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Riverina Agricultural Freight Flows

Department of Infrastructure and Regional Development – Case studies of critical supply chains
October 2017

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Contents

Overview

1

Overview

Scope and objectives

PricewaterhouseCoopers Consulting (Australia) and Ranbury Pty Ltd (Ranbury) have prepared a case study of Riverina agricultural freight flows on behalf of the Department of Infrastructure and Regional Development (DIRD) as part of the National Freight Inquiry. This work is intended to assist the Inquiry in informing the forthcoming National Freight and Supply Chain Strategy.

The presentation provides an overview of:

- the Riverina agricultural freight flows supply chain
- participants and associated infrastructure
- the regulatory framework
- a list of IA priority list projects which are relevant to this supply chain.

An illustrative case study provides a high level example of:

- supply chain operations
- potential bottlenecks.

Study area

This case study extends to grain and cotton produced in and transported from the Riverina region (below), for both domestic consumption and export.

The Riverina region analysed includes the following Statistical Local Areas (SLAs) and is shown in the map below:

Tumut	Tumbarumba	Temora	Urana
Murrumbidgee	Gundagai	Griffith	Leeton
Narrandera	Hay	Albury	Jerilderie
Wagga Wagga	Cootamundra	Greater Hume Shire	Berrigan
Junee	Harden	Corowa Shire	Coolamon
Lockhart			

Study Area

Source: PwC analysis

The freight task

Grain

The Riverina grain industry is export based with 74 per cent of volumes exported. Grain production includes wheat, barley and canola (used in the production of oils, margarine and livestock feed).

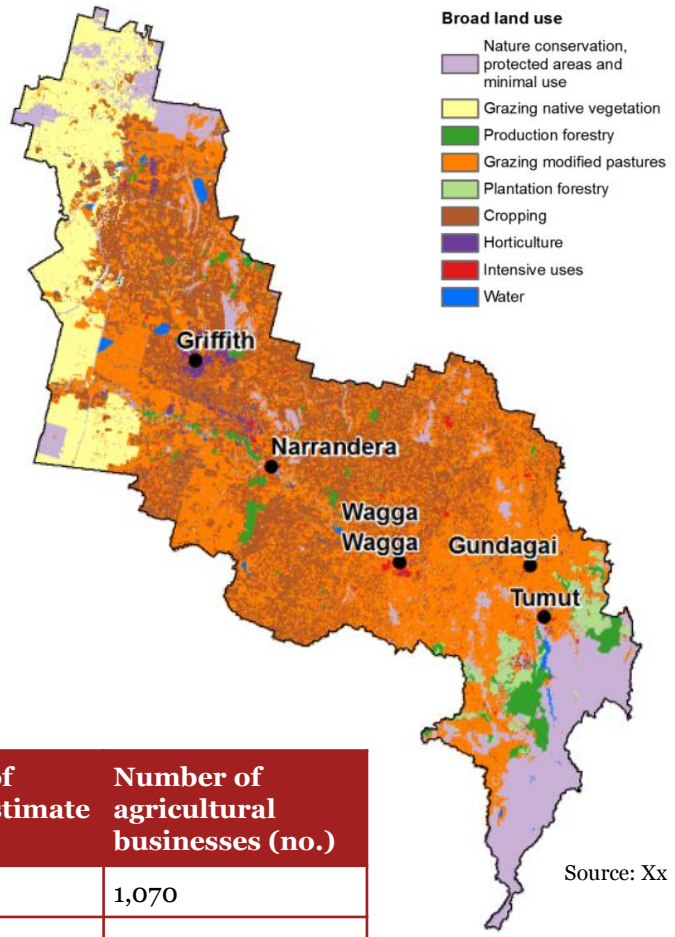
Major production and storage sites located in the Riverina include Tocumwal, Warragoon, Benerembah, Carrathool and Wumbulgal. A large number of these facilities are situated along rail freight networks and include major companies such as Grain Corp.

Cotton

The Riverina cotton industry is export based with 99 per cent of volumes exported. The Riverina region produces around 17 percent of Australia's total cotton production.

