) was based on two measures: the Benefit Cost Ratio (BCR) and the percentage of heavy vehicle (HV) percentage. The rational for this was that the BCR alone does not reflect the importance of the route for freight. Having a measure of the importance to freight and logistics is extremely important, however this HV percentage may not be sufficient to ensure strategic development of the network for regional industry.

The aspect that the analysis in the Northern Inland Study (PEECE, 2012a) did not include is the potential economic benefit to regional industry. The prioritisation weighing criteria should also include a measure for the economic benefits from the projects, such as employment and growth for the region. The inclusion of the potential economic development of the region and benefits to industries and businesses in the ranking of the projects would ensure that analysis is strategic and proactive in nature, and achieves the goals of enabling capital investment and removing supply chain obstacles to regional development. As the connectivity to markets is a key challenge for industries and businesses within the Northern Rivers NSW, measures of the potential industry development, such as expansion and production increases, need to be incorporated into the weighing criteria.

Austroads have also recognised that freight routes that may not deliver highly positive outcomes in traditional upgrade project priority assessments based on AADT measures, may still have high value to the communities and regions that the routes support (Austroads, 2016). They have created a tool designed to identify and support investment in 'Life Line' freight routes, which considers factors relevant to determining priorities for road upgrade investment including:

- The needs and of communities serviced
- Alternative routes availability
- Length and convenience of any alternative routes
- Historic events, such as incidences that have closed routes
- Responses to previous events, including the costs and impacts to the region

Therefore the proposed freight study for the Northern Rivers should include a measure of the strategic importance of the project in the appraisal process and the weighting criteria. The projects must also be considered against their contribution to an overall network strategy. Projects considered in isolation may not be able to achieve their full benefits, for example, increasing the clearance for a bridge doesn't benefit heavy vehicles on a route unless all bridges have increased clearances. Such projects are considered complementary. Initiatives can be

(Australian Transport Council, 2006):

- *Independent:* implementation of one has no effect on the benefits or costs of the other
- *Complementary:* implementing one initiative increases the benefits or reduces the costs of another initiative
- *Substitutable:* one initiative reduces the benefits or increases the costs of another initiative

The benefit cost assessment criteria and weightings therefore must be developed with respect to the overall objectives of the study, and an overall network strategy.

EXPECTED OUTCOMES

The expected outcomes of the proposed Northern Rivers freight study include:

1. Mapping of the supply chain network with the Northern Rivers Region
2. Identification of the impediments to regional businesses and industry
3. Compilation of the industry needs regarding the freight transportation network
4. Development of a transport network strategies to improve productivity and economic development in the Norther Rivers Region
5. Development of an associated list of transport network projects to achieve the strategic goals
6. Quantification of the potential benefits and costs to the region based the proposed strategies

The study would provide a "missing link" in the NSW transportation network, as freight studies have already been conducted for adjacent regions, such as Northern Inland NSW, Mid North Coast NSW and NSW Central West. The study would therefore enable integration of the supply chain and freight transportation needs for the entire northern NSW.

Extensive stakeholder interviews would enable the study to represent wide range of interests in the region, and enable the study to reflect the needs of those impacted by the freight network. In summary, the project would result in an *identification of projects* and a *quantification of benefits*, which would provide a basis for investment in the freight network, improving the regions' capacity for growth and enabling business development.

CONCLUSIONS AND RECOMMENDATIONS

The development of existing and new industries is dependent upon the availability of efficient and effective transport, and improved logistics and supply chain networks that can transform the economy of regional areas. The larger freight study would quantify the benefits of transportation network and supply chain improvements, which would enable funding to provide the maximum economic benefit to the region. Industries in the Northern Rivers are at a significant disadvantage compared to a number of the other regions within NSW which have completed freight network studies. This study would provide a basis for investment in the freight network, improving the regions' capacity for growth and enabling business development.

As Infrastructure Australia (2015) state "Productive, sustainable infrastructure is essential if we are to drive economic growth, increase employment and enhance the quality of life of all Australians. Our roads, rail, ports and airports are all critical to the movement of people, goods and resources. When our transport and logistics networks work effectively, they raise productivity levels and strengthen the economy."

There are significant direct and indirect benefits to the regional community from a dynamic agricultural sector. Benefits include not just direct employment, with agriculture employing 5.2% of the region's workforce (Regional Development Australia – Northern Rivers, 2013b), but also substantial indirect benefits with the related economy. The agricultural sector supports a range of ancillary and service industries, which generate economic activity in supply and

distribution chains, in addition to processing industries. For example, the region has a strong agriculture and food production sector, which provides employment for a further 2,648 people (Regional Development Australia – Northern Rivers, 2013b).

The larger study into the freight network within the Northern Rivers would support regional growth and development by providing detailed and quantifiable network information that would assist the relevant levels of government to make transportation network planning decisions. Therefore the study aligns with the NSW Government vision for the Northern Rivers region, as detailed in the Northern Rivers Regional Action Plan (RAP), that is economically strong by investing in infrastructure to support a growing population and to drive investment and jobs growth (NSW Department of Premier and Cabinet, 2013). The study also aligns with one of the five goals listed in the Economic Development Strategy for Regional NSW (NSW Department of Trade and Investment, 2015) of investing in economic infrastructure and connectivity.

The study will identify and plan the transportation network and supply chain improvements that will enable business and industry to generate and sustain employment and economic activity in the Northern Rivers Region. The study would assist business and industry in the region by providing a mechanism by which they can have direct input into the formulation of the freight network. The scoping study identified support from numerous stakeholders, including industries in the region, local government, state government agencies related to the local industry, and relevant commonwealth government agencies. There was significant support, which indicates the need for a freight study within the region.

Therefore it is recommended that the study is conducted, with the methodology as set out in this report.

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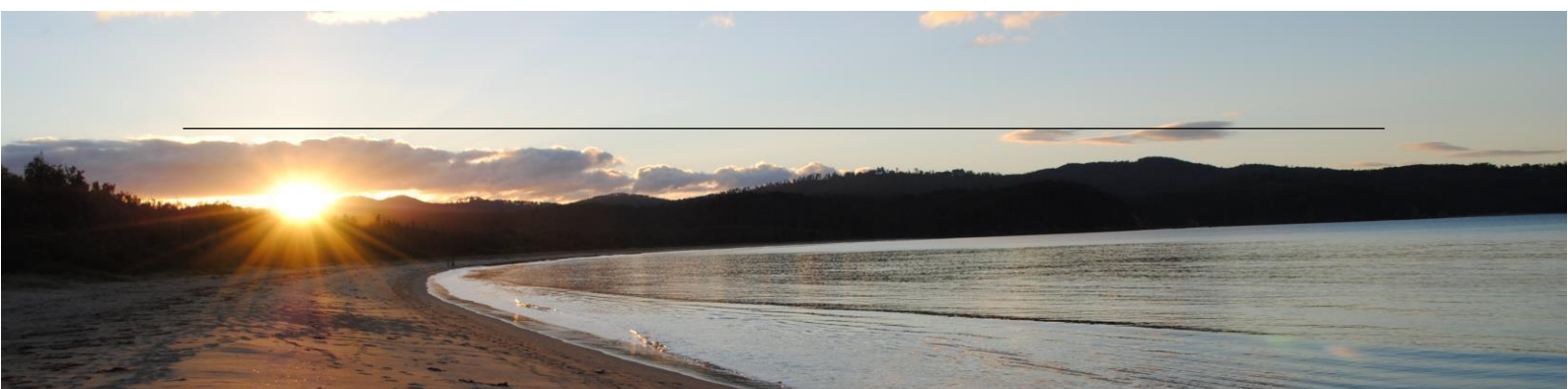
Northern Rivers Freight and Supply Chain

Southern Cross University, Lismore Campus

Workshop Minutes

17 August 2018

Version 1.1 Final



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1. LIST OF ATTENDEES

The one-day workshop was held on the 17th August 2018 at Southern Cross University's Lismore Campus. Below is the list of attendees:

Table 5: List of Attendees

Name	Company	Workshop
Phil Hilliard	Ballina Fishermens Coop	AM
Greg Williams	Northern Cooperative Meat Company	AM
Alex Smith	Australian Blueberry Growers Association	AM
Isaac Jurjens	Richmond Dairies Pty Ltd	AM
Allison Henry	Northern Rivers Food	AM
Mark Walsh	Sunshine Sugar	AM
Amy Colli	Regionality	AM
Joel Orchard	Future Feeders	AM
Jason Clifford	Transport for NSW	AM
Michael Green	Macadamia Direct	AM
Jason Clifford	Transport for NSW	PM
Graham Kennett	Kyogle Council	PM
Mark Tickle	Tweed Shire Council	PM
Elizabeth Fairweather	Clarence Valley Council	PM
Simon Scott	Ballina Shire Council	PM
Cherie Holdsworth	Richmond Valley Council	PM
Kylie Hardy	Ballina Shire Council	PM
Henry Fenner	Department of Premier and Cabinet	PM
Tara McAuley	Roads and Maritime Services	PM
Scott Turner	Lismore City Council	PM
Vaughan Macdonald	Richmond Valley Council	PM
Robert Rollin	Southern Cross University	Both
David Jenkins	Southern Cross University	Both
Matthew Jenkins	Southern Cross University	Both
Joyce Doust	Southern Cross University	Both
Ken Doust	Southern Cross University	Both
Andrew Swan	Southern Cross University	Both

2. WORKSHOP PURPOSE

This workshop is an essential part of a Northern Rivers Freight and Supply Chain Study for Regional Development Australia (Northern Rivers), key components of the study are;

- Stakeholder engagement with producers, manufacturers, logistics companies and government organisations to ensure that project outcomes align with real needs.
- Best practice traditional agent based logistics modelling to support decision making and recommendations.
- A robust and future-proof 20-30 year plan for the Northern Rivers Freight and Supply Chain.

