

South East Queensland Regional Freight Network Strategy 2007-2012



Moving Queensland forward

Published June 2007 Updated January 2009

[©] The State of Queensland (Queensland Transport and the Department of Main Roads). Copyright protects this publication. Except for purposes permitted by the Copyright Act 1968, no part may be reproduced by any means without the prior written permission of the Departments.

Prepared by: Rail Ports and Freight Division Queensland Transport

Corridor Management and Operations Group Department of Main Roads

Forward



The South East Queensland Regional Freight Network Strategy 2007-2012 represents the Queensland Government's commitment to addressing the region's emerging and future freight demands and challenges. This strategy is a key element of the South East Queensland Regional Plan 2005-2026, which acknowledges freight as an important issue for the region.

As Queensland continues to grow, the demands of a rapidly increasing population and economic activity arising from high business confidence across all industrial sectors is leading to greater demand for goods and services from industry, the commercial sector and households. This is posing significant transport challenges, highlighting the need for a more efficient and better integrated freight transport system for the region.

South east Queensland is the gateway for intra and interstate trade, and is a key point for international trade with overseas markets. Therefore, the efficient movement of freight is crucial to industrial and commercial productivity, and the future economic development of the region.

The South East Queensland Regional Freight Network Strategy will inform our policy and planning for freight in the region and support the Queensland Government's broader commitment to delivering a world class transport system. It will also contribute to urban amenity, safety and environment outcomes by encouraging effective and sustainable freight movements.

This strategy identifies the key trends and challenges for freight in south east Queensland and focuses on encouraging better integration and utilisation of transport modes, infrastructure and inter-modal links to support the effective and efficient end-to-end delivery of freight. It will be updated regularly to ensure the movement of freight continues to support the productivity, performance and competitiveness of our fast-moving economy.

I would like to acknowledge the contribution of the many stakeholders in developing this Strategy, and look forward to working with them to address the emerging freight opportunities and challenges of the region.

Hohn Michel.

The Honourable John Mickel MP Minister for Transport, Trade, Employment and Industrial Relations



Table of contents

1.0 Introduction	4
1.1 Background	4
1.2 Purpose	4
1.3 Aim	4
1.4 Scope	4
2.0 Freight in SEQ	5
2.1 Nature of freight	5
2.2 SEQ trade, industry and freight movement	5
3.0 SEQ freight network	8
3.1 Northern Freight Corridor	
3.2 Southern Freight Corridor	
3.3 Western Freight Corridor	
3.4 Eastern Freight Corridor	
3.5 Inner Freight Corridor	
3.6 Inter-Modal Connections	17
4.0 Future SEQ freight flows and movements	
5.0 Future inter-modal connections	20
6.0 Future challenges in SEQ	22
6.1 Key trends	
6.2 Externalities	24
6.3 Alternative freight transport	25
6.4 Heavy road freight	25
7.0 Responding to SEQ's future demand for freight	
7.1 Policy development	
7.2 Freight network planning	
7.3 Transport infrastructure design	
7.4 Investment	
7.5 Freight operations	
7.6 Institutional arrangements	
8.0 References	32

1.0 Introduction



1.1 Background

The transportation of freight around south east Queensland (SEQ) sustains our lifestyle and supports economic growth. As Queenslanders continue to become wealthier, we consume more goods – homes and vehicles are larger with more appliances, and we are consuming a greater variety of food – increasing the demand for freight in SEQ.¹ Also contributing to this trend is SEQ's level of growth. SEQ is recognised as Australia's fastest growing region. Its population is expected to reach around 3.8 million by 2026 – an increase of more than 1 million people. This presents significant challenges for the region's transport system, including the effective and efficient movement of freight necessary to sustain this growth.

The SEQ Regional Plan 2005 – 2026 acknowledges freight as an important issue for the region. The plan recognises that efficient freight movement is crucial to industry and commercial productivity, as well as the future economic development and growth of the region It also outlines the region's priority freight routes (both rail and road) that form the SEQ freight network. It notes freight movements across Queensland are forecast to double by 2020 and explores the associated challenges of managing road and rail freight across the network.

Due to the importance of this issue to the region's prosperity, Queensland Transport and the Department of Main Roads (the government) has developed the SEQ Regional Freight Network Strategy 2007-2012 (the Strategy) to manage the impact of freight to drive the level of investment and policy making necessary to sustain the freight task.

1.2 Purpose

The purpose of the Strategy is to support the implementation of the SEQ Regional Plan and in particular the achievement of its broad vision to "*provide an efficient and integrated freight transport system for the region*". In doing so, it will inform the SEQ Integrated Regional Transport Plan and the various

Integrated Local Transport Plans of the region's future freight requirements. This will ensure the region's freight needs are considered in the broader strategic transport and land use aspects of the Regional Plan and in future transport infrastructure proposals in the SEQ Infrastructure Plan and Program 2006 – 2026 (SEQIPP).

1.3 Aim

The aim of the Strategy is to "facilitate freight moving efficiently across the transport network" in a manner that enhances economic development, safety, quality of life and environmental sustainability. To ensure this occurs, the Strategy describes the existing freight demands and freight network; examines the region's future demands and challenges; and provides direction for future policy, planning, infrastructure design, operations and institutional arrangements to encourage the effective and efficient end-to-end delivery of freight.

1.4 Scope

The Strategy examines the movement of freight into and out of the region as well as freight moving within SEQ. It focuses on developing and encouraging better integration and utilisation of the existing road and rail freight routes to enhance their ability to support the economic activity and prosperity of the region. In particular, the Strategy identifies the existing priority one and two road freight routes*, which distinguish the region's key business-to-business and/or business-toretail freight movement based on heavy vehicle traffic volumes.

The Strategy has a five-year (2007-2012) time horizon and will be monitored and reviewed to accommodate emerging opportunities and challenges confronting the SEQ Freight Network to ensure the achievement of the Regional Plan's broad vision for freight.

^{*} Priority One Freight Routes facilitate high volume, business-to-business freight movements. These routes carry more than 1000 articulated trucks per day. Priority Two Freight Routes provide for the distribution of freight from factories or distribution centres to retail outlets or warehouses. They carry over 250 articulated trucks and more than a total of 1000 trucks per day.

2.0 Freight in SEQ

2.1 Nature of freight

Freight involves the transportation of goods from one location to another. Freight moves in response to demand; sometimes to provide goods for intermediate production, sometimes to transport products for final consumption or to shift goods from one place to another for purposes such as storage.

