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Containerised cargo demand assessment

Riverina and South West Slopes and Plains

Transport for NSW

Riverina and South West Slopes and Plains Containerised Cargo Demand Assessment

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Executive Summary

The Riverina and South West Slopes and Plains Region (the study area) is responsible for a large portion of Australia's agricultural production. This produce is consumed both domestically and in international markets, meaning connectivity to freight transport networks is critical to enabling these products access to markets.

The capital cities of Melbourne, Sydney, Adelaide, and Brisbane are all readily accessible via National Highways passing through the study area. The Hume Highway connects Melbourne to Sydney and also connects with the Sturt Highway, which connects NSW to Adelaide. Finally, the Newell Highway provides an inland route from the study area to Queensland. The study area is traversed by the main north-south rail line from Sydney to Melbourne. There are also a number of branch lines connecting to the main line in the area, which are part of the NSW Country Rail Network.

Data obtained from the Bureau of Freight Statistics' Strategic Freight Model estimated that in 2011 outbound freight volumes were more than triple the volume of inbound freight in the study area (approximately 175,000TEU outbound compared to 49,000 TEU inbound). Therefore, this report focusses on demand analysis for outbound freight volumes from the study area, given the comparatively low volume of cargo coming into the area.

PwC has identified key producers in each of these major industries in order to understand the base commodity production volumes in the region. Whilst there are other smaller producers in the area, their volumes are unlikely to influence the location of future intermodal terminals.

Industry output forecasts were developed using PwC's economy-wide modelling data, capabilities and experience. The model database was sourced from the Australian Bureau of Statistics (ABS) input-output tables, National and State Accounts, and other ABS data sources.

There are currently five operational intermodal terminals in the Riverina and South West Slopes and Plains region. There are five planned intermodal terminals within the study area that could potentially be developed.

Based on 2014 and 2030 volumes, it is estimated that the Griffith IMT and the Harefield IMT both transport sufficient volumes by rail to commercially sustain themselves. In particular, the Harefield IMT would attract sufficient volumes from a single commodity group, timber and paper products, to allow it to specialise its infrastructure and customer service offerings.

If each of the proposed terminals were developed, the Yenda, Wumbulgal and Leeton terminals would derive most of each of their volumes from a single producer, giving these producers a very high level of service but at the detriment of terminal efficiency, with each of these projected volumes falling short of the 15,000 TEU per annum target.

Cootamundra would be the most attractive location for a future terminal, given that it has a projected future volume from a single customer, Visy, that is sufficient to justify a standalone terminal.

There is likely to be an overall cost reduction driven by two factors. First, there is a substitution of trucks with trains. Given that research has shown that on average it costs less to transport a tonne kilometre by rail than by road, there is likely to be an overall cost reduction. Second, the new IMTs are likely to be closer to production regions, and therefore there will be fewer tonne kilometres for trucks to travel to each IMT.

After some time, and under the new operating environment, the supply chain is likely to begin to re-organise itself, shift the way its capital is deployed, and optimise itself based on

the new operating conditions. For example, currently over 59,000 TEUs of Timber and Paper within the study area is transported by road as opposed to over 36,000 TEUs by rail. These volumes are transported across Australia, likely to dispersed individual distribution centres or to end users. If there is a substantial shift from road transport to rail, which implies greater volumes of cargo at receiving intermodal terminals, it is likely that the logistics supply chain will shift from disperse distribution centres to large centralised distribution warehouses.

Contents

1 Introduction

1.1 Study purpose and objectives

The Riverina and South West Slopes and Plains Region (the study area) is responsible for a large portion of Australia's agricultural production. This produce is consumed both domestically and by international markets, meaning connectivity to freight transport networks is critical to enabling these products access to market.

The purpose of this study was to investigate demand for transporting containerised cargo as there is a focus on moving more freight from road to rail. The objectives of this study were:

a) Define the demand for containerised cargo over time;

b) Identify existing intermodal terminals in the cargo catchment, potential new competing terminals, and define the impacts of these potential terminals on transport behaviour; and

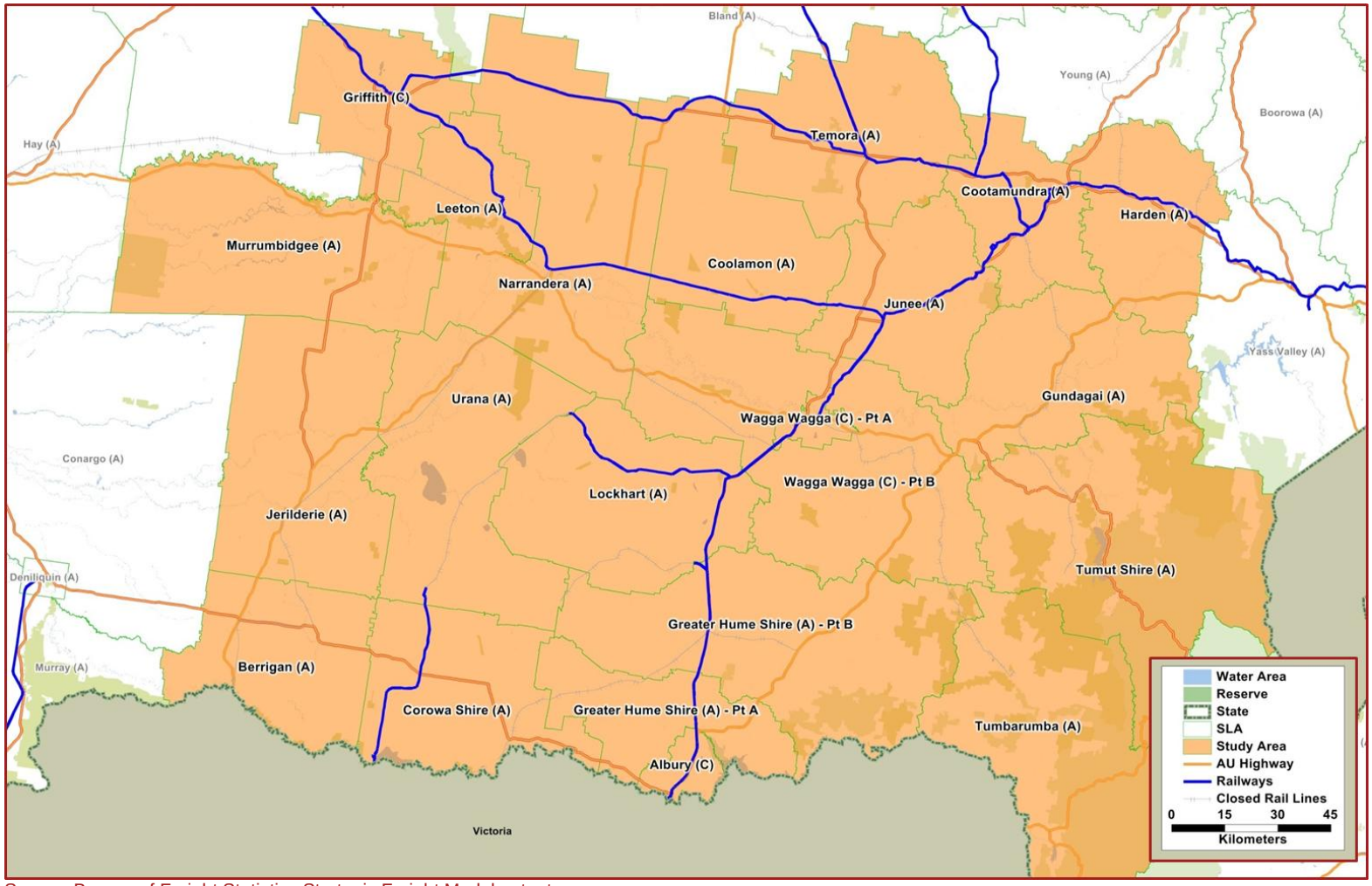
c) Identify potential economic benefits in the study area arising from the development of intermodal terminals.

In 2011, data obtained from the Bureau of Freight Statistics' Strategic Freight Model estimated that outbound freight volumes were more than triple the volume of inbound freight for the study area. Therefore, this report focusses on demand analysis for outbound freight volumes from the study area, given the comparatively low volume of cargo coming into the area.

1.2 Study area

The study area is indicated in Figure 1. It is bounded by Murrumbidgee in the west, Tumut Shire to the East, Temora to the North and Albury to the South.

Figure 1: Study Area and Statistical Local Areas



Source: Bureau of Freight Statistics Strategic Freight Model output

The study area is characterised by its size and the diverse nature of the commodities produced and exported from the region. As shown in Figure 1, the study area has been viewed at the level of Statistical Local Areas (SLAs) to enable sufficiently granular demand reflecting the size and diversity of production. The SLAs were grouped into Study Area Regions, as described in Table 1.

Table 1: Study Area Regions and Statistical Local Areas

Region	Statistical Local Areas (SLAs)
1	Cootamundra, Harden, Temora
2	Griffith, Leeton, Murrumbidgee Narrandera
3	Wagga Wagga, Junee, Lockhart, Coolamon
4	Tumut, Tumbarumba, Gundagai
5	Albury, Greater Hume Shire, Corowa Shire
6	Urana, Jerilderie, Berrigan

Source: TfNSW 2014

1.3 Structure of this report

The remainder of this report is structured as follows:

- Section 2: Details the commodities that underpin demand analysis in the study area:
- Section 3: Details forecast growth in the freight task in the study area;
- Section 4: Details the existing freight network in the study area, terminals that may potentially be developed in the future and the modal split of the freight task;
- Section 5: Develops a framework for demand analysis and estimates the growth of freight volumes currently on rail and the potential volume of freight presently transported on road that is contestable by rail;
- Section 6: Details the high level primary and secondary economic benefits delivered by intermodal terminals generally in the study area.

2 The Freight Task

This section of the report details the freight task generated in the study area.

Data obtained from the Bureau of Freight Statistics' Strategic Freight Model estimated that in 2011 outbound freight volumes were more than triple the volume of inbound freight in the study area (approximately 175,000TEU outbound compared to 49,000 TEU inbound). This reflects the settlement and economic characteristics of the area. The study area is characterised by:

- Dispersed settlements with low population densities; and
- Dispersed agricultural production

The absence of a large central point of population or production means that there is no single point to which consolidated and containerised freight could be railed and be broken down and distributed over a relatively small area. Therefore, most of the freight driven by household demand, such as fast moving consumer goods (FMCG), and production inputs such as logs are freighted into the area by road.

Many empty containers are sourced from the Sydney metropolitan area and railed into the study area, given:

- Imports dominate throughput at Port of Botany which guarantees supply compared to Port of Melbourne; and
- There are several container parks located along the southern freight line out of Sydney that can supply the market.

This report focusses on demand analysis for outbound freight volumes from the study area, given the comparatively low volume of cargo moving into the area and the dominance of road given the dispersed nature of markets within the study area.

2.1 Outbound Freight

The Riverina and South West Slopes and Plains region is characterised by substantial agricultural production. The primary commodities produced in the area are:

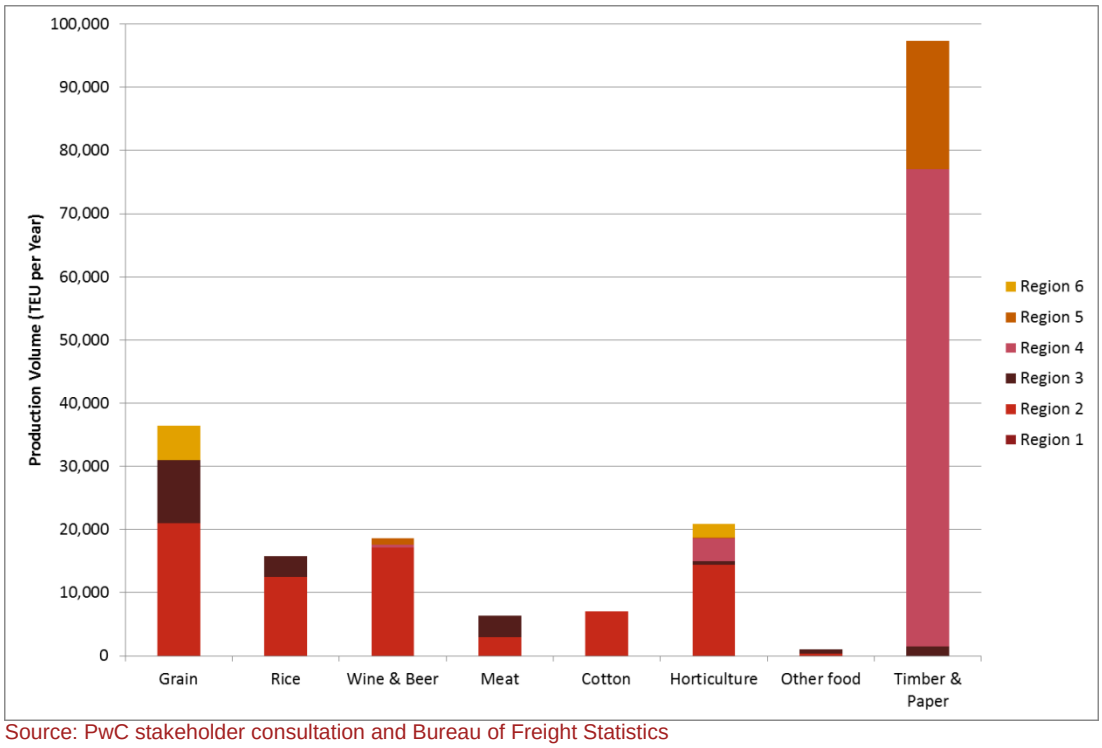
- Grain: including wheat, barley, canola (~36,450 TEU, 18% of market)
- Rice (~15,800 TEU, 8% of market)
- Wine and beer (~18,560 TEU, 9% of market)
- Meat (~6,400 TEU, 3% of market)
- Timber and paper products (~97,390 TEU, 48% of market)
- Cotton (~7,000 TEU, 3% of market)
- Other agriculture: including fruit, citrus, walnuts, horticulture (20,925 TEU, 10% of market)
- Other food: includes processed food and drinks (~1,060 TEU, 1% of market)

In addition to the grain crops identified above, the region also produces pulse crops such as soybean, faba bean, chickpeas, peas and alfalfa. Specific data regarding the volumes of these products was not able to be captured to an accuracy that allowed more detailed analysis.

PwC identified key producers in each of these major industries in order to understand the base commodity production volumes in the region. Whilst there are other smaller producers in the area, their volumes are unlikely to influence the location of future intermodal terminals.

Where sufficient data was not able to be obtained through consultation with major producers to establish a baseline of commodity volumes produced in each SLA within the study area, volumes were obtained from the Bureau of Freight Statistics (BFS) Strategic Freight Model. Total volumes of production for each region within the study area are summarised in Figure 2.

Figure 2: Estimated 2013 Annual Production Volumes by Commodity and Region



Source: PwC stakeholder consultation and Bureau of Freight Statistics

The following sub-sections provide an overview of:

- Each of the key commodity markets in the study area;
- The major producers in each market; and
- Their volumes/production.

2.1.1 Grain

The Grain market includes the production of:

- Wheat;
- Barley (including malt barley for the production of beer); and
- Canola used in the production of oils and margarine, and livestock feed.

Additionally, the region also produces pulse crops such as soybean, faba bean, chickpeas, peas and alfalfa, however these have not been specifically analysed due to a lack of data.