The workshop goal is to provide an opportunity for people to connect with other businesses in the Northern Rivers and to collectively discuss:

- What are your freight needs now?
- What will they be in 20-30 years?
- Where are or will be the pressure points in freight and dispatch to market?
- What needs to be done about that?

The one-day workshop consisted of two parts; producers and manufacturers in the morning, and Agencies in the afternoon.

Figure 3: Workshop Introductions

3. CURRENT STATE

CURRENT CHALLENGES

To quickly and efficiently survey the workshop participants views on current challenges faced by the Northern Rivers Freight and Supply Chain.

All workshop participants were asked:

'What three words describe the biggest challenges facing the Northern Rivers Freight and Supply Chain?'.

A word cloud was then created, showing a survey of the workshop participants' views on current challenges facing Northern Rivers Freight and Supply Chain.

Both the morning session (Producers & Manufacturers) and the afternoon session (Agencies) created separate word clouds as shown below.

Figure 4: Morning Session with Producers: Current Challenges word cloud

Figure 5: Afternoon Session with Agencies: Current Challenges word cloud

The current state of the Northern Rivers Freight and Supply Chain was then explored further with workshop participants forming small groups who rotated through four short presentations;

- *A. Freight and supply chain concerns, Northern Rivers geography and issues (Rob Rollin)*
- *B. Study background, deliverables and timeline (Ken Doust)*
- *C. Existing Northern Rivers infrastructure (Andrew Swan)*
- *D. NSW 2018 Freight Study outcomes (Jason Clifford)*

As the information was being presented, the subject matter experts jotted down any feedback questions on yellow post it notes and attached them directly onto the poster, this was then seen by the next group.

The detailed feedback and questions are listed within the corresponding presentation topic in Appendix A.

Figure 6: Participants exploring current state in small groups

All workshop participants were asked:

'What are the external factors that will effect resilience of the region?''.

Responses were recorded to tell a story of the current state external factors affecting the Northern Rivers Freight and Supply Chain. The PESTEL chart below provided prompts to identify these external factors during the session.

Figure 7: PESTEL Chart

Political factors	Economic factors	Social Factors	Technological factors	Environmental factors	Legal factors
Stability of government Social policies: (e.g. social welfare etc.) Trade regulations Tax policies Entry mode regulations	Disposable income of buyers Credit accessibility Unemployment rates Interest rates Inflation	Population demographics: (e.g. aging population) Distribution of Wealth Changes in lifestyles and trends Educational levels	New innovations and discoveries Pace of technological innovations and advances Pace of technological obsolescence New technological platforms (e.g. DVD and Cloud)	Environmental protection laws Waste disposal laws Energy consumption regulation Popular attitude towards the environment	Employment regulations Competitive regulations Health and safety regulations Product regulations

During both the morning session (Producers & Manufacturers) and the afternoon session (Agencies), The individual responses were captured below.

Table 6: List of external factors that affect resilience of the Northern Rivers region industries

Producers & Manufacturers	*Agencies*
- Rural residential encroachment on productive land - Youth unemployment - Regional strategy to be cohesive with national strategy - Timing and outcome of upcoming elections - Lack of affordable land - Cross jurisdictional issues - Unemployment - Support and stimulus for new / young farmers - Capital investment attraction - Preservation of agriculture land - Urban encroachment - Regulatory influence or drivers - New technology - International competitiveness - Youth employment opportunities - Linkages to south east Queensland - Regional "brand" / provincial identity - Connectivity challenges	- Slow technology uptake - Trade regulations and export opportunities. - Cost and availability of land - Animal welfare - NIMBYs and environmental campaigners impacting political/government expediency and investment - Climate change adaptation. - Changes in lifestyle and trend - Capacity to compete with increasing competitiveness in freight costs. B double access, rail - International investment - Weather events - Climate change - High cost of infrastructure upgrades making regional areas unattractive to new expanding business. - Planning laws and urbanization pressures. - Environmental & technological & political (regulation & red tape) - Government regulations restricting market development

Producers & Manufacturers	*Agencies*
- Regulations creating barriers to entry - Restrictions on access - Export market access - Demographic shifts - Lack education facilities that focus on local industry needs - Trade education facilities that focus on local industry needs - Trade regulations - Marginal seats - Technology - Energy policies - Changes to land use planning in LGA areas to allow for diversification on farms - Regional food policies - On an international market Aust. Clean and green as marketing advantage - Lack of infrastructure - Social license to farm - Lack of collaboration between industry and government agencies - Localizing food economies - Expanding residential areas - Improved communication facilities, or NBN to all areas - International air freight - Lack of local government cohesion/alignment with state or national strategy - Impact of drought - Improved collaboration between industry and government agencies - Residential complaints against existing operations - Getting young farmers onto the land - Shifting to short supply chain models - Create efficiencies by determining synergies of regional industry and sharing freight opportunities - Governments taking a risk on investments - Access to competent, reliable labor - Implementation of a Northern Rivers food strategy – covering provenance, distribution, access to affordable local food - Infrastructure to address high energy costs - Support for educational opportunities	- Trade regulations - Too much regulation - State govt regulations - Social factors effecting demand for health and lifestyle products that are our region's key strength - Cost prohibitive legislative requirements - Network capacity - Cost of compliance with health and safety regulations - Population growth and demand - Intra region competitiveness stymying investment - Red tape - Flood protections and infrastructure resilience. - Political ideology e.g. food miles driverless vehicles - National consistency - Funding availability - Political commitment to fund local infrastructure - Availability and access to technology - RMS investing sufficient funds in regional road network - Connectivity to the south east Queensland markets and infrastructure - Increase in value adding within region. Processing bulk goods to processed goods.

To survey the rankings of external PESTEL factors facing Northern Rivers Freight and Supply Chain from the perspective of the workshop participants.

All workshop participants were asked:

'Which external factors have the greatest effect on the resilience of the region?'.

These responses were graphed to quickly show the rankings of external PESTEL factors facing Northern Rivers Freight and Supply Chain. The possible responses/rankings available to participants were:

(1) Minimal Effect
(2) Some Effect
(3) Moderate Effect
(4) Significant Effect
(5) Maximum Effect.

Both the morning session (Producers & Manufacturers) and the afternoon session (Agencies) rankings are shown below:

Figure 8: Morning session with Producers: Ranking of current external fact

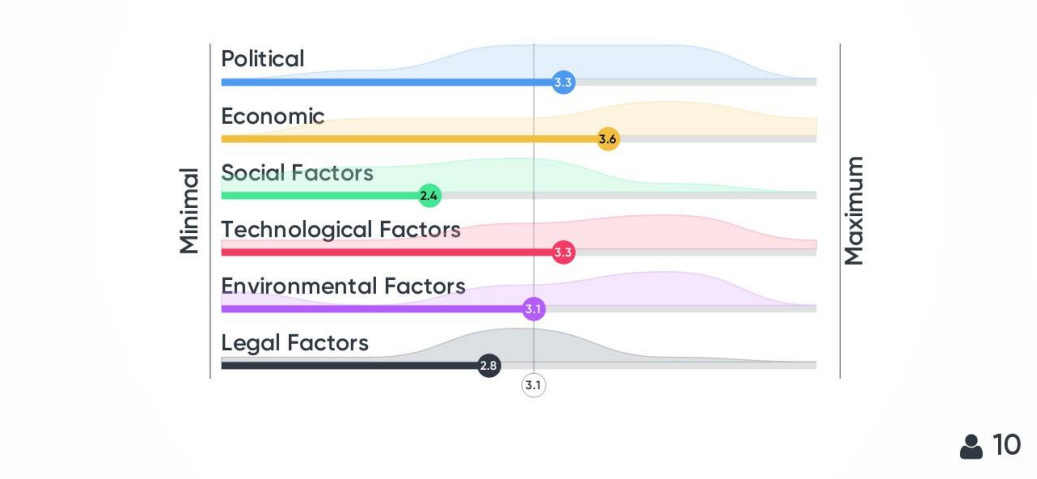
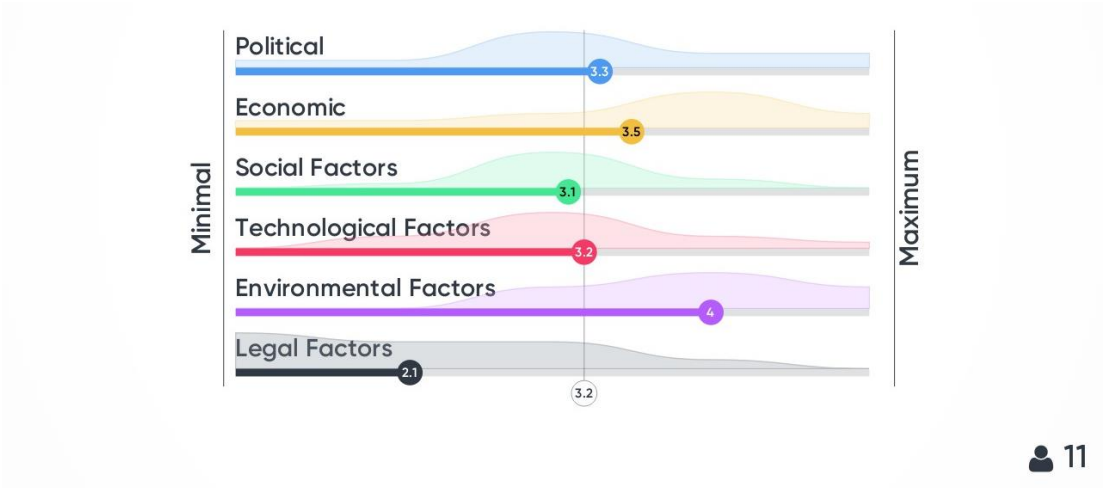


Figure 9: Afternoon session with Agencies: Ranking of current external factors

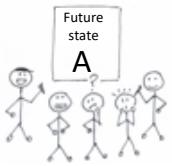


4. FUTURE STATE

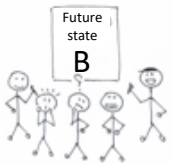
BRAINSTORMING

The participants were asked to imagine it is in the future, they have been successful and made the transition to realising their goals. If they were to walk around, what words would describe what they would 'see', 'hear' and 'feel' that differs from today In terms of:

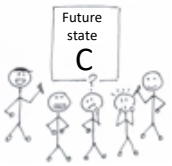
Figure 10: Future State groups



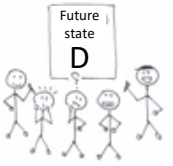
Collaboration
How we work together?



