Western Downs Regional Organisations of Council

Freight Network Integration Issues and Opportunities

Submission to Federal Government Enquiry

Report

May 2005

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1. Introduction

1.1 Purpose

In April 2005, GHD was commissioned by the Western Downs Regional Organisation of Councils (WDROC) to undertake a study on the integration of regional rail and road freight transport and their interface with ports. The purpose of this report is to discuss potential freight opportunities for the WDROC region and to identify impediments to current and potential future operations.

This report is for inclusion in the WDROC's submission to the House of Representatives Standing Committee on Transport and Regional Services Enquiry. In developing this report existing information, reports and data have been examined and reviewed and additional analysis undertaken to reveal specific issues associated with linkages with the major Ports that either currently serve the region or potentially could serve the region.

1.2 Western Downs Regional Organisation of Councils

The Western Downs Regional Organisation of Councils was formed in 1991 and consists of the following districts:

- Bendemere Shire;
- Chinchilla Shire;
- Dalby Town;
- Murilla Shire;
- Roma Town;
- Tara Shire;
- Taroom Shire; and
- Wambo Shire.

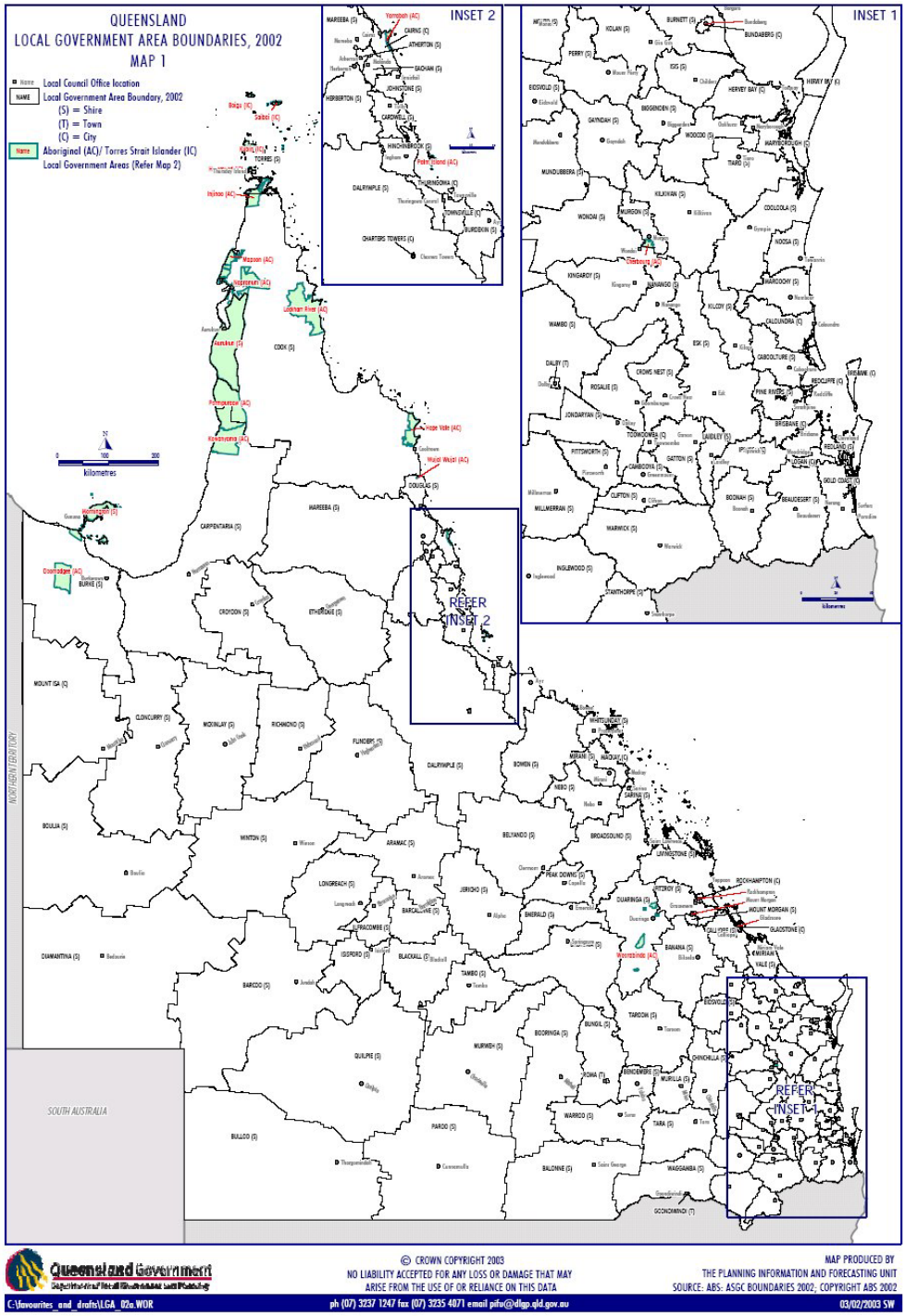
Refer to Figure 1 for an illustrative description of these areas.

1.3 The Transport Network

The transport network surrounding the WDROC region consists of both road and rail links. The major highways servicing the region include the Warrego Highway (which provides for the east-west movement) and the Leichhardt Highway (provides north-south movement). The Warrego Highway is a high-speed 2-lane sealed road capable of accommodating freight vehicles up to Road Train Type 1 (2-trailers). The Leichhardt Highway is also a high-speed sealed road, which bypasses the mountainous terrain of the Great Dividing Range. These highways connect directly to other important parts of the road network that provide main access to other regions within Australia. Examples of these include the Brisbane-Melbourne National Highway at Toowoomba and the Newell Highway at Goondiwindi.

Existing rail infrastructure that currently services the WDROC region is the Western Line from Brisbane to Charleville. For any north-south movement, access to the North Coast Line is required through Brisbane and this is long, cumbersome and too costly. Similarly, the current Western Line's capacity, speed and axle loadings restrict the development of the regions natural resources because the product cannot be moved to the ports. Even with the upgrade of the Western Line, with improved alignments, increasing passing loops and lengths and an upgrade of the Toowoomba Range Crossing, rail traffic will still need to compete with commuter traffic through the Brisbane network. Therefore, if the missing inland rail link from Wandoan to the Moura Rail System were built, there would be a shift in rail freight movement from the North Coast Line and rail connectivity will be significantly increased for the WDROC region. Refer to Figure 2 for a diagrammatic illustration of these rail links.

Figure 1 WDROC Location Map



Source: Queensland Government Local Government and Planning

Figure 2 Rail Network

Source: Queensland Government Natural Resources and Mines

2. Role of the Transport Network

2.1 Overview

This chapter will provide details of the freight movement into and out of the WDROC region and its relationship with other regions of Queensland and Australia.

2.2 Freight Movement

2.2.1 Current Freight

Dominant freight production for the WDROC region is currently cotton, wheat and livestock. In 2000, the Queensland Treasury indicated that Chinchilla Shire, Murilla Shire, Tara Shire and Taroom Shire produced a total of 1,198,432 tonnes of crop (i.e. cotton and wheat) and 668,997 sales of livestock.

A detailed description of current freight types and quantities for the WDROC region is included in Appendix A.