Freight demand is a broad measure indicating freight movements in terms of tonnes. It should not be confused with the freight "task", which refers to the number of times freight moves in order to satisfy demand. For example, an international shipment of television sets will arrive at the Port of Brisbane before it is sent to a warehouse. It will then be unpacked and distributed to several retail outlets by truck or railed to another warehouse for later distribution. Each television set will then make its final journey to households in the back of the family car or in door-to-door delivery vehicles. Each of these movements is part of the freight "task".

Non-bulk freight is typically subject to a number of origins and destinations before it reaches the end user. Bulk freight on the other hand, often only requires point-to-point pick up and delivery (for example, from a coal mine to a port terminal). This generally requires significant coordination to minimise costly double handling and storage of bulk commodities.

The way freight moves between origin and destination is generally governed by a range of factors including:

- the distance between origin and destination;
- the size (volumetric or weight) of the shipment;
- the time sensitivity (including perishability) of the goods;
- the value of the goods;
- the cost associated with the movement of freight to satisfy demand;
- prevailing logistics practices; and
- the shape and make-up of the goods.

2.2 SEQ trade, industry, and freight movement

The SEQ region is the gateway for intra and interstate trade, and is a key point for international trade with overseas markets. The region represents about 62 per cent² of the Queensland economy and has the potential to assume an increasing role based on regional population and economic forecasts. Increasing trade is expected to influence industrial development and hence greater freight transport activity across SEQ. The key industry groups supporting trade within the region are manufacturing, building and construction, services and retail sectors, accommodation, and finance and business services.



5



Figure 1 – SEQ major freight-generating and receiving areas



The movement of freight by rail and/or road to support trade and industry activity can be broadly categorised as:

- Transit freight moves through SEQ to connect external origins and destinations.
- Trans-urban freight moves between origins or destinations in SEQ and those located external to SEQ.
- Inter-urban freight moves between origins and destinations in separate SEQ concentrations.
- Intra-urban freight moves between origins and destinations within a local urban area.

Transit freight typically includes freight moving between regional Queensland and other states. It also includes export or import freight moving through the Port of Brisbane. Much of the freight transiting through SEQ is bulk freight movements to the Port of Brisbane for export. These are generally long-haul rail operations designed to transport large quantities of a particular commodity such as coal and grain.

Trans-urban freight generally involves the movement of smaller quantities of agricultural, wholesale, retail

and manufactured products to or from the SEQ region. The majority of this freight utilises articulated and rigid road freight vehicles, although rail also makes an important contribution. The major SEQ freightgenerating or receiving points for this type of freight are clustered in the Brisbane metropolitan area (particularly for heavy and secondary industry freight tasks) within three distinct locations (refer Figure 1). These include Brisbane's northern suburbs (that is, Brendale, Northgate and Virginia), the Australia TradeCoast (that is, Pinkenba, Colmslie-Lytton and Fisherman Islands) and Brisbane's south-west (that is, Rocklea, Acacia Ridge and Wacol).¹

Inter and intra-urban freight represents a significant proportion of general freight movements within SEQ. Construction, light industries, services, and retail activities are the main drivers of this type of freight. Increasing demand for these industries has contributed to an increase in light commercial vehicles supporting this type of freight. Because of the localised nature of this type of freight it tends to rely on dispersed single user terminal facilities. In addition, many of the origin/ destination pairs require lateral movement across key freight corridors.

3.0 SEQ freight network



The SEQ freight network extends north to Cooroy, south to the Queensland – New South Wales border, east to the Australia TradeCoast and west to Toowoomba. There are currently five corridors and two key intermodal terminals within the SEQ freight network. This section describes each corridor's priority one and two road freight routes, key rail freight routes (the majority of which are part of the Brisbane metropolitan rail network), current freight demands, and the capability of inter-modal connections.

3.1 Northern Freight Corridor

3.1.1 Road

The northern road freight corridor primarily comprises the Bruce Highway from the Pine River Bridge in the south, to the SEQ regional boundary in the north. The highway is a priority one road freight route and is supported by various priority two road freight routes that link the highway to key local government roads (refer Figure 2). It is the key road facilitating intraregional freight along the corridor and inter-regional freight between SEQ and the central and northern areas of Queensland. It connects to the Gateway Motorway and a number of priority two road freight routes in the inner freight corridor to provide a link to the Australia TradeCoast as well as industrial precincts in Brisbane's northern suburbs (that is, Brendale, Northgate and Virginia).

In 2002, the amount of road freight travelling throughout the corridor was approximately 6 million tonnes (mt).¹³⁴ The majority of this freight was non-bulk commodities transported to and from markets in major urban centres along the coast between Brisbane

and northern Queensland. The type of freight vehicles utilising the corridor ranges from light rigid vehicles to articulated heavy vehicles, including semi-trailers and B-doubles providing line haul operations to areas outside SEQ. The majority of road freight vehicles travelling the corridor use the highway as a link to priority two road freight routes and local government roads to access intra-regional locations such as Caboolture and the Sunshine Coast.

3.1.2 Rail

The northern rail freight corridor extends from Eagle Junction through Northgate, Caboolture, Nambour to Cooroy (refer Figure 2). In 2002, the amount of rail freight travelling throughout the corridor was approximately 3mt.¹ Non-bulk commodities accounted for a large portion of this freight (approximately 2.9mt).¹ The main commodities were containerised goods, containerised meat, and livestock. Containerised goods are predominantly transported from Brisbane to markets in central and northern Queensland for consumption, while containerised meat is transported to Brisbane for export (via the Port of Brisbane) and livestock is transported to various meat processing plants in SEQ.

Bulk commodities comprise the remainder of the freight railed through the corridor. The main commodities transported by volume were bitumen, cement and fuel. (Note: only a portion of total bulk cement and fuel movements are undertaken by rail). Bitumen and fuel are typically railed from Brisbane to central and northern Queensland for distribution, while cement is transported from central and northern Queensland to Brisbane for use within the region.

Figure 2 – SEQ Northern Freight Corridor





3.2.1 Road

The southern road freight corridor comprises the Pacific Motorway commencing at the interchange with the South-East Arterial Road in the north, to Tugun in the south where the motorway joins the Pacific Highway at the New South Wales border (refer Figure 3). The motorway is a priority one road freight route. It is a key road facilitating intra-regional freight between Brisbane, Logan/Beenleigh, and the Gold Coast and inter-regional freight between SEQ and the southern states. It connects with other priority one and two road freight routes in the inner freight corridor to provide access to the Australia TradeCoast and commercial and industrial precincts in south-west Brisbane (that is, Rocklea, Acacia Ridge and Wacol).