Supply chain
Improving flow through the supply chain?



Domestic
Reaching current and new domestic markets?



Export
Reaching current and new export markets?

We used a three step approach to map the future of the Northern Rivers Freight and Supply Chain. Each technique is designed to gradually challenge participants to look for different ways of imagining the future state.

Figure 11: Three step approach to brainstorming

Brainwaves
get preconceived ideas off our chest and in front of the team.

Random input
generates radical new ideas, especially where the same ideas keep coming up over and over.

Super heroes
generate new ideas by removing constraints and giving teams superpowers.

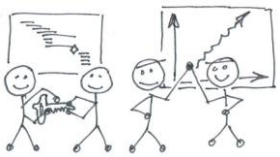
We then screened the ideas to provide new insights to focus our attention against the following criteria:

- *Type of innovation* – Continuous improvement, incremental innovation, or step-change innovation
- *Idea benefit* – Low, Medium, or High

Refer to Appendix B of these workshop minutes for detailed criteria.

Figure 12: Idea Screening

Type of innovation



Idea benefit

BRAINSTORMING RESULTS

The brainstorming sessions produced 100 Ideas recorded by individuals on post-it notes. See below tables for breakdown of results (see all details in Appendix D in these workshop minutes):

Table 7: Brainstorming Summary

Focus Area	*No. of Idea's*
Collaboration	18
Supply Chain	48
Domestic	25
Export	9
Grand total	100

These ideas were then screened as shown below:

Table 8: Brainstorming Results; Benefit Screening

Benefit	*A - Collaboration*	*B - Supply Chain*	*C - Domestic*	*D - Export*	*Grand Total*
High				2	2
High (A,B,C,D)		9	11		20
High (A,C)				1	1
High (A)			3	1	4
High (B)	1	1	2	1	5
High (C)	1	2	1	2	6
High (D)	6		2		8
Low (C)			1		1
Low (D)			1		1
Medium (A,B,C,D)		3			3
Medium (A)	1		2		3
Medium (B)	3	2			5
Medium (C)	2	1	1	1	5
Medium (D)	3	2			5
Grand Total	**17**	**20**	**24**	**8**	**69**

Note: Some ideas were not ranked against criteria due to time constraints

Table 9: Brainstorming Results; Innovation Screening

Innovation	*A - Collaboration*	*B - Supply Chain*	*C - Domestic*	*D - Export*	*Grand Total*
Continuous improvement	7	17	3	7	34
Incremental Innovation	9	15	8		32
Step-change innovation	2	10	13		25
Grand Total	**18**	**42**	**24**	**7**	**91**

Note: Some ideas were not ranked against criteria due to time constraints

SPOTLIGHTED IDEAS

From ideas generated, a spotlighted group were chosen by the study team for the agencies in the afternoon session to focus on. The choice was based on what ideas the agencies could most contribute. The spotlighted ideas are shown below;

Table 10: List of Spotlighted Ideas

Group	*Idea*	*Innovation screening*	*Benefit screening*
A - Collaboration	Local agency alignment with needs	Continuous improvement	
	Greater networking and collaboration between 3 levels of government, Co-production of government initiatives, Government acknowledgement of co-ops	Incremental Innovation	High (D)
	Adapting to new technologies; accepting new food types & producers e.g. "insects", inclusion of indigenous agri business, big business bigger but still lots of small	Continuous improvement	High (D)
	Regional approach of coordinating freight & logistics because we; have half loads/empty journeys cost + mixing produce in freight that is not normally mixed, Uber and Airbnb uses existing capacity, Uber for pallets "i.e. Cargo", transport "coop", freight coops coordinates not owns	Incremental Innovation	High (D)
B - Supply Chain	Distribution and storage e.g. cool store	Continuous improvement	High (A,B,C,D)
	Consumer Education / Food Strategy for Region	Incremental Innovation	High (A,B,C,D)
	Method of Supply Chain : unique - local repeatable - across region and larger centres could share the same transport trips, Distribution in and out of the region information needed to tap into empty space capacity - pallets & containers backload potential (transport) can always bring back	Incremental Innovation	High (A,B,C,D)
C - Domestic	Tight Restrictions on chemicals, education on land management, no bad players i.e.: poison, toxicity	Step-change innovation	High (A)
	Hubs; farms come to people, Virtual Hub; virtual farmers market, Hubs should be more than products (inputs, outputs), easy access to local people	Incremental Innovation	High (A,B,C,D)
	Farmland to be protected; land trusts, land value based on food production and ecosystem, land ownership by state; leases	Step-change innovation	High (A,B,C,D)
D - Export	Increase in China/India middle class: They will run planet, Middle class quality of life China/India, Indonesia, Disconnect with Oz image e.g. Sydney fish market, more integration in China	Continuous improvement	High (C)
	Oz is leader: Mateship to get through hardship - drought, Multi-culture, Egalitarian - protect the weak, Tolerance of communities, Managed relationship with US old and new relationship (Incremental innovation)	Continuous improvement	High
	Policy: Regulations from various STDs, control on exports, OZ control of our destiny, provide infrastructure, punch above our weight, manage our underdog position, foresight to see opportunities	Continuous improvement	High
	Branding Identity; Tourist pay premium to experience our lifestyle e.g. camping, indigenous export, need to get tourists to explore more; differentiators, images and branding, organic resto, Authenticity - educate, bring history to tourists, Eat fresh clean and green, sustainability travel, protect the brand - clean & green, mystery		High (C)

5. SELECT REVIEW OF INITIATIVES

PEOPLE'S CHOICE

During the afternoon session of the workshop, the Agency participants walked the room to identify priority ideas from within the spotlighted ideas. The voting is shown below;

Table 11: People's choice top votes

Group	*Idea*	*Innovation screening*	*Benefit screening*	*Votes*
C - Domestic	Hubs; farms come to people, Virtual Hub; virtual farmers market, Hubs should be more than products (inputs, outputs), easy access to local people	Incremental Innovation	High (A,B,C,D)	6
B - Supply Chain	Distribution and storage e.g cool store	Continuous improvement	High (A,B,C,D)	5
A - Collaboration	Greater networking and collaboration between 3 levels of government, Co-production of government initiatives, Government acknowledgement of co-ops	Incremental Innovation	High (D)	4
D - Export	Policy: Regulations from various STDs, control on exports, OZ control of our destiny, provide infrastructure, punch above our weight, manage our underdog position, foresight to see opportunities	Continuous improvement	High	3
D - Export	Branding Identity; Tourist pay premium to experience our lifestyle e.g. camping, indigenous export, need to get tourists to explore more; differentiators, images and branding, organic resto, Authenticity - educate, bring history to tourists, Eat fresh clean and green, sustainability travel, protect the brand - clean & green, mystery		High (C)	3
A - Collaboration	Regional approach of coordinating freight & logistics because we; have half loads/empty journeys cost + mixing produce in freight that is not normally mixed, Uber and Airbnb uses existing capacity, Uber for pallets "i.e. Cargo", transport "coop", freight coops coordinates not owns	Incremental Innovation	High (D)	2
A - Collaboration	Local agency alignment with needs	Continuous improvement		1

The priority ideas were then discussed, two ideas were identified to be further defined by using Edward De Bono thinking hat technique:

- *Risks, difficulties and problems* the skeptical view – What concerns you, are we making a mistake? It did not work before, a reason must be given
- *Information,* Do we have enough facts and data, what's missing, is our data accurate, what info would we like?
- *Benefits and feasibility,* The optimistic view – what are the benefits, what will make it work? Must give reason, needs more effort than a black hat
- *New ideas, possibilities* Creative thinking – are there alternatives, can it be done a different way, could it be explained another way?
- *Feelings, intuition, gut instinct* Permission to express feelings – What is your gut feel, will it work? No need to justify

The idea definition for "hubs" and "supply chain" as shown below;

Table 12: Hubs Idea definition

Idea	*Question*	*Post-it note*
Hubs	Risks, difficulties and problems	- Competing with supermarket - Who is selling Product? Getting all producers involved - Location - multiple locations - Cost of land & infrastructure - Getting to farmer to cooperate - Who is responsible for what - getting through regulations - will the community actually use it?
	Information	- What's the demand? What do customers want to buy? - Current volume to supply to hub is there enough? - Current destination for primary products - production costs, expense costs, licence to operate costs, setup - level of interest from the producers - limitations of current contracts to make a change (e.g.: Coles)
	Benefits and feasibility	- Efficiencies in the supply chain - Build a regional brand - Build a sense of community between producers & end user - Increase a profit by value adding - reduce costs through economies of scale - Genuine regional collaboration
	New ideas, possibilities	- Buy produce and see it being made - Adaptive regulative framework - Have a farmers market uber model - Fits into Agritourism model
	Feelings, intuition, gut instinct	- Yes in this region it could work - Will govt be an impediment or facilitator?

