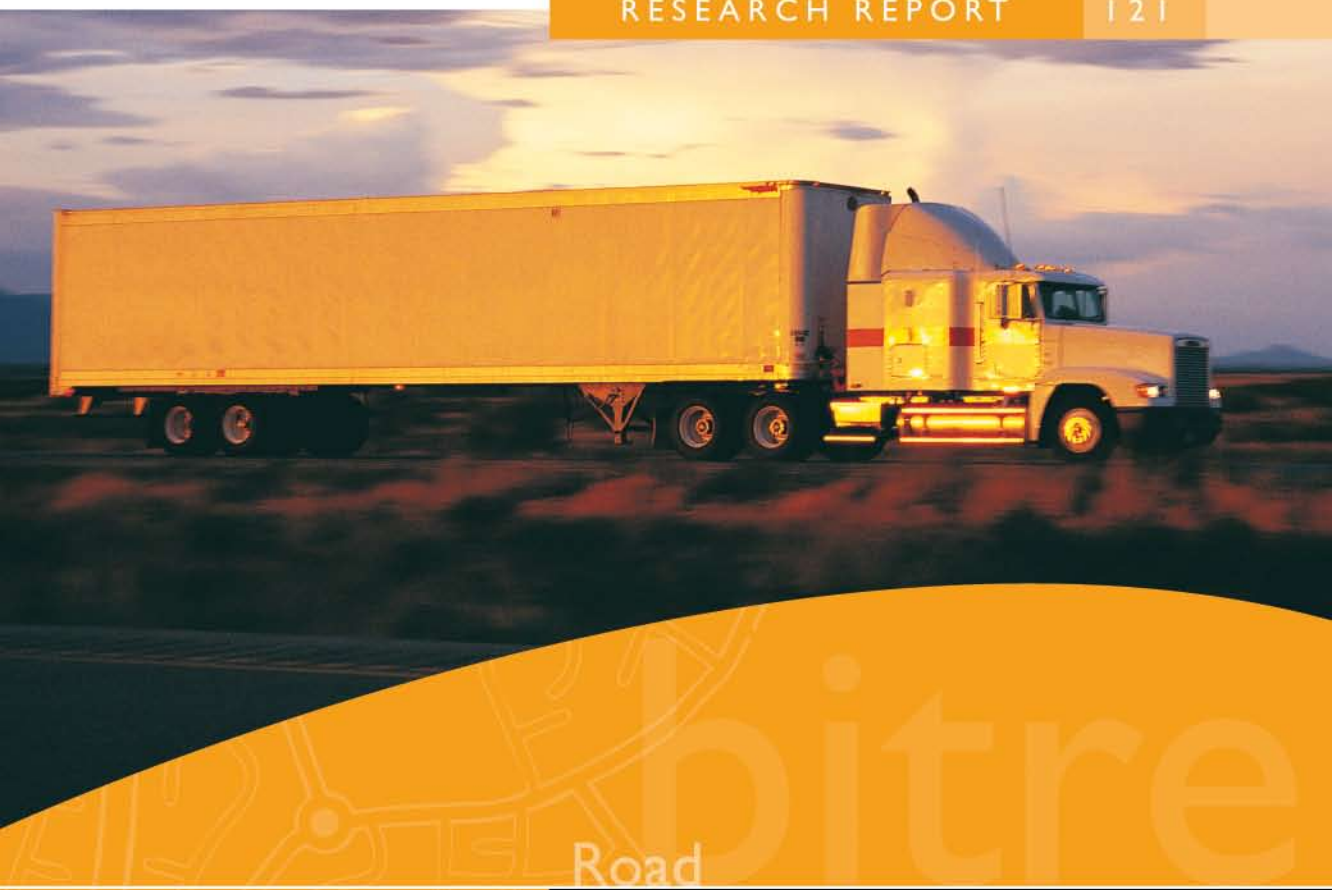
Australian Government
Department of Infrastructure and Transport
Bureau of Infrastructure, Transport and Regional Economics

RESEARCH REPORT 121



Road

Road freight estimates and forecasts in Australia: interstate, capital cities and rest of state

Bureau of Infrastructure, Transport and Regional Economics

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Report 121

Department of Infrastructure and Transport
Canberra, Australia

ISBN 978-1-921260-46-9

September 2010 / INFRASTRUCTURE09202

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An appropriate citation for this report is:

Bureau of Infrastructure, Transport and Regional Economics (BITRE), 2010, *Road freight estimates and forecasts in Australia: interstate, capital cities and rest of state*, *Report 121*, Canberra ACT.