In 2002, the amount of road freight travelling throughout the corridor was approximately 11mt.¹³⁴ The majority of this freight was non-bulk commodities transported to and from southern markets. The type of freight vehicles using the motorway ranges from light rigid vehicles to articulated heavy vehicles, including semi-trailers and B-doubles providing line haul operations to interstate destinations such as Sydney and northern New South Wales.

3.2.2 Rail

The southern rail freight corridor extends from the Acacia Ridge terminal to the Queensland-New South Wales border (refer Figure 3). This corridor has a single rail line which is shared between freight and interstate passenger transport services. It is the only rail line linking Brisbane to Sydney and Melbourne.

In 2002, the amount of rail freight travelling throughout the corridor was approximately 2.8mt.¹⁵ This was attributed almost exclusively to non-bulk general freight commodities travelling to and from the Sydney and Melbourne markets.



Figure 3 – SEQ Southern Freight Corridor



Figure 4 – SEQ Western Freight Corridor

3.3 Western Freight Corridor

3.3.1 Road

The western road freight corridor comprises the Warrego and Cunningham highways, which commence at the common interchange with the Ipswich Motorway at Dinmore. The Warrego Highway exits SEQ at the western edge of the city of Toowoomba in the west, and the Cunningham Highway exits SEQ at the boundary of Warwick and Boonah Shires in the south-west (refer figure 4). Both highways are priority one road freight routes.

The Warrego Highway is a key road facilitating the movement of freight to southern markets in Melbourne via the Gore and Newell highways. It also links SEQ and freight markets in Darwin and regional Queensland communities via the Landsborough and Barkly highways. Similarly, the Cunningham Highway links SEQ to the southern freight markets including Sydney, and is a major freight route to and from regional communities in north-west New South Wales and southwest Queensland. Both roads connect with the Ipswich Motorway in the inner freight corridor to provide access to and from industrial precincts in south-west Brisbane (that is, Rocklea, Acacia Ridge and Wacol) and the Australia TradeCoast.

In 2002, the amount of road freight travelling throughout the corridor was approximately 8.5mt.^{1 3 4} The majority of this freight was non-bulk commodities transported to and from southern markets and the Darling Downs. There is also some bulk freight transported along western road corridor for consumption within the region. For example, coal is transported to the Swanbank Power Station near Ipswich. The type of freight vehicles travelling along these highways ranges from light rigid vehicles to articulated heavy vehicles, including semi-trailers and B-doubles providing line haul operations to inter and intrastate destinations.

3.3.2 Rail

The western rail freight corridor extends from Corinda, through Rosewood to Toowoomba (refer Figure 4). In 2002, the amount of rail freight travelling throughout the corridor was approximately 4.5mt.¹ Bulk commodities accounted for approximately 3.9mt of the corridor's rail freight.¹ The major bulk commodities transported were coal, grain and fuel. Coal and grain is transported from the Darling Downs and southwestern Queensland respectively to Brisbane. This freight is typically destined for the Port of Brisbane for export, with only a small amount consumed within the region. A portion of the region's bulk fuel movements are transported by rail from Brisbane's oil refineries to south-western Queensland for distribution to rural communities.

Non-bulk commodities accounted for the remainder of the freight railed through the corridor (approximately 600,000t).¹ The main commodities transported were cotton, livestock and general freight. Commodities such as cotton and containerised grain typically travel from south western Queensland to the Port of Brisbane for export. Livestock originates in western Queensland and is transported to various meat processing plants in SEQ. General freight is transported from Brisbane to western and south western Queensland for distribution to rural communities.





Figure 5 – SEQ Eastern Freight Corridor



3.4 Eastern Freight Corridor

3.4.1 Road

The eastern road freight corridor comprises the Port of Brisbane Motorway commencing at the interchange with the Gateway Motorway through to the Port of Brisbane (refer Figure 5). The motorway is a priority one road freight route. It is the major road link to the port supporting the region's import and export activities. It connects with the Gateway Motorway in the inner freight corridor to the port industrial precinct and Lytton/Hemmant industrial estates.

In 2002, the amount of road freight travelling along the motorway was approximately 20.5mt.¹³⁴ This was attributed almost exclusively to non-bulk commodities transported to and from SEQ and various markets beyond. The type of freight vehicles utilising the motorway ranges from light rigid vehicles to articulated heavy vehicles, including semi-trailers and B-doubles providing line haul operations to intra and interstate locations.

3.4.2 Rail

The eastern rail freight corridor comprises two separate sections of line from Dutton Park through Lytton Junction to Fisherman Islands and from Eagle Junction through Doomben to Pinkenba (refer Figure 5). The majority of the rail freight movements within this corridor travel on the line between Dutton Park and Fisherman Islands to the Port of Brisbane.

In 2002, the amount of rail freight travelling throughout the corridor was approximately 4.1mt.¹ Bulk commodities accounted for approximately 3.4mt of the corridor's rail freight.1 The major commodities transported along the rail corridor were coal and grain destined for the Port of Brisbane for export.

Non-bulk commodities accounted for the remainder of freight along the rail corridor (approximately 700,000t).¹ The majority commodities included cotton, containerised grain, containerised meat and general freight. A large portion of these commodities were exported via the port, with a small amount (that is, general freight) imported for consumption within SEQ or regional communities.

3.4.3 Sea transport

The eastern corridor includes the channel from the Port of Brisbane through Moreton Bay to the open sea north of Moreton Island. The Port of Brisbane is the most significant infrastructure connecting these waterways with the SEQ coast line. It is SEQ's major link to international markets. In 2002/03, total throughput for the Port of Brisbane was approximately 24.5mt (increasing to approximately 27mt in 2005/06).⁶ There are also small barge operations for freight movements from various points to islands within Moreton Bay.

3.4.4 Air transport

Air freight is considered as part of the eastern corridor due to the location of the Brisbane Airport. It is acknowledged that a small amount of freight, such as high value goods and perishables, does travel via air. In 2002/03, the throughput of the Brisbane Airport was approximately 140,000 tonnes (t) (increasing to 165,000t in 2005/06).7 International imports and exports represented approximately 51 per cent or 72,000t (increasing to approximately 67 per cent or 103,000t in 2005/06) while domestic freight accounted for the remainder. 7





3.5 Inner Freight Corridor

3.5.1 Road

The inner road freight corridor is the most critical in SEQ as it provides the vital linkages to the region's other freight corridors and key economic and commercial precincts. The corridor comprises all priority one and two road freight routes within the Brisbane metropolitan area (refer Figure 6). The priority one routes are the strategic road links within the corridor and include the Ipswich Motorway, Logan Motorway, Brisbane Urban Corridor and Gateway Motorway. These routes are supported by a broader network of priority two freight routes which provide further access to the key local distribution roads.