Table 13: Supply Chain idea definition

Idea	*Question*	*Post-it note*
Supply chain	Risks, difficulties and problems	- Invest here but another appears nearby/investment risk - got the wrong location - changes to industry/access/need makes it redundant - NCMC just built their own? - Who's responsible? - Who pays for it? - Ensure the little guys can use it? - What if Government doesn't back it? - Ongoing op. costs? Government?
	Information	- What are the drivers?/efficiency/convenience/cost - What could happen? No data? - Utilisation by current businesses? - Volume prediction, current cold storage use elsewhere? - Will it stimulate growth? - New industries like land based aquaculture? - What regulations govern use? - Which products would use it
	Benefits and feasibility	- New markets & products - Stimulate economy/jobs - Unlock otherwise constrained land - Strategic alignment with govt. planning initiative - Reduced costs - Proactive and supportive council - Better network efficiency by putting it in the right spot - Industry take up - Community support - Govt incentives
	New ideas, possibilities	- Storage word' branding - Combine with tourism - combine with food hub - Waste to energy facility - Eco-friendly design like underground - Off grid

	Feelings, intuition, gut instinct	- It'll work x3

6. APPENDICES

APPENDIX A OF WORKSHOP MINUTES – CURRENT STATE PRESENTATIONS

A. FREIGHT AND SUPPLY CHAIN CONCERNS, NORTHERN RIVERS GEOGRAPHY AND ISSUES (ROB ROLLIN)

Threats

ROADS

- Need Local Government Approval for bridges etc.
- Poor road condition leads to 'above normal wear and tear' on vehicles. R&M contributes about 15% of total costs….
- Fuel costs increasing / including ocean fleet / (20% of total cost)

WEATHER

- No income guarantees
- Season fluctuation in production is one factor
- Localized weather impacts can cause up to 70% crop loss (vulnerabilities)
- Time to processing affected by weather - particularly with farms that don't have grass on steep slopes…
- Weather dependent - wet weather halts harvesting

Temperature Control & Handling

- Key issues in freight relate to temperature control of the product
- Correct handling of the product by the freight company
- Shipping companies freezing fresh product, contract says they'd have no responsibility
- Animal welfare requirements (holding times before processing)
- Careful transit of the product (which can often be affected by poor road condition)

Inefficiencies

- The costs (and associated ethical considerations of food-miles) of small scale distribution to customers in the region.
- Lack of suitable dedicated trucks (modified freezer trucks are used),
- Alternate routes add long times to deliveries, off-road infrastructure is not great
- Double handling with rail = B-Double, Silo, Rail Wagon, Silo B-Double…
- National freight imbalance (a lot coming back empty from Brisbane),
- Trucking companies consolidation - need for compliance etc, greater barrier for entry
- Unclear reporting of optimized freight routes
- Insanity or small freight movements

Coordination

TRUCKING

- Difficulty in aligning supply with demand (in terms of seasonal varieties).
- Difficulty in aggregating different producers crops to meet local market requirements
- Aggregation of processed goods (i.e. multiple farmers) into large loads
- Coordination of shipments with the freight company (freight needs can be variable and only known the morning of the shipment)
- Reusable packaging materials not always returned after delivery.
- Perception of being displaced by larger further-away producers who can meet local retail market requirements

LAND USE

- Land tenure ('tree changers' not using or making available to use land that would be suitable to the local food economy)

Road Congestion

- Congestion both ways cause problems, particularly north to tweed / surfers
- Local rates In cities have gone up due to congestion and tolls
- Yatala congestion (getting on to the highway), trucks can loose 10 to 20 mins trying to get on the highway.

Availability

- Difficulty in accessing the local retail market due to the market requirements for quantity, 'quality' and consistency,
- Issue with growth is Supply
- Availability of local cold storage storages locally
- Expressed post to customers is a waste of time / couriers reduced services /Fastway and Startrak is all that's available
- Only pacific rail service the rail connection at Grafton
- Inland rail increase the costs / decrease availability of the coastal rail
- Rail expensive, but is cheaper than paying for an empty load back from Brisbane
- Roads becoming more feasible but rail becoming worse
- Irrational nature of shipping companies (bypassing Brisbane even though its booked)
- Lack of availability of Department of Industries approved containers
- Waste management a big problem, 1 or 2 approved carriers
- Using the back haulage rate can be cheaper but less flexible, could be seen as a risk but not a real risk?
- Lack of trucking options available /Unreliable /in frequent delivery service
- No one to run deliveries from here 'door to door' to Woolworths (deliver from here to Brooklyn bridge in Sydney)
- Product movements are too big for courier too little for freight
- Specialized forms of transport (bulk) most costly than generic forms of transport (industrial packaging)
- Uses refrigeration because its enclosed - not 100% critical, between 6-12 ºC when possible

Access

ROADS

- 9T limit for many growers / Road and bridge load limits around Kyogle and Dorrigo,
- Can't use B-doubles to majority of farms / deliveries up to semis (not to B-Double) / facilities a bit tight for large trucks
- Access for B-Doubles to farms and to the Booyong facility (where staging occurs as B-double access is not possible)
- Lack of B-Double access to Tabulam and Tenterfield from Casino
- Lack of access to Byron bay industrial estate
- Business are growing but don't have suitable and safe access due to larger trucking sizes
- Attempt to ship direct to market to reduce double handling
- If you miss a market then you double up on stock at the next market
- Looking for high mass permits in Road / who gives permits for approved routes for vehicles
- No shipping capability to go inland
- Poor road network between NSW and the downs (Queensland).
- Processing facilities located away from a large highway
- Safety issues pulling into to Bruxner highway from site

RAIL

- Rail sidings lack flexibility

- Customers don't have rail sidings

EXPORT

- Road capacities of receiving countries in the export market
- Problems exporting into Korea so stopped

Participant Feedback on Freight & supply Chasing Concerns Geography & Issues
- Economic growth, employment for youth
- Can't use existing sidings due to technical or commercial issues
- Need to incorporate with state and national transport strategy
- Need capital – business case to demonstrate the need
- Boutique food in area, lots of members
- Is air freight from Gold Coast possible?
- Summerland Highway avoids congestion, but the road has geometric restrictions and load issues
- Welcamp airport Bromelton road/rail interchange – need efficient freight access
- Utilise existing assets, support locals
- How do we prove need to RMS/govt?
- Policy are made for business not farmers
- Road turning radius is too restrictive
- Existing business moving away from rail due to double handling
- Why are we doing study?
- Council do not know existing assets & conditions
- NSW is lagging behind QLD
- Local road for freight
- No single directory for dist(ribution) system
- Weather climate/ policy -> need preparations
- There is some cold storage in Lismore
- Cold storage is a common issue
- Tweed council own cattle facility
- Facilities to decouple trucks
- Safe rest stops on roads
- Coop style cool storage
- No multi -va in farms small holdings – lifestyle farming 6% Agr. Development urban – land too expensive for young farmers

The objective of the study is to understand and quantify the impediments and supply chain restrictions of the region's freight and supply chain network and to identify initiatives that can lead to a strategy that facilitate the efficient and cost-effective movement of freight, to and from the Northern Rivers. As an efficient transportation network is vital to a region achieving its economic growth potential, this would generate capital investment and skilled jobs growth.

Stakeholder engagement is critical to the success of the proposed project. The approach includes seeking "bottom up" information and feedback, to ensure that strategic thinking is informed by practical industry information, provide a mechanism by which industry and agencies in the region can have direct input into the formulation of a freight & supply chain strategy.

The study will result in an *identification of freight network and supply chain constraints and identify potential freight network and supply chain enhancement initiatives for the region. The following specific initiatives will be assessed from a value perspective, resilience to events such as climate change and for ease of implementation:*

- *Cool & Cold supply chain*
- *Fresh food exports from the region by air freight*
- *Rail Shuttle option between Grafton, Casino and Kyogle and Bromelton*,

The timetable for the study is summarized below:

Timeline	Phase
July to September 2018	Individual Stakeholder interviews & secondary data collation
August 2018	Workshops - Stakeholders (Producers, Manufacturers & agencies) forecast supply chain demand, issues and future scenario
September 2018	Analysis of stakeholder information
September to October 2018	Value assessment & modelling to identify initiatives
September to October 2018	Specific supply chain analysis of • Cool & Cold supply chain • Fresh food exports from the region by air freight • Rail Shuttle option between Grafton, Casino and Kyogle and Bromelton,
November 2018 to January 2019	Research Findings Report & Supply Chain Strategy

In 2017 The Northern Rivers NSW Freight Scoping Study was published. The following is an extract from the Study Report. The full report is available from your browser on:

HTTPS://RDANORTHERNRIVERS.ORG.AU/DOWNLOAD/PROJECTS/RDA-SCOPINGSTUDY-REPORT-FINAL2RDA-JAN2017-2.PDF

Executive Summary

This scoping study report details a methodology and process for a study on the freight network and supply chain requirements for the Northern Rivers NSW. It has been prepared in response to the identification, by Regional Development Australia - Northern Rivers (RDA-NR), of a need for a strategy to improve the efficiency of freight movements across the region to assist local industry and other stakeholders improve the economic potential of the region.


Source: ABC, 2014

The objective of the proposed study is therefore to understand and quantify the impediments and supply chain restrictions of the regions freight network and develop strategies to facilitate the efficient and effective movement of freight, to and from the Northern Rivers region. As a good quality transportation network is vital to a region achieving its economic growth potential, this would enable regional development.

The scoping study has focused on developing a suitable methodology to understand the supply needs of the Northern Rivers area and has been developed based on extensive reviewing of similar studies, best practice guidelines and other relevant documentation. A four step process is proposed, for which the first step is to conduct in depth consultation with stakeholders to identify network and system deficiencies.