The major production area in NSW stretches south from the Macintyre River on the Queensland border and covers the Gwydir, Namoi and Macquarie valleys. The Riverina cotton production is a relatively new industry and exists along the Lachlan and Murrumbidgee rivers in the south of NSW.

Riverina production area



Source: Xx

Production statistics

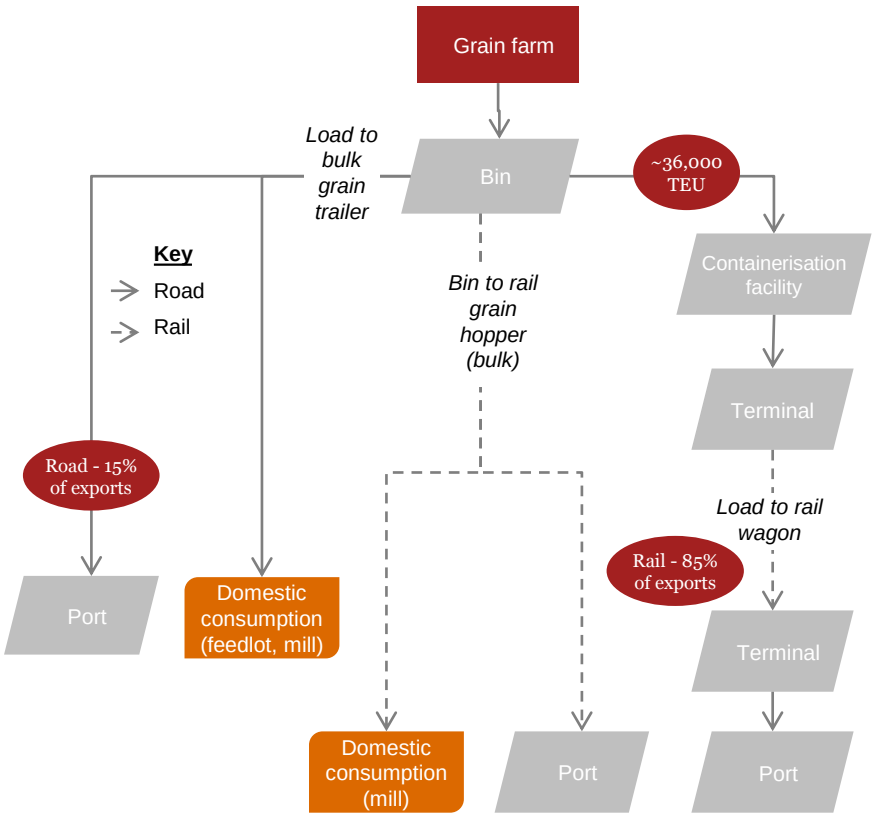
Commodity	Production (tonnes)	Proportion of Australian production (%)	Export share of production (estimate %)	Number of agricultural businesses (no.)
Grain	3,917,847	8	74	1,070
Cotton	94,793	17	99	115