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Published by

Bureau of Infrastructure, Transport and Regional Economics

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Desktop publishing by Melinda Keane.

Foreword

In Australia, road transport is the predominant mode for moving freight within the country, especially interstate and within capital cities. It represents a vital link in various logistics chains, providing access for freight to ports and terminals and urban freight distribution between warehouses and retail outlets. It is also the dominant mode for moving freight over relatively short distances and where alternatives are not readily available.

This report provides estimates and forecasts of road freight in Australia. Estimates cover the period 1972 to 2007, and forecasts from 2008 to 2030 (including estimates of the effect of global financial crisis).

The road freight estimates and forecasts cover freight moving between states/territories, within the eight capital cities and in the rest of states/territories.

This project was undertaken by Afzal Hossain and David Gargett.

Gary Dolman
Head of Bureau
Bureau of Infrastructure, Transport and Regional Economics
September 2010

At a glance

Trucks are a common sight on Australian roads, be it in the outback or within our capital cities. The road freight that they carry is an important component of Australia's economic activity, both in its own right and in its role in facilitating much of the rest of activity in the economy.

Given limited and inconsistent data sources, it has always been a challenge to actually derive consistent measures of road freight that stretch over enough years to allow modelling and forecasting of road freight and its growth. And the truck traffic involved is a very important consideration in determining the need for and the cost per kilometre of the very extensive road network in Australia.

The present report generates such consistent measures of interstate, capital city and rest-of-state road freight for each of the eight states over a period of 35 years, and then forecasts these measures out to 2030.

Interstate road freight was one component of BITRE Report 120 (BITRE 2010), but the present report extends the measurement and forecasting to road freight in the capital cities and in the rest-of-state areas.

Several trends emerge from the work. The global financial crisis will only dampen road freight growth slightly and for a limited time. Over the longer term, there will be substantial growth. By 2030, the interstate road freight task is expected to be 2.3 times its 2008 level, the capital city task 1.7 times and the rest-of-state task 1.4 times. The total national road freight task in 2030 is expected to be 1.8 times its 2008 level. This represents a 2.7 per cent per year growth rate, much faster than the expected rate of population growth, but similar to the expected average rate of GDP growth over the period.

The measurements, modelling and forecasts presented here by state are designed to aid longer-term planning by the Federal and state governments, especially in the design of infrastructure investments to facilitate the expected growth in the road freight task.

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Executive summary

The main objective of the research project was to derive consistent time series estimates of road freight tasks for each state and territory. These estimates and forecasts were split to cover the interstate, capital cities and the rest of state. Interstate road freight tasks were further split into three components originating 'from', arriving 'to' and passing 'through' each state and territory.

The specific aims of this study were to answer two important questions:

- What are the long-term historical trends between 1971–72 (hereafter referred as 1972) and 2006–07 (hereafter referred as 2007) in interstate road freight, capital city road freight, rest of state road freight and total state road freight estimates?
- What will growth be between 2007–08 (hereafter referred as 2008) and 2029–30 (hereafter referred as 2030) in these road freight forecasts?

Road freight estimates and forecasts in Australia

Historical growth rates (1972–2007) in interstate, capital city, rest of state and total road freight tasks have been high compared to forecast (2008–30) growth rates in respective components of road freight (Table ES.1). This is due to two reasons. Firstly, relatively lower predicted economic growth rates in the forecast period, and secondly, an expected gradual 'tapering off' in the trend growth in freight per person.

TES.1 Road freight tasks and growth rates for interstate, all capitals, rest of state and total Australia, 1972–2030

Road freight components	Units	Estimates			Forecasts		
		1972	2007	Growth a (per cent)	2008	2030	Growth a (per cent)
Interstate	Task (billion tkm)	5.4	64.7	7.4	70.4	159.1	3.8
	Share of total (per cent)	19.9	35.5		36.8	46.5	
All capitals	Task (billion tkm)	7.9	38.4	4.6	40.2	66.6	2.3
	Share of total (per cent)	29.2	21.0		21.0	19.5	
Rest of state	Task (billion tkm)	13.8	79.3	5.1	80.9	116.4	1.7
	Share of total (per cent)	50.9	43.5		42.2	34.0	
Total Australia	Task (billion tkm)	27.1	182.5	5.6	191.5	342	2.7
	Share of total (per cent)	100	100		100	100	

a Average annual growth rate from 1972 to 2007 (estimates) and from 2008 to 2030 (forecasts).