In 2002, the amount of freight moving throughout the corridor was estimated to be in excess of 39mt.¹ The type of freight vehicles operating throughout the corridor ranges from light commercial vehicles to articulated heavy vehicles, including semi-trailers.

3.5.2 Rail

The inner rail freight corridor fulfils an important role in the SEQ rail freight network by facilitating the majority of rail freight movements in SEQ. Importantly it provides some flexibility in the route choice for train controllers during periods of high network demand and congestion. The corridor comprises the section of line that extends from Eagle Junction through Bowen Hills, Roma Street, Park Road and Yeerongpilly to Acacia Ridge, and from Yeerongpilly through Corinda, Roma Street and via the Exhibition Grounds loop to Bowen Hills (refer Figure 6).

3.6 Inter-modal connections

The two main inter-modal freight facilities within SEQ are the Acacia Ridge terminal and the Brisbane

Multimodal Terminal which is part of the Port ofBrisbane. Importantly, these terminals have a critical function supporting connectivity between the freight corridors.

3.6.1 Acacia Ridge terminal

Acacia Ridge terminal services both north Queensland and interstate markets and is the largest road/rail inter-modal terminal in SEQ. It handles the majority of interstate container traffic moved by rail on the standard gauge line between Brisbane-Sydney and Brisbane-Melbourne (via Sydney) and a large volume of the container freight moving on Queensland's narrow gauge rail network. The terminal is accessible via Beaudesert Road and has links to the Ipswich, Pacific and Gateway motorways and the Warrego and Cunningham highways.

In 2004/05, the throughput of Acacia Ridge terminal was approximately 380,000 Twenty Foot Equivalent containers (TEU) per annum, with a proportion of this supported by smaller facilities at Clapham and Moolabin.⁸ Acacia Ridge terminal is estimated to have an operational capacity of between 362,000 and 750,000 TEU per annum.⁸ Potential infrastructure and equipment enhancements would provide the terminal with the capacity to handle approximately 1 million TEU per annum.⁸ However, the ability to achieve this level of capacity is likely to be restricted by existing road and/or rail networks.⁸

3.6.2 Brisbane Multi-Modal Terminal

The Brisbane Multimodal Terminal is the key rail terminal supporting the movement of import and export containers to and from the port by rail. It is located at Fisherman Islands and is operated by the Port of Brisbane Corporation Limited. The terminal is accessible via the Port of Brisbane Motorway. It also has a dual gauge rail link.



4.0 Future SEQ freight flows and movements

In 2007/08, the Port of Brisbane Corporation Limited reported the Brisbane Multimodal Terminal's throughput as 92,000 TEU.⁹ The port estimates the Brisbane Multimodal Terminal's maximum operational capacity as between 158,000 and 277,000 TEU per annum.⁸ The major feed road to the Brisbane Multimodal Terminal (and therefore the port) is the Port of Brisbane Motorway. This road has the capacity to cater for an additional 1.8 million TEU movements.⁸ The rail link supporting the Brisbane Multimodal Terminal has the potential to support a throughput of around 350,000 to 480,000 TEU per annum (depending on the balance of narrow and standard gauge services).⁸

In SEQ, population growth and economic activity are expected to be the key drivers of freight. The major activities linked to these drivers include production of goods and services by business, consumption of freight as inputs to production, and household consumption.⁸ Future freight flows associated with these activities are outlined in Table 1. These freight flows reflect the region's propensity to continue to consume freight at a higher rate than it can produce.

Forecast freight flows are expected to lead to an increase in freight movements for both road and rail. However, it is expected that road will continue to fulfil a dominant role in facilitating the region's freight due to increasing inter and intra-urban movements and the inability of rail to provide a door-to-door service.

Growth in inter and intra-urban freight movements is likely to have a significant impact on the performance of the region's priority road freight routes and local road networks in urban areas. In response, the government is committed to refining its priority road freight route network to identify emerging freight routes and to better inform land use planning schemes of future freight needs.

The state government is also working with local government to identify key local urban routes and align these with the region's priority freight routes to support the end-to-end delivery of freight. Key locations recognised as likely to experience an increase in road freight activity include:

- Brisbane's Central Business District (driven by growth in service administrative activities).
- Australia TradeCoast (driven by the Port of Brisbane and Brisbane Airport growth. Both the port and airport have plans to significantly expand their freight handling facilities to capitalise on emerging opportunities, with the Brisbane Airport Corporation also seeking to develop commercial and retail precincts).

Economic Activity	SEQ Freight	SEQ Freight Flows (Mt)	
	2003	2026 (base case)	
SEQ Production	45	80	
SEQ Household Consumption	15	41	
Locally-sourced SEQ household consumption	7	12	
Non-SEQ-sourced SEQ household consumption	8	29	
SEQ Industrial consumption	33	66	
Locally-sourced SEQ industrial consumption	18	36	
Non-SEQ-sourced SEQ industrial consumption	15	30	
Surplus SEQ production to outside SEQ	20	32	
Outside SEQ production to SEQ consumption	23	59	
Transit Freight Flows	6	14	

- Existing industrial precincts within and between Brisbane and high growth areas such as the Gold and Sunshine Coasts and Ipswich (for example, Acacia Ridge, Yatala, Brendale, Virginia, Wacol, and Swanbank).
- Regional business centres such as Ipswich.
- New industrial land areas such as Ebenezer, Bromelton, and Purga.
- New urban and infill development, particularly in the western corridor.

A future increase in transit and trans-urban freight has the potential to be carried by either road or rail. However, the majority of this type of freight is already on the optimum mode (for example, the movement of bulk coal by rail to the port). Generally, broader modal choice will continue to be informed by a range of external factors such as characteristics of line haul capacity, inter-modal terminal efficiency, changing logistic practices and supply chain characteristics including delivery times.

Competition between road and rail will be influenced by regulatory efficiency and policy decisions in SEQ and other jurisdictions, particularly in relation to road and rail safety, heavy vehicle management, and public transport policies such as the prioritisation of passenger rail services over the movement of freight across the Brisbane metropolitan rail network. Furthermore, strategic investments in the broader transport network, particularly those that link with SEQ, have the potential to shape the balance of freight movements. Key examples include:

- Future investment and development of the strategic national land transport network arising from the Australian Government's AusLink initiative and associated corridor strategies.
- The establishment of the Surat Basin Railway, which would link Toowoomba and Gladstone providing the potential for a redirection of major coal traffic from Brisbane to Gladstone.