Source: Xx

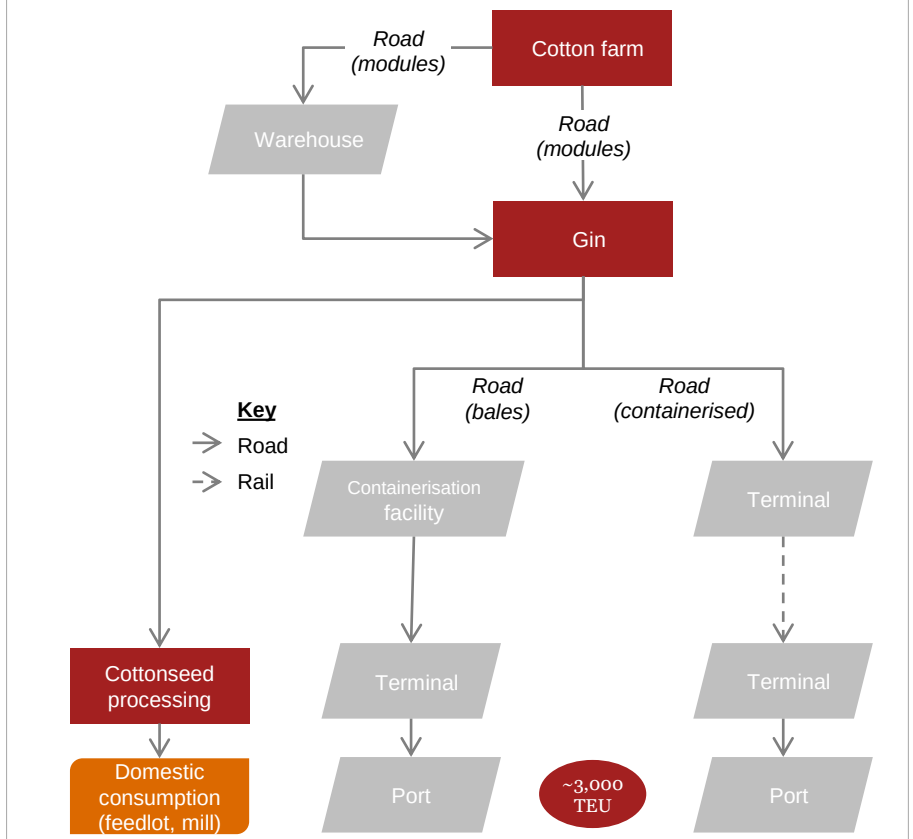
The supply chain

The stylised supply chains for grain and cotton produced and transport from the Riverina are show in the two schematics below.

Stylised supply chain: Riverina grain



Stylised supply chain: Riverina cotton



Key infrastructure – grain

1. Harvest

The are 3,572 grain farms in the Riverina who produced 3.9 million tonnes of grain in 2015-16

Farms are typically owned and operated by individual farmers as opposed to large corporations.

2. On-farm storage

On farm storage estimated at 6.4 million tonnes.

On-farm storage is suited to grain delivered for domestic consumption.

3. Receival site/processing

Grain Corp operates 50 receival sites/bulk handling with a total estimated capacity of 5 million tonnes.

Key bulk handlers include:
- GrainCorp
- Emerald Grain

4. Linehaul transport

Rail (65%)
Three rail network managers:
- Country Regional Network (CRN), managed by John Holland Rail,
- the North-south interstate rail network, managed by the Australian Rail Track Corporation (ARTC)
- the Victorian regional network, managed by V/Line

CRN - max train length of 1,200 metres, wagons limited to a combined gross mass load limit of 76 tonnes.

Road (35%)
The main north-south line connects the Riverina area to:
- Port Kembla, Port of Botany, Enfield intermodal terminal and Moorebank intermodal terminal at an approximate distance of 500kms; and
- Port of Melbourne at an approximate distance of 440kms

5. Port

2 bulk grain handling terminals at Port Kembla
6 container terminals at Port Botany and Port of Melbourne

6. Feedlots, mills

X% of Riverina grain is consumed domestically by mills and feedlots.

Key infrastructure - cotton

1. Harvest

The are 115 cotton farms in the Riverina who produced 94,793 tonnes of cotton during 2015-16.

Farms are typically owned and operated by individual farmers as opposed to large corporations.

2. Gin

There are 7 cotton gins located in the Riverina

Key players include Namoi Cotton Cooperative Limited, Auscott Limited and Rivcott.

3. Terminals (incl intermodal)

Cotton from the northern areas of Wee Waa and Narrabri is transported to Port Botany by rail on the Hunter Valley Coal Network.

Cotton is also transported on the Country Regional Network from the North West of Sydney.

4. Linehaul transport

Rail

Three rail operators:

- Country Regional Network (CRN), managed by John Holland Rail,
- the North-south interstate rail network, managed by the Australian Rail Track Corporation (ARTC)
- the Victorian regional network, managed by V/Line

CRN - max train length of 1,200 metres, wagons limited to four, based on a combined gross mass load limit of 76 tonnes, maximum train length of 1,800 metres.

Road

The main north-south line connects the Riverina area to:

- Port Kembla, Port of Botany, Enfield intermodal terminal and Moorebank intermodal terminal at an approximate distance of 500kms; and
- Port of Melbourne at an approximate distance of 440kms

5. Port

Cotton is transported to Port Botany, Port of Melbourne and the Port of Brisbane.