Note: Share of total may not add to 100, due to rounding.

Source: BITRE estimates.

However, even at lower growth rates, the expected growth in the volume of road freight poses many challenges. Two examples are: increased truck movements in capital cities, and increased road damage from more heavy vehicle traffic.

In terms of share of total road freight, interstate freight's share increased in the past (between 1972 and 2007) and is forecast to continue to increase to 2030. By contrast, capital city road freight's share and the share of total road freight in the rest of state has decreased and is forecast to decrease further by 2030 (Table ES.1).

'From', 'to' and 'through' interstate road freight estimates and forecasts

The interstate component of road freight can be viewed 'from', 'to' or 'through' a state or territory. Estimates of the 'from' and 'to' interstate road freight grew similarly and are forecast to grow at the same pace (Table ES.2). These two components of interstate road freight tasks had higher growth rates than the 'through' interstate road freight task. It is expected that the growth of 'through' interstate road freight will be much slower (2.9 per cent per annum between 2008 and 2030) than either the 'from' or 'to' interstate road freight growth rates (3.9 per cent per annum during the same forecast period).

TES.2 Interstate road freight tasks and growth rates by from, to and through, Australia, 1972–2030

Interstate road freight components	Estimates			Forecasts		
	1972	2007	Growth a (per cent)	2008	2030	Growth a (per cent)
	(billion tkm)			*(billion tkm)*		
From	2.3	28.8	7.5	30.7	71.8	3.9
To	2.2	27.4	7.4	29.7	68.3	3.9
Through	0.8	8.6	7.0	10.1	19.0	2.9
Total	5.4	64.7	7.4	70.4	159.1	3.8

a Average annual growth rate from 1972 to 2007 (estimates) and from 2008 to 2030 (forecasts).

Source: BITRE estimates.

Road freight estimates and forecast by states and territories

Historical trends (1972–2007)

- The 'rest of state' road freight estimates exceeded 'capital cities' and 'interstate' estimates in Queensland, Western Australia, Tasmania (interstate freight assumed to be all by sea) and the Northern Territory.
- In terms of total interstate (sum of 'from', 'to' and 'through') road freight, Western Australia had the highest growth between 1972 and 2007 of all states and territories.
- In terms of 'capital city' road freight growth from 1972 to 2007, Brisbane had the highest growth rate. Rest of state road freight growth was also highest in Queensland.

Forecast trends (2008–30)

- Due to a lower assumed economic growth rate and a growing saturation effect in terms of freight per person, the forecast growth rates (2008–30) of road freight are expected to be slower in all states and territories when compared to the historical growth rates (1972–2007).
- The growth in the interstate road freight task between 2008 and 2030 is forecast to be faster than for either the capital city or the rest of state freight growth, except for Queensland, Western Australia and the Northern Territory.
- Interstate road freight growth is forecast to be higher in Queensland, while rest of state road freight growth is forecast to grow faster in Queensland, South Australia and Western Australia, compared to other states and territories.
- Generally, the proportion of interstate road freight in total road freight is forecast to grow in each state and territory during 2008 to 2030, while the proportion of rest of state road freight is forecast to decline.

In conclusion:

- Although the combination of expected lower GDP growth and reducing responsiveness to this growth (a trend toward saturation in per person freight) results in the lower freight growth rates in the forecast period compared to the historical road freight growth rates, rapid growth is still expected. The interstate road freight task is expected to increase by 2.3 times, capital cities by 1.7 times, rest of state by 1.4 times and the total national road freight task by 1.8 times between 2008 and 2030. Similarly, the 'to' and 'from' interstate road freight task is expected to increase by 2.3 times, while the 'through' interstate by 1.9 times during the same forecast period.
- The overall total road freight task in Australia is projected to grow much faster (2.67 per cent per annum) than the rate of national population growth (1.58 per cent per annum), but similar to the average GDP growth in Australia (2.79 per cent per annum). However, with road freight beginning to saturate with respect to GDP, the differential between freight growth and population growth will be reducing over time.