The Miles Intermodal Freight Hub Options study identified freight flows for the proposed intermodal facility at Miles. A summary of the existing freight flows that are relevant to this area include the following:

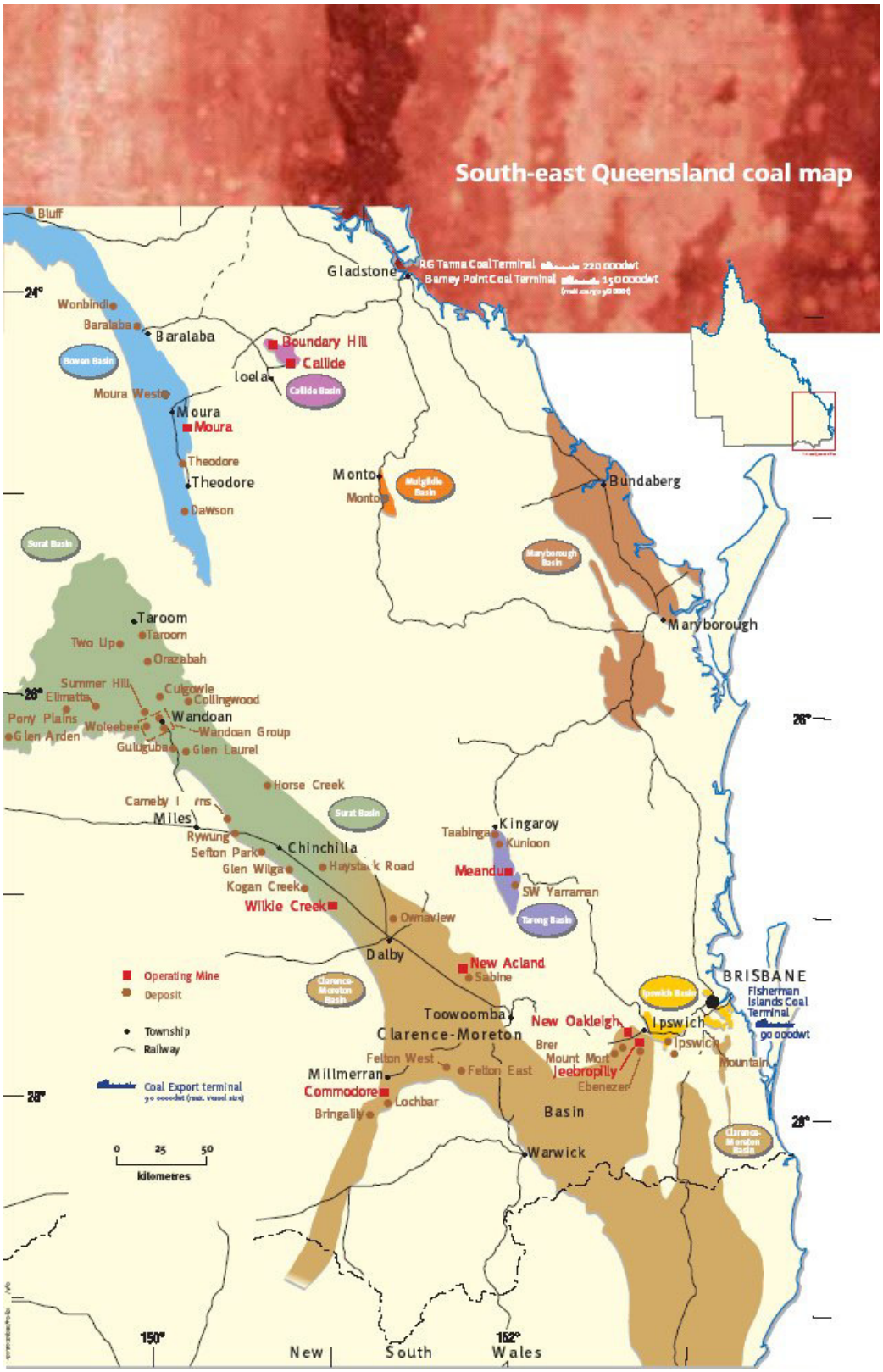
- 274,000 tonnes per annum travelling from the South West to Queensland by road (58% of this freight travels to the east through Miles, 41% travels north through Miles and 1% travels south);
- 309,000 tonnes per annum travelling from the South West to Queensland by rail;
- 481,000 tonnes per annum travelling from the Darling Downs to Queensland by road (83% of this freight is destined north of Miles, 10% is destined to the east, 6% is destined to the west and 1% is destined south);
- 74,500 tonnes per annum travelling from Queensland to the South West by road (80% of this freight is travels west through Miles while the remaining 20% travels south of Miles); and
- 47,000 tonnes p.a. travelling from Queensland to the South West by rail.

2.2.2 Freight Movement Opportunities

Potential freight opportunities for the WDROC region come from the Surat Basin; a large body of shallow untapped thermal coal deemed to be greenhouse friendly. The Surat Basin stretches from Dalby to Taroom (Figure 3) and contains in excess of 4 billion tonnes of coal to a shallow depth of only 80 metres.

The only operating mine in the Surat Basin is located at Wilkie Creek. In 2004, approximately 2 million tonnes of Surat coal from Wilkie Creek was exported to Japan and Korea via the Port of Brisbane. At Taroom, results from the feasibility studies have indicated that up to 5 million tonnes of saleable open pit thermal coal can be produced per annum.

Figure 3 South-East Queensland Coal Basins



Source: Bureau of Mining and Petroleum

However, major impediments to the development of the Surat basin are the restrictions placed on current coal freight movement through the Great Dividing Range. As a result, a major catalyst for next stage development is the construction of a high capacity rail line between Wandoan and Moura.

2.3 Road Transport

Freight commodities that are typically transported in and out of the WDROC region by road are foodstuffs, non-metallic minerals, crude materials, non-metallic products, livestock and fuel. Foodstuffs are the primary shipment for both in and out movement, resulting in approximately 443,000 tonnes per annum from the Darling Downs to Queensland alone. Livestock also makes a significant portion with approximately 78,000 tonnes moving from the region to the greater Queensland area per annum.

In March 2001, the Australian Bureau of Statistics (ABS) conducted a study into freight movements for selected statistical divisions. While data was unavailable for all shires within the WDROC, data was collected for the Darling Downs. Since Chinchilla Shire, Murilla Shire, Tara Shire and Taroom Shire form part of the Darling Downs, the results presented for mode share are indicative only and do not represent the WDROC as a whole.

Results from the ABS indicated that approximately 11.3 M tonnes of product originated from the Darling Downs at the end of 2001. Data from the freight study indicate that road had an 81% mode share for this period. For tonne-kilometres travelled, data indicated that road-based freight held a 73% mode share.

At the end of 2001, 2,634,000 tonnes of product were destined for the Darling Downs. Results indicate that road held a 99% mode share for this period and for tonne-kilometres travelled, road held a 95% mode share.

Table 1 and Table 2 below illustrate the typical operational cost for transport of general freight to the ports at Brisbane and Gladstone via B-Double or Semi.

Table 1 Road Operational Costs to the Port of Brisbane

Origin	Travel Time (hrs)	B-Double ($/t)	Semi ($/t)	Distance ($/t)	B-Double ($/t)	Semi ($/t)
Bendemere	3.53	3.09	4.11	7.77	10.86	11.88
Chinchilla	5.35	4.68	6.22	12.13	16.81	18.35
Dalby	5.77	5.05	6.71	13.14	18.19	19.85
Murilla	4.58	4.01	5.33	10.28	14.29	15.61
Roma	5.90	5.16	6.86	13.46	18.62	20.32
Tara	5.75	5.03	6.69	13.10	18.13	19.79
Taroom	5.80	5.07	6.74	13.21	18.28	19.95

Wambo	5.77	5.05	6.71	13.14	18.19	19.85

Table 2 Road Operational Costs to the Port of Gladstone

Origin	Travel Time (hrs)	B-Double ($/t)	Semi ($/t)	Distance ($/t)	B-Double ($/t)	Semi ($/t)
Bendemere	7.9	6.9	9.14	18.87	25.75	28.01
Chinchilla	7.6	6.7	8.87	18.30	24.97	27.17
Dalby	8.2	7.2	9.52	19.65	26.81	29.17
Murilla	6.6	5.8	7.67	15.84	21.61	23.51
Roma	8.4	7.3	9.72	20.07	27.39	29.79
Tara	8.2	7.1	9.49	19.59	26.73	29.08
Taroom	8.2	7.2	9.56	19.74	26.94	29.30
Wambo	8.2	7.2	9.52	19.65	26.81	29.17

2.4 Rail Transport

Freight commodities that are typically transported to the WDROC region by rail are foodstuffs and other goods, fuel and non-metallic products. For rail freight transport out of the region, livestock is the primary shipment, equalling to approximately 79,000 tonnes per annum. For freight entering the WDROC area, foodstuffs are the predominant commodities at approximately 228,000 tonnes per annum.