Each of these ports have multiple container berths with modern loading facilities

Regulatory frameworks

The following table outlines the regulators with oversight of monopoly infrastructure and their key access and pricing arrangements.

	Road	Rail	Ports and Terminals
Regulators	• Dept. of Transport, Roads and Maritime NSW (RMS) • Heavy Vehicle Regulator	• Essential Services Commission Victoria (ESCV) • Independent Pricing and Regulatory Tribunal (IPART) NSW • Australian Competition and Consumer Commission (ACCC)	• Essential Services Commission (VIC) • IPART (NSW) • ACCC
Remit & Powers	• National Heavy Vehicle Regulator • Vehicle standards and access	• Rail pricing and access	Access to and pricing for the: • Port of Melbourne • Port Kembla • Port Botany

Source: http://ilco.com.au/About-Us/History-Background

Case studies

2

There are three key moves in the Riverina Grain supply chains

Rail Transport Model

Rail services are available to NSW or Victorian Ports for bulk grain haulage. Rail services are also available for containerised product.

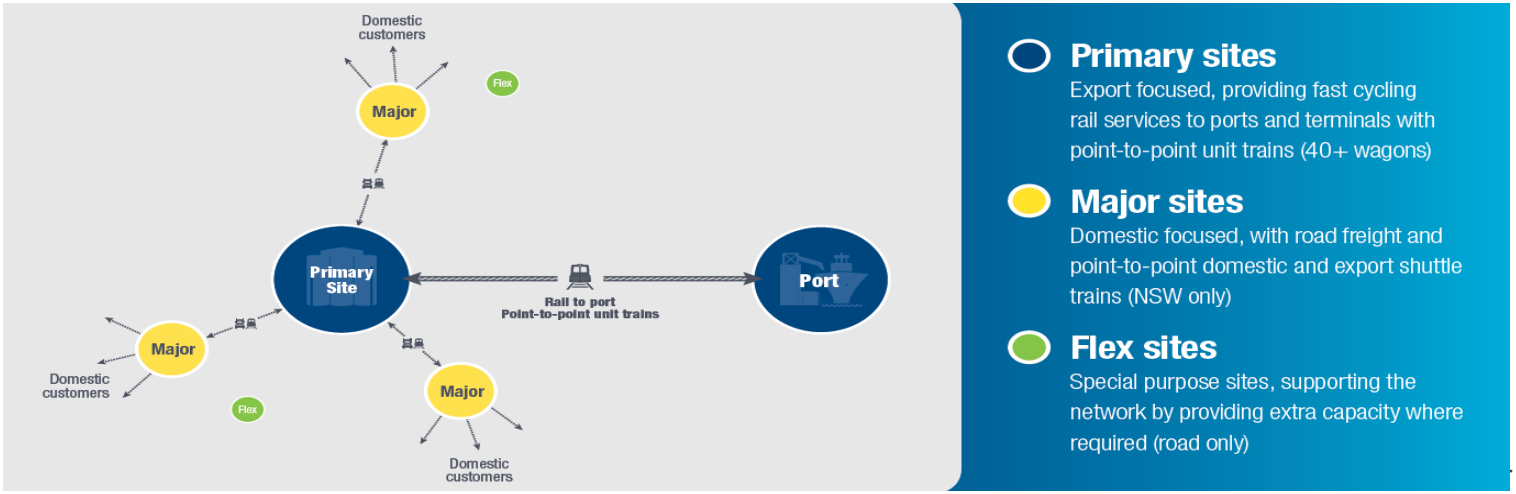
Road Transport Model

Road services are available for the haulage of bulk grain to NSW or Victorian Ports. Road haulage of containerised grain is also available.

(1)
Farm to Storage

(2)
Rail / Road
Linehaul services by rail or road

(3)
Port
Storage at Port and transfer to vessel



Source: Graincorp Regeneration Brochure.

Move 1: Farm

(1)
Farm
The farm harvests grain and stores the product for transport to port.