Growers may deliver grain to consolidation silos operated by bulk handling companies (BHCs), of which GrainCorp is the dominant eastern Australian company. Rail is the dominant mode of transport for export grain and domestic transport of grains to most of the larger NSW mills. Road transport is used for delivery to the livestock feed sector and to service smaller mills and maltsters.

While traditionally grain has been shipped in bulk carriers (both rail carts and truck hopper trailers), there has been a recent increase in the movement of containerised grain. Although trucks carry less tonnage of grain due to load requirements, road transport reduces handling costs associated with consolidation/disbursement at the ends of the supply chain.

Table 2 provides an overview of the key players in the Grain market within the study area. Although exact figures for the split of exported product versus domestic-bound product were not able to be obtained due to variations in harvest volumes from year to year, data from the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) shows that generally two thirds of grain produced by eastern Australian farmers is consumed domestically. Volumes estimated for the study area reflect a higher level of exports, suggesting that other grain producing regions in Eastern Australia (e.g. Queensland, Victoria, and northern NSW) may counteract this with higher levels of domestic consumption.

Table 2: Key Grain Producers and Estimated 2013 Volumes

Producer	Region	Location	Volumes	Export %	Domestic %	Domestic markets
Northern Riverina Grain	2	Tabbita	2,000 TEU	100%	-	N/A
Grain Link	2	Griffith	12,000 TEU	100%	-	N/A
Riverina Oils and Bio Energy (ROBE)	3	Wagga Wagga	8,250 TEU	3%	97%	Victoria, Tasmania, Sydney
Croker Grain	3	Marrar	4,000 TEU	100%	-	N/A
LGL Commodities	3	Harefield (Packing facilities)	6,000 TEU	100%	-	Pittsworth QLD (packing facility), Brisbane (Port)

Source: PwC stakeholder consultation

Graincorp's key operations/distribution facility is located in Wagga Wagga, however volumes have not been able to be obtained through the consultation process. Additionally, Emerald Grain operates silo/storage facilities at approximately five sites across the study area, for which volumes have not been determined.

2.1.2 Cotton

Table 3 shows that the key cotton producer in the study area is Southern Cotton, which provides warehousing for cotton seed and ginning/processing facilities for cotton growers. The facility was established in 2012 and also provides forward sales negotiation services to secure prices for primary producers. The key export markets for cotton include China, Korea, Japan, Indonesia, Thailand, and Bangladesh (Cotton Australia, 2014).

There are also cotton ginning facilities in Hillston (Namoi Cotton) and a new facility opening in 2015 in Hay (Auscott Ltd). Production volumes for these additional facilities have not been included in this analysis.

Table 3: Key Cotton Producers and Estimated 2013 Volumes

Producer	Region	Location	Volumes	Export %	Domestic %	Domestic markets
Southern Cotton	2	Whitton	7,000 TEU	100%	-	N/A

Source: PwC stakeholder consultation

2.1.3 Rice

The Riverina is responsible for the majority of Australia's rice production. Sunrice, based in Leeton, undertakes the vast majority of the storage, milling, processing, and marketing of Australian rice. Rice production is a water-intensive industry and, as such, rice production suffered dramatically from 2002-2010 due to drought conditions. Depending on the climatic variability and the price of the Australian dollar, production has been up to as high as 1.7 million tonnes in 2000-2001, to less than 20,000 tonnes in 2007-08 as shown in Figure 3.

Figure 3: NSW Riverina rice production and price 1991-92 to 2010-11

Source: The Rice Marketing Board for the State of New South Wales (2011)

The most recent production volumes and export/domestic consumption splits for Sunrice are shown in Table 4. It is important to note that the split of exports and domestic consumption, whilst currently correct, may in future years be susceptible to variations in weather conditions and fluctuations in export prices/exchange rates.

Table 4: Key Rice Producers and Volumes

Producer	Region	Location	Volumes	Export %	Domestic %	Domestic markets
Sunrice	2	Leeton	15,300 TEU	40%	60%	Nationwide

Source: PwC stakeholder consultation

2.1.4 Wine and beer

The majority of wine and beer in the region is produced in the Griffith / Yenda area, as shown in Table 5. The largest producer is Casella wines, a large wine exporter. Casella Wines and Coca-cola Amatil are also establishing a new joint venture in the area, producing beer under the name Australian Beer Company. There is also a small amount of cider production in Batlow, Tumut Shire, from the Batlow Cider Company for domestic consumption.

Table 5 provides an overview of wine and beer production in the study area.

Table 5: Wine and Beer Key Producers and Volumes

Producer	Region	Location	Volumes	Export %	Domestic %	Domestic markets
Casella Wines	2	Yenda	10,000 TEU	80%	20%	Melbourne, Brisbane, Sydney
De Bortoli	2	Bilbul (Griffith)	2,000 TEU	10%	90%	Melbourne, Sydney, Brisbane, Perth, Adelaide
Berton	2	Yenda	300 TEU	20%	80%	Melbourne, Brisbane, Sydney
McWilliams	2	Hanwood	1,000 TEU	Unknown split		National
Calabria Family Wines	2	Griffith	410 TEU	Unknown split		National
Nugans Estate	2	Griffith	450 TEU	Unknown split		National
Warburn Estate	2	Tharbogang (Griffith)	3,000 TEU	Unknown split		Unknown

Source: PwC 2014

The split of exports and domestic consumption for some of these companies is unknown, but many sell their product internationally across North and South America, Europe, and Asia. In 2013, McWilliams, Warburn Estate, and Nugans Estate ranked 8th, 11th and 12th respectively among Australia's top 20 wine exporters.

2.1.5 Meat

The Riverina and South West Slopes and Plains region includes a number of abattoirs and meat processors, with lamb, chicken and beef being produced in the area. This is for both domestic consumption and export, with the region's key producer JBS exporting various products to more than 50 countries. In addition to the key producers presented in Table 6, Gundagai Meat Processors and GM Scott in Cootamundra have major contracts with Coles and Woolworths respectively for lamb. In each case, product is packaged locally and then transported by road. Baiada poultry in Griffith also produce live poultry, feed, eggs, processed chicken and pet food.

Table 6: Meat Key Producers and Volumes

Producer	Region	Location	Volumes	Export %	Domestic %	Domestic markets
JBS Swift	2	Leeton	3,000 – 4,600 TEU	Unknown split		Unknown
	3	Wagga Wagga				
Teys	3	Bomen	2,400 TEU	-	100%	Unknown
Junee Abattoir	3	Junee	1,000 TEU	-	100%	Unknown

Source: PwC 2014
Note: The volume shown for JBS Swift is across both locations, more detail was not made available through consultation

2.1.6 Timber and paper products

The forestry, timber and paper products industry in the region is characterised by 5 major timber and paper processors;

- Ausply;
- Visy;
- Hyne;
- Carter Holt Harvey; and
- Norske Skog.

Visy and Norske Skog operate pulp and paper mills, whilst Hyne is a major softwood saw miller (providing timber to Bunnings), and Carter Holt Harvey's Tumut operations focus on timber and particleboard. The largest of these processors is Visy, Australia's largest cardboard box (or packaging carton) exporter. Ausply produces plywood and timber veneer products, with its raw materials sourced from a timber plantation in Tumut, NSW.

In addition to outward flow of products from these processors, as summarised in Table 7, there are also large volumes of inbound freight to the paper and timber mills. Aside from using timber from the local pine plantations in Tumut and Tumbarumba, processors transport saw logs by road from Bathurst, Oberon and Bega. In addition, Visy is currently transporting recycled material from Melbourne into the mill, primarily transported on trucks on their return journey from offloading domestically consumed finished products.

Table 7: Key Timber and Paper Products Producers and Volumes

Producer	Region	Location	Total Volumes	Export %	Domestic %	Domestic markets
Ausply	3	Wagga Wagga	30,000 tonnes (~1,430 TEU)	-	100%	All
Visy	4	Tumut	650,000 tonnes (~53,060 TEU)	77%	23%	Sydney, Melbourne

Producer	Region	Location	Total Volumes	Export %	Domestic %	Domestic markets
Hyne	4	Tumbarumba	200,000 tonnes (~12,500 TEU)	-	100%	All
Carter Holt Harvey	4	Tumut	160,000 tonnes (~10,000 TEU)	-	100%	All
Norske Skog	5	Albury	250,000 tonnes (~20,400 TEU)	-	100%	Sydney, Melbourne

Source: PwC stakeholder consultation

2.1.7 Horticulture and other agriculture

The Horticulture market includes fruits, vegetables and nuts. The largest identified volumes of horticulture presented in Table 8 are citrus fruits, with crops in the Riverina region composed of 90% oranges and the remaining crops being mandarins, lemons and grapefruits. Apples represent a significant proportion of agricultural production, the majority of which are grown in Batlow in Tumut Shire. Prune production is also increasing in the region, with buyers from the US recently showing interest in the region's product to meet their own domestic shortfalls.

Recently, Walnuts Australia established operations in Leeton expanding on its existing operations in Tasmania. The company expects that its combined operations will be able to produce 11,000 tonnes of in-shell walnuts once their plantations mature.

Table 8: Key Horticulture Producers and Volumes

Producer	Region	Location	Volumes	Export %	Domestic %	Domestic markets
Walnuts Australia	2	Leeton	800 TEU	N/A	N/A	Domestic – Woolworths "Select", plus overseas export
Citrus	2	Griffith	185,000 tonnes (~13,000 TEU)	N/A	N/A	Unknown
Batlow Apples	4	Batlow	8,000 tonnes (~575 TEU)	-	100%	National

Source: PwC stakeholder consultation

Although the figures presented in Table 8 do not provide details of exported volumes, from the information obtained through consultation and company profile searches, the proportion of exported goods in this category can be confirmed as minimal.

2.1.8 Other Food

The Other Food volumes summarised in Table 9 are classified as value added food production, as opposed to the raw products covered in the Horticulture market. Harvey Fresh was the southern hemisphere's largest manufacturer of niche juice products exported to Asia, with the company recently acquired by Parmalat Australia (a subsidiary of Italian company, Parmalat Finanziaria SpA). Freedom Foods is a health foods company, with the Leeton facility forming part of a wider Australian network of factories for different products.

Table 9: Key Other Food Producers and Volumes

Producer	Region	Location	Volumes	Export %	Domestic %	Domestic markets
Harvey Fresh / Nugan Quality foods	2	Griffith	260 TEU	N/A	N/A	Unknown
Freedom Foods	2	Leeton	100 TEU	N/A	N/A	Unknown

Source: PwC stakeholder consultation

3 Freight Growth

This section of the report details the growth rates used to forecast growth in commodities and growth in the freight task in the study area to 2030.

3.1 Forecast growth by commodity

Industry output forecasts were developed using PwC's economy-wide modelling data, capabilities and experience. The model database was sourced from the Australian Bureau of Statistics (ABS) input-output tables, National and State Accounts, and other ABS data sources. Modelling assumptions for growth were based on:

- ABS's population projections;
- Commonwealth Treasury's terms of trade forecasts;
- Commonwealth Treasury's 3-Ps framework (population, productivity and participation); and
- Industry productivity assumptions.

Economic output forecasts were generated for 58 industries for the Riverina region (Murrumbidgee and Murray statistical divisions) which were then matched to TfNSW's product groups exported by the region (contained in BFS Strategic Freight Model).

Where sufficient data was not able to be obtained through consultation with major producers to establish a baseline of commodity volumes produced in each SLA within the study area, volumes were obtained from the BFS Strategic Freight Model.

3.1.1 Forecast growth rates

The growth rates in Table 10 below reflect the forecast growth in Gross Value Added (GVA) for production of each of the commodities shown. The growth in freight volumes generated was assumed to be commensurate to the growth in industry GVA.

Table 10: Commodity Growth Rates

Commodity	Forecasted annual growth rate to 2030
Grain	1.21%
Rice	1.21%
Wine and beer	1.67%
Meat	1.47%
Timber and paper products	2.36%
Cotton	1.34%
Horticulture	1.34%
Other food	1.67%

Source: PwC Input / Output model

3.2 Growth by region

Table 11 summarises the volumes of each commodity produced in each region and their estimated growth to 2030 based on the methodology summarised in Section 3.1.

Table 11: Forecast Commodity Growth by Region

Region	SLAs	Commodities	Current TEUs	Forecast annual growth rate	Forecast TEUs (2030)
1	Cootamundra, Harden, Temora	No significant volumes			
2	Griffith, Leeton, Murrumbidgee Narrandera	Grain	21,000	1.21%	25,460
		Rice	15,300	1.21%	18,550
		Wine & Beer	17,160	1.67%	22,370
		Meat	3,000	1.47%	3,800
		Cotton	7,000	1.34%	8,700
		Horticulture	14,375	1.34%	17,790
		Other food	360	1.67%	470
3	Wagga Wagga, Junee, Lockhart, Coolamon	Grain	10,000	1.21%	12,120
		Rice	3,300	1.21%	4,000
		Meat	3,400	1.47%	4,300
		Timber & Paper	1,430	2.36%	2,080
		Horticulture	550	1.34%	680
		Other food	700	1.67%	910
4	Tumut, Tumbarumba, Gundagai	Wine & Beer	400	1.67%	510
		Timber &Paper	75,560	2.36%	110,000
		Horticulture	3,650	1.34%	4,520
5	Albury, Greater Hume, Corowa	Wine & Beer	1,000	1.67%	1,300
		Timber & Paper	20,400	2.36%	29,630
		Horticulture	100	1.34%	120
6	Urana, Jerilderie, Berrigan	Rice	5,450	1.21%	6,610
		Horticulture	2,550	1.34%	3,160

Source: PwC analysis, stakeholder consultation and Bureau of Freight Statistics data

Table 12 combines the total volumes for each commodity group presented in Table 11 for each of the study area regions. Region 4 is expected to be the largest producer, driven mostly by significant volumes of timber and paper products, whilst the next largest producer, Region 2, comprises a more even spread of volumes driven by grain, wine and beer, rice, and horticulture.

Table 12: Forecast Trade Volume Growth (All Commodities) by Region

Region	SLAs	Current TEUs	Forecast TEUs (2030)
1	Cootamundra, Harden, Temora	No significant volumes	
2	Griffith, Leeton, Murrumbidgee Narrandera	78,195	97,140
3	Wagga Wagga, Junee, Lockhart, Coolamon	18,830	24,090
4	Tumut, Tumbarumba, Gundagai	79,610	115,030
5	Albury, Greater Hume, Corowa	21,500	31,050
6	Urana, Jerilderie, Berrigan	8,000	9,770

Source: PwC analysis, stakeholder consultation and Bureau of Freight Statistics data

4 Transporting Freight

This section of the report details the existing freight network serving the study area and the modal split of the outbound freight task.

4.1 Existing Network

The study area is serviced by both rail and road networks. As shown below in Figure 4 the study area has strong connectivity to the National Highway Network with the Hume (Route 31), Sturt (Route 20) and Newell (Route 39) Highways passing through the area to provide inland connections to Melbourne, Sydney, Adelaide and Brisbane.

The main north-south rail line from Sydney to Melbourne traverses the study area. Cootamundra, Harefield, Bomen and Ettamogah intermodal terminals are all located on the main line. Other regions in the study area are connected to the main line via a series of regional spur lines, not all of which are operational.