The 2001 ABS study into freight movements indicated that rail held a 19% mode share for product originating from the Darling Downs. This increased slightly for mode share in tonne-kilometres, with rail experiencing a 27% mode share.

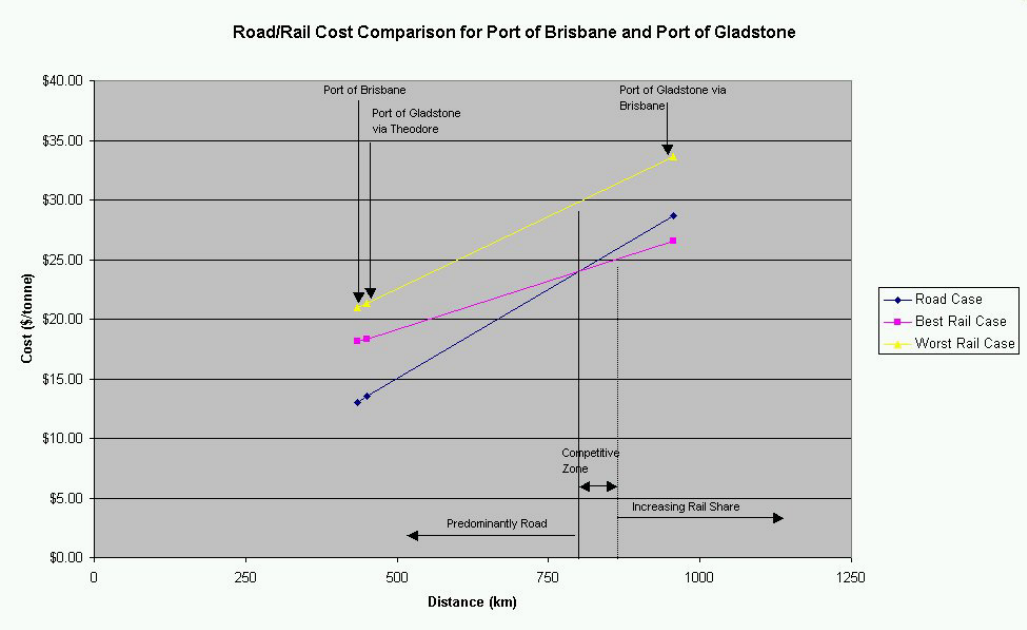
At the end of 2001, 2,634,000 tonnes of product were destined for the Darling Downs. Results indicate that rail held a mode share of only 1%. This remains relatively unaffected for tonne-kilometres travelled, with rail holding only 5%.

Table 3 below shows the typical rail operating costs that can be expected for general freight to the ports of Brisbane and Gladstone. The potential for rail is derived from its line haul efficiency. However, as freight travel distance decreases, road transport becomes more dominant due to its effectiveness in terms of economic benefits and versatility in door-to-door delivery. This cost comparison is illustrated diagrammatically in Figure 4. The worst rail cost is the cost associated with a 'travel time penalty' when compared with road travel time. Therefore, where the rail travel time is equivalent to road travel time, rail becomes more competitive (i.e. best rail cost).

Table 3 Rail Operational Costs from WDROC Intermodal Facility to Ports

	Best Rail Cost ($/tonne)	Worst Rail Cost ($/tonne)
Miles to Port of Brisbane	18.11	21.01
Miles to Port of Gladstone (via. Theodore)	18.36	21.36
Miles to Port of Gladstone (via. Brisbane)	26.55	33.60

Figure 4 Road/Rail Cost Comparison



2.5 Intermodal Hubs

Freight hubs within the vicinity of the WDROC region that have been considered for development include the Miles intermodal facility in Murilla Shire and the Charlton intermodal facility on the Darling Downs. Both of these facilities allow for significant locational advantage since they are located on the Warrego highway (major freight route) and have access to rail via the Western Line. Further to this, both are located on the proposed Australian Inland Rail Expressway.

The Miles Intermodal Freight Hub Options Study conducted by Egis (now GHD) in March 2001 identified the likely freight catchments for the proposed facilities at Miles and Charlton. For the WDROC region, it is expected that an intermodal facility at Miles would cater for Bendemere Shire, Murilla Shire, Roma Town, Tara Shire, Taroom Shire and part of Chinchilla Shire. Dalby Town and Wambo Shire would most likely fall within the freight catchment boundaries of Charlton. While this may be subject to change with the construction of the missing inland rail link (from Wandoan to Moura), analysis and considerations for further sections have been based upon these freight catchment definitions.

3. Relationship and Co-ordination between Road and Rail Networks and Ports

3.1 Overview

This chapter will discuss the relationship and co-ordination between the road and rail system connecting the WDROC region to the Ports of Brisbane and Gladstone. In particular, it will discuss the impediments and issues associated with road and rail transport through an analysis of port capacity (in terms of coal and grain), rail and road capacity.

3.2 Port Capacities

3.2.1 Port of Brisbane

In 2002/2003 over 24.5 million tonnes of cargo passed through the Port of Brisbane, equalling to a value in excess of A$19.4 billion. Its major exports include crude oil, cement, cereal, building products, iron and steel, gypsum and limestone, transport equipment, motor vehicles, paper and wood pulp, timber, rural and industrial chemicals, and fertiliser. Its principle export markets are Asia and the United States of America.

While coal is not a major export for the Port of Brisbane, it currently exports 3 million tones of coal per annum. Its current capacity for coal is 8 million tonnes. The Ports Corporation of Queensland has stated that the capacity of the ports (both Brisbane and Gladstone) is only limited by ship handling capabilities and could be expanded further if demand required. However, the Ports Corporation of Queensland has also identified the difficulty of rail access for potential mines sites in the Surat Basin.

Therefore, the implications for the WDROC region in terms of coal freight does not wholly depend on port capacity. While there is evidence to suggest that sufficient port capacity may be available for *some* development of the Surat Basin, the inefficiency of rail freight transport and current capacity limit on the Western Line is most likely to influence the decision on whether development of the regions natural resources can occur and which export port should be utilised. Indeed, if construction of the missing inland rail link does not come to fruition, the Port of Brisbane may be the preferred port for export (this is still subject to infrastructure upgrades on the Western Line). However, since preliminary studies for Taroom indicate that it has a capability of producing 5 million tonnes of coal per annum, it is likely that much more capacity than the available 5 million tonnes from the Port of Brisbane is required.

3.2.2 Port of Gladstone

The Port of Gladstone is divided into 6 main wharfs for specific uses. Descriptions of these wharfs are as follows:

- Boyne Wharves - main export: aluminium;

- South Trees Wharves - main export: alumina;
- Barney Point Wharves - main export: coal and other dry bulks;
- Auckland Point Wharves - main export: woodchip, calcite, magnesia, grain, containers, general cargo;
- RG Tanna Coal Terminal - main export: coal; and
- Fisherman's Landing Wharves – main export: cement clinker, cement, fly ash, light fuel oil and naphtha.