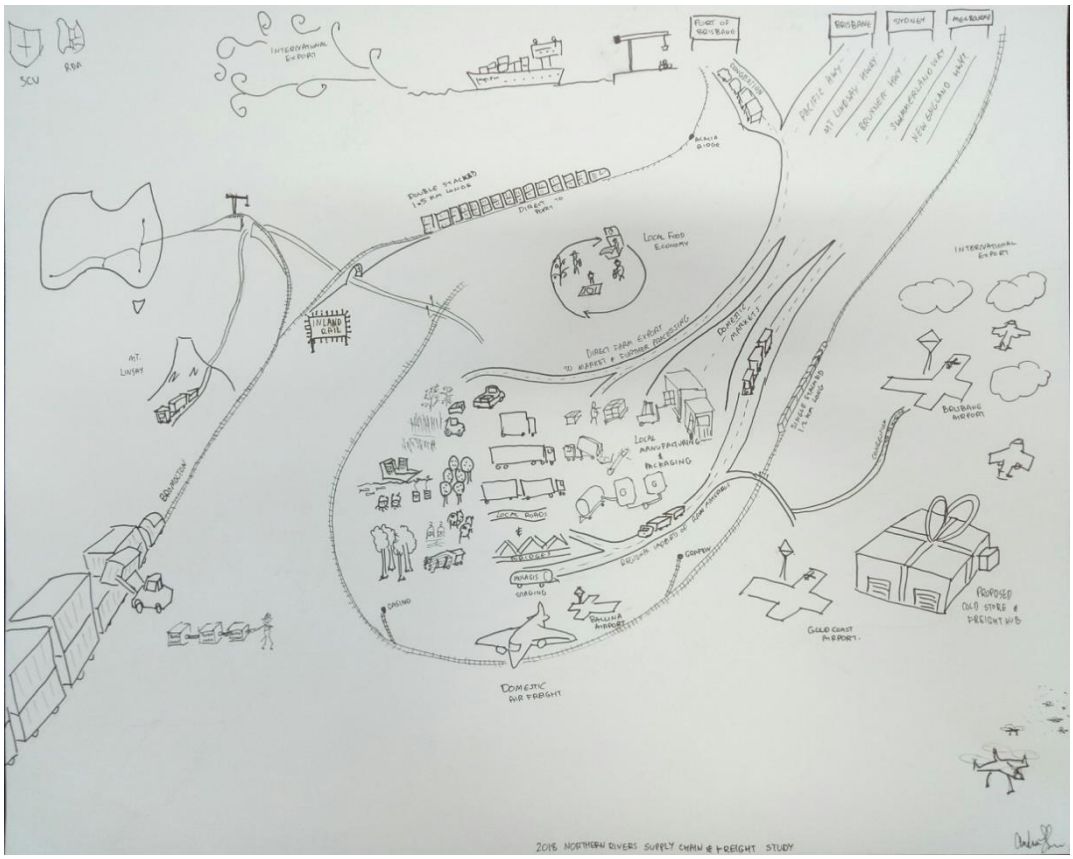
Stakeholder engagement is critical to the success of the proposed study. A number of stakeholders within industry and local governments have already pledged support for participation in a larger study. This list is not exhaustive, however, and the larger study would expand on these stakeholders to ensure the needs of smaller operators are considered when determining the requirements for the region. The extensive consultation process would give an enhanced appreciation of the influences on the freight task, and provide a mechanism by which business and industry in the region can have direct input into the formulation of a freight network strategy.

The proposed process assesses the strategic and economic importance of the projects in the appraisal process and weighting criteria, so that the study achieves the project objectives of enabling regional growth and development.

The study would result in an *identification of projects* and a *quantification of benefits*, with the potential to inform future network improvements and initiatives. It would provide a basis for investment in the freight network, improving the regions' capacity for growth and enabling business development.

Participant Feedback on Study Background, Deliverables & Timeline
- Map out Northern rivers breakdown of ABS agri. Commodities (which areas generate which commodities) - Family farms (succession) decreasing – change in products farmed is occurring - Succession planning model needs updating - Overseas companies own some produce areas - Contracts, how far ahead with growers – productivity - May be grain in the future, at present too wet. - Most of transport is trucks - Norco – largest manufacturer in Lismore - New ABS data – note changes since 2014 data set for commodities produced - Can we use ABS data to identify geographic shift in commodities produced and transport - Only pacific Hwy as access from QLD to here (due to mountain range) - Chickens at casino need follow up - Outside commodities/products transported into area for production - Checkout food tourism (Agri tourism) - Meat – trimmed meat in boxes now provided to give higher value (e.g. wagyu 24hr schedule generates more with less - Maccas – coordinate back loads - Sugar – land constraints, land cost up, move further west, transport cost up - Macadamias – more plantings, hobby farms may change in the future, more produced from QLD - Grapes grown top of region production QLD - Some outside area milk comes here for production, follow up with milk perishables - REDS regional economic development strategy (5 council areas; not Tweed & not Clarence)… - Contribution of industries to vehicle miles across the region - Also the destination, farm to factory and factory to market. E.g. Port of Brisbane. Does RMS or Northern Rivers Food have information on this? - Change in farming from mum and dad to major companies in Southern part of region - Need data on trip volumes and destinations by truck types. Who has this data?

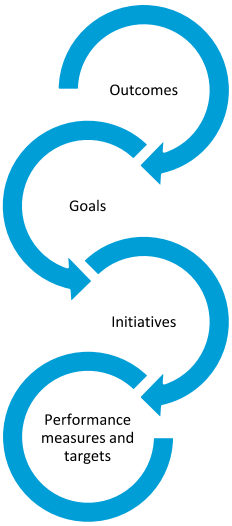
C. EXISTING NORTHERN RIVERS INFRASTRUCTURE (ANDREW SWAN)



Participant Feedback on Existing Northern Rivers Infrastructure
- When is Gold Coast Air Hub being built? - Air freight from Lismore airports been discussed - How long for inland rail? - Biggest Coop in southern hemisphere - Northern Rivers internal freight distribution? - What about Welcamp? - Ballina food producers (email) - Coastal rail and inland rail Naruma [Kagaru] - Coffs Harbour regional airport export? - Currently no screening of domestic freight - Food hubs: where? - Local food economy connection? - 2x proposed railhubs in casino - Drought - Anyone using the Naruma [Kagaru] connection - Pinch points of Bruxner - Qld benefits from NSW Govt

Outcomes, goals, actions and targets

"Moving goods in an efficient, safe and environmentally sustainable manner, providing successful outcomes for communities and industry"



1

Outcomes

- **Economic Growth** – Providing confidence and certainty that encourages continued investment in the freight industry to support economic growth.
- **Efficiency, connectivity and access** – Improving the efficiency of existing infrastructure and ensuring greater connectivity and access along key freight routes.
- **Capacity** – Maximising infrastructure investment and increasing land use capacity to accommodate growth.
- **Safety** – Creating a safe supply chain, involving safe networks, safe vehicles, safe speeds and safe people.
- **Sustainability** – Developing a sustainable supply chain that delivers benefits to our environment and continue operations into the future.

2

Next steps

- **Release** the final NSW Freight and Ports Plan together with the freight forecasts prepared for the development of the Plan

- **Implement** the Plan
  - NSW Government Departments and Agencies working together
  - Assisting Local Councils to meet the growing freight task
  - Working collaboratively with industry

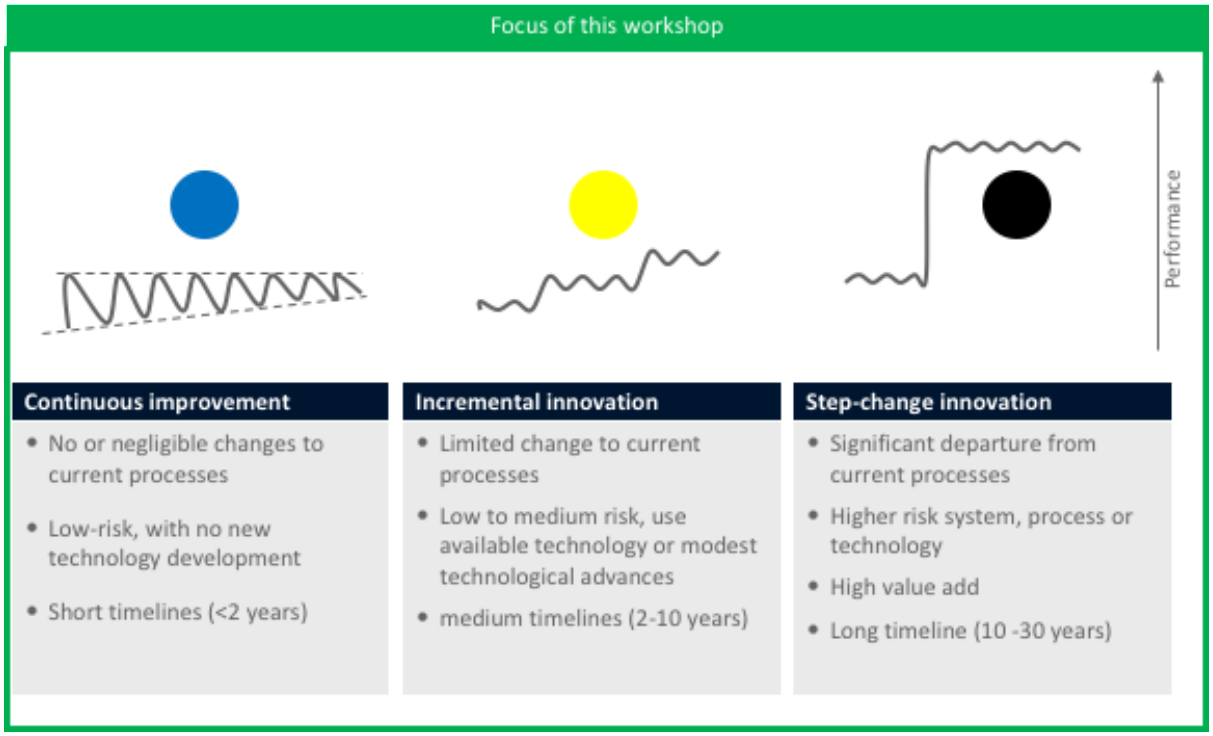
- **Report** on progress:
  - Report on performance measures and progress towards targets
  - Update freight forecasts – **data access is imperative**