Figure 4: National Rail and Highway Network

Source: NSW Freight and Ports Strategy 2013

4.1.1 Existing rail network

As shown in Figure 4, the study area is traversed by the main north-south rail line from Sydney to Melbourne. There are a number of branch lines connecting to the main line in the area, which are part of the Country Rail Network (managed by John Holland). The only branch line currently operating for containers in the area is that from Griffith to the main line at Junee. Two container freight services operate from the region:

- Pacific National, originating service at Patrick's Griffith terminal and running via Leeton (Sunrice), Bomen and Ettamogah then south to Melbourne; and

- Qube originating in Harefield and terminating in Melbourne.

Both services run approximately 6 days a week.

The main north-south line and adjoining spurs connect the study area to:

- Port of Botany, Enfield intermodal terminal and the planned Moorebank intermodal terminal at an approximate distance of 500kms; and

- Port of Melbourne at an approximate distance of 440kms.

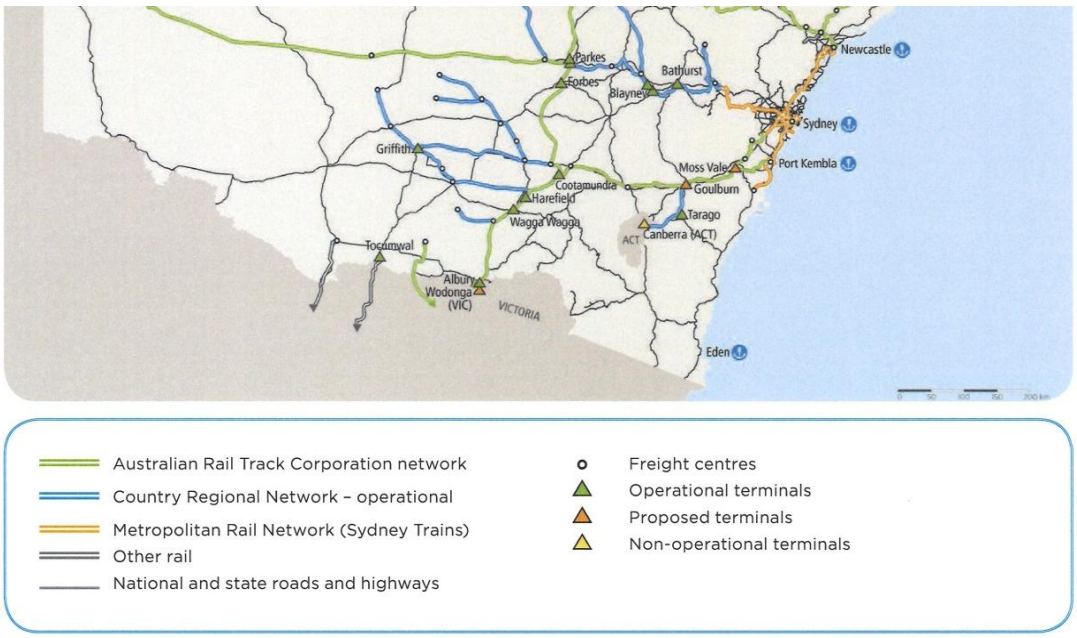
In spite of the relative equidistance between the two ports, rail services are presently concentrated on journeys to/from the Port of Melbourne, reflecting:

- The large proportion of freight transported by rail that is destined for export markets. Rail services to Port of Melbourne provide direct access to Swanson Dock, which significantly reduces the Pick-Up and Delivery (PUD) cost of transferring containers to the respective marshalling area; and

- The Bethungra Spiral which lies north of Harefield and south of Cootamundra on the main north-south line. Shippers and service providers alike perceive that there is a significant price differential arising from transiting the spiral as a result of the locomotive configuration necessary to achieve the requisite power to weight ratio. However, no evidence was provided to substantiate this perception.

There are currently five operational intermodal terminals in the Riverina and South West Slopes and Plains region, as shown in Figure 5. These terminals are detailed in Table 13.

Figure 5: Current Study Area Intermodal Terminals



Source: NSW Freight and Ports Strategy 2013

Table 13: Current Study Area Intermodal Terminals

Location	Operator	Primary Users	Description
Griffith	Patrick	Casella	Located one block from Griffith's main street and town centre. The 5Ha site runs adjacent to the Griffith train station, serving passengers on the NSW TrainLink Regional network's Southern Line
Bomen (Wagga Wagga)	Patrick	Teys, JBS Swift, ROBE, Heinz Watties, Austrak, BOC gases	Located at the rail siding in Bomen Industrial Estate in Wagga Wagga, Patrick Port Logistics consigns containerised freight to and from their Wagga rail terminal to the respective wharf in the Port of Melbourne, offering a train service 5 days per week for import and export containers.
Harefield (Junee)	Qube	Visy	Commenced operation in October 2012 after the Harefield Grain Complex was converted into an intermodal terminal by Qube. Siding is 700m long, double shunting is required as approximate static service length for Visy is 952m.
Cootamundra	Sutherland's Transport (also has open access)	Unknown	Current terminal was built approximately 35 years ago when container freight was new. Trains put together in the Cootamundra rail yards, with three 250m sidings.
Ettamogah (Albury)	Ettamogah Rail Hub (Colin Rees Transport)	Mountain H20, Norske Skog, Mars Petcare	Situated 10km from Albury on the Melbourne – Sydney rail line, although rail services currently only operate to Melbourne and Brisbane. The hub has been upgraded to include its own rail sidings with direct access to the main line

Source: PwC 2014

Other developments that are currently being progressed through the NSW Freight and Ports Strategy will improve the ability for exports to reach NSW ports, such as Port Botany and Port Kembla, by rail over time. Key developments that are currently underway include:

- Investigations into the reopening of disused rail lines in the country rail network: the Cowra Lines project will identify the capacity of the private sector to restore, operate and maintain non-operational rail lines on a commercially sustainable basis, without NSW Government funding;

- TfNSW's "Fast-tracking Freight" and "Fixing Country Roads" initiatives, which are aimed at unlocking productivity for freight in the regions, with a focus on enabling intermodal hubs to accept Higher Productivity Vehicles in their catchments;
- Metropolitan IMTs, i.e. Enfield, Moorebank, Chullora, Eastern Creek, and others that will provide triangulation and staging opportunities for rail;
- New dedicated freight infrastructure, i.e. ARTC works and improvements to the Southern Sydney Freight Line, Metropolitan Freight Line and Botany Rail Yard; and
- Planned future projects such as the duplication of the Port Botany Rail Line, Western Sydney Freight Line, Maldon to Dombarton Rail Link.

TfNSW is also investigating a range of options under the Container Rail Share Improvement Program to meet the NSW Government's 2021 objective to "double the proportion of containers moved by rail through NSW's ports by 2020".

The Cargo Movement Coordinator (CMC) began on July 1, 2014 and subsumes the Port Botany Landside Improvement Strategy. The CMC has established a Rail Operations and Coordination Committee (ROCC), which will improve the reliability and efficiency of rail through the Port Botany supply chain. Moreover, an Operational Performance management regime similar to the successfully integrated regime for road is being investigated.

Further, there may also be greater private investment potential for regional rail infrastructure from the private NSW Ports owner following refinancing.

4.1.2 Potential new Intermodal terminals

Throughout the stakeholder consultation process it became apparent that there are several planned intermodal terminals within the study area that could potentially be developed. Where available, details of these intermodal terminals are provided below. It should be noted that many stakeholders were not willing to share more detailed terminal plans given the commercial sensitivity of the plans and the competition to attract investment and co-location at the terminals – particularly from Patrick and Qube.

Therefore, it was difficult to assess the level of planning to date and the likely timing of delivery of these terminals.

Wagga Wagga

A new Wagga Wagga terminal has been proposed by the Wagga Wagga City Council to be developed on 80 hectares of land in Bomen. The Riverina Freight and Logistics Hub (RiFL) received a proposal grant from the Australian Government's Regional Infrastructure fund for a quarter of the planned $57.4 million capital expenditure. This grant is contingent upon commensurate private sector investment.

Constraints on the success of the project are the existing terminals in Bomen and Harefield which are 3.4km and 13.5km km away from the proposed site respectively. Therefore, the terminal operator would either have to compete with Patrick and Qube or either/both of these operators would need to relocate to the new terminal under an open access agreement. At this stage neither Patrick nor Qube have indicated a desire to move to the RiFL.

Wumbulgal

Grainlink has proposed to develop an intermodal terminal to replace the existing terminal in the Griffith city centre, should Patrick relocate from the town centre as conflict between freight and commercial activity escalates. The intermodal terminal is planned to have a 600-700m siding, significant hardstand area, and several reach stackers to shift containers.

Development approval has been given for a grain facility to be built at the site. Development on the grain facility has progressed. An intermodal terminal would effectively be a co-tenant on the site.

Yenda

The Yenda terminal option lies on a currently non-operational site outside of Griffith. It lies on the branch line between Griffith and Stockinbingal on the main North-South line. Whilst there has been some talk of reopening the site, there is concern that the cost of recommissioning the line is prohibitive.

The intermodal terminal is adjacent to the Casella Wines site – which is the largest generator of TEUs in the Griffith area. It is understood that Casella currently utilise the Griffith terminal in the centre of town.

Leeton

Currently there is a significant volume of freight (~20,800 TEU) generated in the Leeton area. Excluding Sunrice's volumes (~15,300 TEU) this freight goes predominantly by road to Melbourne. There is a significant opportunity for some of this freight to move to rail given that the train line passes directly through Leeton. The current existence of 2 spur lines and an additional spur line into Sunrice in Leeton means the capital expenditure to set up an intermodal terminal in Leeton would be relatively low.

Cootamundra

There are multiple proposed terminals in Cootamundra. A key feature of the terminals proposed in Cootamundra is that they are north of the Bethungra Spiral. Therefore, they can potentially provide a service to the Port of Botany that is perceived as more cost effective by shippers.

Visy has proposed to build a terminal on the Cootamundra-Tumut line, which would require restoring a section of the line, the development of an 800 metre siding, and heavy vehicle access from the rear of the site. Visy plans to also operate the terminal. There is an opportunity to hub at the terminal, which would enable Port Botany access for producers shipping from Griffith. A potential barrier is the provision of open access to rail service providers at both terminals.

VSuthern has proposed to build a terminal directly adjacent to the Main South line. The intention for this terminal is to provide a hub for shippers outside the study area who can access the site via spur lines to Cootamundra. The service would operate daily and provide access to broader markets in Brisbane.

TfNSW is examining potential additional IMT options at Nash's Lane, Cootamundra and at Coolac that will utilise the currently non-operational Cootamundra to Tumut Rail Line. As a result, TfNSW may conduct a future Registration of Interest to test market interest to construct, operate and maintain an IMT at one of these locations on a commercially sustainable basis, without NSW Government funding. Such an IMT would provide open access for all access seekers.

4.1.3 Existing Road network

The capital cities of Melbourne, Sydney, Adelaide, and Brisbane are all readily accessible via National Highways passing through the study area. The Hume Highway connects Melbourne to Sydney and also connects with the Sturt Highway, which connects NSW to Adelaide. Finally, the Newell Highway provides an inland route from the study area to Queensland. The Newell Highway meets the Cunningham Highway near the NSW-Queensland border, providing a national highway route to Brisbane.

Table 14 presents the estimated road journey times from the study area to capital city markets, taking Wagga Wagga as a central point within the study area. It takes approximately 5 hours to reach either Melbourne or Sydney. Brisbane is the furthest market, approximately 15 hours away by road.

Table 14: National Highways and Journey Times

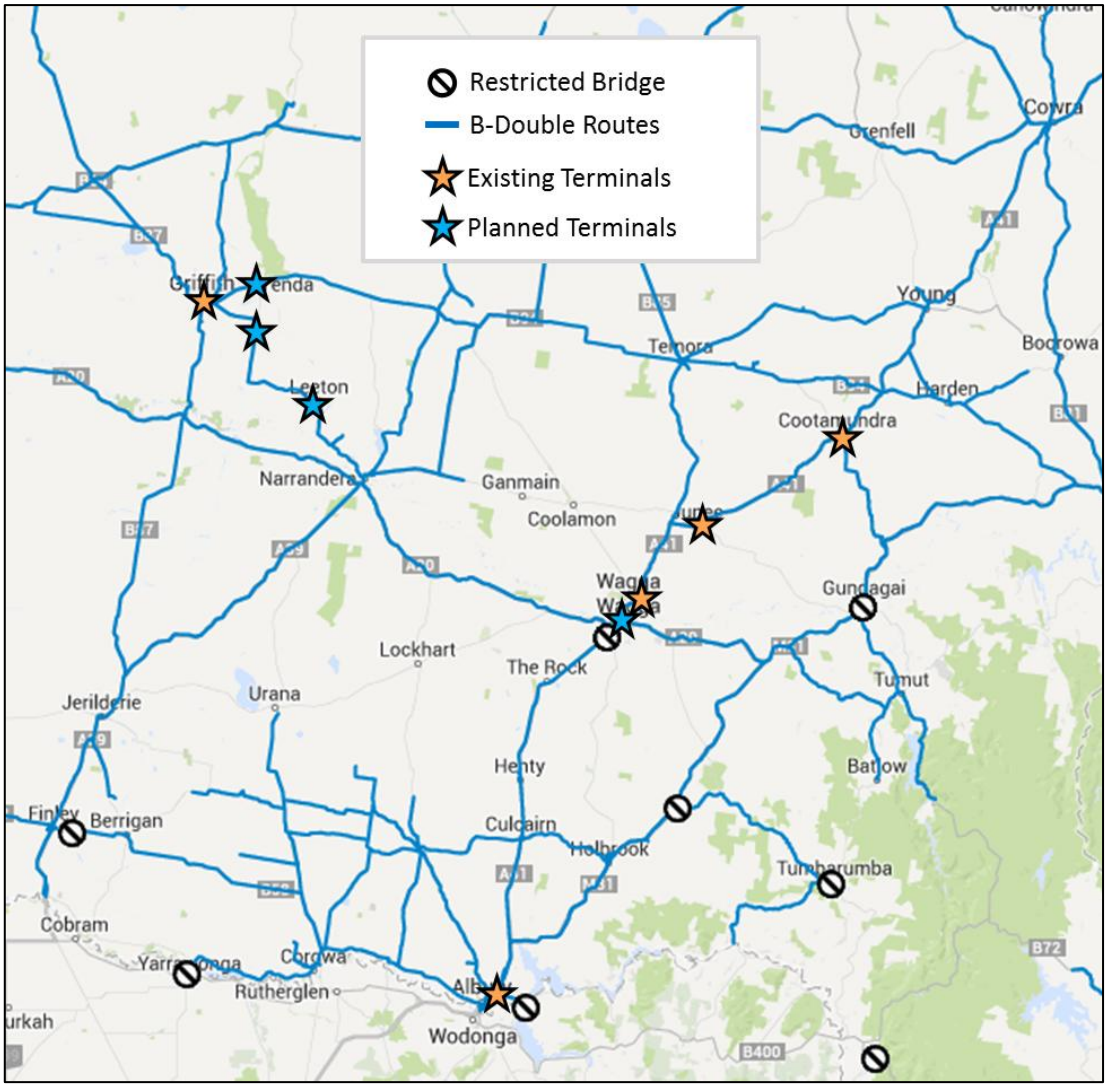
National Highway	Market(s) Accessible	Towns in study area on highway	Approximate journey time[1]	Approximate distance
Hume Highway	Melbourne	Albury, Gundagai	5 hours	450 km
	Sydney		5 hours	450 km
Sturt Highway	Adelaide	Gundagai, Wagga Wagga, Narrandera	11hours	950 km
Newell Highway	Brisbane	Narrandera	15 hours	1,250 km

Source: PwC analysis

Aside from the National Highway Network, freight must also travel on state and local roads in order to reach the National Highways or rail network. Figure 6 shows access roads to the National Highway Network and the intermodal terminals in the study area. It shows that first-mile access to the National Highway Network is not mass restricted. It also shows that there is only one significant last-mile access restriction to any of the existing or proposed intermodal terminals - the "restricted bridge" shown to the south of Wagga Wagga has been flagged for priority upgrades under the TfNSW "Bridges for the Bush" program (discussed in Section 4.1.4).