The RG Tanna Coal Terminal handled approximately 38 million tonnes of coal in the year of 2003/02004. It is a multi user berth facility that exports coal from mines in the Central Queensland Basin. Its current throughput capacity is 40 million tonnes, however, the Port of Gladstone has indicated that a long-term development plan has been prepared and will be implemented as demand dictates. Its expected capacity with the implementation of the plan will be in excess of 60 million tonnes. It currently operates 417 vessels and 15 stockpiles, which collectively have a capacity of 4.2 million tonnes. Access to the wharf is currently by rail only.

In contrast to this, the Barney Point Wharves handled approximately 4.7 million tonnes of freight for 2003/2004. It operates a total of 81 vessels and has an annual design capacity of 5 million tonnes. It is a multi user facility for the export of coal and other bulk commodities. Access to the wharf is by either rail or road.

The investigation of the Port of Gladstone indicates that sufficient capacity for coal exports is available should the Port of Brisbane become over-saturated. However, it should be expected that the Port of Gladstone would become an export terminal regardless of whether the Port of Brisbane is utilised if development of the Surat Basin occurs. This is due to the limiting capacity of coal rail freight movement on the Western Line. However, as mentioned earlier, the relative dependence of the WDROC region on the Port of Gladstone will most likely be subject to the extension of the Moura Line to Wandoan.

3.3 Rail Capacities

An assessment of the existing Western Line in terms of spare capacity to handle additional coal freight movement is described in Table 4. The tabulated results indicate that the section from Toowoomba to the metropolitan network is the constraining factor on the rail network and the main section that is the problem is the section between Grandchester and Gowrie.

Table 4 Indicative Rail Capacity (WDROC to Brisbane)

Section	Indicative Capacity (trains/day)	Current traffic (trains/day)	Theoretical Additional Capacity (M tpa)
Miles-Chinchilla	39	9	22
Chinchilla-Dalby	18	9	6.6
Dalby-Toowoomba	25	12	12.8
Toowoomba-Metropolitan network	20	16	4.2

It should be noted that the Brisbane metropolitan rail network remains a major bottleneck to movement of bulk materials through to the Port of Brisbane.

When also considering the Moura Line, the Wandoan to Theodore link may connect the capacity and additional coal throughput that could be handled with existing infrastructure is highlighted in Table 5. This data indicates that on crude assumptions regarding operating hours, etc however it does indicate greater opportunities for the development of the Surat coal basin with better access to the Port of Gladstone.

Table 5 Moura Line Additional Freight Capacity

Critical Data	Details
Min passing loop length (m)	1025
Capacity (trains/day)	30
Current traffic (trains/day)	20
Available trains/day	10
Tonnes/year (M tpa)	15.4

3.4 Road Capacities

The Toowoomba Range Crossing restricts road capacity, where heavy vehicles have to travel at very slow speeds. The proportion of heavy vehicles in the traffic stream then dictates what the capacity of the road system is to accommodate additional freight. This is illustrated in Table 6 where a negative value for additional capacity indicates that current freight volumes are greater than that which equates to the 5% heavy vehicles in the traffic stream.

Table 6 Road Capacity (WDROC to Brisbane) by Proportion of Heavy Vehicles (HV) in traffic Stream

% HV	HV/hr	Tonnes/hr	Tonnes/day	M Tonnes/yr	Additional capacity (M tpa)
5%	65	1,659	23,227	8.1	(3.2)
7%	91	2,323	32,517	11.4	0.08
10%	131	3,318	46,453	16.3	4.96
15%	196	4,977	69,680	24.4	13.1
20%	261	6,636	92,906	32.5	21.2
25%	327	8,295	116,133	40.6	29.4

Additional issues with the Brisbane urban network have not been considered in this context but the additional growth and traffic demands on the South East Queensland road network will have an impact on the ability to accommodate significant increases in road freight from the western areas.

When this road capacity is compared to the rail capacity, various maximum rail mode share scenarios can be ascertained. This is illustrated in Table 7.

Table 7 Maximum Achievable Mode Share Split Based on Current Infrastructure

% HV	Road (M tpa)	Rail (M tpa)	Rail mode share
5%	8.1	5.4	40%
7%	11.4	5.4	32%
10%	16.3	5.4	25%
15%	24.4	5.4	18%
20%	32.5	5.4	14%
25%	40.6	5.4	12%

Based on the current rail mode share of 19% and the fact that heavy vehicles make up 6.5% of the traffic stream, it is clear that rail is certainly not being used to its maximum potential to service the WDROC region and it is restricted by the current rail and road infrastructure to Brisbane as well as the lack of connection from Wandoan to Theodore.

4. Potential Improvements

4.1 Land Transport Access to Ports

4.1.1 Road Movement

The road travel time to the major trade ports is illustrated in Table 8 below. It is clear that the Port of Brisbane will remain the major destination for non-bulk related goods from the WDROC region that are not likely to be able to be transported on rail.

The recently released South East Queensland Infrastructure Plan and Program (2005-2026) clearly indicate a number of major infrastructure upgrades that should assist with increased and better travel times to the Port of Brisbane by road. These works include the following:

- Ipswich motorway and/or alternative upgrades
- Toowoomba Range upgrade
- Logan Motorway 6 laning
- Gateway Motorway upgrade (6 lanes Pacific Motorway to Wynnum Road and 8 lanes from Wynnum Road to the river)
- Port of Brisbane Motorway Stage 2
- Various intersection upgrades to the Brisbane Urban Corridor

Table 8 Road Travel Time to Ports of Brisbane and Gladstone

	Port of Gladstone		Port of Brisbane	
Origin	**Distance (km)**	**Time (mins)**	**Distance (km)**	**Time (mins)**
Murilla Shire	528	396	259	265
Bendemere Shire	629	472	259	265
Chinchilla Shire	610	458	404	410
Dalby Town	655	491	438	444
Roma Town	669	502	449	454
Tara Shire	653	490	437	442
Taroom Shire	658	494	440	446
Wambo Shire	655	491	438	444

4.1.2 Rail Movement

Table 9 illustrates the current travel time to the ports of Brisbane and Gladstone. Because rail travel time is dependent on the direction of travel, the results tabulated below have been presented with the ports as either origin or destination.

Table 9 Current Rail Travel Time to Ports of Brisbane and Gladstone

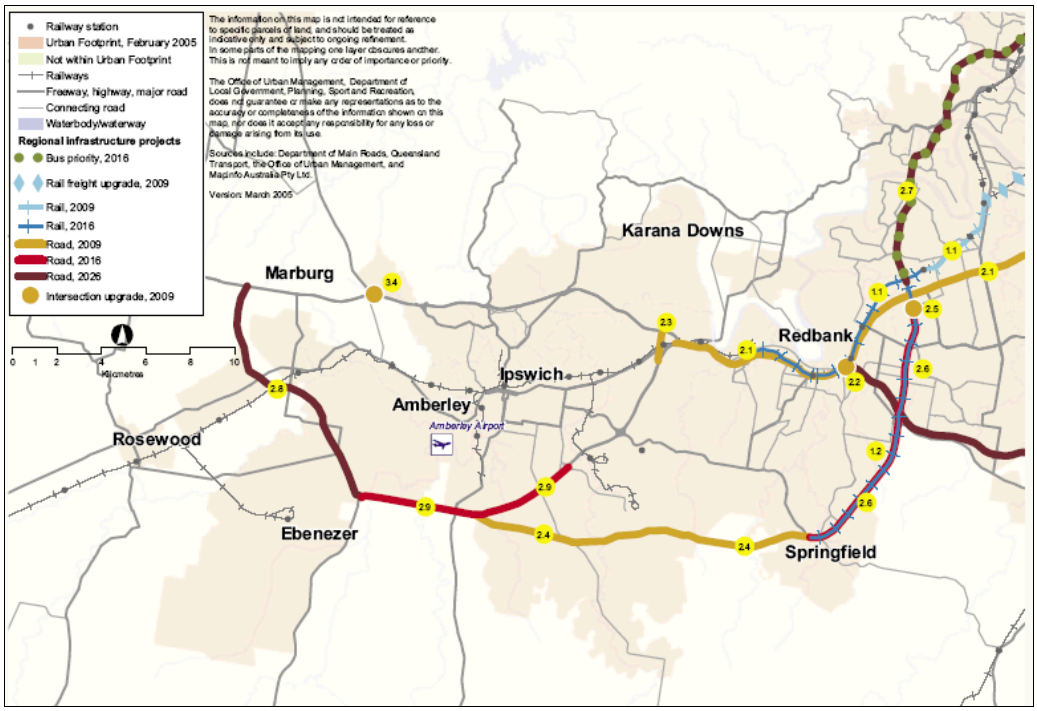
Origin	Port of Brisbane Travel Time (mins)	Port of Gladstone Travel Time (mins)
Murilla Shire	532	947
Bendemere Shire	655	1070
Chinchilla Shire	587	1002
Dalby Town	673	1088
Roma Town	710	1125
Tara Shire	796	1211
Taroom Shire	688	1103
Wambo Shire	673	1088