Participant Feedback on NSW 2018 Freight Study Outcomes
- Cross border issues
- Inland rail
- Connection storage capacity efficiency
- Rail North South
- Safety
- Road/rail interchange Port of Brisbane
- Rail connections Data
- Heavy vehicle bridge access
- East West connect

Freight & supply Chasing Concerns Geography & Issues	*Study Background Deliverables & Timeline*
- Economic growth, employment for youth - Can't use existing sidings due to technical or commercial issues - Need to incorporate with state and national transport strategy - Need capital – business case to demonstrate the need - Boutique food in area, lots of members - Is air freight from Gold Coast possible? - Summerland Highway avoids congestion, but the road has geometric restrictions and load issues - Welcamp airport Bromelton road/rail interchange – need efficient freight access - Utilise existing assets, support locals - How do we prove need to RMS/govt? - Policy are made for business not farmers - Road turning radius is too restrictive - Existing business moving away from rail due to double handling - Why are we doing study? - Council do not know existing assets & conditions - NSW is lagging behind QLD - Local road for freight - No single directory for dist(ribution) system - Weather climate/ policy -> need preparations - There is some cold storage in Lismore - Cold storage is a common issue - Tweed council own cattle facility - Facilities to decouple trucks - Safe rest stops on roads - Coop style cool storage - No multi -va in farms small holdings – lifestyle farming 6% Agr. Development urban – land too expensive for young farmers	- Map out Northern rivers breakdown of ABS agri. Commodities (which areas generate which commodities) - Family farms (succession) decreasing – change in products farmed is occurring - Succession planning model needs updating - Overseas companies own some produce areas - Contracts, how far ahead with growers – productivity - May be grain in the future, at present too wet. - Most of transport is trucks - Norco – largest manufacturer in Lismore - New ABS data – note changes since 2014 data set for commodities produced - Can we use ABS data to identify geographic shift in commodities produced and transport - Only pacific Hwy as access from QLD to here (due to mountain range) - Chickens at casino need follow up - Outside commodities/products transported into area for production - Checkout food tourism (Agri tourism) - Meat – trimmed meat in boxes now provided to give higher value (e.g. wagyu 24hr schedule generates more with less - Maccas – coordinate back loads - Sugar – land constraints, land cost up, move further west, transport cost up - Macadamias – more plantings, hobby farms may change in the future, more produced from QLD - Grapes grown top of region production QLD - Some outside area milk comes here for production, follow up with milk perishables - REDS regional economic development strategy (5 council areas; not Tweed & not Clarence)… - Contribution of industries to vehicle miles across the region - Also the destination, farm to factory and factory to market. E.g. Port of Brisbane. Does RMS or Northern Rivers Food have information on this? - Change in farming from mum and dad to major companies in Southern part of region - Need data on trip volumes and destinations by truck types. Who has this data?

Participant Feedback on Existing Northern Rivers Infrastructure	*Participant Feedback on NSW 2018 Freight Study Outcomes*
- When is Gold Coast Air Hub being built? - Air freight from Lismore airports been discussed - How long for inland rail? - Biggest Coop in southern hemisphere - Northern Rivers internal freight distribution? - What about Welcamp? - Ballina food producers (email) - Coastal rail and inland rail Naruma [Kagaru] - Coffs Harbour regional airport export? - Currently no screening of domestic freight - Food hubs: where? - Local food economy connection? - 2x proposed railhubs in casino - Drought - Anyone using the Naruma [Kagaru] connection - Pinch points of Bruxner - Qld benefits from NSW govt	- Cross border issues - Inland rail - Connection storage capacity efficiency - Rail North South - Safety - Road/rail interchange Port of Brisbane - Rail connections Data - Heavy vehicle bridge access - East West connect

INNOVATION SCREENING



BENEFIT SCREENING

	BENEFIT DRIVERS	Low	Medium	High
A	**Impact on local communities values** (ie: trust, environment, jobs, legacy)	**Little** positive impact on local community values	**Some** positive impact on local community values	**Significant** positive alignment on local community values
B	**Impact on industry cost** (ie: reduce costs, increase throughput)	**Little** positive impact	**Some** positive impacts in the short term	**Significant** positive impact that continues in the long term
C	**Impact on customers** (ie: customer satisfaction, loyalty, increase demand)	**Little** positive impact on customers	**Some** positive impact on customers	Enabler or **significant** positive impact on customers
D	**Impact on Northern Rivers efficiency and effectiveness** (ie: streamline, increase turnaround, share resources, reduce waste, increase collaboration)	**Little** impact on efficiency and effectiveness	**Some** impact on efficiency and effectiveness	Enabler or very **significant** impact on efficiency and effectiveness

All the future state ideas generated in the workshops.

Group	*Idea*	*Innovation screening*	*Benefit screening*	*Votes*
A - Collaboration	Local agency alignment with needs	Continuous improvement		1
	Greater networking and collaboration between 3 levels of government, Co-production of government initiatives, Government acknowledgement of co-ops	Incremental Innovation	High (D)	4
	Adapting to new technologies; accepting new food types & producers e.g. "insects", inclusion of indigenous agri business, big business bigger but still lots of small	Continuous improvement	High (D)	
	Regional approach of coordinating freight & logistics because we; have half loads/empty journeys cost + mixing produce in freight that is not normally mixed, Uber and Airbnb uses existing capacity, Uber for pallets "i.e. Cargo", transport "coop", freight coops coordinates not owns	Incremental Innovation	High (D)	2
	Constitute reform "republic"	Step-change innovation	High (D)	
	Predictive demand forecasting "Big Data"	Incremental Innovation	High (C)	
	Supply chain focus on time to market	Incremental Innovation	High (D)	
	Closer working relationship with foreign governments	Incremental Innovation	High (B)	
	Common culture in communication that is fast; It connectivity between different producers/businesses, Visibility and awareness of other activities, "common data platform" for easy sharing of info "clearing house", digital platform, "collaboration app", open data source for shared data, instant messaging, less words more picture emojis, sharing of wastes for production	Incremental Innovation	High (D)	
	Core Business; coop mindset, create a collab culture, ongoing support structure, NR foods branding of region, clear business case/why?	Continuous improvement	Medium (D)	
	Self sufficiency in collaboration	Continuous improvement	Medium (D)	
	Government reps for industry	Incremental Innovation	Medium (B)	
	Virtual meeting in VR	Incremental Innovation	Medium (B)	
	internal alignment and consistency within govt agencies (EPA)	Incremental Innovation	Medium (D)	
	Food story including land	Continuous improvement	Medium (A)	
	Improve market awareness e.g culture of export markets	Continuous improvement	Medium (C)	
	Farm to "AR" market live communication e.g Woolies to farm video; interactive with consumer, improved transparency for customer	Step-change innovation	Medium (C)	
	Focus on relationship	Continuous improvement	Medium (B)	

B - Supply Chain	Distribution and storage e.g cool store	Continuous improvement	High (A,B,C,D)	5
	Consumer Education / Food Strategy for Region	Incremental Innovation	High (A,B,C,D)	
	Method of Supply Chain : unique - local repeatable - across region and larger centres could share the same transport trips, Distribution in and out of the region information needed to tap into empty space capacity - pallets & containers backload potential (transport) can always bring back	Incremental Innovation	High (A,B,C,D)	
	Idea	***Innovation screening***	***Benefit screening***	***Votes***
	Local seasonal produce with local outlets	Continuous improvement	High (A,B,C,D)	
	Growing IT & tech sector - keep improving	Continuous improvement	High (A,B,C,D)	
	Internet - all to link into: - capture	Continuous improvement	High (A,B,C,D)	
	Digital platform for farmer product	Incremental Innovation	High (B)	
	Aussie native foods - weeds protection to keep as own, are indigenous food patentable, growing demand for our bushfoods, still discounting amazing properties - davidson plums, centralised control - digital platform	Incremental Innovation	High (A,B,C,D)	
	Maglev train	Step-change innovation		
	Trucks on trains	Incremental Innovation	Medium (B)	
	Google glasses to check product source	Incremental Innovation	Medium (D)	
	Awareness of food miles	Continuous improvement	Medium (C)	
	Land trusts (model)	Incremental Innovation	High (C)	
	Community farms - education & employment	Continuous improvement	Medium (D)	
	Levitating trucks	Step-change innovation		
	Teleportation	Step-change innovation	High (C)	
	Broad communication - individuals - at each leg	Continuous improvement	Medium (A,B,C,D)	
	Hubs for products	Incremental Innovation	Medium (A,B,C,D)	
	Value chain, more recognition & payment for farmer, demand driven for product	Incremental Innovation	High (A,B,C,D)	
	Communication & collaboration - same activities		Medium (A,B,C,D)	
	Stranger communities	Continuous improvement		
	Pods into transport	Incremental Innovation		

	Industry & agency - procurement policies (local)	Continuous improvement		
	Flying cars	Step-change innovation		
	Centralised control - up above	Incremental Innovation	High (A,B,C,D)	
	Block chain	Incremental Innovation		
	Info of product	Incremental Innovation		
	Niche markets	Continuous improvement		
	Unique style - elegant	Continuous improvement		
	Idea	***Innovation screening***	***Benefit screening***	***Votes***
	per farmer has less impact - seamless	Continuous improvement		
	less negative impact to people & environment	Continuous improvement		
	more flexible & effort - better supply	Continuous improvement		
	Back to the future - hoverboard	Step-change innovation		
	Connecting seasonal labour heads	Continuous improvement	Medium (B)	
	Instant roads, 2 storey roads	Step-change innovation		
	Flying trucks	Step-change innovation		
	AI	Step-change innovation		
	Carbon data on distribution - embedded cost star rating	Incremental Innovation		
	Trucks are old technologies - ?new tech	Step-change innovation		
	preservation, keeping items fresh	Continuous improvement		
	Safety - protection of other road users - road conditions	Continuous improvement		
	Waste management induction, Dark freezers - tagged (infrared) - autonomous, input output only			
	Environmental crop sugar in efficient			
	hypertube	Step-change innovation		
	Ironman. Drones are cheaper & quicker, availability of produce	Incremental Innovation		
	Centralised or decentralised? Cool/cold storage			
	On site manufacturer product (no need for ….)			