• The outcomes of the North South Rail Corridor Study which may influence volumes, modal share and flows between SEQ and southern states as well as the location of future inter-modal terminals.

The Queensland Government fully appreciates the impact of cross-jurisdictional regulation and strategic transport investment on the region's freight movements. Consequently, it is committed to actively influencing the development of the national transport network, particularly through AusLink corridor strategies, and national transport policy and reform processes designed to streamline cross-jurisdictional freight issues.

In addition, the state government is investing in the SEQ freight network (as outlined in SEQIPP) by upgrading various road corridors and enhancing the capacity of the metropolitan rail freight network to support future freight increases.



5.0 Future Inter-Modal connections



SEQ's growing demand for freight is expected to have implications for existing inter-modal terminals by increasing the number of inter-modal movements. To satisfy future inter-modal demands, it is anticipated ongoing improvements to terminal operations and the supporting transport network will be needed with an additional terminal(s) required between 2010 and 2020 to manage inter-regional and interstate freight.⁸

Investigations carried out by the government and other Queensland Government stakeholders indicate there are two locations that are suitable for development as inter-modal terminals and which are likely to benefit from future patterns of industrial development and access to the SEO freight network. These locations are Bromelton in the south, and Purga/Ebenezer in the west (refer Figure 7). Both sites have strong links to major highways and the rail network, and offer surplus land for additional facilities which is not restricted by neighbouring residential areas. The potential site at Bromelton is currently considered more suitable as the next inter-modal development due to its location along the interstate rail line (the main rail freight route to southern markets) and its close proximity to key road links such as the Beaudesert and the Mt Lindsay highways. However, the government is aware of the potential impact that various strategic land transport

system proposals and/or development such as an inland rail between Melbourne and Brisbane, and other national transport reforms could have on future freight flows. These issues have the potential to influence the future development of the SEQ freight network. For example, an inland rail between Melbourne and Brisbane could result in freight experiencing a modal shift to rail as well as the introduction of interstate rail freight movements entering SEQ from the west. This could potentially lead to the development of Purga/ Ebenezer accelerated over Bromelton as the next intermodal terminal to service the region.

Given the potential of these sites as inter-modal connections, the government, along with other relevant state agencies and local government, is assessing their development in the context of the next generation of inter-modal terminals. These studies will ascertain the most efficient use of available and suitable land to support inter-modal freight hubs and seek to harmonise best practice rail and road operations. The government also acknowledges it has an ongoing role in providing policy direction for inter-modal terminal development to foster industry investment and ensure terminal operation and design is both sustainable and complementary to the freight network.

Figure 7 – SEQ inter-modal freight terminals



6.0 Future challenges in SEQ

6.1 Key trends

SEQ is witnessing significant change in freight movements. The changing nature of industries, globalisation, technology, and increasing competition are just some of the issues driving the logistics industry to develop more innovative and cost effective approaches to moving freight. These issues have been significant in influencing the freight logistics chain and freight patterns. This has led to broad supply chain changes, such as a shift of non-bulk freight off rail and onto road, the utilisation of larger containers for the transportation of product, the use of larger freight efficient road vehicles, 24-hour freight operations and more flexible manufacturing practices.

Increasingly, freight customers are driving the need for more innovative and complex freight transport solutions. This is flowing through the logistics industry with some larger freight customers (that is, retail, supermarkets, and automotive industries) demanding and receiving tailor-made freight solutions from freight service operators (for example, just-in-time deliveries). This is influencing the type of freight vehicles used, distribution centre locations and inventory management practices.¹⁰

To effectively respond to the changing environmental pressures and the diverse demands of freight customers, the logistics industry requires a highly skilled and dynamic workforce. However, attracting and retaining adequately skilled workers, developing competencies to satisfy emerging needs, and managing the impacts of an aging workforce are just some of the issues challenging the industry. This is recognised by the government, which is committed to supporting the ongoing development and capability requirements of the industry.

In SEQ, increasing population and strong economic growth is expected to increase the demand for freight. In particular, the ongoing demand for light industries, services and retail activities are expected to drive an increase in freight movements in urban areas. As these types of industries continue to develop, managing freight movements will become more challenging across the region. The government acknowledges the potential economic costs of freight delays and congestion in urban areas. It is responding to this by conducting works during non-peak periods (where possible), aligning its freight network with key urban freight routes, and proactively informing users of planned upgrades and alternate transport options well ahead of time.

Like many other Australian regions, growth in SEQ freight movements is increasing pressure on effective utilisation of existing transport infrastructure. For example, increasing inter-modal movements are contributing to congestion around transport nodes. This is highlighting the need to consider broader supply chain issues, such as the call for better container management practices, more efficient inter-modal facilities and the need to address the mismatch in hours of freight operations. To encourage optimum use of existing infrastructure and transport nodes, the government is working with industry and stakeholders to enhance relationships within the supply chain to streamline freight logistic practices and transport system efficiency.



22 Queensland Transport, South East Queensland Regional Freight Network Strategy 2007-2012, 2009



The ongoing 'build-out' of industrial and residential land is dissolving the once distinct division between residential and commercial/industrial centres within urban areas. This has led to industry relocating further afield, which in some instances has had an adverse affect on freight movements by compelling freight consumers/operators to travel further distances to key freight hubs and distribution points.11 The SEQ Regional Plan aims to minimise this pattern of development and associated impacts by encouraging self containment through more integrated land use and transport planning. Through the regional planning process, the government has been actively contributing to the integration of future industrial estate land with road and rail freight routes to minimise the distance freight is transported. It has also led to identification of additional potential locations for the development of multi-modal connections to encourage industry to adopt a more integrated approach to delivering freight to consumers.

The recent trend of rising fuel prices presents further implications for the freight transport industry as transport costs are generally sensitive to fluctuations in fuel prices. This is likely to have flow-on effects for retail industries, the community and the transport industry as a whole. Fuel accounts for 20 per cent of transport costs in Australia across all modes.¹² With cost being one of the main factors in industry's choice of transport mode, rising fuel prices may result in freight shifting across transport modes. It is also possible that fuel efficiency may take priority and further influence distribution patterns, logistics practices and further drive the usage of innovative, fuel-efficient vehicles. To more effectively monitor these trends, the government continues to improve its data collection and freight modelling capabilities to better support future planning and development of the freight network.