The results suggest that the current rail travel time is typically much longer than travel by road, therefore, it can be concluded that current rail connectivity to the ports is poor. The South East Queensland Infrastructure Plan and Program (2005-2026) includes rail upgrades of:

- The western line with the Gowrie to Grandchester deviation,
- Freight priority links and upgrade through the metropolitan network,
- Potential southern railway links from Ebenezer to Greenbank
- Additional rail track capacity between Redbank and Corinda

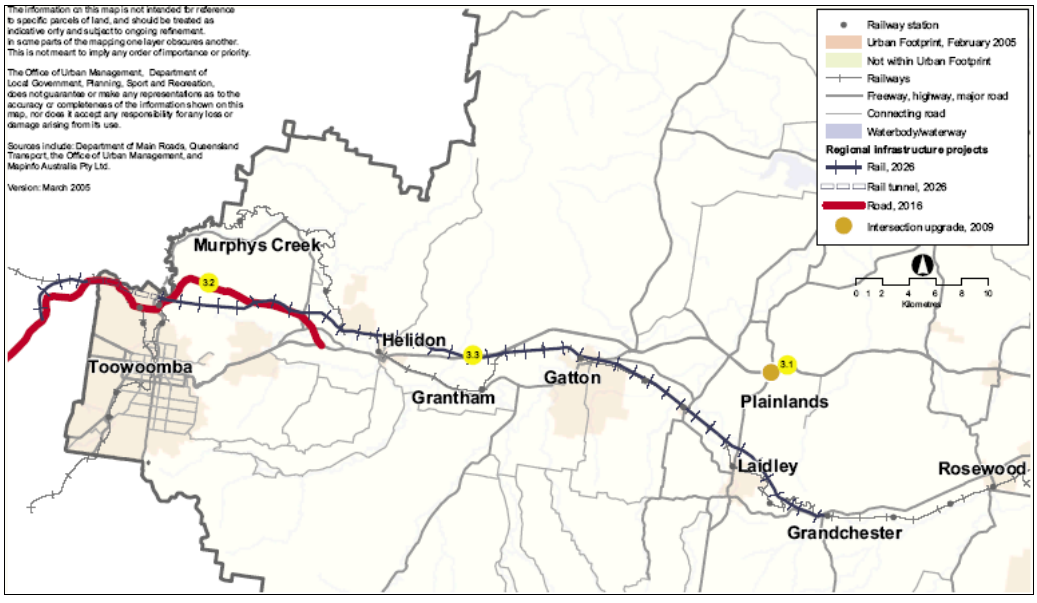
Refer to Figure 5 and Figure 6 for indicative locations of various upgrade works.

Figure 5 Transport Infrastructure Upgrades – Ipswich Area



Source: South East Queensland Infrastructure Plan and Program (2005-2026)

Figure 6 Infrastructure Upgrades – Toowoomba Area



Source: South East Queensland Infrastructure Plan and Program (2005-2026)

Potential improvements to rail capacity on the Western Line (i.e. duplication of the track to Toowoomba) are deemed to be excessively costly due to the difficult construction environment. Furthermore, if coal freight were to use this transport route to access the Port of Gladstone, parts of the track on the North Coast Line would also

have to be duplicated. Since the Port of Gladstone has greater shipping capacity than the Port of Brisbane, potential coal freight movements should consider the more likely movement to the Port of Gladstone. Therefore, an extension of the Moura System to Wandoan becomes a much more attractive solution to increase throughput than the aforementioned infrastructure upgrades.

Table 10 below shows the projected travel times to the Port of Gladstone via the inland rail link. Results indicate that rail travel time to the port improves significantly to become more comparable with road. In addition to this, if the inland rail link becomes constructed, existing mine sites in surrounding areas (e.g. Wilkie Creek, New Acland) may also choose to utilise the link, thus reducing demand on the near-saturated Western Line. Therefore, it can be concluded that land access by rail through the region would be considerably improved.

Table 10 Expected Rail Travel Time to Port of Gladstone via Inland Rail Link

Origin	Travel Time (mins)	Travel Time Saving (mins)
Murilla Shire	512	435
Bendemere Shire	635	435
Chinchilla Shire	567	435
Dalby Town	653	435
Roma Town	690	435
Tara Shire	776	435
Taroom Shire	668	435
Wambo Shire	653	435

4.2 Capacity and Operation of Ports

The future capacity of the Ports of Brisbane and Gladstone in terms of coal handling are described in Table 11, this indicates that the Gladstone port offers greater opportunities for any additional coal that might be exported from the Surat basin, originating from the WDROC region.

Table 11 Future Capacity Limitations in Coal Handling by Port

Descriptor	Port of Brisbane	Gladstone
Coal Capacity (Port Infrastructure) (M t/yr)	8	60
Current Throughput (M t/yr)	3	38
Available Capacity (Mt/yr)	5	22

The capacity of various infrastructure to handle this additional movement is discussed in Section 4.3

4.3 Movement of Bulk Freight from Region

The movement of bulk materials from the region to either the Port of Brisbane or the Port of Gladstone by existing road and rail infrastructure, is severely constrained by the current infrastructure, as described in Table 12. It should be noted that rail services must travel via Brisbane to access Gladstone Port, as there is no existing link and the Toowoomba Range is the constraining factor in this case. This indicates that the development and subsequent movement of bulk materials from the region is restricted by the rail capacity. If a mixture of road and rail transport was used to cater for the movement of bulk commodities from the region then rail would only be catering for 28% of the mode share, whilst the equivalent number of b-Doubles to carry the 4.9M tpa is an additional 540 vehicles per day. This is a large increase in heavy vehicle volumes and is not considered sustainable.

If the Wandoan to Theodore link is constructed then the area can be developed at a much more rapid pace, refer to Table 13. This indicates that rail is still the constraining factor, however is not accommodating the entirety of the available capacity at Gladstone indicating there is still additional potential for the movement of bulk materials to Gladstone with judicious upgrades to the Moura line.