CHAPTER 1
Introduction

1.1 The road freight picture in Australia

Australia's land transport infrastructure is a valuable asset that makes a significant contribution towards the nation's economic performance and its international competitiveness. It is also well documented that freight movements on the road and rail networks and by coastal shipping play an important part in the Australian economy, due to our role as a major trading nation. Overall, Australia's economic growth involves both international and domestic freight movements.

Road transport is the predominant mode for moving freight within the country, especially interstate, between capital cities, rest of state and to major non-bulk ports. Australia has the lowest number of people per kilometre of road in the developed world and is the most intensive user of road freight on a tonne-kilometre (tkm) per person basis (DFAT 2008).

The road freight transport industry is an important industry not only in its own right but also in terms of its role in the general economy. In Australia, the road freight transport sector dominates employment in the 'transport and storage' industry. Nationally, total employment in road transport industry was over a quarter of a million people in 2008—about 48.7 per cent of total employment in the overall 'transport and storage' sector and road–transport–specific businesses contributed 1.7 per cent of national GDP (BITRE 2009a). In year ending August 2008, this road freight activity was valued at nearly 18 billion dollars (BITRE 2009a).

Out of more than 2.44 billion tonnes of total freight moved within Australia in 2004–05, about 1.76 billion tonnes (or 72 per cent of the total) was transported via the road system (BITRE 2008). However, growth of the road freight task slowed down from 6.8 per cent per annum for 1980–90 to 3.9 per cent per annum for 1990–2000 (BTRE 2003a).

Freight vehicles on Australian roads carried an estimated 184 billion tonne-kilometres in the 12 months ended 31 October 2007, an increase of 31 billion tonne-kilometres (or 20.5 per cent) since the same period four years previously (ABS 2008b).

Road transport represents a vital link in various logistics chains, providing access for freight to ports and terminals and urban freight distribution between warehouses and retail outlets. It is also the dominant mode for moving freight over relatively short distances and where alternatives are not readily available. Most non-bulk goods carried by other modes also use road transport for part of their journey. Approximately 80 per cent of road freight is transported over distances of less than 100 kilometres.

The Survey of Motor Vehicle Use (SMVU) conducted by the Australian Bureau of Statistics (ABS) is the primary data source for road freight task estimates. But its definition of interstate

road freight is limited to 'freight carried by trucks registered in other states on a state's roads'. Included in this definition is rest-of-state freight carried mostly within the state/territory (e.g. New South Wales) by trucks registered in Victoria. Excluded from this definition is that portion of interstate tonne-kilometres performed by New South Wales trucks within New South Wales as they head to, say, Victoria. On both counts, the SMVU task estimates of interstate freight for New South Wales do not measure what road authorities wish measured—which is interstate freight carried by all trucks on a state's roads.

BITRE has, over several years, developed separate models for projecting future heavy (i.e. freight) vehicle traffic growth across the Australian non-urban road network using the FreightSim model. FreightSim is designed to project the freight transport implications of alternative economic development scenarios. FreightSim uses a 'mass-balance' equilibrating process to project future interregional freight movements for 16 separate commodity classes—15 bulk commodity classes and one non-bulk commodity class. Under the mass-balance approach, total annual production plus regional imports (inflows), for each commodity class, must equal the sum of total annual consumption and regional exports (outflows) for each freight region. Details of model structure, key assumptions and freight projections can be found in BITRE Working Paper 75, *National road network intercity traffic projections to 2030* (BITRE 2009b).

Recently, BITRE has produced new disaggregate interstate road freight estimates—56 state-to-state origin–destination (OD) time series from 1971–72 to 2003–04 (Gargett et al 2006). These new interstate estimates resulted in a re-shuffling of the typical matrix of interstate freight flows derived from Table 18 of the ABS Survey of Motor Vehicle Use data cube, which present the origin as 'state/territory of registration' rather than as 'origin of trip'. If these new interstate estimates are to be accepted, a way of generating new 'rest of state' freight estimates needs to be developed and integrated into a methodology for deriving estimates of freight moving within each state/territory. Later BITRE work integrated disaggregated interstate road freight estimates into a framework of estimates of road freight tasks from 1971–72 to 2005–06 by state/territory, i.e. into interstate ('from', 'to' and 'through'), as well as the 'capital city' and 'rest of state' (Gargett and Hossain 2008). These estimates are important because capital city to capital city data is not otherwise available.