6.2 Externalities

All modes of transport impose external costs on the general community and the transport network. These external costs generally manifest themselves in the form of environmental (that is, greenhouse gas and noxious emission), social (that is, congestion, transport infrastructure utilisation, fuel usage, and noise pollution) and safety (that is, incidents) issues. External costs are generally higher in urban areas than non-urban areas and are significantly lower for rail transport than road. It is likely that these costs will be subject to greater public debate and possibly influence future freight practices, including modal choice.

6.2.1 Environment

The community is becoming increasingly informed of the impacts of greenhouse gases and poor air quality on individual health, well-being, and global climate change. Emissions are a key issue for the transport industry. In Brisbane alone, greenhouse gases produced by road freight vehicles are forecast to increase by approximately 41 per cent from 1.4Mt in 2006 to 2.0Mt in 2020.¹³ From a transport perspective, the Queensland Government is committed to mitigating the impacts of greenhouse gases and poor air quality. This is demonstrated through the government's commitment to achieving national greenhouse gas emissions targets through the development of the National Transport Plan and Policy Framework, which will consider responses to transport related climate change, environment, and energy challenges. In addition, the government is also committed to mitigating greenhouse gas impacts associated with freight movements by optimising the performance of the freight network and encouraging more efficient freight operations; both of which are being pursued in the context of congestion management initiatives.

The release of noxious emissions due to transport is also expected to increase in the future as the demand for freight increases. While this is likely to occur at a lower rate than for greenhouse gases due to the emergence of cleaner fuels and more stringent vehicle emissions standards for light and heavy vehicles, the government continues to contribute to the task of improving air quality through the development and continuous review of Australian Design Rules for vehicle emissions standards.



24

6.2.2 Social

Traffic congestion imposes significant costs on the movement of freight by increasing travel times, fuel consumption, and vehicle operating and maintenance costs. The government recognises the time cost of congestion will become a more prevalent issue for freight in the future, particularly as the region's population increases. Increases in population have already led to an extension in the morning and evening peak commuter periods. This extension is likely to further constrain the timing of freight movements and hence the economic development of the region. To minimise the impact of congestion on freight operators, the government is actively managing the application of its Multi-modal Intelligent Transport System Strategy (2005-2013) to allow operators the use of technology to better utilise transport infrastructure. It is also enhancing rail signalling to enable the more efficient use of rail corridors, monitoring and managing vehicle access to the road network, and facilitating the quick clearance of heavy vehicles and their loads from roads when involved in an incident etc.

Open level crossings (that is, intersections where rail crosses road) also have the ability to add to traffic waiting times and congestion. To ensure these intersections support the efficient transport movements, the government is continually improving level crossings and increasing public awareness of these intersections.

Noise pollution is also becoming a significant community amenity issue, with road freight contributing to a greater extent than rail due to the higher volume and frequency of road vehicles. While measures are in place to limit the noise produced by road and rail freight vehicles (including noise limits for road vehicles, restrictions on vehicle use of suburban streets, and corridor sound barriers), it is likely to become more problematic in areas experiencing increasing population density. With the demand for freight forecast to significantly increase, the impact of transport activity on community amenity is continually considered by the government in relation to the planning and/ or development of transport corridors. This includes ensuring proposed transport routes complement land uses and assessing suitability of proposed developments adjacent to transport corridors.

6.2.3 Safety

Freight transport safety is expected to remain an important issue, particularly as freight activity increases across SEQ. To manage the risk of safety incidents, the government is committed to ongoing road and rail regulation to ensure operators are capable of meeting the minimum standards for the provision of services. In addition, the government is committed to encouraging new systems and/or the application of best practice initiatives to enhance road and rail safety. For example, it is investigating the feasibility of train protection systems across the SEQ rail network to safeguard a train from exceeding a speed profile.

6.3 Alternative freight transport

From time to time, a particular freight task emerges that lends itself to a less traditional solution than usually associated with road and rail. Coastal and river barges have been used in the past and continue to be used in parts of SEQ, including the movement of freight and passengers to and from Moreton Bay islands. Barges are also sometimes used to move heavy or overdimensional equipment such as power transformers. Barging has suffered as a result of increased land values for riverfront or coastal property which makes the installation of barge ramps and the infrastructure required to service them expensive compared to other potential uses. There is also the potential for pipelines to undertake part of the freight task for appropriate commodities.

The government remains open to innovative approaches to the movement of freight and will ensure assistance is provided to proponents seeking to exploit existing or emergent infrastructure to lessen the impact on road and rail networks within SEQ.

6.4 Heavy road freight

Industry has been increasingly using road transport for the movement of bulk commodities. In SEQ, this often occurs for the movement of coal from Acland to the Swanbank Power Station and new industry developments. This is due to the lack of rail and sea transport networks in specific locations and/or the ability of road to provide a competitive service in terms of cost and timeliness.

Road transport offers some benefits for the movement of bulk commodities. However, it does have the potential to impact on infrastructure and present social and environmental impacts which can not go unchecked. Bulk haulage by road tends to be a point-to-point operation, thus concentrating and intensifying the impact on specific infrastructure and communities. As such, the government is exploring ways and means to better manage heavy road freight across the SEQ freight network and its impact on community amenity.



7.0 Responding to SEQ's future demand for freight



The government is committed to providing a freight network that is safe and efficient, and supports the movement of freight by the most practical and sustainable means. This includes establishing effective links between all modes of transport to encourage a more integrated logistics system.

Clearly, road and rail have key roles in supporting the region's increasing demand for freight. As such, the government is dedicated to supporting the capacity of road and rail to shoulder future freight increases. However, it is likely that road will assume a greater role due to the increasing demand for inter and intra-urban freight and the inability of rail to provide a door-todoor freight service. Despite this obvious advantage, opportunities exist for rail to attract and share some of the future inter and intra-urban freight increases with road. For instance, there are several proposals investigating rail freight operations with the potential to provide innovative rail solutions and offer modal choice to freight customers within the Brisbane metropolitan area. Each proposes to service the Port of Brisbane from future 'inland ports', which have 'in principle' support from the government.

To satisfy SEQ's future demand for freight, the government is focusing on the following key areas:

- 1. Policy development
- 2. Freight network planning
- 3. Transport infrastructure design
- 4. Investment
- 5. Freight operations
- 6. Institutional arrangements

7.1 Policy development

Over the past 20 years, government policy and regulation has played a critical role in managing freight growth. In particular, it has led to significant productivity improvements for freight movement, for instance, by increasing mass limits for road and enabling competition for rail.