Table 12 Available Capacity from Region Limited by Infrastructure (M tpa)

Destination	Available Rail Capacity (Mtpa)	Available Road Capacity (Mtpa)	Available Port Capacity (Mtpa)	Max. Output from Region (Mtpa) at Current mode Share (29% rail)
To Port of Brisbane via Western Line	2.09	4.9*	5	6.05
To Port of Gladstone via Brisbane	2.09	4.9*	22	6.05

* at 10% Heavy Vehicles

Table 13 Available Capacity from Region With Missing Link (M tpa)

Destination	Available Rail Capacity (Mtpa)	Available Road Capacity (Mtpa)	Available Port Capacity (Mtpa)	Max. Output from Region (Mtpa)
To Port of Gladstone via Moura	15.4	15.93*	22	15.4

The cost of upgrading the rail and road infrastructure to accommodate additional freight is discussed in Section 4.5

4.4 Intermodal Hubs

There are proposed intermodal hubs at Miles and Charlton that would be able to service the region and the future development of these facilities will be largely dependant on the progress of the inland rail. The hubs can accommodate and handle freight generated by the region that is non-bulk related and as rural production increases to meet demand from the rapidly growing urban areas of South East Queensland the demand of the hubs

4.5 Existing Infrastructure Efficiencies

4.5.1 Road

Based on the proposed improvements to the Toowoomba Range crossing the capacity of the road system to cater for additional freight movement is 11.3 M tpa, an increase of 6.4 M tpa. However this would not assist in improving the bulk freight generated from the region as the Port of Brisbane would not be able to handle it. Therefore this upgrade would provide for more efficient and cost effective movement of non-bulk commodities from the region to Southeast Queensland.

At a cost of $680M this project equates to $60/tpa additional freight capacity.

4.5.2 Rail

There are two rail scenarios to increase the efficiency of freight movement from the region:

- The construction of the Wandoan to Theodore link
- The upgrade of the Toowoomba Rail crossing via the Gowrie to Grandchester project

Wandoan to Theodore Link

The Wandoan to Theodore link could be built in the range of $500 to $600M[1] and would be able to handle 15.4M tpa, refer to Table 13, this equates to a cost effectiveness ratio of $39/ tpa.

Toowoomba Range Upgrade

The Toowoomba Range upgrade is considered to cost $1.05B according to the SEQ Infrastructure Plan and could handle in excess of 10 M tpa, however the section between Chinchilla and Dalby will constrain the development capacity of the region for bulk material movement at 6.6 M tpa. As a result the cost effectiveness ratio equals $159/ tpa.

[1] Dawson Surat Transport Study, GHD 2003

As a result of this analysis it is evident that the Wandoan to Theodore Link offers the greatest benefit for the development of the region in being able to access the available Ports and providing cost effectiveness in funding for projects.

4.6 Intelligent Transportation System (ITS) Opportunities

The outcomes of the recent Austroads Intelligent Access Program may offer opportunities for the WDROC region in terms of better truck felt utilisation and management, back loading rates and identification of opportunities to achieve greater rail mode share splits through better use of intermodal facilities.

Appendix A

Freight Types and Quantities

RQ1214 - Miles Intermodal Freight Hub Options Study
Catchment Production - South West

SLA	Commodity	Measure
SLA	Commodity	Measure
Bendemere (S)	Barley for grain - Production (t)	1,542
Bendemere (S)	Canola - Production (clean seed) (t)	11
Bendemere (S)	Cereals for grain, total production (t)	45,561
Bendemere (S)	Chick peas - Production (t)	676
Bendemere (S)	Cotton - irrigated - Production (lint) (kg)	482,950
Bendemere (S)	Cotton - irrigated - Production (seed cotton) (kg)	1,312,150
Bendemere (S)	Crops and pastures for hay total production (t)	764
Bendemere (S)	Dairy cattle (excludes house cows) at 31 March (no)	12
Bendemere (S)	Faba beans (incl tick and horse) - Production (t)	442
Bendemere (S)	Field peas for grain - Production (t)	31
Bendemere (S)	Grain sorghum (for grain) - Production (t)	2,389
Bendemere (S)	Hay sold during year ended 31 March (t)	110
Bendemere (S)	Lab Lab Purpureus (seed) - Production (t)	68
Bendemere (S)	Legumes for grain - Total production (t)	2,744
Bendemere (S)	Mung and other field beans - Total production (t)	1,595
Bendemere (S)	Oats for grain - Production (t)	72
Bendemere (S)	Oilseeds - Total production (t)	673
Bendemere (S)	Sales of cattle and calves, total (no)	30,931
Bendemere (S)	Sales of cows and heifers - 1 year and over (no)	13,333
Bendemere (S)	Sales of pigs (no)	5,353
Bendemere (S)	Sales of steers, bullocks and bulls - 1 year and over (no)	14,288
Bendemere (S)	Sugar cane cut for crushing - Production (t)	4,012
Bendemere (S)	Sunflower - Production (t)	662
Bendemere (S)	Wheat for grain - Production (t)	41,558

RQ1214 - Miles Intermodal Freight Hub Options Study
Catchment Production - Darling Downs

SLA	Commoditiy	Measure
Chinchilla (S)	All other red grapes total production (t)	78
Chinchilla (S)	All other white grapes - total production (fresh weight) (t)	2
Chinchilla (S)	Barley for grain - Production (t)	20,466
Chinchilla (S)	Beeswax (kg)	624
Chinchilla (S)	Canola - Production (clean seed) (t)	99
Chinchilla (S)	Cereals for grain, total production (t)	130,201
Chinchilla (S)	Chick peas - Production (t)	1,162
Chinchilla (S)	Cotton - irrigated - Production (lint) (kg)	594,740
Chinchilla (S)	Cotton - irrigated - Production (seed cotton) (kg)	1,506,588
Chinchilla (S)	Cotton - non irrigated - Production (lint) (kg)	1,969,477
Chinchilla (S)	Cotton - non irrigated - Production (seed cotton) (kg)	4,979,854
Chinchilla (S)	Crops and pastures for hay total production (t)	7,976
Chinchilla (S)	Dairy cattle (excludes house cows) at 31 March (no)	1,934
Chinchilla (S)	Field peas for grain - Production (t)	99
Chinchilla (S)	Grain sorghum (for grain) - Production (t)	42,734
Chinchilla (S)	Grapes, total production (fresh weight) (t)	127
Chinchilla (S)	Hay sold during year ended 31 March (t)	1,975
Chinchilla (S)	Honey (including honey comb), total (kg)	20,156
Chinchilla (S)	Legumes for grain - Total production (t)	2,129
Chinchilla (S)	Melons (not elsewhere classified) - Production (t)	231
Chinchilla (S)	Melons, rock (incl cantaloupe) - Production (t)	6,707
Chinchilla (S)	Melons, water - Production (t)	7,183
Chinchilla (S)	Milk cows (in milk and dry) at 31 March (no)	1,215
Chinchilla (S)	Millet & panicum (inc. canary seed) - Production (t)	1,794
Chinchilla (S)	Mung and other field beans - Total production (t)	868
Chinchilla (S)	Muscat a Petit Grains Blanc, total production (fresh wt) (t)	1
Chinchilla (S)	Muscat a Petit Grains Rouge/Rose, total production (frsh wt) (t)	46
Chinchilla (S)	Muscat Gordo Blanco, total production (fresh weight) (t)	1
Chinchilla (S)	Nectarines - Production (kg)	12,500
Chinchilla (S)	Oats for grain - Production (t)	3,297
Chinchilla (S)	Oilseeds - Total production (t)	652
Chinchilla (S)	Pasture seed - Production (kg)	5,037
Chinchilla (S)	Pastures - total cut for hay - Production (t)	988
Chinchilla (S)	Peaches - Total production (kg)	15,500
Chinchilla (S)	Peanuts - Production (in shell) (kg)	404,444
Chinchilla (S)	Plums and prunes - Total production (kg)	4,200
Chinchilla (S)	Pumpkins, triambles, trombones, etc. - Production (t)	108
Chinchilla (S)	Red grapes, total production(fresh weight) (t)	124
Chinchilla (S)	Sales of cattle and calves, total (no)	48,971
Chinchilla (S)	Sales of cows and heifers - 1 year and over (no)	16,857
Chinchilla (S)	Sales of horses, total (no)	72
Chinchilla (S)	Sales of pigs (no)	88,975
Chinchilla (S)	Sales of sheep and lambs, total (no)	3,065
Chinchilla (S)	Sales of steers, bullocks and bulls - 1 year and over (no)	26,453
Chinchilla (S)	Silage made during year ended 31 March (t)	2,568
Chinchilla (S)	Soybeans - Production (t)	227
Chinchilla (S)	Sugar cane cut for crushing - Production (t)	7,824
Chinchilla (S)	Sunflower - Production (t)	326
Chinchilla (S)	Wheat for grain - Production (t)	61,912
Chinchilla (S)	White grapes, total production (fresh weight) (t)	3
Chinchilla (S)	Wool production (kg)	14,411