Previous BITRE studies used SMVU data from 1971–72 to 2003–04 (Gargett et al 2006), from 1971–72 to 2004–05 (Soames et al 2007) and from 1971–72 to 2005–06 (Gargett and Hossain 2008) for developing methods to estimate the various road freight tasks in Australia. This paper uses the SMVU data up to 2006–07 and derives a methodology for estimating the interstate road freight task as well as the 'capital city' and 'rest of state' as was done previously (see Gargett et al 2006, Soames et al 2007 and Gargett and Hossain 2008). Also, using the forecasting equations derived from the estimated road freight data for 1971–72 to 2006–07, road freight forecasts from 2007–08 to 2029–30 within each state/territory are provided.

1.2 Context of the study

The Nation Building Program requires that the volumes of freight and the likely growth in volumes be linked to likely future investment in the National Land Transport network (both road and rail). This work will help set benchmarks for understanding the influence of freight and thus trucking growth on the networks, as well as the likely growth in funds needed for investment and maintenance.

In Gargett et al (2006), a methodology was developed to estimate disaggregate road freight state-to-state origin–destination (OD) pair matrices. The study also presented a time-series analysis of interstate road freight task on states' roads between 1971–72 and 2003–04.

In Soames et al (2007), new disaggregate rail and coastal shipping (sea) state-to-state OD pair freight series and derived new OD pair interstate road, rail and sea freight forecasts to 2029–30 were reported. In this study, historical data was used between 1971–72 and 2004–05, while the forecasts were reported to 2031.

In Gargett and Hossain (2008), integration of the new disaggregate interstate road freight estimates, which was reported in Gargett et al (2006), into a framework of estimates of road freight tasks by state/territory, i.e. into interstate ('from', 'to' and 'though'), as well as the 'capital city' and 'rest of state'. In this study, historical data was used from 1971–72 to 2005–06.

This report extends the estimates of road freight movements on origin–destination routes, by states/territories and at the national level from 1971–72 to 2006–07. Also, this report produces new road freight projection in light of the global financial crisis. Estimates cover interstate origin–destination routes, capital cities, states/territories and the national level.

The interest in this report is focussed on interstate road freight. Readers interested in all modes (road, rail and coastal shipping) interstate freight can consult BITRE Report 120, *Interstate freight in Australia* (BITRE 2010).

1.3 Objectives of the study

The main objective of this study is to derive consistent time series estimates of road freight tasks on interstate origin–destination routes, as well as for capital cities and rest of state or rest of state.

The specific aims of the research project were to answer two important questions:

1. What are the long-term historical trends between 1971–72 (hereafter referred as 1972) and 2006–07 (hereafter referred as 2007) in interstate road ('to', 'from', 'through' and 'total') freight, capital city road freight, rest of state road freight and total state road freight estimates?
2. What will growth be to between 2007–08 (hereafter referred as 2008) and 2029–30 (hereafter referred as 2030) in these road freight tasks?

In particular, the research was focussed on:

1. the development of estimates of past freight tasks carried out by road between 1972 and 2007, and
2. long-term forecasts (from 2008 to 2030) of future road freight tasks in Australia.

1.4 Structure of the report

This report is structured as follows:

- Chapter 2 provides total road freight (sum of interstate, capital city and rest of state) estimates and forecasts for Australia and by states/territories between 1972 and 2030.
- Chapter 3 provides a brief literature review of the freight measurement modelling, a short account of the past origin–destination (OD) road freight matrices in Australia and data limitations, followed by the development of OD matrices for estimating interstate road freight tasks. It also provides estimates of interstate road freight tasks (as 'to', 'from', 'through') from 1972 to 2007.
- Chapter 4 provides interstate road freight forecasts between 2008 and 2030. This chapter is also outlined a methodology for forecasting interstate road freight by OD route.
- Chapter 5 provides road freight estimates and forecasts by 'capital cities' between 1972 and 2030. Also, an aggregate model of the Australian 'metropolitan' road freight task was updated.
- Chapter 6 provides rest of state road freight estimates and forecasts between 1972 and 2030 at the national level and by states and territories.
- Discussions and concluding remarks are presented in Chapter 7.

Appendices provide more detail on various aspects relevant to the overall report.