	What about other non primary products industries			
C - Domestic	Hyperloop - light rail?	Step-change innovation	High (A,B,C,D)	
	Tight Restrictions on chemicals, education on land management, no bad players ie: poison, toxicity	Step-change innovation	High (A)	
	No middlemen, Blockchain	Step-change innovation	High (D)	
	Own our own data	Step-change innovation	High (A,B,C,D)	
	Concept of innovation	Step-change innovation	High (A,B,C,D)	
	Hubs; farms come to people, Virtual Hub; virtual farmers market, Hubs should be more than products (inputs, outputs), easy access to local people	Incremental Innovation	High (A,B,C,D)	6
	Less regulation; simplified, working together Govt etc. cutting red tape	Step-change innovation	High (A,B,C,D)	
	Food sold at Nutrient value not price value	Step-change innovation	High (C)	
	Market advantage 'clean and green' Northern Rivers is leader in…..	Incremental Innovation	High (A,B,C,D)	
	Idea	***Innovation screening***	***Benefit screening***	***Votes***
	Less packaging	Continuous improvement	High (A)	
	Decentralised power, cooperatives, comms, value statement coops are recognised business model, Govt needs to change thinking; coop model, collaboration between producers	Incremental Innovation	High (A,B,C,D)	
	Farmland to be protected; land trusts, land value based on food production and ecosystem, land ownership by state; leases	Step-change innovation	High (A,B,C,D)	
	Access to capital; impact investment, alternative investment	Step-change innovation	High (A,B,C,D)	
	Brand recognition, positive message to markets, effective competition; positive/effective competition	Incremental Innovation	High (B)	
	Infrastructure available to domestic markets	Incremental Innovation	High (D)	
	Decoupling from fossil fuels. Celebration of natural assets, agriculture/farming should support environment	Step-change innovation	High (A,B,C,D)	
	Hyperlocalisation, decommodifying; even playing field, localised	Step-change innovation	High (A,B,C,D)	
	Carbon farming	Step-change innovation	High (A)	
	Short supply chains (drones, couriers), cost effective access to farmland	Step-change innovation	High (B)	
	Agritourism	Incremental Innovation	Medium (A)	
	Connection to story of farmers; sense of ownership, connection to indigenous land knowledge; regen farming	Incremental Innovation	Medium (A)	
	Very good climate control; systems	Continuous improvement	Medium (C)	

	Willing farm owners and workers	Continuous improvement	Low (D)	
	Uber eats for local produce	Incremental Innovation	Low (C)	
	Supermarkets are big barriers - less control to supermarkets			
D - Export	Increase in China/India middle class: They will run planet, Middle class quality of life China/India, Indonesia, Disconnect with Oz image e.g. Sydney fish market, more integration in China	Continuous improvement	High (C)	
	Oz is leader: Mateship to get through hardship - drought, Multi-culture, Egalitarian - protect the weak, Tolerance of communities, Managed relationship with US old and new relationship (Incremental innovation)	Continuous improvement	High	
	Policy: Regulations from various STDs, control on exports, OZ control of our destiny, provide infrastructure, punch above our weight, manage our underdog position, foresight to see opportunities	Continuous improvement	High	3
	Branding Identity; Tourist pay premium to experience our lifestyle e.g. camping, indigenous export, need to get tourists to explore more; differentiators, images and branding, organic resto, Authenticity - educate, bring history to tourists, Eat fresh clean and green, sustainability travel, protect the brand - clean & green, mystery		High (C)	3
	Marketing: Clean & safe food, positive image, promote, high quality, non threatening, paid shoppers for rich Asian customers, Oz product is marketable, Trust to deliver, pay for better quality	Continuous improvement	High (A,C)	
	Idea	***Innovation screening***	***Benefit screening***	***Votes***
	Technology and Innovation: Good and developing products; using new technologies - robots, innovate in tough conditions, shift from manufacturing, innovation intellectual assets, good innovative tech to be show cased, pickers/cushions, invest in education - agriculture, we have increased production. more than demand, Oz milk, build on existing strength, healing: technology to collect & protect (Step Change innovation)		High (B)	
	Self-sufficiency; sustainability: Oz is food bowl, increase yield, grow best in different places, no more frozen cherries/chillis	Continuous improvement	Low (C)	
	Product development: Grow China / India products here e.g. Wagyu Beef, $ increase creates demand for premium, market needs	Continuous improvement	Medium (C)	
D - Export	Product diversification: understand future demands, adapt to demand e.g. full fish vs fillet, fresh, processed, premium, premium OZ berries, protein cycles, changing diet structures, move from primary products e.g. Africa - dog, not cat meat	Continuous improvement	High (A)	

APPENDIX E – SPECIFIC FIRST MILE LAST MILE NEEDS IDENTIFIED BY STAKEHOLDERS

SUMMARY OF ROADS ISSUES RAISED IN INTERVIEWS:

- 9T limit for many growers / Road and bridge load limits around Kyogle and Dorrigo.
- Can't use B-doubles to majority of farms / deliveries up to semis (not to B-double) / facilities a bit tight for large trucks.
- Access for B-doubles to farms and to the Booyong facility (where staging occurs as B-double access is not possible).
- Lack of B-double access to Tabulam and Tenterfield from Casino.
- Lack of access to Byron Bay industrial estate.
- Business are growing but don't have suitable and safe access due to larger trucking sizes.
- Attempt to ship direct to market to reduce double handling.
- If you miss a market then you double up on stock at the next market.
- Looking for high mass permits in road / who gives permits for approved routes for vehicles.
- No shipping capability to go inland.
- Poor road network between NSW and the downs (Queensland).
- Processing facilities located away from a large highway.
- Safety issues pulling into to Bruxner Highway from site.

SPECIFIC ROADS ISSUES RAISED IN INTERVIEWS:

BLUE BERRIES:

- Damage to stock from farm to Tabulam processing facility, due to potholes, unformed roads.
- Need to get the berries from 35deg temp down to 10deg on the truck and then to 2deg at the plant within the first hour, travel time is therefore important.
- Key issues are the bridges and roads between growers, the facility at Tabulam and to the Pacific highway. e.g. B double access on the Bruxner Hwy and recent 9tonne bridge limits on local roads which until recently were unrated (therefore previously allowing higher truck loads).

BEEF & PORK PROCESSING:

- Road weight limits are impacting both incoming stock truck consists (producers within 100km) and outgoing truck consists.
- Currently weight restrictions near Booyong on bridges on access to facility.

DAIRY PRODUCTS FROM CASINO

- Road conditions to Port of Brisbane weight restrictions, also weight restrictions in the destination country roads (20 foot instead of 40 foot containers).
- Congestion in Brisbane area, impact on meeting time slots.

MILK PRODUCERS:

- Dorrigo access is road & bridge limited, also the Kyogle area. Limit on bridge capacity means more trucks needed to shift the tonneage. Effects Bonalbo, Kyogle, Casino, Lismore, Murwillumbah.
- Better road system connection to the Darling Downs e.g. Mt Lindesay, would improve the inbound access for grain from the Darling Downs & movement of Hay.

HEMP FOOD PRODUCTS:

- B double won't fit on the factory site. Semi-trailers are even congested on facility site, there is a question on the B double road capacity on the Bangalow road to the Pacific Highway.

- Desire to have sufficient room for storage of raw material, processing and waste, including truck access.

MACADAMIA PRODUCTS:

- Alfadale Rd/Cowlong Rd/ Bruxner intersection, too dangerous to use, needs roundabout or other intersection design
- Dunoon to Lismore road capacity

KYOGLE COUNCIL:

- Hootons Road.
- Paddys Flat Road.
- The following bridges:

Road	Bridge Name	Material	Length	Load Limit (T)	Comments
BAILEYS BRIDGE ROAD	BAILEYS BRIDGE	Timber	27.2	**10**	manage/monitor
COLLINS CREEK ROAD	OVER RAIL	Concrete	23.9	**18T rigid 33T semi**	Railways, no action
DUNNS ROAD	DUNNS ROAD NO.2	timber	12	**20**	manage/monitor
DYRAABA ROAD	DYRAABA STATION NO.2 BRID	Timber	7	**20**	manage/monitor
DYRAABA ROAD	LOCKHARTS BRIDGE	Timber	11.5	**25**	Replacement Program 2020/2021.
EDENVILLE ROAD	CEDAR POINT BRIDGE	Concrete	70.3	**20**	Manage/monitor. Investigation underway for replacement structure, identified as priority for future funding opportunity.
FINDON CREEK ROAD	BURT RAYNAR	Timber	53	**20**	Replacement program 2019/2020
GREEN PIGEON ROAD	MATHEWS BRIDGE	Timber	34.1	**25**	Replacement Program 2020/2021.
HAYES ROAD	TIMBER 12.7M LONG	Timber	12.7	**2**	Replacement program 2018/2019.
HORSESHOE CK RD	HORSESHOE CREEK NO.1	Timber	19	**20**	Manage/monitor, concrete piers and abutments
IRON POT CREEK ROAD	MONTGOMERYS BRIDGE	Steel/Concrete/Timber	53	**2**	manage/monitor
LINDSAY CREEK ROAD		Timber	11	**15**	Load limit imposed July 2018; piles and girders in poor condition. Manage/monitor
LYNCHES CREEK ROAD	J.CAMPBELLS NO.1 BRIDGE	Timber	46.6	**25**	Replacement Program 2017/18, revoted to 2018/19.
LYNCHES CREEK ROAD	J.CAMPBELLS NO.2 BRIDGE	Timber	38	**25**	Replacement Program 2017/18, revoted to 2018/19. Works in progress.
MILLS ROAD	TIMBER 11.1 LONG	Timber	11	**closed**	Sidetracked, included in replacement program 2017/18, revoted to 2018/19.
NEEDHAMS ROAD	MULCAHYS BRIDGE	Timber	33	**25**	Replacement program 2019/2020
OLD LAWRENCE ROAD	OLD LAWRENCE NO.1 BRIDGE	Timber	11	**5**	Sidetracked, manage/monitor.
OLD TWEED ROAD	CRANE BRIDGE	Timber	11.2	**closed**	Replacement bridge not in current program
PHELPS ROAD	TIMBER 15M	Timber	15	**20**	manage/monitor
RISK ROAD	THE RISK STATION BRIDGE	Timber	26	**20**	manage/monitor
RYANS CK ROAD	RYANS CREEK ROAD NO.2 BRIDGE	Timber	11.7	**closed**	sidetracked

Road	Bridge Name	Material	Length	Load Limit (T)	Comments
TREE FERN ROAD	BRINDLE CREEK NO.1 BRIDGE	Timber	19.6	**20**	manage/monitor
TUNGLEBUNG CK RD	MASLENS NO.2 BRIDGE	Timber	13.9	**15**	Replacement bridge needed, not in current program
WILLIAMS ROAD	ANDREW BRIDGE	Timber	28.3	**20**	Replacement Program 2017/18, revoted to 2018/19. Works in progress.
WILLIAMS ROAD	MITCHELL BRIDGE	Timber	40.1	**20**	Replacement Program 2017/18, revoted to 2018/19. Works to commence once Robothams Bridge replacement completed.
WILLIAMS ROAD	BIRNEY BRIDGE	Timber	34.2	**20**	Major repairs funded under Natural Disaster restoration funds, works to be programmed upon completion of remaining bridge replacements on Williams Road
WYNDHAM ROAD		Timber	19.2	**7**	Replacement Program 2021/2022.
YABBRA ROAD	HAYSTACK CREEK BRIDGE	Timber	14	**20**	Replacement Program 2020/2021.

APPENDIX F – INITIATIVES IDENTIFIED IN AGENCY PLANS & BY LOCAL GOVERNMENT

TFNSW REGIONAL NSW SERVICES AND INFRASTRUCTURE PLAN INITIATIVES:

- Woolgoolga to Ballina (State and Federal funded).
- Bruxner Highway, Replacement Bridge over Clarence River (committed).
- Summerland Way, Additional Clarence River Crossing (Grafton Bridge) (committed).
- Upgrade of Bangalow Road between Bangalow and Lismore (to be investigated next 10 years).
- Bruxner Highway Improvements (Ballina-Casino) (to be investigated next 10 years).
- Gwydir Highway Improvements (between Grafton and Glen Innes, Jackadgery) (to be investigated next 10 years).
- Summerland Way Improvements (Grafton-QLD border) (to be investigated next 20 years).
- Bruxner Highway Improvements (Casino-Tenterfield) (to be investigated next 20 years).
- Higher Speed Connections (east coast) via Grafton, Casino and Kyogle (visionary 20 +years).

SOUTH EASTERN QUEENSLAND STUDY INITIATIVES:

- Delays in freight movement along the strategic freight corridors of the Pacific Motorway, Mount Lindesay Highway and to a lesser extent the Cunningham Highway could impact on the region and the state.
- Undertake planning to inform options for upgrading the Mount Lindesay Highway between Park Ridge South and Jimboomba.
- Pacific Highway Varsity Lakes to Tugun capacity upgrades.
- Freight access road connecting the Bromelton State Development Area to the Mount Lindesay Highway at Woodhill.

RMS BRUXNER HIGHWAY ISSUES/INITIATIVES:

- Detailed discussions with RMS:
  - The sealed lane and overall carriageway width for significant sections of the route are deficient for the safe operation of 26m restricted access vehicles. It is considered for the combination vehicle to traverse the road and curves safely, additional lane width is required in order to accommodate the greater tracked path of the vehicle. RMS believes it is essential to provide sufficient carriageway for larger heavy vehicles to operate without imposing a risk to other road users by impinging on adjacent lanes or encroaching on limited or no shoulders.
  - Improved signposting and a lower speed limit for freight vehicles may also be required for a number of sections featuring grades of up to 10% with lesser than standard curves. This is considered essential in order to mitigate the risk of lateral acceleration and potential rollovers.
  - The route, is primarily two lane (two-way) single carriageway, which requires any overtaking vehicle to use the opposing lane. The opportunities for this to be undertaken safely are limited due to sight distance, road profile and the availability of sufficient gaps. Concern is raised due to increased length of the proposed vehicle and the subsequent time it may take for an overtaking manoeuvre to be conducted. Prior to the road being classified to allow 26m restricted vehicle access, it may require the construction of dedicated overtaking lanes.
  - The Bruxner Hwy also features several (approximately 6) narrow bridges. These structures are less than the recommended 7.2m carriageway width for 26m vehicles. Structure widening or other mitigating action would be required.
  - Concern is also raised in respect to connectivity to the New England Hwy at Tenterfield. The current intersection in the Tenterfield CBD is not suitable for 26m B-double access.
- Ballina to Tenterfield Corridor Study (2009) Initiatives:
  - Continue to improve intersection efficiency, especially within Lismore and Casino. Particularly capacity restrictions that cause peak period pinch points and traffic delays around Lismore and between Lismore and Ballina.
  - Expand capacity in the section between Lismore and Alstonville (expand duplication) and improve capacity between Alstonville and the Pacific Highway, to extend the benefits of the Alstonville Bypass.
  - Provide overtaking opportunities west of Casino, especially in the Great Dividing Range west of Drake. Inclusive of physical constraints (alignment) on B-double vehicles, pavement width and condition.
  - Monitor environmental and climatic conditions in the corridor and develop effective strategies that respond to

these changes and minimise their impacts. For example, moderate slope stability issues around the Mallanganee Range Crossing.

KYOGLE COUNCIL NEEDS/INITIATIVES:

- Bruxner to Bonalbo 14km of Clarence Way needs pavement (currently gravel). Council has adopted a multi-pronged approach to maintaining the seal integrity of the existing pavement north of the Bruxner Hwy supplemented by a rolling program of new sealing works to the south. Ultimately Council would like to see this road elevated to Highway status. Interim treatments include;
  - Heavy patching of failed sealed sections with cement or lime stabilisation as required
  - Programmed replacement of existing infrastructure as useful lives are exhausted
  - Focus on improving drainage to protect existing infrastructure

- To rebuild Mt Lindesay Road from Legume to Woodenbong to suit heavy vehicles:
  - 30km of road reconstruction (pavement and widening).
  - 12km of renewal.
  - Two bridge reconstructions.

NORTHERN RIVERS REGIONAL ECONOMIC DEVELOPMENT STRATEGY (REDS)

- Summerland Way realignment and upgrade program
- Western Bruxner freight productivity program
- Eastern Bruxner regional connectivity program
- Kyogle Town Centre Bypass
- Ballina-Byron Gateway Airport Stage Three
- 'First Mile' / 'Last Mile' Fixing Country Roads Investment program
- Bridge Upgrades:
  - Hollingworth Bridge
  - Duplication of Ballina Bridges
  - North Creek Bridge
- Road Upgrades:
  - Oliver Avenue –Pineapple Road
  - Alternative route to Bruxner Highway
  - Alphadale Road
  - Union street –roundabout
  - Bruxner Highway/Ballina Road interchange at Lismore
  - Pacific Highway -Ballina Bypass –Cumbalum Interchange.

CLARENCE VALLEY REGIONAL ECONOMIC DEVELOPMENT STRATEGY (REDS)

- Woolgoolga to Ballina section of the Pacific Highway (under construction)
- New Grafton Bridge –together with upgrades to the road network in Grafton and South Grafton (under construction)
- Marine precinct development
- Harwood Road upgrade
- Local Road Network Integration:
- Yamba access road
- Goodwood Street access to Pacific Highway.

TWEED REGIONAL ECONOMIC DEVELOPMENT STRATEGY (REDS)

- Tweed Precincts Investment Program
- Tweed River Bank Stabilisation
- Tweed Shire Last Mile and Pinch-Point Investment Program

- Pottsville Food Processing and Enterprise Cluster
- Murwillumbah Industry Central enterprise and industrial cluster
- Tweed Coast Road duplication
- Growth roads projects:
    - New Broadwater Parkway
    - Kirkwood Road Interchange
    - Business Cases for identified roads in the Tweed Road Development Strategy 2017
        - Upgrade Pacific Highway ramp (southbound)/ Gold Coast Highway intersection.
        - Upgrade Pacific Highway ramp (northbound)/Sugarwood Drive intersection
        - Six-laning of the Pacific Highway north of Kirkwood Rd Tweed Heads
        - Signalise Pacific Highway (southbound)/ Kennedy Drive intersection
        - Four-laning of Tweed Valley Way (River Street to Quarry Road)
        - Upgrade Tweed Valley Way/ Quarry Road intersection