In SEQ, the provision of additional transport infrastructure alone is an unsustainable means of managing increasing demand for freight. It will become increasingly expensive to acquire new corridors for transport infrastructure, particularly in urban areas. So managing the growth of future freight traffic will require improvements to regulatory approaches and innovative policy to achieve favourable economic, social and environmental outcomes for the transport industry and the community as a whole.

Strategy:

• Support regional economic development through innovative policy designed to enhance the movement of freight.

Key priorities:

- Refine the region's priority freight routes to ensure alignment with strategic land transport developments (such as the outcomes of the North South Rail Corridor Study and AusLink network studies and funding proposals) and to identify additional routes that emerge as major regional freight connectors. This will be central to supporting economic development, keeping freight on the priority freight routes rather than other unsuitable roads and limiting the impacts of freight on local communities. It will inform future decisions about network requirements, interchange facilities, investment priorities and network stewardship arrangements.
- Align the priority freight route concept to strategic urban freight routes in local government areas. This will support the seamless delivery of freight within SEQ by providing the opportunity to better align urban freight routes with major intra and interregional connectors.



- Enhance policy for innovative heavy vehicle access to the road network in conjunction with a balanced approach to greater infrastructure utilisation and protection.
- Provide direction for the development of future inter-modal freight terminals (for example, Bromelton and Purga/Ebenezer). This will encourage the efficient use of available and developable land to support inter-modal freight hubs and seek to harmonise rail and road operations, including access, operation and triangulation issues.
- Continue delivery of Queensland's Rail Network Strategy to ensure decision making for the ongoing development of the state's rail infrastructure reflects Queensland Government priorities. The Rail Network Strategy provides a framework for future rail infrastructure and corridor policy and planning. Delivering this strategy ensures the expanding roles for both government and private enterprise are realised and enables new opportunities to be pursued.
- Actively influence the development of the national transport direction and associated policy and reform processes. This will involve working with other levels of government, jurisdictions, and industry to ensure the national transport system reflects the needs and priorities of the SEQ freight network.

Indicator:

- SEQ freight network recognises key existing and emerging strategic links.
- Urban freight routes align with key inter and intra-regional freight routes.
- SEQ freight network supports modal choice.

In SEQ, the Queensland Government has made a conscious decision to work with local governments through the SEQ Regional Plan to strategically identify and preserve future transport corridors and ensure better integration between transport and land use planning. The plan provides a sustainable growth management strategy for SEQ by aligning broader systems and processes, such as preferred patterns of development and its relationship with transport connectivity. Consequently, the government is committed to enhancing freight network planning to inform the regional planning process.

Strategy:

• Plan a sustainable and integrated freight network.

Key priorities:

- Ensure road and rail freight routes inform local area planning and land use schemes. This will enable local governments to identify urban routes that support freight movements and guide development activities that support economic development adjacent to these routes.
- Continue to improve freight data collection and management capabilities to better understand emerging freight issues and trends. Improving the government's freight data capabilities will enhance its ability to establish freight priorities, and identify and achieve desired freight outcomes.
- Deliver future upgrades to further enhance the metropolitan rail network's capacity to support the operation of a broad range of future rail services. The government continues to analyse network requirements to identity and inform system upgrades and incorporates these findings in its forward rail program. For instance, the Metropolitan Rail Capacity Study (2006) has informed this program by providing greater clarity of the timing of upgrades and identifying additional system requirements and strategies to enhance rail system capacity.

• Enhance freight modelling capabilities to better support future planning and development of the SEQ freight network. Further rigour and depth of analysis is constantly being pursued to allow the government to best assess the viability of transport corridors and the suitability of various actions to address system capacity and performance.

Indicator:

- SEQ freight network supports appropriate land uses.
- Freight information informs the development of the strategic SEQ freight network.

7.3 Transport infrastructure design

The government recognises the importance of maximising its investment towards transport infrastructure by designing road and rail networks to cater for future freight transport needs such as growing freight volumes and innovative vehicle designs.

Strategy:

• Ensure transport infrastructure design supports the use of innovative freight vehicles.

Key priorities:

- Ensure the design of road corridors, intersections, on/off ramps, and merging lanes take into consideration possible future advances in vehicle technology, designs for larger freight-efficient vehicles, and increasing traffic volumes.
- Ensure road pavement and bridge designs consider possible future road access arrangements and higher mass freight vehicles.
- Deliver low-maintenance, long-life pavements to minimise whole-of-life costs and user costs.
- Optimise rail and road alignments to allow freight and passenger vehicles and services to quickly and efficiently travel throughout the transport network.
- Ensure proposed rail corridors and rail maintenance activities allow for possible future advances in technology for rollingstock (for example, new generation locomotives and wagons) and permanent way design.
- Ensure rail and terminal infrastructure accommodate longer trains.



Indicator:

• SEQ freight network supports evolving freight logistics practices and innovation

7.4 Investment

SEQIPP outlines a 20-year program of investment across transport modes and is designed to enhance freight movement and links. It commits the government to a program of transport infrastructure over a 10year period and outlines its intention over the next 20 years. It also outlines future planning studies and investigations (such as the Australia TradeCoast Transport Study) aimed at addressing future transport needs. Consequently, the government is continuously identifying the region's emerging transport needs through its transport modelling programs and informing SEQIPP of regionally significant transport requirements.

In addition, the government undertakes various non-SEQIPP related planning activities and investigations to support ongoing investment, maintenance and rehabilitation of road and rail infrastructure. The major instruments outlining the government's ongoing commitment to Queensland's road and rail networks include the Roads Implementation Program and the rail Transport Service Contracts.

The Roads Implementation Program is a rolling five-year program of road works. It is developed annually and is subject to confirmation of state and Commonwealth road funding allocations. It is a capital investment plan for infrastructure and provides a firm funding commitment for projects in the first two years, with indicative funding for years three to five for planning purposes. Key investments of the Roads Implementation Program include upgrading key freight routes and managing the impacts of increases in heavy vehicles in urban areas.

The Transport Service Contracts are agreements between Queensland Transport and QR Limited that provide funding to enable QR Limited to maintain the capability



of Queensland's narrow and standard gauge rail networks to a specified performance level in both the metropolitan and non-metropolitan areas. This type of agreement is generally negotiated over a sevenyear period to assist the government meet its transport objectives. The SEQ rail network is subject to these contractual arrangements and includes key investments such as noise amelioration, security fencing, signal upgrades, and track reconditioning and upgrades.

Strategy:

• Ensure investment in transport infrastructure supports efficient freight movement.