[1] From Wagga Wagga to each capital city

Figure 6: B-Double Higher Mass Limit Designated Roads



Source: Transport for NSW: Roads and Maritime Services
(via: http://www.rms.nsw.gov.au/heavyvehicles/iap/hmlmap/index.html)

As evident in Sections 2 and 3, 37% of the known outbound freight task within the study area is generated by Visy's pulp and paper processing in Tumut. Freight generated in Tumut and the surrounding area can take one of two main routes out to the Hume Highway, Gocup Road or the Snowy Mountains Highway (via Adelong)

Gocup Road (road B7 in Figure 7) is a primary access route into and out of Tumut, with trucks carrying logs coming into the area from the north (Bathurst, Oberon and Bega). Gocup Road is a two-lane road with 24/7 access for heavy vehicles, however it has weight restrictions from approximately 20km north of Tumut due to the poor quality of the road. The road was not originally designed for the large volumes of freight that move along it and therefore suffers from poor alignment and formation that in turn impacts freight productivity.

Gocup Road is favoured by road transport operators for outbound freight that has a destination North of Gundagai and is increasingly used as a route for inbound freight for the timber industry in the South West Slopes of NSW. Gocup Road is also used for destinations South of Gundagai such as the intermodal terminal at Harefield when the Adelong Curfew on the Snowy Mountains Highway (10pm – 7am) is active. The terrain is undulating at the Tumut end of the road but quite hilly towards Gundagai, causing difficulties for heavy vehicles.

On 1 July 2010 Gocup Road was reclassified as a State Road due to significant changes in economic activity and traffic flows in the area, particularly with the expansion of the local timber industry. The route currently provides access for 26m B-Doubles.

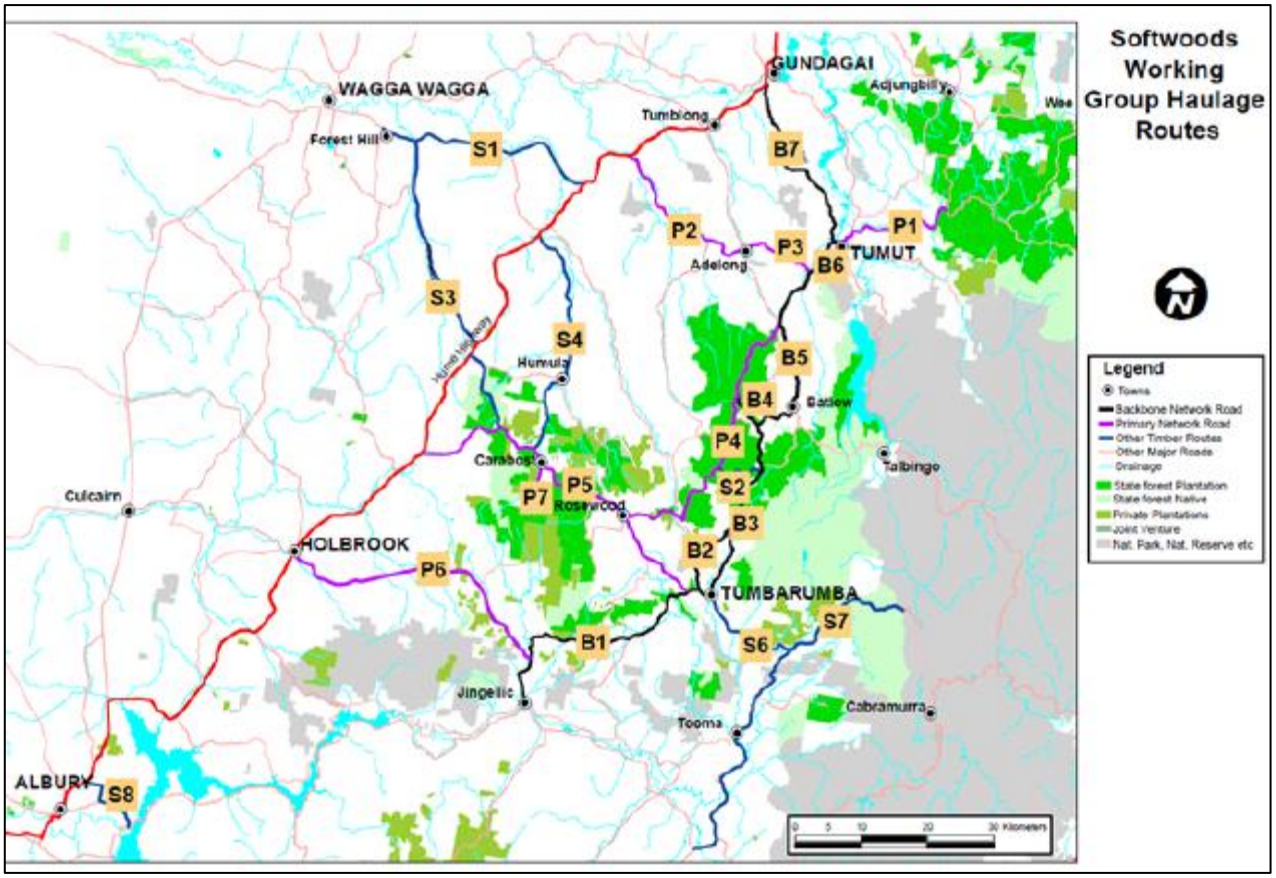
An upgrade to Gocup Road is included in the NSW Long Term Transport Master Plan (LTTMP), the NSW Freight and Ports Strategy (FPS) and the Southern Regional Transport Plan (SRTP). The LTTMP in the medium to longer term proposes an action to investigate upgrades to Gocup Road to accommodate modern freight demands and address vehicle safety requirements. The SRTP has an action in the medium to longer term to investigate upgrades to Gocup Road to accommodate modern freight demands and address vehicle safety requirements. The FPS also includes an upgrade of Gocup Road in the Infrastructure Program with funding sources to be determined.

There is no agreement on a potential financial contribution from Visy, the road's primary freight traffic generator, to an upgrade of Gocup Rd.

Visy previously made enquiries (not a formal application) with NSW Roads and Maritime Services (RMS) regarding access for a Performance Based Standards (PBS) Level 3A vehicle (30.7m A-Double) on Gocup Road for exports to port via an intermodal terminal. A preliminary RMS PBS A-Double assessment report indicates that vehicle movements from the Visy mill would drop from 435 per week to 210 per week if A-Doubles were utilised, as this vehicle can carry two 40 foot containers.

The Snowy Mountains Highway (roads P2 and P3 in Figure 7) passes directly through the township of Adelong. It is understood that a curfew between 10pm to 7am is imposed to Visy B-Double operations through Adelong, due to concern of continuous operation through the residential area. Other B-Double operations through the township do not face the same restriction.

Figure 7: Timber Haulage Routes



Source: Timber Industry Haulage Study for the South West Slopes of New South Wales (2009)

4.1.4 Future Road network

As mentioned previously, the road network out of Tumut requires upgrading due to the large increase in volumes of freight moving in and out of the area. There could be potential to either create an Adelong bypass on the Snowy Mountains Highway, avoiding the need for noise restrictions and operating curfews, or to upgrade Gocup Road.

Local councils in regional areas such as the study area often have difficulty in generating sufficient funds from ratepayers to facilitate their developments, especially in the case of Tumut Shire, which is approximately 60% National Park. In the past, Gundagai and Tumut Shire councils have sought the upgrade of Gocup Road, with it being reclassified as a State road in 2010. The current NSW Freight and Ports Strategy identifies further investigation of Gocup Road improvements including widening, realignment, and the addition of overtaking lanes in some sections, however funding has not yet been allocated. A Nation Building 2 submission was also made to the Federal Government for funding.

The NSW Freight and Ports Strategy also outlines a “Bridges for the Bush” program of works to upgrade and maintain bridges on rural highways to provide “continuity of access for High Productivity Vehicles”. TfNSW and RMS have prepared an Infrastructure Australia submission to provide 50% of the funding for the estimated $290m program. Of the 17 locations included in the program just one lies within the study area; Kapooka Bridge on Olympic Highway, South of Wagga Wagga (shown as a restricted bridge in Figure 6). This location has also been identified as one of the top five high-priority High Mass Limit deficient bridges within the state.

4.2 Mode Share

Table 15 indicates the mode share of outbound freight volumes by commodity. Table 16 indicates mode share by region. The figures presented in Table 15 and Table 16 were calculated using the road and rail volumes provided through the stakeholder consultation process. Where rail was not specifically mentioned as a mode of transport it has been assumed that volumes bound for export are transported by rail to port, and those volumes remaining unknown are transported by road. This assumption was based on the case that rail provides the best direct access to ports, whilst road is best suited to potentially more dispersed end markets.

Table 15: Mode Share of Known Volumes of Containerised Freight by Commodity

Commodity	Road%	Rail %
Grain	35%	65%
Rice	57%	43%
Wine and beer	55%	45%
Meat	53.5%	46.5%
Timber and paper products	63%	37%
Cotton	0%	100%
Horticulture	100%	0%
Other food	72%	28%

Source: PwC analysis

Table 15 shows that with the exception of cotton (100% rail) and horticulture (100% road) there is a relatively even distribution of the freight task between modes.

However, given that timber and paper products account for such a large volume of regional production, the skew towards road in this market means significantly more TEUs are being moved on road.

Table 16 indicates that the distribution between modes in each region is relatively even, with the exception of Regions 5 & 6.

Table 16: Mode Share of Known Volumes of Containerised Freight by Region

Region	Nearest Existing Intermodal Terminal(s)	Road%	Rail %
Region 1: Cootamundra, Harden, Temora	Cootamundra	No significant volumes	
Region 2: Griffith, Leeton, Murrumbidgee Narrandera	Griffith	51%	49%
Region 3: Wagga Wagga, Junee, Lockhart, Coolamon	Wagga Wagga, Harefield	42%	58%

Region	Nearest Existing Intermodal Terminal(s)	Road%	Rail %
Region 4: Tumut, Tumbarumba, Gundagai	Cootamundra, Harefield, Wagga Wagga	55%	45%
Region 5: Albury, Greater Hume, Corowa	Albury (Ettamogah)	100%	0%
Region 6: Urana, Jerilderie, Berrigan	Griffith, Wagga Wagga	100%	0%

Source: PwC analysis

5 Evaluating Contestability

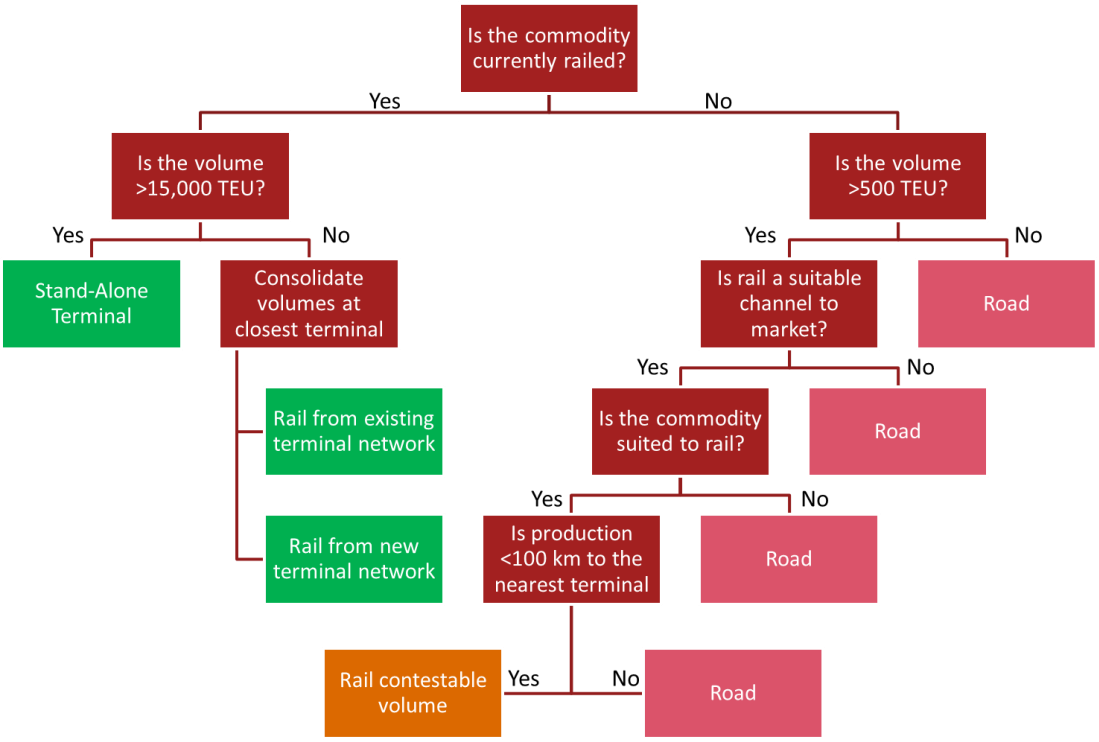
This section of the report:

- Establishes a framework against which the modal contestability of products can be evaluated;
- Evaluates modal contestability, identifying a core volume of TEUs transported by rail and a contestable market;
- Forecasts growth in TEU throughput at existing and planned intermodal terminals; and
- Quantifies potential throughput at existing and planned intermodal terminals.

5.1 A Framework of Contestability

The framework to evaluate the contestability of TEU volumes for each commodity is illustrated below in Figure 8.

Figure 8: Framework for Evaluating Modal Contestability



Source: PwC 2014

The framework is discussed in greater detail below.

5.1.1 Freight currently transported on rail

Generally, agricultural commodities destined for export markets are transported on rail throughout Australia. This is provided that the destination port is greater than 300kms distance from the point of production/consolidation. In the case of the Riverina region, shippers are generally in excess of 450kms from Port of Melbourne and 500kms from Port Botany. In this situation railing TEU can be up to 20% cheaper per container than using a road option. This is a conservative assumption given that a case study conducted by Charles River Associates (CRA) International for the Productivity Commission in 2006 found that the cost of transporting freight between Sydney and Brisbane could be up to 30% cheaper depending on the level of rail infrastructure utilisation.

As shown in Section 2, many agricultural exporters in the region are currently using rail. Therefore, it is assumed that these volumes will continue to be transported on rail and will grow at the forecast rates shown in Section 3.