RQ1214 - Miles Intermodal Freight Hub Options Study
Catchment Production - Darling Downs

SLA	Commoditiy	Measure
SLA	Commoditiy	Measure
Dalby (T)	Barley for grain - Production (t)	4,719
Dalby (T)	Beeswax (kg)	150
Dalby (T)	Beetroot - Production (t)	1
Dalby (T)	Broccoli - Production (kg)	193
Dalby (T)	Cabbages - Production (t)	3
Dalby (T)	Carrots - Production (t)	1
Dalby (T)	Cauliflower - Production (t)	2
Dalby (T)	Cereals for grain, total production (t)	28,394
Dalby (T)	Chick peas - Production (t)	306
Dalby (T)	Citrus fruit - Total production (kg)	3,176
Dalby (T)	Cotton - irrigated - Production (lint) (kg)	70,909
Dalby (T)	Cotton - irrigated - Production (seed cotton) (kg)	212,727
Dalby (T)	Crops and pastures for hay total production (t)	4,021
Dalby (T)	Cucumbers - Production (kg)	146
Dalby (T)	Dairy cattle (excludes house cows) at 31 March (no)	879
Dalby (T)	Eggs produced for human consumption (Doz)	6,526
Dalby (T)	Grain sorghum (for grain) - Production (t)	11,060
Dalby (T)	Hay sold during year ended 31 March (t)	55
Dalby (T)	Honey (including honey comb), total (kg)	3,800
Dalby (T)	Legumes for grain - Total production (t)	437
Dalby (T)	Melons, water - Production (t)	-
Dalby (T)	Milk cows (in milk and dry) at 31 March (no)	844
Dalby (T)	Millet & panicum (inc. canary seed) - Production (t)	189
Dalby (T)	Mung and other field beans - Total production (t)	132
Dalby (T)	Oats for grain - Production (t)	354
Dalby (T)	Onions, white and brown - Production (t)	27
Dalby (T)	Oranges, total production (kg)	3,176
Dalby (T)	Pastures - total cut for hay - Production (t)	2,162
Dalby (T)	Pumpkins, triambles, trombones, etc. - Production (t)	47
Dalby (T)	Pure lucerne cut for hay - Production (t)	2,162
Dalby (T)	Sales of cattle and calves, total (no)	6,530
Dalby (T)	Sales of cows and heifers - 1 year and over (no)	1,759
Dalby (T)	Sales of horses, total (no)	9
Dalby (T)	Sales of pigs (no)	645
Dalby (T)	Sales of sheep and lambs, total (no)	4,542
Dalby (T)	Sales of steers, bullocks and bulls - 1 year and over (no)	4,425
Dalby (T)	Silage made during year ended 31 March (t)	48
Dalby (T)	Wheat for grain - Production (t)	12,072
Dalby (T)	Wool production (kg)	22,016

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Catchment Production - Darling Downs

SLA	Commoditiy	Measure
SLA	Commoditiy	Measure
Murilla (S)	Barley for grain - Production (t)	6,495
Murilla (S)	Cereals for grain, total production (t)	176,064
Murilla (S)	Chick peas - Production (t)	473
Murilla (S)	Cotton - irrigated - Production (lint) (kg)	1,038,061
Murilla (S)	Cotton - irrigated - Production (seed cotton) (kg)	2,761,042
Murilla (S)	Cotton - non irrigated - Production (lint) (kg)	545,583
Murilla (S)	Cotton - non irrigated - Production (seed cotton) (kg)	3,522,340
Murilla (S)	Crops and pastures for hay total production (t)	1,418
Murilla (S)	Grain sorghum (for grain) - Production (t)	37,882
Murilla (S)	Legumes for grain - Total production (t)	1,677
Murilla (S)	Milk cows (in milk and dry) at 31 March (no)	51
Murilla (S)	Millet & panicum (inc. canary seed) - Production (t)	1,791
Murilla (S)	Mung and other field beans - Total production (t)	1,204
Murilla (S)	Oats for grain - Production (t)	1,271
Murilla (S)	Pasture seed - Production (kg)	333
Murilla (S)	Pastures - total cut for hay - Production (t)	44
Murilla (S)	Sales of calves - under 1 year (no)	4,096
Murilla (S)	Sales of cattle and calves, total (no)	43,261
Murilla (S)	Sales of cows and heifers - 1 year and over (no)	15,566
Murilla (S)	Sales of horses, total (no)	20
Murilla (S)	Sales of pigs (no)	903
Murilla (S)	Sales of sheep and lambs, total (no)	5,189
Murilla (S)	Sales of steers, bullocks and bulls - 1 year and over (no)	23,600
Murilla (S)	Silage made during year ended 31 March (t)	15,453
Murilla (S)	Wheat for grain - Production (t)	128,625
Murilla (S)	Wool production (kg)	34,575

RQ1214 - Miles Intermodal Freight Hub Options Study
Catchment Production - South West

SLA	Commodity	Measure
SLA	Commodity	Measure
Roma (T)	All other red grapes - Production for other uses (t)	11
Roma (T)	All other red grapes total production (t)	12
Roma (T)	All other white grapes - total production (fresh weight) (t)	5
Roma (T)	Barley for grain - Production (t)	2,808
Roma (T)	Canola - Production (clean seed) (t)	36
Roma (T)	Cereals for grain, total production (t)	122,944
Roma (T)	Chenin Blanc, total production (fresh weight) (t)	8
Roma (T)	Chick peas - Production (t)	1,229
Roma (T)	Citrus fruit - Total trees (no)	1,269
Roma (T)	Crops and pastures for hay total production (t)	735
Roma (T)	Dairy cattle (excludes house cows) at 31 March (no)	634
Roma (T)	Eggs produced for human consumption (Doz)	111,364
Roma (T)	Grain sorghum (for grain) - Production (t)	8,434
Roma (T)	Grapes, total production (fresh weight) (t)	47
Roma (T)	Grapes, total production for other uses (t)	14
Roma (T)	Grapes, total production for winemaking/distillation (t)	33
Roma (T)	Hay sold during year ended 31 March (t)	445
Roma (T)	Legumes for grain - Total production (t)	3,130
Roma (T)	Mung and other field beans - Total production (t)	1,901
Roma (T)	Muscat a Petit Grains Rouge/Rose, total production (frsh wt) (t)	14
Roma (T)	Oats for grain - Production (t)	1,166
Roma (T)	Oilseeds - Total production (t)	392
Roma (T)	Red grapes, total production(fresh weight) (t)	31
Roma (T)	Riesling, total production (fresh weight) (t)	3
Roma (T)	Ruby Cabernet total production (fresh weight) (t)	1
Roma (T)	Sales of cattle and calves, total (no)	52,642
Roma (T)	sales of cows and heifers - 1 year and over (no)	27,626
Roma (T)	Sales of horses, total (no)	133
Roma (T)	Sales of pigs (no)	270
Roma (T)	Sales of sheep and lambs, total (no)	22,758
Roma (T)	Sales of steers, bullocks and bulls - 1 year and over (no)	20,729
Roma (T)	Shiraz, total production (fresh weight) (t)	5
Roma (T)	Silage made during year ended 31 March (t)	2,823
Roma (T)	Sunflower - Production (t)	356
Roma (T)	Wheat for grain - Production (t)	110,536
Roma (T)	White grapes, total production (fresh weight) (t)	16
Roma (T)	Wool production (kg)	393,463