Key Priorities:

- Manage the Roads Implementation Program.
- Manage the rail Transport Service Contracts.

Indicator:

• Investment in the SEQ transport network supports the movement of freight.

7.5 Freight operations

The government recognises that innovation has a significant role to play in the movement of freight. It is committed to pursuing a range of initiatives to enhance the performance of the SEQ freight network and support the optimisation of industry freight operations. In particular, it has developed a Multi-modal Intelligent Transport System Strategy for Queensland (2005-2013), which aims to enhance freight movements by supporting the use of technology that encourages better utilisation of transport infrastructure and optimises freight operations, for example:

• Remotely monitoring heavy vehicle compliance to provide better access to the road network and to optimise the performance of road freight.

• Providing a sustainable Weigh-in-Motion network used to monitor heavy vehicles in transit and their adherence to allowable load, speed, and vehicle length limits.

Strategy:

• Support and encourage freight operations that optimise the performance and integrity of the freight network.

Key priorities:

- Manage the ongoing application of multi-modal intelligent transport systems across the SEQ freight network.
- Facilitate the quick clearance of heavy vehicles and their loads or cargo from the road when involved in an incident.
- Investigate freight initiatives that sustainably mitigate the increasing rate of congestion on road and rail networks in urban areas including key freight nodes and ports.
- Manage access of innovative heavy vehicles and/or combinations that encourage more efficient freight movements without compromising the integrity of road assets.
- Extend higher mass limits to the first vulnerable asset (such as bridge, culvert or pavement) on B-double routes that connect to the National Land Transport Network.
- Designate existing road train and B-double networks to coincide with the Performance Based Standards classified network to meet the national requirements.
- Improve rail and road safety regulation across the network.
- Enhance the flexibility of available train paths to better balance the economic activities of the region while maintaining the integrity of passenger services.
- Enhance rail signalling to enable existing freight services to utilise rail corridors more efficiently (that is, minimise freight train stopping and idling) and provide the potential for longer trains and/or various train consists.



- Investigate the feasibility of train protection systems across the broader SEQ network.
- Improve level crossings across the SEQ freight network to decrease waiting times and congestion.

Indicator:

• Freight operations are safe and efficient and are enhanced by the network.

7.6 Institutional arrangement

The emergence of SEQ as an economic hub and gateway for intrastate, interstate and international freight highlights the need for enhanced institutional arrangements between stakeholders to guide and inform the development of the SEQ freight network. There are currently a number of mode or industry specific organisations through which issues affecting supply chains can be discussed. However, the growing complexity of the freight task and the increasingly multi-modal nature of supply chains require a more coordinated approach.

This has led to the government creating the Queensland Transport and Logistics Council, a cooperative industry and government body to provide advice to stakeholders on the development, planning, regulation and operation of freight and logistics transport, infrastructure and services in Queensland.

The Queensland Transport and Logistics Council objectives are to:

- Promote the efficiency and development of the freight transport and logistics industry in Queensland, including the movement of goods to urban, intrastate, interstate, and overseas markets across all modes of transport.
- Facilitate improved efficiency and integration of freight transport infrastructure throughout the freight logistics chain.

The Queensland Transport and Logistics Council will do this by identifying issues impacting on the state's freight movements as raised by industry and government, exchange views as to the means of progressing resolution of those issues and then determine a solution which can form the basis of advice given in an objective and holistic manner to industry and the government.



Strategy:

• Develop institutional arrangements that better inform the multi-modal interests of the freight network.

Key priorities:

- Support the role of the Queensland Transport and Logistics Council including its ability to:
 - » enhance understanding of the changing nature of the freight task;
 - promote interdependencies within the supply chain within and between port, rail and road systems, and facilitate working relationships and synergies;
 - identify future freight demands, trends and issues; and
 - » provide a forum for industry to contribute to the development of freight policy, regulations and infrastructure planning.
- Work with industry and all levels of government to contribute to identify and pursue innovative solutions, studies and or partnerships designed to optimise the freight network, freight operations and the ongoing development of the logistics industry.

Indicator:

• Institutional arrangements inform freight policy and the development of the freight network.

8.0 References

- ¹ Strategic Design and Development, 2004, Freight Demand Study-Input and Output Freight Generation within South East Queensland.
- ² SEQ Catchments n.d., Fact Sheet 2: About the SEQ Region. Retrieved 12 February, 2007, from http://www. seqcatchments.com.au.
- ³ Main Roads, 2002, A Road Management Information System.
- ⁴ Main Roads, 2002, Weigh in Motion System.
- ⁵ Australian Bureau of Statistics, 2002, Freight Movements 9220.0 For the Year Ended 31 March 2001, http://www.austats.abs.gov.au/Ausstats/subscriber.nsf/0/388FSF76EF7FC352CA256C2C 00024AC2/\$File/92200_01%20apr%202000%20to%2031/020mar%202001%20(reissue).pdf.
- ⁶ Queensland Transport, 2005, Queensland Ports Trade Statistics- For the Years Ending 30 June 2005.
- ⁷ Brisbane Airport, 2006, Freight Cargo Statistics: Brisbane Air Cargo Statistics, http://www.brisbaneairport.com.au/ content/standard.asp?name=FastFacts_AirportAndTravelStatistics.
- ⁸ GHD and Booz Allen Hamilton, 2004, SEQ Freight Intermodal Terminal Study Stage 2 Additional Site Needs Investigation Report, Queensland Transport.
- ⁹ Port of Brisbane, 2008, Annual Report 2007/08.
- ¹⁰ Bureau of Transport Economics, 2001, Working Paper 49 Logistics in Australia, A Preliminary Analysis.
- ¹¹ McGregor+Partners, AILA National Conference, Brisbane, 2004, Challenging Australian Sub Urbanism-The Case For Compact Cities.
- ¹² Sinclair Knight Merz, 2006, Twice the Task A Review of Australia's Freight Transport Tasks, National Transport Commision, http://www.ntc.gov.au/filemedia/Reports/Twice the Task ReportFeb2006.pdf.
- ¹³ Bureau of Transport and Regional Economics, 2002, Report 107, Greenhouse Gas Emissions from Transport: Australian Trends to 2020, Commonwealth of Australia, http://www.btre.gov.au/docs/reports/r107/r107.pdf.

Images courtesy of Department of Main Roads; iStockphoto/Lisa and Colin McKie; iStockphoto/Ivars Zolnerovichs; Les Dixon; Port of Brisbane Corporation Limited.

Maps courtesy of Office of Urban Management.