Volume

Combined with distance to destination, volume is a highly critical factor in the viability of a regional intermodal terminal. A generally accepted rule is that a terminal is viable when transporting at a distance greater than 400kms when it has a threshold throughput of 30,000TEU per annum (loaded and empty). As this assessment focusses on outbound freight volumes, a threshold of 15,000 TEU was adopted, with the remaining 15,000 TEU generated by inbound goods and empty containers. A terminal is considered unlikely to be sustainable without this volume of TEU.

Given this threshold volume there are generally two operating models available to regional shippers when using intermodal terminals:

- Operate a standalone terminal; or
- Consolidate commodities to generate sufficient volumes at a common terminal.

A standalone terminal may also act as a hubbing point by:

- Offering open access to other shippers to consolidate at the standalone facility; or
- Shuttling TEUs from smaller terminals on common lines and reforming wagons at the terminal. A key challenge to this approach exists where multiple rail service providers operate in the network but open access to service providers is not enabled at the hubbing terminal.

Consolidation and Pick-Up and Delivery Costs

If a shipper is consolidating (when a shipper is choosing the location for a single terminal) PUD costs will be a key consideration in choosing a terminal.

PUD costs can be minimised in two key ways:

- Access to terminals can be differentiated based on vehicle productivity. For example, Visy can effect a saving by travelling to Harefield or Cootamundra rather than Bomen based on higher productivity enabled through avoiding access restrictions on Snowy Mountains Highway; and
- Delivering to the closest terminal to minimise the PUD cost per kilometre.

Given that the vehicle productivity saving can only be captured by shippers in the Tumut region, distance (and its relationship to cost) is the key factor that will drive terminal choice for shippers who consolidate products at terminals.

5.1.2 *Freight currently Using Road*

Volume

There are shippers in the region who may be exporting their produce but have insufficient volumes to warrant using rail transport. Some of the key volume based disadvantages that rail presents to these shippers are:

- Inability to effectively sustain a take or pay arrangement with a service provider. This is particularly difficult for agricultural producers generating low volumes and who are at risk of being affected by seasonality;
- Potential to be bumped from service when clients with larger volumes require additional capacity; and
- Loss of flexibility that road-based transport provides, which can be critical to end customers in low volume operations.

Given that the lowest known rail volume in the Riverina is generated by Australian Nuts (500 TEU per annum) it was assumed that this is the floor volume for using rail. At volumes lower than this, shippers were assumed to favour road regardless of distance.

Channel to market

In addition to volume there has to be a clear channel to market provided by rail. This can be challenging for domestic shipping – unlike export destinations they can be dispersed throughout the nation and each state. This has two impacts:

- It dilutes the threshold volumes required for a shipper to utilise rail; and
- It has a significant impact on the cost of transporting TEUs. In a rail context this can involve second and third moves between modes and destinations as containers are deconsolidated in warehouses and products transported on to final destinations. This significantly increases handling costs in comparison to loading a truck with multiple consignments and serving multiple destinations without additional lifts or material handling.

Therefore, if a product is shipped to multiple destinations outside Melbourne, Sydney and/or Brisbane it was assumed the shipper will continue to use road as rail is unlikely to be cost effective.

Further, the cost differential between modes may be diminished when new IMT developments such as Moorebank and Eastern Creek become operational, as these terminals will enable Higher Productivity Vehicles to link with major freight precincts in their catchment zones.

These terminals may also comprise significant on-site warehousing and distribution functions as well as Empty Container Park capacity. Additional services such as container repair, quarantine and wash, and train provisioning may be provided.

It is understood that there has also been significant work done to improve the accessibility of rail mode into Port Botany.

Other works that are currently under way include the Cargo Movement Coordinator, which commenced in July 2014, and TfNSW is currently investigating a range of options to improve rail mode share through the state's ports, including reliability, pricing, competition, serviceability, and operational improvements.

Suitable for Rail

The characteristics of each commodity will have an impact on whether it is suitable for rail transport. These include the physical fragility of the commodity, impacting whether additional lifting and ride quality on rail (steel on steel) may damage the goods, the perishability or time sensitivity of the commodity which may not be suited to the additional time required to transport by rail, and whether the commodity has a history of being shipped by rail, meaning infrastructure is already in place to handle these goods. For example:

- Grain is a highly suitable commodity to be shipped by rail given its history of being transported this way and the existing network of silos and rail heads. Grain is generally packed in 20ft containers and therefore is a heavy commodity suited to rail. Grain is also driven by export markets meaning direct links to sea ports are an important part of the supply chain;

- Shorter shelf life and susceptibility to damage of fresh fruits and vegetables mean that the additional handling and transit times associated with transferring to rail make these commodities less suitable to mode shift away from road; and

- Meat, poultry and fruit juices are items whose time sensitivity is also driven at the consumer end of the supply chain, with large end customers such as Woolworths and Coles receiving daily deliveries of smaller volumes to a disperse number of locations, meaning these products are more suited to road transport.

If a product is evaluated as having characteristics making it unsuitable for rail then it is assumed that these volumes will remain on road.

Transport Cost to Terminal

The cost of pick-up and delivery to the terminal is also a key factor in whether a shipper will chose to use rail. Generally, regional intermodal terminals have a service catchment of approximately 100 km. When a shipper has to move their goods via road for more than 100 km the cost effectiveness of rail is eroded and it is most probable that the shipper will continue to use road based transport to the destination.

Therefore, if a shipper has to transport their goods greater than 100km by road to reach the nearest intermodal terminal it is assumed the product will continue using road to reach its destination.

5.2 Demand Assessment

Based on the framework described in Section 5.1 an assessment wasg made of existing and future demand for railed products in terms of:

- Products presently transported on rail that will remain on rail. This can be understood as a probable base level of demand for rail, provided that there are no significant shifts in the industry that erode rail's cost advantage over road for those products at a greater travel distance of 400km; and

- Products that are currently using road but could potentially shift to rail. The modal shift is not guaranteed and the freight would remain highly contestable between road and rail.

5.2.1 Currently Railed Commodities

This section demonstrates the demand for each intermodal terminal by the commodities produced in the study area that are currently shipped on rail. For both current and expected future volumes of commodities produced, and the current and potential future IMT network, it is shown that:

- Only the timber & paper production area in Tumut produces sufficient TEUs to sustain a single commodity intermodal terminal; and

- The Griffith catchment appears to produce sufficient volumes to sustain an intermodal terminal, with the potential for a second terminal based on expected 2030 volumes.

It is important to note that this analysis considers commodities being produced within the study area and that the existing intermodal terminals undertake other activities such as handling inbound containers and re-configuring trains from branch lines before re-distributing goods to main line markets, capital cities and ports. For example, the Ettamogah terminal is located farther south than all other terminals, meaning it is not estimated to attract any volumes based on the shortest distance criterion; however the terminal would handle inbound goods, goods from unknown producers within the study area, and potentially goods from producers in Victoria.

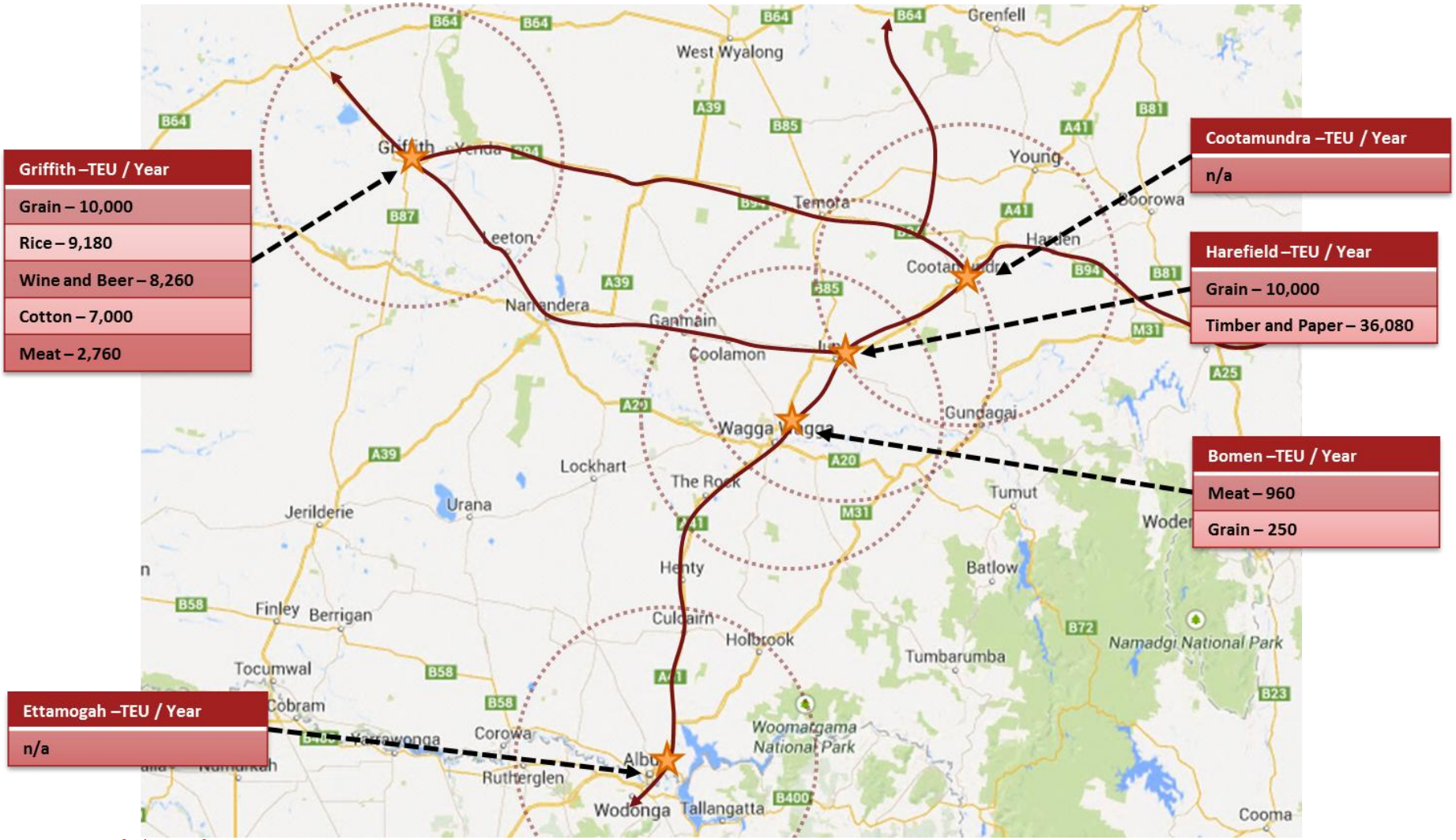
Existing intermodal terminal network

Based on 2014 volumes, it is estimated that the Griffith IMT transports over 43,000 TEUs and the Harefield IMT transports over 46,000 TEUs. Both IMTs transport sufficient volumes by rail to commercially sustain themselves. In particular, the Harefield IMT would attract sufficient volumes from a single commodity group, timber and paper products, to allow it to specialise its infrastructure and customer service offerings. The remaining IMTs are unlikely to transport sufficient TEUs, both now and in the future, to be commercially sustainable as standalone terminals, with Bomen transporting 1,210 TEUs and the Ettamogah and Cootamundra terminals not attracting any volumes from the study area's identified producers.

Forecasting to 2030, the Griffith and Harefield IMTs are expected to be commercially viable, transporting over 53,000 TEUs and 66,000 TEUs respectively. Conversely, the Cootamundra, Bomen and Ettamogah IMTs are deemed unlikely to transport sufficient TEUs to commercially sustain operations based on the current network of terminals. However, if any existing terminals' operations are ceased, the increase in capacity requirements at the other remaining terminals may mean that they become more viable.

In addition to the commodities shown in Figure 9 that make up the majority of each terminal's expected throughput, there are some smaller volumes of horticultural goods and other foods transported from Griffith.

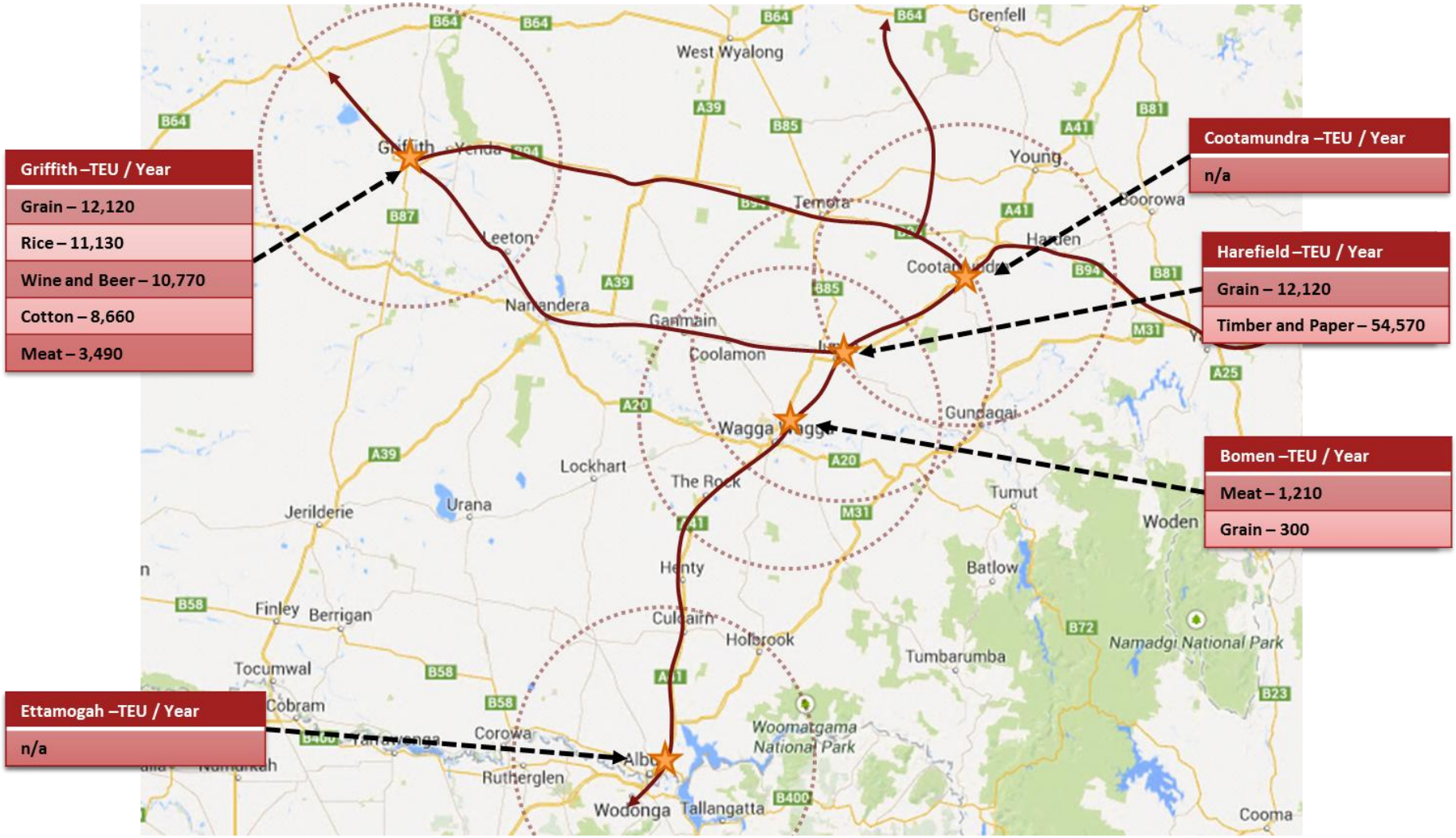
Figure 9: Major commodities and key volumes processed by the current five IMTs based on 2014 cargo volumes



Source: PwC analysis, Google Maps

The volumes presented in Figure 10 show that Harefield and Griffith terminals can be expected to continue to be the key hubs if no new terminal are built. The Bomen terminal can be expected to operate with lower throughput than the key terminals, and the Ettamogah and Cootamundra terminals do not attract cargo volumes from the study area.