(2)
Rail/Road
Haulage of grain to the port

(3)
Port
Storage at port and transfer to vessel

Process

A grain farmer harvests his crop and has to make a number of key decisions in terms of transfer of the product to market. These are :

- Does the farmer sell his crop into the domestic market or the international market?
- Does the farmer invest in on farm storage to increase the control and marketing of his crop or use existing up country storage avoiding storage capex?
- Does the farmer immediately transfer the grain after harvest to the up country depots owned by the grain marketers (e.g. GrainCorp)?
- Does the farmer use a rail or road supply chains to transport his crop to Port?
- Does the farmer insource or outsource the transport task to either accept or avoid additional risk?

The farmer has a large crop and estimates that there would be circa 500,000 tonnes or 25,000 TEU of grain and the farmer choses to sell the product into the export market. He intends to transfer the grain by rail to the port.

Potential Bottlenecks

Capacity
The farmer must invest in farm storage capacity to store the product prior to transport to the port. The farmer decides to containerise his product to help supplement his local storage and pursue options for transport to either Sydney or Melbourne. The farmer must secure rail haulage and loading capacity for his product

Commercial
The farmer will have to make a contractual commitment to secure rail capacity to transport his containerised product to the port. His alternative is to use road transport which is more flexible and can be procured in smaller increments.

Move 2: Rail

(1)
Farm
The farm harvests grain and stores the product for transport to port.

(2)
Rail/Road
Haulage of grain to the port

(3)
Port
Storage at port and transfer to vessel

Process

The farmer realises that with 25,000 TEU per annum there is an opportunity to scale an intermodal terminal within containerisation facilities at a rail siding. While 25,000TEU is a the margin for a viable up country terminal, the farmer believes it possible to attract rice and cotton volumes to the terminal.

In negotiation with the above rail service provider, the farmer is unwilling to sign up to the proposed take or pay arrangements given seasonal variability in production volumes.

The framer decides to seel the crop to GrainCorp and minimise the risk involved in managing the supply chain.

GrainCorp containerise the grain and send the container via an intermodal terminal since the line does not have sufficient TAL to enable a fully loaded bulk grain train.

Potential Bottlenecks

Commercial

Take or Pay contracts are required by service operators given the uncertainty surrounding contracted volumes due to seasonal variations in production. These can be a bottleneck for freight on rail, however they do provide revenue protection for the service operator and shift risk to the cargo owner.

Capacity

The legacy lines in the Riverina are not fit for purpose and have substantially lower TAL and Travel Speed required for bulk payloads and cycle times for an efficient service

Regulatory

Regulatory triggers based on any proposed capacity investment dictate who will pay for the additional capacity – Additional access fees may jeopardise the viability of marginal rail operations in the region.

Move 3: Port

(1)
Farm
The farm harvests grain and stores the product for transport to port.

(2)
Rail/Road
Haulage of grain to the port

(3)
Port
Storage at port and transfer to vessel

Process

GrainCorp rail the containerised volumes to Port Botany for export.

In previous years if the rail service provider missed their window onto the Metropolitan network due to unscheduled track occupation upcountry, the rail service provider would be held over so as not to disrupt the scheduled passenger services on the network. This created significant challenges in meeting shipping windows and incurred substantial costs.

However since the construction of the Southern Sydney Freight Line, this has become a much less frequent issue. the associated costs

Potential Bottlenecks

Nil – the dedicated freight line has removed a key bottleneck at the regional/metropolitan network interface and resolved issues around available paths.

Appendix: Infrastructure Australia priority list projects & the Riverina

A

IA Priority List: Inland Rail is a standout project in terms of impact on Riverina supply chains