- Appendix A—Interstate road freight tasks: SMVU raw data and origin–destination (OD) road distance.
- Appendix B—Methodology for estimating interstate road freight based on origin–destination (OD) matrix.
- Appendix C—Interstate road freight tonnage data on origin–destination (OD) routes and route distances.
- Appendix D—National gross domestic products and changes between 1972 and 2030.
- Appendix E—Aggregate transport mode share trends for 56 interstate origin–destination (OD) routes between 1972 and 2030, which were used to separate the forecast all modes interstate freight tasks into separate road, rail and sea freight tasks.
- Appendix F—Estimating the 'capital cities' road freight tasks.
- Appendix G—Methodology for estimating and forecasting 'rest of state' road freight tasks by states and territories.
- Appendix H—Glossary and abbreviations.

CHAPTER 2

Total road freight estimates and forecasts for Australia and by states/territories, 1972–2030

Summary

The key features in historical (1972–2007) and forecast (2008–30) trends of different components of road freight (interstate, i.e. 'total' and 'from', 'to' and 'through', capital cities and rest of state) in Australia and states and territories are summarised below:

- For Australia, historical trends showed that the total road freight task increased at an average annual growth of 5.6 per cent per annum, from 27.1 billion tkm in 1972 to 182.5 billion tkm in 2007.
- On the other hand, the total road freight task in Australia is forecast to grow at an average annual rate of 2.7 per cent, from 191.5 billion tkm in 2008 to 342.0 billion tkm in 2030.
- Historical growth rates (1972–2007) in the interstate, capital city, rest of state and total road freights have been high compared to forecast (2008–30) growth rates in respective components of road freights.
- In terms of share of total road freight, interstate freight's share increased in the past (between 1972 and 2007) and is forecast to continue to increase to 2030. By contrast, capital city road freight's share and the share of total road freight in the rest of state decreased in the past and are forecast to decrease further by 2030.
- Estimates of the 'from' and 'to' interstate road freight grew similarly between 1972 and 2007, and are forecast to grow at the same pace between 2008 and 2030. These two components of interstate road freight tasks had higher growth rates than the 'through' interstate road freight task. It is expected that the growth of 'through' interstate road freight will be much slower (2.9 per cent per annum between 2008 and 2030) than either the 'from' or 'to' interstate road freight growth rates (3.9 per cent per annum during the same forecast period).
- The 'rest of state' road freight estimates exceeded 'capital cities' and 'interstate' estimates in Queensland, Western Australia, Tasmania (interstate freight assumed to be all by sea) and the Northern Territory.

- In most states (except Tasmania), most of the interstate road freight movements during 1972 to 2007 occurred 'from' and 'to'.
- In terms of total interstate (sum of 'from', 'to' and 'through') road freight, Western Australia had the highest growth between 1972 and 2007 of all states and territories.
- In terms of 'capital city' road freight growth from 1972 to 2007, Brisbane had the highest growth rate. Rest of state road freight growth was also highest in Queensland.
- Due to the lower assumed economic growth rate and the growing saturation effect, the forecast growth rates (2008–30) of road freight are expected to be slower in all states and territories when compared to the historical growth rates (e.g. 1972–2007).
- The growth in the interstate road freight task between 2008 and 2030 is forecast to be faster than for either the capital city or the rest of state freight tasks, except for Queensland, Western Australia and Northern Territory.
- Interstate road freight growth is forecast to be higher in Queensland, while rest of state road freight growth is forecast to grow faster in Queensland, South Australia and Western Australia, compared to other states and territories.
- Generally, the proportion of interstate road freight in total road freight is forecast to grow positively in each state and territory during 2008 to 2030, while the proportion of rest of state road freight is forecast to decline.