Figure 10: Major commodities and volumes processed by the current five IMTs assuming expected 2030 cargo volumes



Source: PwC analysis, Google Maps

The volumes presented in Table 17 show that only one producer, Visy's Tumut operations, is expected to produce sufficient volumes to justify a standalone terminal operation. The terminal at Griffith is expected to attract sufficient volumes to sustain commercial operations, however this is made up from volumes of various commodities from multiple producers and production areas.

Table 17: Currently railed volumes transported by production region and closest existing IMT (2014 and 2030)

Commodity	Production region	Region	Closest Existing Terminal	Volumes at 2014		Volumes at 2030	
				Current Volume on Rail (TEUs)	Sufficient volume for Standalone Terminal	Future volumes on rail (TEUs)	Sufficient volume for Standalone Terminal
Cotton	Whitton	2	Griffith	7,000	No	8,860	No
Rice	Leeton	2	Griffith	9,180	No	11,130	No
Grain	Tabbita	2	Griffith	2,000	No	2,420	No
	Griffith	2	Griffith	8,000	No	9,700	No
	Wagga Wagga	3	Bomen	250	No	300	No
	Marrar	3	Harefield (Junee)	4,000	No	4,850	No
	Harefield	3	Harefield (Junee)	6,000	No	7,270	No
Meat	Leeton	2	Griffith	2,760	No	3,490	No
	Bomen	3	Bomen	960	No	1,210	No
Other food	Griffith	2	Griffith	260	No	340	No
	Leeton	2	Griffith	40	No	50	No
Timber & Paper	Tumut	4	Harefield (Junee)*	36,080	Yes	54,570	Yes
Wine & Beer	Yenda	2	Griffith	8,000	No	10,430	No
	Bilbul	2	Griffith	200	No	260	No
	Yenda	2	Griffith	60	No	80	No

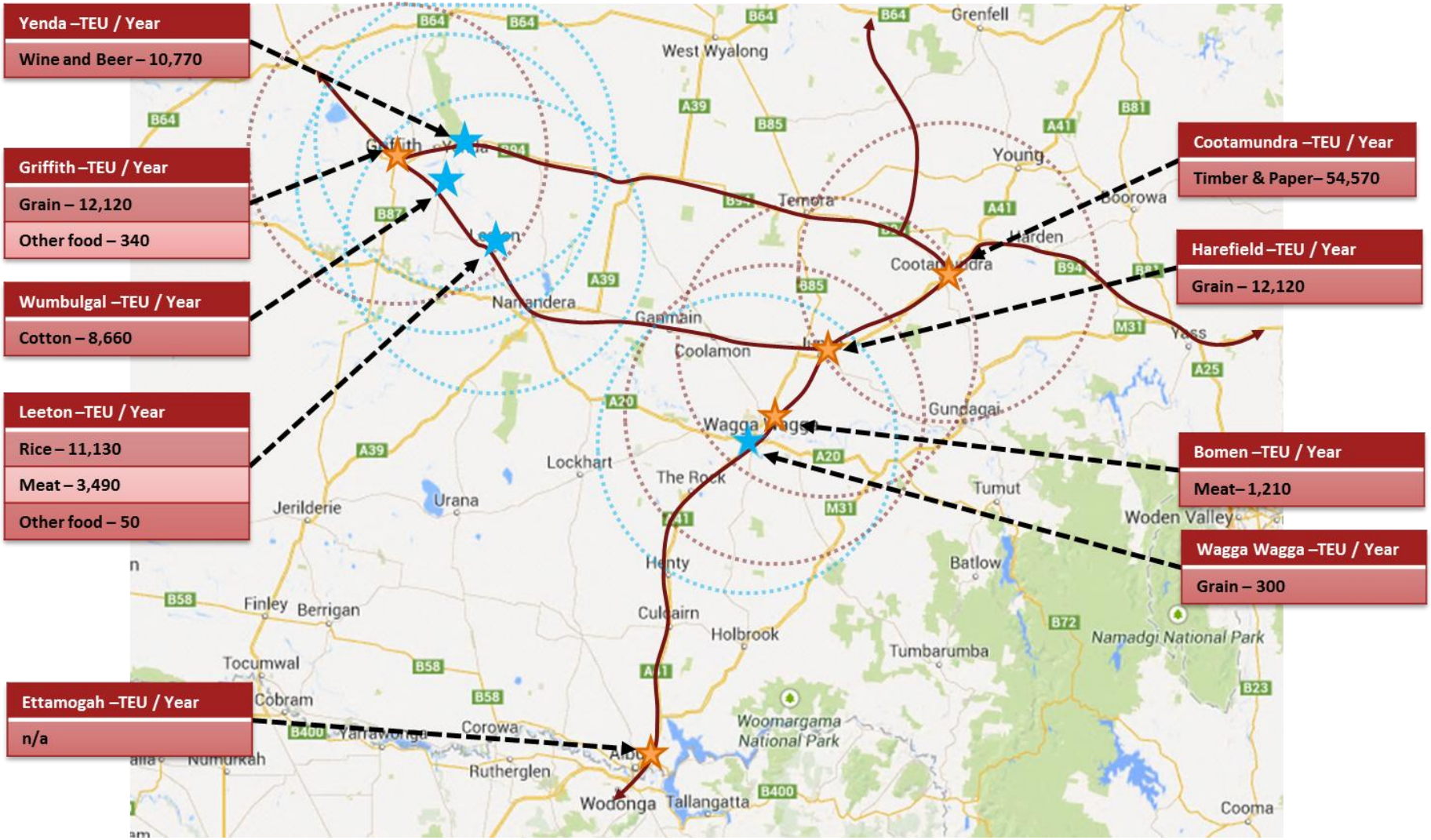
Source: PwC analysis, Consultation
* Visy currently utilise the Harefield terminal even though the Cootamundra terminal is a shorter distance via road from its production facility in Tumut

Potential future intermodal network

Assuming there are four additional IMTs located at Yenda, Wumbulgal, Leeton and Wagga Wagga (as depicted in Figure 11), by 2030 none of these new terminals are expected to be commercially viable based on only transporting those goods that currently utilise rail.

In fact, the overlap in catchment areas for the Yenda, Wumbulgal and Leeton terminals erodes the viability of the Griffith terminal, potentially causing (or enabling) its closure. By focussing investment efforts on only one or two of these three terminals there may be a greater chance of creating a more commercially sustainable operating environment in this region.

Figure 11: Major commodities and volumes processed by the current 5 and potential 4 IMTs assuming expected 2030 cargo volumes



Source: PwC analysis, stakeholder consultation, Google Maps

Table 18 details which areas of production are forecast to either continue using the existing intermodal terminals or move their products to one of the proposed new intermodal terminals based on the updated shortest distance to terminal method. The Yenda, Wumbulgal and Leeton terminals would derive most of each of their volumes from a single producer, giving these producers a very high level of service but at the detriment of terminal efficiency, with each of these projected volumes falling short of the 15,000 TEU per annum target. From this information, Cootamundra would be the most attractive location for future terminal, given that it has a projected future volume from a single customer, Visy, that is sufficient to justify a standalone terminal.

Table 18: Currently railed volumes transported by production region and closest future IMT (2030)

Commodity	Production region	Region	Closest Future Terminal	Volumes in 2030	
				Future volumes on rail (TEUs)	Sufficient volume for Standalone Terminal
Cotton	Whitton	2	Wumbulgal	8,660	No
Rice	Leeton	2	Leeton	11,130	No
Grain	Tabbita	2	Griffith	2,420	No
	Griffith	2	Griffith	9,700	No
	Wagga Wagga	3	Wagga Wagga	300	No
	Marrar	3	Harefield (Junee)	4,850	No
	Harefield	3	Harefield (Junee)	7,270	No
Meat	Leeton	2	Leeton	3,490	No
	Bomen	3	Bomen	1,210	No
Other food	Griffith	2	Griffith	340	No
	Leeton	2	Leeton	50	No
Timber & Paper	Tumut	4	Cootamundra	54,570	Yes
Wine & Beer	Yenda	2	Yenda	10,430	No
	Bilbul	2	Yenda	260	No
	Yenda	2	Yenda	80	No

Source: PwC analysis, Consultation

5.2.1 Potential Modal Shifts

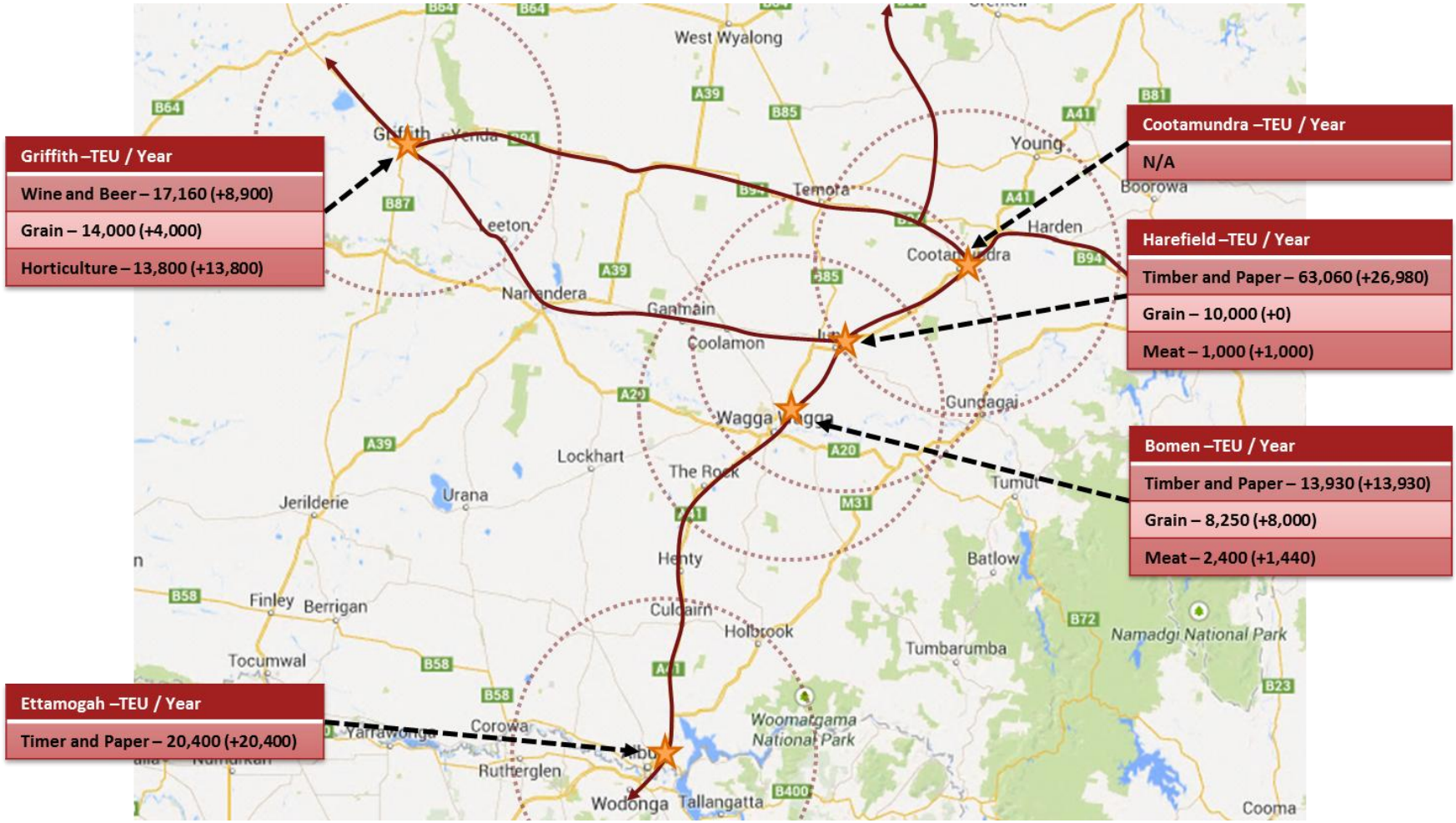
This section analyses those products that are currently transported using road but could potentially shift to rail. The analysis is based on the framework presented in Section 5.1. Similar to Section 5.1.1, the analysis was conducted for 2014 and 2030 volumes using the existing intermodal terminal network, and 2030 volumes using the potential future network of terminals.

It is important to note that the volumes quoted in this analysis represent the maximum potential volumes of known producers that could be suitable for transfer from road to rail transport. Actual volumes will vary according to detailed breakdowns of each producer's product range and customer locations.

Existing intermodal terminal network

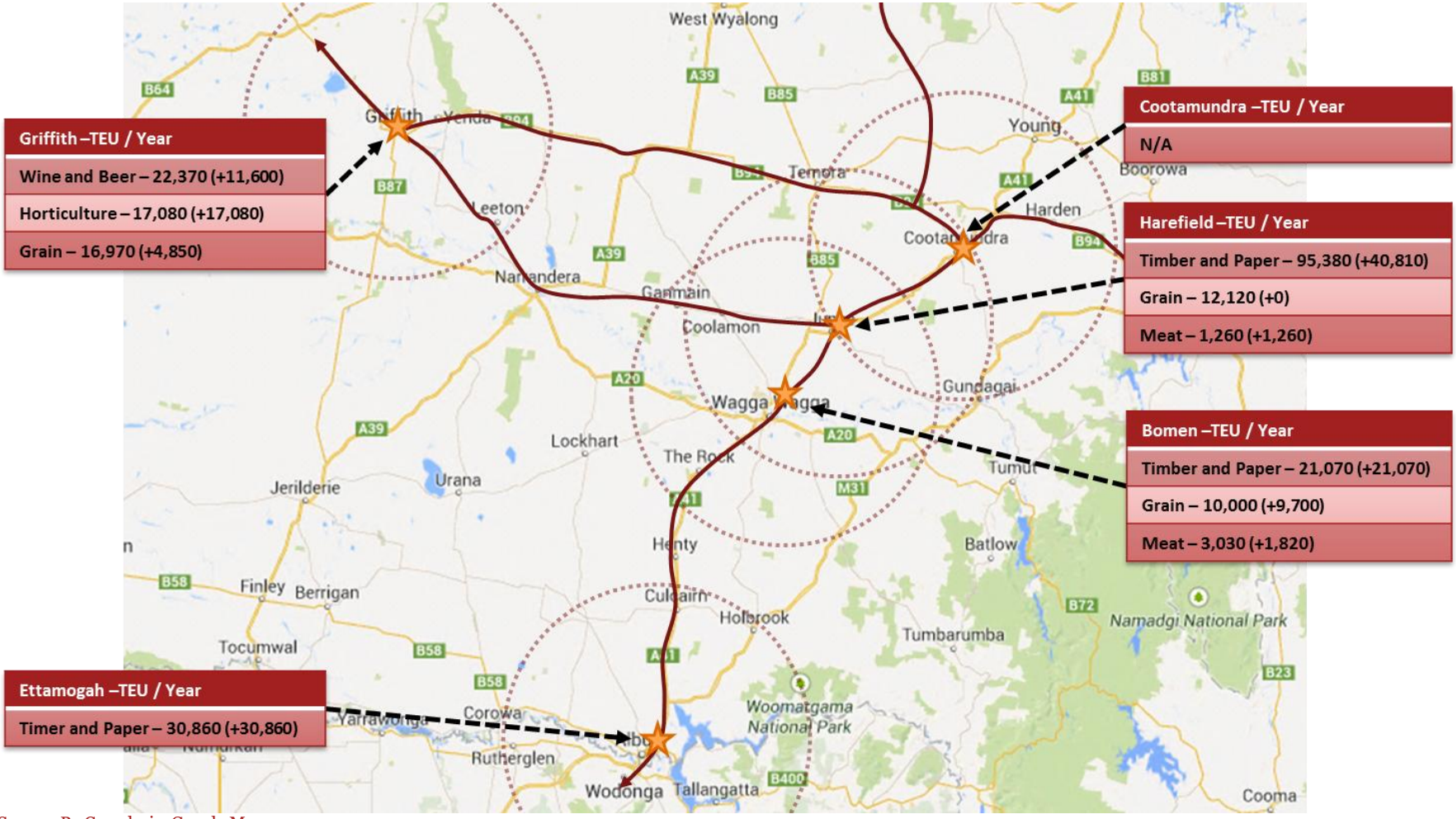
Figure 12 and Figure 13 show the distribution of freight to the current network of intermodal terminals of commodities that have sufficient volumes and appropriate characteristics to move from road to rail transport. Note that these figures focus on the major commodity groups and may not show all volumes that are expected to pass through each terminal.