RQ1214 - Miles Intermodal Freight Hub Options Study
Catchment Production - Darling Downs

SLA	Commoditiy	Measure
SLA	Commoditiy	Measure
Tara (S)	Barley for grain - Production (t)	7,641
Tara (S)	Cereals for grain, total production (t)	266,121
Tara (S)	Chick peas - Production (t)	1,843
Tara (S)	Cotton - non irrigated - Production (lint) (kg)	1,051,714
Tara (S)	Cotton - non irrigated - Production (seed cotton) (kg)	3,024,899
Tara (S)	Crops and pastures for hay total production (t)	2,131
Tara (S)	Faba beans (incl tick and horse) - Production (t)	30
Tara (S)	Grain sorghum (for grain) - Production (t)	51,087
Tara (S)	Hay sold during year ended 31 March (t)	365
Tara (S)	Legumes for grain - Total production (t)	5,673
Tara (S)	Maize for grain - Production (t)	18
Tara (S)	Milk cows (in milk and dry) at 31 March (no)	330
Tara (S)	Millet & panicum (inc. canary seed) - Production (t)	545
Tara (S)	Mung and other field beans - Total production (t)	3,800
Tara (S)	Oats for grain - Production (t)	407
Tara (S)	Oilseeds - Total production (t)	196
Tara (S)	Ostriches (no)	82
Tara (S)	Pasture seed - Production (kg)	21,271
Tara (S)	Pastures - total cut for hay - Production (t)	395
Tara (S)	Sales of cattle and calves, total (no)	48,644
Tara (S)	Sales of cows and heifers - 1 year and over (no)	14,968
Tara (S)	Sales of goats (excluding feral) (no)	1,663
Tara (S)	Sales of horses, total (no)	70
Tara (S)	Sales of sheep and lambs, total (no)	96,442
Tara (S)	Sales of steers, bullocks and bulls - 1 year and over (no)	29,620
Tara (S)	Silage made during year ended 31 March (t)	1,121
Tara (S)	Soybeans - Production (t)	196
Tara (S)	Sunflower - Production (t)	-
Tara (S)	Triticale for grain - Production (t)	166
Tara (S)	Wheat for grain - Production (t)	206,256
Tara (S)	Wool production (kg)	1,183,568

RQ1214 - Miles Intermodal Freight Hub Options Study
Catchment Production - Darling Downs

SLA	Commoditiy	Measure
Taroom (S)	Barley for grain - Production (t)	832
Taroom (S)	Cereals for grain, total production (t)	49,707
Taroom (S)	Chick peas - Production (t)	93
Taroom (S)	Crops and pastures for hay total production (t)	1,659
Taroom (S)	Dairy cattle (excludes house cows) at 31 March (no)	950
Taroom (S)	Grain sorghum (for grain) - Production (t)	6,192
Taroom (S)	Hay sold during year ended 31 March (t)	861
Taroom (S)	Legumes for grain - Total production (t)	593
Taroom (S)	Milk cows (in milk and dry) at 31 March (no)	818
Taroom (S)	Millet & panicum (inc. canary seed) - Production (t)	33
Taroom (S)	Mung and other field beans - Total production (t)	500
Taroom (S)	Oats for grain - Production (t)	998
Taroom (S)	Olives - Production (kg)	-
Taroom (S)	Pasture seed - Production (kg)	14,785
Taroom (S)	Pastures - total cut for hay - Production (t)	1,273
Taroom (S)	Pigs, total (no)	145
Taroom (S)	Sales of cattle and calves, total (no)	107,140
Taroom (S)	Sales of cows and heifers - 1 year and over (no)	38,832
Taroom (S)	Sales of horses, total (no)	97
Taroom (S)	Sales of lambs (no)	296
Taroom (S)	Sales of sheep (no)	3
Taroom (S)	Sales of sheep and lambs, total (no)	299
Taroom (S)	Sales of steers, bullocks and bulls - 1 year and over (no)	61,414
Taroom (S)	Silage made during year ended 31 March (t)	439
Taroom (S)	Sugar cane cut for crushing - Production (t)	4,409
Taroom (S)	Wheat for grain - Production (t)	41,651
Taroom (S)	Wool production (kg)	1,952

RQ1214 - Miles Intermodal Freight Hub Options Study
Catchment Production - Darling Downs

SLA	Commoditiy	Measure
SLA	Commoditiy	Measure
Wambo (S)	All other red grapes total production (t)	78
Wambo (S)	All other sheep (excluding breeding ewes), number (no)	81
Wambo (S)	All other white grapes - total production (fresh weight) (t)	2
Wambo (S)	Barley for grain - Production (t)	63,038
Wambo (S)	Cereals for grain, total production (t)	401,480
Wambo (S)	Chick peas - Production (t)	11,231
Wambo (S)	Cotton - irrigated - Production (lint) (kg)	10,452,054
Wambo (S)	Cotton - irrigated - Production (seed cotton) (kg)	27,553,780
Wambo (S)	Cotton - non irrigated - Production (lint) (kg)	12,303,529
Wambo (S)	Cotton - non irrigated - Production (seed cotton) (kg)	28,504,608
Wambo (S)	Crops (excl cereals) cut for hay - Production (t)	288
Wambo (S)	Crops and pastures for hay total production (t)	8,184
Wambo (S)	Dairy cattle (excludes house cows) at 31 March (no)	9,244
Wambo (S)	Field peas for grain - Production (t)	22
Wambo (S)	Grain sorghum (for grain) - Production (t)	173,758
Wambo (S)	Grapes, total production (fresh weight) (t)	82
Wambo (S)	Hay sold during year ended 31 March (t)	1,998
Wambo (S)	Legumes for grain - Total production (t)	25,131
Wambo (S)	Maize for grain - Production (t)	8,575
Wambo (S)	Melons, water - Production (t)	1,007
Wambo (S)	Millet & panicum (inc. canary seed) - Production (t)	12,101
Wambo (S)	Mung and other field beans - Total production (t)	13,879
Wambo (S)	Oats for grain - Production (t)	2,383
Wambo (S)	Oilseeds - Total production (t)	4,608
Wambo (S)	Olives - Production (kg)	84
Wambo (S)	Pastures - total cut for hay - Production (t)	2,106
Wambo (S)	Peaches - Total production (kg)	8,945
Wambo (S)	Popcorn - Production (t)	784
Wambo (S)	Pumpkins, triambles, trombones, etc. - Production (t)	9
Wambo (S)	Pure lucerne cut for hay - Production (t)	2,106
Wambo (S)	Red grapes, total production(fresh weight) (t)	78
Wambo (S)	Sales of cattle and calves, total (no)	81,966
Wambo (S)	Sales of cows and heifers - 1 year and over (no)	20,568
Wambo (S)	Sales of horses, total (no)	18
Wambo (S)	Sales of ostriches (no)	31
Wambo (S)	Sales of pigs (no)	85,706
Wambo (S)	Sales of sheep and lambs, total (no)	2,042
Wambo (S)	Sales of steers, bullocks and bulls - 1 year and over (no)	55,678
Wambo (S)	Silage made during year ended 31 March (t)	11,304
Wambo (S)	Soybeans - Production (t)	1,176
Wambo (S)	Sultana, total production (fresh weight) (t)	2
Wambo (S)	Sunflower - Production (t)	3,432
Wambo (S)	Wheat for grain - Production (t)	141,625
Wambo (S)	White grapes, total production (fresh weight) (t)	4
Wambo (S)	Wool production (kg)	19,717

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