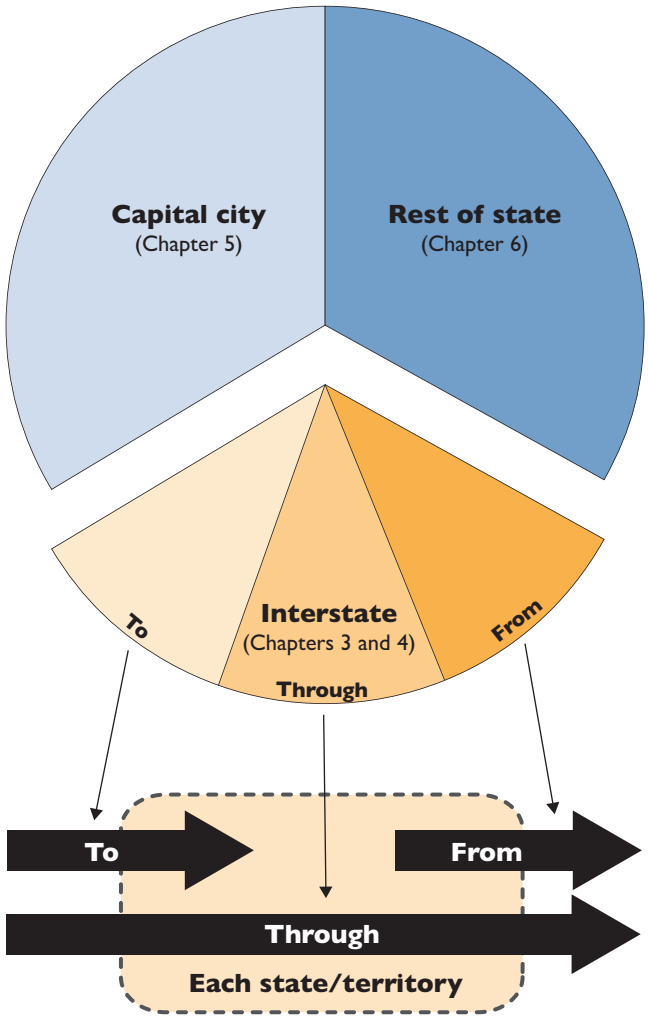
2.1 Background

This chapter assembles road freight estimate (1972–2007) and forecast (2008–30) data at the national level (see Figure 2.1) on total interstate (combination of 'from', 'to' and 'through', as well as each of these individual components of interstate road freight) (Chapters 3 and 4), capital cities (Chapter 5) and rest of state (Chapter 6).

The chapter also includes data on components of interstate ('from', 'to', 'through'), capital cities, rest of state and total road freight estimates and forecasts for each of the states and territories between 1972 and 2030.

In addition, this chapter presents the average annual growth rates for the road freight estimates and forecasts, interstate ('from', 'to', 'through' and total), 'capital city', 'rest of state' and total state, at the national level and also for each state and territory.

F2.1 Schematic diagram showing formation of the chapter

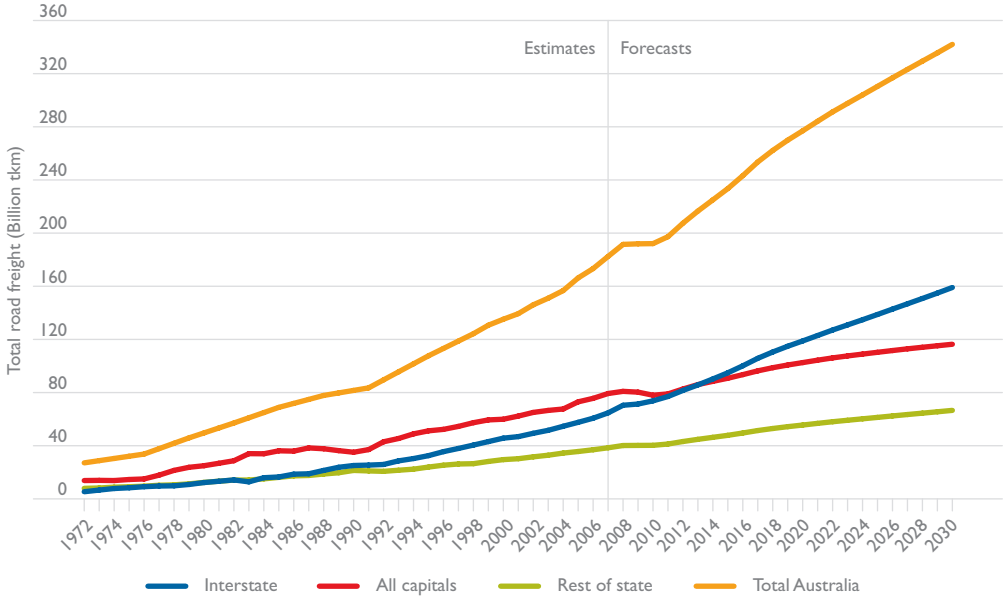


2.2 Total road freight estimates and forecasts, Australia, 1972–2030

Figure 2.2 shows the trends in national total as well as component of interstate, capital cities and rest of state road freight estimates from 1972 to 2007 and the forecasts from 2008 to 2030. Data underlying this figure is presented in Table 2.3.