Figure 12: Major commodities and volumes processed by the current 4 IMTs based on 2014 cargo volumes (increase in rail TEUs caused by mode shift in parentheses)



Source: PwC analysis, Google Maps

Figure 13: Major commodities and volumes processed by the current 4 IMTs based on 2030 cargo volumes (increase in rail TEUs caused by mode shift in parentheses)



Source: PwC analysis, Google Maps

Table 19 summarises the results of the contestability assessment (again based on the methodology outlined previously in Figure 8) for the commodities produced in each region that are currently transported via road. The table has been organised from left to right in the same order of consideration of factors in the framework, such that as soon as a commodity is deemed unsuitable for rail then no further analysis/data is required for that row. The most common reason for classifying existing road volumes as unsuitable for transfer to rail is the dispersed nature of the end markets/customers, followed by those producers with volumes too small to warrant rail transport.

The table shows that there are a number of producers whose volumes are sufficient enough and whose products are suitable for transfer to rail under both the current and future environments, even though they may currently be transported via road. For those goods that have been classified as unsuitable for modal transfer there is not expected to be a change in this case in the future, as even though there may be an increase in their volumes to a sufficient level, the locations of their end markets or the nature of the products themselves will prevail as limiting factors for modal transfer.

Table 19: Contestable volumes for transfer from road to rail using current intermodal terminal network

Commodity	Region	Current Road Volume Meets Rail Threshold (500 TEU)		2030 Road Volume Meets Rail Threshold (500 TEU)		Rail is a Suitable Channel to Market		Commodity is Suitable to Rail		Within 100km Terminal Catchment			Assign to Road or Rail (Current)	Assign to Road or Rail (2030)
Grain	Griffith	Yes	4,000	Yes	4,850	Yes	Product is for export	Yes	Durability and long shelf life. and extensive networks of existing storage and loading infrastructure	Yes	<5 km	Griffith	Rail	Rail
	Wagga Wagga	Yes	8,000	Yes	9,700	Yes	Key markets are Sydney, Victoria and Tasmania (via Port of Melbourne)	Yes		Yes	11 km	Bomen	Rail	Rail
Rice	Leeton	Yes	6,120	Yes	7,420	Yes	Capital city markets	Yes	Product is already railed for export	Yes	<5 km	Leeton*	Rail	Rail
Wine and Beer	Yenda	Yes	2,000	Yes	2,610	Yes	Capital city markets	Yes	Suitable shelf life and transit time requirements	Yes	16 km	Griffith	Rail	Rail
	Bilbul	Yes	1,800	Yes	2,350	Yes	Capital city markets	Yes		Yes	10 km	Griffith	Rail	Rail
	Yenda	No	240	No	310	-	-	-	-	-	-	-	Road	Road
	Hanwood	Yes	1,000	Yes	1,300	No	Disperse markets	-	-	-	-	-	Road	Road
	Griffith	No	410	Yes	530	No	Disperse markets	-	-	-	-	-	Road	Road
	Griffith	No	450	Yes	590	No	Disperse markets	-	-	-	-	-	Road	Road

Commodity	Region	Current Road Volume Meets Rail Threshold (500 TEU)		2030 Road Volume Meets Rail Threshold (500 TEU)		Rail is a Suitable Channel to Market		Commodity is Suitable to Rail		Within 100km Terminal Catchment			Assign to Road or Rail (Current)	Assign to Road or Rail (2030)
	Tharbogang (Griffith)	Yes	3,000	Yes	3,910	Yes	Assuming capital city markets	Yes	Suitable shelf life and transit time requirements	Yes	11 km	Griffith	Rail	Rail
Meat	Leeton	Yes	1,840	Yes	2,320	Yes	Assuming capital city markets	Yes	Requires reefer containers	Yes	56 km	Griffith	Rail	Rail
	Bomen	Yes	1,440	Yes	1,820	Yes	Assuming capital city markets	Yes	Requires reefer containers	Yes	<5 km	Bomen	Rail	Rail
	Junee	Yes	1,000	Yes	1,260	Yes	Assuming capital city markets	Yes	Requires reefer containers	Yes	13 km	Harefield	Rail	Rail
Timber and Paper Products	Wagga Wagga	Yes	1,430	Yes	2,160	No	Disperse markets	-	-	-	-	-	Road	Road
	Tumut	Yes	16,980	Yes	25,680	Yes	Sydney, Melbourne	Yes	Paper and pulp products suitable for containers	Yes	93	Coota-mundra	Rail	Rail
	Tumbarumba	Yes	12,500	Yes	18,910	No	Disperse markets	-	-	-	-	-	Road	Road
	Tumut	Yes	10,000	Yes	15,130	No	Disperse markets	-	-	-	-	-	Road	Road
	Albury	Yes	20,400	Yes	30,860	Yes	Sydney, Melbourne	Yes	Paper and pulp products suitable for containers	Yes	16	Ettamogah	Rail	Rail
Other Food	Leeton	No	60	No	80	-	-	-	-	-	-	-	Road	Road
Horticulture	Leeton	Yes	800	Yes	990	No	Some exports, but unlikely to be sufficient volume to meet threshold	-	-	-	-	-	Road	Road
	Griffith	Yes	13,000	Yes	16,090	Yes	Some exports	Yes	Requires reefer containers	Yes	<5 km	Griffith	Rail	Rail
	Batlow	Yes	575	Yes	710	No	Disperse markets	-	-	-	-	-	Road	Road

Source: PwC analysis, stakeholder consultation
* The Leeton terminal is currently a dedicated rice terminal and not a multi-commodity intermodal terminal

Table 20 shows the combined volumes from commodities currently transported via rail and the potential uplift from volumes shifting from road to rail. These combined volumes result in the potential for multiple terminals to operate at a commercially sustainable level.

Table 20: Railed volumes transported by production region and closest existing IMT assuming suitable road transport volumes shift to rail, based on existing IMT structure (2014 and 2030, increase in rail TEUs caused by mode shift in parentheses)

Commodity	Production region	Region	Closest Existing Terminal	Volumes at 2014		Volumes at 2030	
				Current Volume on Rail (TEUs)	Sufficient volume for Standalone Terminal	Future volumes on rail (TEUs)	Sufficient volume for Standalone Terminal
Cotton	Whitton	2	Griffith	7,000 (+0)	No	8,660 (+0)	No
Grain	Tabbita	2	Griffith	2,000 (+0)	No	2,420 (+0)	No
	Griffith	2	Griffith	12,000 (+4,000)	No	14,550 (+4,850)	No
	Wagga Wagga	3	Bomen	8,250 (+8,000)	No	10,000 (+9,700)	No
	Marrar	3	Harefield (Junee)	4,000 (+0)	No	4,850 (+0)	No
	Harefield	3	Harefield (Junee)	6,000 (+0)	No	7,270 (+0)	No
Horticulture	Leeton	2	Griffith	800 (+800)	No	990 (+990)	No
	Griffith	2	Griffith	13.000 (+13,000)	No	16,070 (+16,070)	Yes
	Batlow	4	Bomen	575 (+575)	No	710 (+710)	No
Meat	Leeton	2	Griffith	4,600 (+1,840)	No	5,810 (+2,320)	No
	Bomen	3	Bomen	2,400 (+1,440)	No	3,030 (+1,820)	No
	Junee	3	Harefield (Junee)	1,000 (+1,000)	No	1,260 (+1,260)	No
Other food	Griffith	2	Griffith	260 (+0)	No	340 (+0)	No
	Leeton	2	Griffith	100 (+60)	No	130 (+80)	No
Rice	Leeton	2	Leeton*	15,300 (+6,120)	Yes	18,550 (+7,420)	Yes

Commodity	Production region	Region	Closest Existing Terminal	Volumes at 2014		Volumes at 2030	
Timber & Paper	Tumut	4	Harefield (Junee)	63,060 (+26,980)	Yes	95,380 (+40,810)	Yes
	Tumbarumba	4	Bomen	12,500 (+12,500)	No	18,910 (+18,910)	Yes
	Albury	5	Ettamogah	20,400 (+20,400)	Yes	30,860 (+30,860)	Yes
	Wagga Wagga	3	Bomen	1,430 (+1,430)	No	2,160 (+2,160)	No
Wine & Beer	Yenda	2	Griffith	10,000 (+2,000)	No	13,040 (+2,610)	No
	Bilbul	2	Griffith	2,000 (+1,800)	No	2,610 (+2,350)	No
	Yenda	2	Griffith	300 (+240)	No	390 (+310)	No
	Hanwood	2	Griffith	1,000 (+1,000)	No	1,300 (+1,300)	No
	Griffith	2	Griffith	860 (+860)	No	1,120 (+1,120)	No
	Tharbogang	2	Griffith	3,000 (+3,000)	No	3,910 (+3,910)	No

Source: PwC analysis, Consultation
* The Leeton terminal is currently a dedicated rice terminal

Potential future intermodal network

Similar to the analysis conducted for volumes currently transported via rail in Section 5.2.1, this section assumes that there are four additional IMTs located at Yenda, Wumbulgal, Leeton and Wagga Wagga. Under the analysis presented earlier in Table 19, the commodities that were deemed unsuitable for modal transfer to rail received this rating due to their lack of volume, their end market distribution, or their commodity characteristics, and not due to their distance from an intermodal terminal. Therefore, as the addition of new terminals only changes the distance travelled, only the same commodities will transfer to rail under the potential proposed network scenario – however volumes currently utilising rail may now be able to go to a closer terminal than they presently do, as summarised in Table 21.

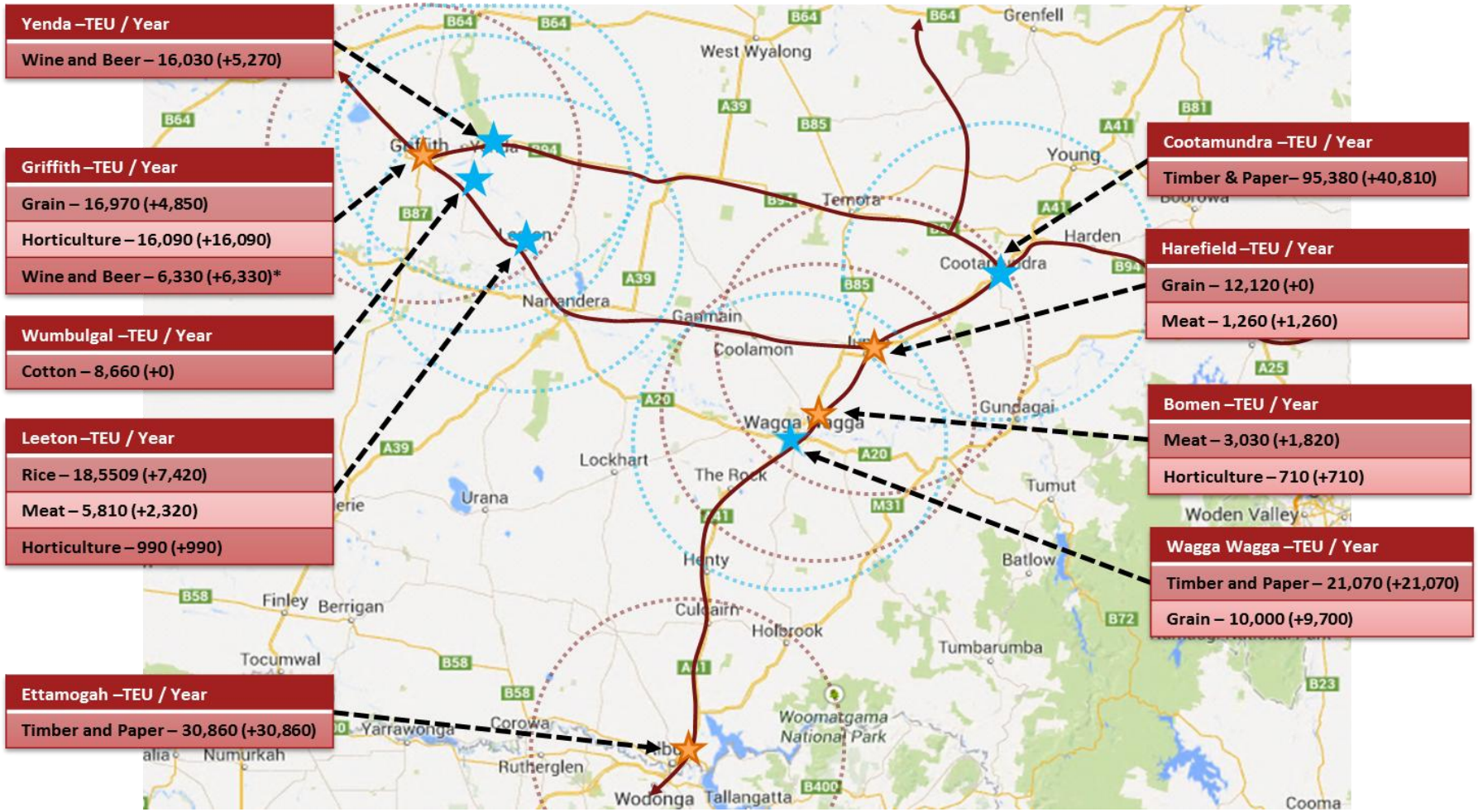
Table 21: Contestable volumes for transfer from road to rail using proposed intermodal terminal network