IA Status	Infrastructure type	Project Title	Project description*	Impact	Timing
High Priority Project	Road	M80 Ring Road upgrade (VIC)	The project proposes to complete three sections of the freeway that have yet to be upgraded. These are (i) Plenty Road to Greensborough Highway (2.4 km); (ii) Princes Freeway to Western Highway (7.9 km) (iii) Sydney Road to Edgars Road (4 km). The project would widen the existing road to a minimum of three through-lanes in each direction with auxiliary lanes between interchanges where required, and implement intelligent transport system infrastructure.	Upgrades to the road network will support the efficiency of the road freight supply chain by increasing capacity and safety and addressing congestion.	Near term (0–5 years)
Priority Project	Freight Rail	Inland Rail	Construction of a freight rail line of approximately 1,700 km between Melbourne and Brisbane via inland Victoria, New South Wales and Queensland. Around 40% of the proposed route would be constructed as new railway, or converted from narrow gauge to dual gauge in Queensland, maintaining the existing narrow gauge connections between Brisbane and regional centres. The remainder of the route would utilise and where necessary upgrade existing standard gauge track in Victoria and NSW. Trains operating the service would have capacity to carry up to 485 containers (TEU) when capacity for longer, double-stacked trains is introduced over time.	The proposed Inland Rail alignment will enhance freight rail connections to the Port of Melbourne and create freight rail connections to the Port of Brisbane for producers in the catchment of the alignment. The project will increase the choice of modes and ports accessible to producers.	Longer term (10–15 years)
High Priority Initiative	Freight Road	Road connection between West Gate Freeway and Port of Melbourne and CBD North (VIC)	The initiative proposes to develop a connection between the West Gate Freeway, CityLink and Port of Melbourne.	By connecting key freight infrastructure (port; major motorways) the project supports the capacity and efficiency in the Melbourne road freight supply chain and therefore regional connections to port.	Near term (0–5 years)

Source: Infrastructure Australia, Infrastructure Priority List, July 2017
*Infrastructure Priority List, Australian Infrastructure Plan, Project and Initiative Summaries, February 2017

IA Priority List: upgrades to road and to freight rail port connections could benefit producers

IA Status	Infrastructure type	Project Title	Project description*	Impact	Timing
Priority Initiative	Freight Rail	Advanced Train Management System implementation on ARTC network (National)	An Advanced Train Management System (ATMS) is a wireless satellite communications-based train control system, that will replace line-side signalling, allowing: • More train paths on single tracks • Improved line capacities • Reduced transit times and improve competition with road • Improved rail safety • Improved system reliability. ATMS will improve the safety and efficiency of train operation between metropolitan centres and between national ports.	Improvements to the capacity, safety and reliability of the ARTC freight rail network will increase modal choice for producers in the catchment of the ARTC network.	Near term (0–5 years)
	Freight Rail	Freight rail access to Port Kembla (NSW)	Improve rail freight access to Port Kembla. This could be through enhancements to the Illawarra and/or Moss Vale–Unanderra lines, or through future development of an alternative rail alignment to the port.	The Port of Kembla is part of export supply chains for the Riverina. Improving rail access to the Port will improve mode choices for producers in the catchment of the Port.	Near term (0–5 years)
	Road	Complete Metro Ring Road from Greensborough to the Eastern Freeway (VIC)	Development of a new motorway-standard connection between the Metropolitan Ring Road and Eastern Freeway ('North East Melbourne Corridor') to reduce congestion and capacity constraints.	Upgrades to the road network will support the efficiency of the road freight supply chain by increasing capacity and safety and addressing congestion.	Medium term (5–10 years)
	Road	New England Highway upgrade (NSW)	The initiative includes a number of potential projects, including bypasses of the towns of Singleton and Muswellbrook, and intersection upgrades. The initiative is designed to contribute to the efficient movement of freight from regional exporters to the Port of Newcastle which is essential to supporting economic growth and productivity in New South Wales.		Medium term (5–10 years)
	Road	Newell Highway upgrade (NSW)	The initiative seeks to improve several sections of the highway to support safe Higher Productivity Vehicle access, and improve safety and reliability. The initiative will also consider first/last mile issues faced by Higher Productivity Vehicle operators in the corridor.	The Newell Highway is a key part of the road based supply chain. Improvements to allow Higher Productivity Vehicle access will increase the efficiency (carrying capacity) and reliability of road services, benefiting producers in the catchment.	Near term (0–5 years)

Source: Infrastructure Australia, Infrastructure Priority List, July 2017
*Infrastructure Priority List, Australian Infrastructure Plan, Project and Initiative Summaries, February 2017