Commodity	Region	Current Road Volume Meets Rail Threshold (500 TEU)		2030 Road Volume Meets Rail Threshold (500 TEU)		Rail is a Suitable Channel to Market		Commodity is Suitable to Rail		Within 100km Terminal Catchment			Assign to Road or Rail (Current)	Assign to Road or Rail (2030)
Grain	Griffith	Yes	4,000	Yes	4,850	Yes	Product is for export	Yes	Durability and long shelf life. and extensive networks of existing storage and loading infrastructure	Yes	<5 km	Griffith	Rail	Rail
	Wagga Wagga	Yes	8,000	Yes	10,000	Yes	Key markets are Sydney, Victoria and Tasmania (via Port of Melbourne)	Yes		Yes	<5 km	Wagga Wagga	Rail	Rail
Rice	Leeton	Yes	6,120	Yes	7,420	Yes	Capital city markets	Yes	Product is already railed for export	Yes	<5 km	Leeton	Rail	Rail
Wine and Beer	Yenda	Yes	2,000	Yes	2,610	Yes	Capital city markets	Yes	Suitable shelf life and transit time requirements	Yes	<5 km	Yenda	Rail	Rail
	Bilbul	Yes	1,800	Yes		Yes	Capital city markets	Yes		Yes	10 km	Griffith	Rail	Rail
	Tharbogang (Griffith)	Yes	3,000	Yes		Yes	Assuming capital city markets	Yes		Yes	11 km	Griffith	Rail	Rail
Meat	Leeton	Yes	1,840	Yes	2,320	Yes	Assuming capital city markets	Yes	Requires reefer containers	Yes	<5 km	Leeton	Rail	Rail
	Bomen	Yes	1,440	Yes	1,820	Yes	Assuming capital city markets	Yes		Yes	<5 km	Bomen	Rail	Rail
	Junee	Yes	1,000	Yes	1,260	Yes	Assuming capital city markets	Yes		Yes	13 km	Harefield	Rail	Rail
Timber and Paper Products	Tumut	Yes	16,980	Yes	25,680	Yes	Sydney, Melbourne	Yes	Paper and pulp products suitable for containers	Yes	93 km	Coota-mundra	Rail	Rail
	Albury	Yes	20,400	Yes	30,860	Yes	Sydney, Melbourne	Yes		Yes	16 km	Ettamogah	Rail	Rail
Horticulture	Griffith	Yes	13,000	Yes	16,090	Yes	Some exports	Yes	Requires reefer containers	Yes	<5 km	Griffith	Rail	Rail

Source: PwC analysis, Consultation

Figure 14 shows the geographical spread of volumes forecast to be moved through each terminal if the maximum potential shift in volumes from road to rail is achieved.

Figure 14: Major commodities and volumes processed by the current 4 and potential 5 IMTs assuming expected 2030 cargo volumes (Increase in rail TEUs caused by mode shift in parentheses)



Source: PwC analysis, Google Maps

Table 22 provides a more detailed breakdown of the volumes that are forecast to be attracted to each future intermodal terminal. The increases in volumes achieved by attracting commodities to rail that are currently transported via road will mean that more intermodal terminals are able to operate at a commercially sustainable level.

Table 22: Railed volumes transported by production region and closest current and potential IMT assuming suitable road transport volumes shift to rail, based on future IMT structure (2030, increase in rail TEUs caused by mode shift in parentheses)

Commodity	Production region	Region	Closest Future Terminal	Volumes at 2030	
				Future volumes on rail (TEUs)	Sufficient volume for Standalone Terminal
Cotton	Whitton	2	Wumbulgal	8,660 (+0)	No
Grain	Tabbita	2	Griffith	2,420 (+0)	No
	Griffith	2	Griffith	14,550 (+4,849)	No
	Wagga Wagga	3	Wagga Wagga	10,000 (+9,700)	No
	Marrar	3	Harefield (Junee)	4,850(+0)	No
	Harefield	3	Harefield (Junee)	7,270 (+0)	No
Horticulture	Leeton	2	Leeton	990 (+990)	No
	Griffith	2	Griffith	16,090 (+16,090)	Yes
	Batlow	4	Bomen	710 (+710)	No
Meat	Leeton	2	Leeton	5,810 (+2,320)	No
	Bomen	3	Bomen	3,030 (+1,820)	No
	Junee	3	Harefield (Junee)	1,260 (+1,260)	No
Other food	Griffith	2	Griffith	340 (+0)	No
	Leeton	2	Leeton	130 (+50)	No
Rice	Leeton	2	Leeton	18,550 (+7,420)	Yes

Commodity	Production region	Region	Closest Future Terminal	Volumes at 2030	
Timber & Paper	Tumut	4	Cootamundra	95,380 (+40,810)	Yes
	Tumbarumba	4	Wagga Wagga	18,910 (+18,910)	Yes
	Albury	5	Ettamogah	30,860 (+30,8609)	Yes
	Wagga Wagga	3	Wagga Wagga	2,160 (+2,160)	No
Wine & Beer	Yenda	2	Yenda	13,040 (+2,610)	No
	Bilbul	2	Yenda	2,610 (+2,350)	No
	Yenda	2	Yenda	390 (+310)	No
	Hanwood	2	Griffith	1,300 (+1,300)	No
	Griffith	2	Griffith	1,120 (+1,120)	No
	Tharbogang	2	Griffith	3,910 (+3,910)	No

Source: PwC analysis, Stakeholder consultation
Note: Some minor rounding errors may occur

6 Economic Benefits

This section of the report provides a high level discussion of the potential economic benefits and dis-benefits from potential new IMTs in the study area. In a standard cost-benefit analysis framework one would quantify the costs and benefits from a particular defined investment – in this case, it would relate to a specific investment into an IMT. However, the context of this study was not of a single investment, but to broadly investigate the economic benefits of several potential new IMTs. As a result, in pursuing that objective and given the limited information, a broader high level and qualitative assessment of the benefits and dis-benefits of investment into IMTs had been undertaken.

As a consequence, this assessment was unable to quantify the costs and benefits of an investment into a specific IMT. This is an area for further investigation once there is greater certainty on where each IMT is to be located, the likely cost of each IMT and when each terminal would be constructed.

6.1 Assessment framework

The assessment approach is to analyse the first and second order economic benefits and dis-benefits of the identified potential new IMTs in the study area, and also any relevant sustainability matters. This approach provides a framework to consider both the economic and sustainability effects of potential new IMTs.

This high level qualitative assessment has been primarily guided by the Transport for NSWs guidelines for the economic appraisal of transport investments (the Guidelines).[2] The following reference material has also been used:

- Road and rail freight: competitors or complements, by BITRE[3];
- Freight transportation – improvements and the economy, by US Department of Transportation [4];
- The value of Rail Intermodal to the U.S Economy, by T.Brown and A.Hatch[5]; and
- Regional intermodal terminals – indicators for sustainability by SD&D.[6]

6.2 Benefits of potential new IMTs

Overall, from the qualitative analysis and within the scope of benefits identified and analysed, it is unclear that the potential new IMTs are likely to generate more benefits than dis-benefits. A summary of the assessment of first and second order benefit, and sustainability matters are found below, and are discussed in greater detail in turn:

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2 Transport for NSW, *Principles and Guidelines for Economic appraisal of Transport Investment and Initiatives,* March 2013

3 Bureau of Infrastructure, Transport and Regional Economics, *Road and rail freight: competitors or complements?,* Information sheet 34

4 US Department of Transportation (federal highway administration), *Freight Transportation Improvements and the Economy,* June 2004

5 Thomas R Brown and Anthony B Hatch, *The value of Rail Intermodal to the U.S Economy,* 19 Sept 2002

6 SD&D, *Regional Intermodal Terminals - Indicators for Sustainability,* January 2004

- First order benefits – There are benefits from reductions to overall transport vehicle operating and capital costs and safety benefits, but these are offset by an increase in cargo handling costs. It is unclear whether there are positive reliability and time benefits;

- Second order benefits– A range of benefits will be generated, driven by a likely reorganisation of the freight supply chain driving greater cost efficiency and more efficient and productive use of existing land; and

- Sustainability benefits – Likely reduction to air pollution, noise and congestion, however this may be offset by a potential reduction in heritage land.

6.2.1 First order benefits

First order benefits represent the benefits derived from the immediate impact of new IMTs on economic behaviour. As discussed and shown earlier, there are two effects from the potential new IMTs:

- Firstly, current users of road transport may transfer their goods to rail transport. Grain producers at Wagga Wagga may consider transporting a proportion of their 10,000 TEUs a year by rail if an IMT is constructed at the prospective Wagga Wagga site. The potential volume shift would depend on the dynamics with currently existing terminals in Bomen and Harefield.

- Secondly, a reduction in the truck travel distance from the production region to the nearest IMT. For example, 2,760 TEUs of Meat from Leeton that currently involves a round trip of over 110 km to and from the Griffith IMT is likely to be reduced to less than 10 km per round trip if the Leeton IMT is constructed.

Put alternatively, there is likely to be an overall reduction in the number of net tonne kilometres travelled by truck, offset by an increase by rail transport.

From these effects, a range of benefits as described in Table 23 has been identified.

Table 23: High level qualitative assessment of first order benefits from potential new IMTs

Benefit	Comment
Vehicle operating and capital cost savings	There is likely to be an overall cost reduction driven by two factors. First, there is a substitution of trucks with trains. Given that research has shown that on average it costs less to transport a tonne kilometre by rail than by road, there is likely to be an overall cost reduction.[7] Second, the new IMTs are likely to be closer to production regions, and therefore there will be fewer tonne kilometres for trucks to travel to each IMT.
Safety benefits	Transport by rail has a lower probability of accidents. For each net tonne kilometre travelled, rail is a third less likely to cause either an injury or fatality.[8] This results in savings in relation to health and vehicle repair costs.

[7] Thomas R Brown and Anthony B Hatch, *The value of Rail Intermodal to the U.S Economy*, 19 Sept 2002

[8] Thomas R Brown and Anthony B Hatch, *The value of Rail Intermodal to the U.S Economy*, 19 Sept 2002

Benefit	Comment
Transport reliability	There is likely to be a reliability dis-benefit caused by modal transfer because road transport is generally more reliable door to door than rail. [9] However, this may be more than offset from an increase in reliability because production areas are closer to the new IMTs than existing ones, reducing truck travel times and distances.
Time costs	There is likely to be a time dis-benefit as road transport takes less time door to door than rail.[10] Again, this may be more than offset from a reduction in travel time for production areas that are closer to the new IMTs than those in the existing network.
Handling costs	There is likely to be a dis-benefit regarding handling costs as cargoes that substitute from road to rail transport will need to be double-handled.

Source: PwC analysis, Consultation

6.2.2 Second order benefits

Second order benefits are distinguished from first order benefits in that they are benefits experienced further in time and are the result of the reorganisation of the industry. After some time, and under the new operating environment, the supply chain is likely to begin to re-organise itself, shift the way its capital is deployed, and optimise itself based on the new operating conditions.

For example, currently over 59,000 TEUs of Timber and Paper within the study area is transported by road as opposed to over 36,000 TEUs by rail. These volumes are transported across Australia, likely to dispersed individual distribution centres or to end users. If there is a substantial shift from road transport to rail, which implies greater volumes of cargo at receiving intermodal terminals, it is likely that the logistics supply chain will shift from disperse distribution centres to large centralised distribution warehouses.

From this analysis, three potential second order benefits have been identified as shown in Table 24.

Table 24: High level qualitative assessment of second order benefits from potential new IMTs

Benefit	Comment
Consolidation of warehousing facilities	Rural producers may be able to reorganise their supply chains and, through the consolidation of production and warehousing facilities, reduce their costs. For example, given that more cargo is being transported by rail, it may be feasible for a common user warehouse facility to handle

[9] Bureau of Infrastructure, Transport and Regional Economics, *Road and rail freight: competitors or complements?,* Information sheet 34

[10] Bureau of Infrastructure, Transport and Regional Economics, *Road and rail freight: competitors or complements?,* Information sheet 34

Benefit	Comment
	warehousing services and therefore, through economies of scale, reduce the overall cost of warehousing. This may be offset by potential increases in transport costs from the new consolidated warehouse.
Land use change	The relocation of IMTs, or the reorganisation of the transport supply chain, results in either increases to available land due to facility consolidation, or land being made available for greater productivity uses. The former occurs through the economies of scale of a larger warehouse/production facility, and the latter from relocating an IMT that uses valuable urban land to lower cost rural land.
Increase in demand for final goods	Due to lower supply chain costs, which are likely to lead to lower prices of goods, there is likely a subsequent increase in demand and therefore output of products.

Source: PwC analysis, Consultation

6.2.3 Sustainability matters

Sustainability matters relate to environmental issues due to potential new IMTs, either due to the construction of the IMT or its short term impact. Several of these matters have been identified, which are explained in further detail in Table 25.

Table 25: High level qualitative assessment of sustainability matters from potential new IMTs

Benefit	Comment
Reduction in air pollution	There are likely to be benefits from a reduction in air pollution, driven by fewer tonne kilometres travelled by road, with some proportion substituted by rail. [11]
Reduction in noise	There are likely to be benefits from fewer net tonne kilometres travelled by road, reducing overall noise. In particular, there are fewer urban net tonne kilometres. [12]
Reduction in congestion	Given that there are fewer net tonne kilometres travelled by road, there are fewer trucks and therefore lower congestion.
Heritage land	There may be dis-benefits from potential reduction to heritage land. This depends on the extent to which heritage land is needed to develop the new IMTs.

Source: PwC analysis, Consultation

It is noted that the construction of any new IMT is likely to cause a temporary increase in air pollution, noise and congestion.

[11] SD&D, *Regional Intermodal Terminals - Indicators for Sustainability,* January 2004

[12] SD&D, *Regional Intermodal Terminals - Indicators for Sustainability,* January 2004

Appendix A Stakeholder Consultation

Stakeholder Group	Organisation	Name	Role
Local Government	Wagga Wagga City Council	James Bolton	Economic Development Manager
	Griffith City Council	Greg Lawrence Neil Southorn	Manager Tourism and Economic Development Director of Sustainable Development
	Tumut Shire Council	Bob Stewart	General Manager
	Cootamundra Shire Council	Ken Trethewey	General Manager
	Gundagai Shire Council	Phil McMurray	Director of Engineering Services
	Leeton Shire Council	Peter Kennedy	Economic Development, Tourism & Events Manager
	Albury City Council	Bradley Ferris Tracey Squire	Director Engineering Director Economic Development and Tourism
Freight Originators	Visy Pulp & Paper	Bernie Vanderrijt	General Manager Commercial & Materials
	Casella Wines	Sam Mcleod	Logistics Manager
	GrainFlow	Jonathan Scott	Operations Manager
	GrainCorp	Nigel Lotz	Southern NSW Manager
	RiceGrowers' Association of Australia	Andrew Bomm	Policy Manager
	ROBE	Joe Fealy	Procurement and supply chain manager
Transport Network	Patrick	Wayne Alpen	
	NSW Ports	Jason McGregor	Business Development Manager
	Qube	David Knight	Director, Business Development
	V-Suthern	Chris Sutherland	Director
	Ettamogah Rail Hub	Rob Perkins	Strategy and Business Development
	Road and Maritime Services	Lindsay Tanner	Southern Region Manager
	Australian Rail Track	Simon Ormsby	Head of Strategy

Stakeholder Group	***Organisation***	***Name***	***Role***
	Corporation		
	Transport for NSW	Mick Sanders	Operations Manager, Country Rail Contracts

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