In 1972, the total interstate freight estimate in Australia was 5.4 billion tonne-kilometres (tkm) and this increased to 64.7 billion tkm in 2007 (Figure 2.2 and Table 2.3). Similarly, the total road freight task in the eight capital cities was 7.9 billion tkm in 1972, which increased to 38.4 billion tkm in 2007. On the other hand, for rest of state (i.e. within the state), the road freight estimate was 13.8 billion tkm in 1972 and this increased to 79.3 billion tkm in 2007. Aggregating these three components, the total road freight estimate for Australia was 27.1 billion tkm in 1972 and 182.5 billion tkm in 2007 (Table 2.1). However, there were two plateaus in early 1980s and 1990s (Figure 2.2). These plateaus were due to economic slowdowns during those periods.

F2.2 Road freight estimates and forecasts by interstate (sum of 'from', 'to' and 'through'), capital cities and rest of state, Australia, 1972–2030



Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

Over the period from 2008 to 2030, the total interstate road freight task in Australia is forecast to increase from 70.4 billion tkm to 159.1 billion tkm, while road freight task in the capital cities is forecast to increase from 40.2 billion tkm to 66.6 billion tkm and rest of state road freight from 80.9 billion tkm to 116.4 billion tkm during the forecast period (2008–30). When these forecasts are aggregated for Australia, total road freight is expected to grow from 191.5 billion tkm in 2008 to 342.0 billion tkm in 2030. However, the total road freight task is expected to plateau temporarily, early in the forecast period (i.e. 2008 to 2010) due to the global economic downturn. It is expected that road freight task will begin to increase after 2010 until the end of forecast period (i.e. 2030), as shown in Figure 2.2 and Table 2.1. In a recent study, BITRE has noted that domestic demand for manufactured goods is underpinning much of road freight's future growth (BITRE 2009b).

For Australia as a whole, the interstate road freight task increased at an average annual growth of 7.4 per cent per annum between 1972 and 2007 (Table 2.2). This interstate road freight task grew faster than the average annual growth of freight tasks in capital cities (4.6 per cent per annum) and rest of state (5.1 per cent per annum) during this period. Overall, the average annual growth rate in the total road freight task in Australia was 5.6 per cent between 1972 and 2007.

T2.1 Road freight estimates and forecasts (billion tkm) by interstate (sum of 'from', 'to' and 'through'), capital cities and rest of state, Australia, 1972–2030

Year	Interstate	All capitals	Rest of state	Total Australia
Estimates				
1972	5.4	7.9	13.8	27.1
1973	6.6	8.2	13.9	28.8
1974	7.8	8.8	13.8	30.4
1975	8.3	9.1	14.6	32.1
1976	9.2	9.6	15.0	33.7
1977	9.7	10.3	17.9	37.8
1978	9.8	10.6	21.4	41.8
1979	10.8	11.3	23.8	45.9
1980	12.3	12.4	24.9	49.6
1981	13.3	13.3	26.8	53.4
1982	14.3	14.2	28.7	57.1
1983	12.8	14.2	34.0	61.0
1984	15.9	15.1	33.9	64.9
1985	16.5	16.2	36.2	68.9
1986	18.6	17.3	35.9	71.8
1987	18.9	17.6	38.3	74.8
1988	21.4	18.7	37.7	77.8
1989	23.8	19.7	36.3	79.7
1990	25.1	21.4	35.1	81.6
1991	25.4	21.0	37.1	83.5
1992	25.9	20.7	43.0	89.6
1993	28.6	21.6	45.4	95.6
1994	30.3	22.4	48.9	101.6
1995	32.5	23.9	51.2	107.7
1996	35.5	25.3	52.3	113.2
1997	38.0	26.2	54.5	118.7
1998	40.5	26.5	57.3	124.3
1999	43.1	28.2	59.4	130.7
2000	45.7	29.5	59.9	135.2
2001	46.8	30.2	62.3	139.4
2002	49.3	31.6	65.1	146.0
2003	51.6	32.9	66.6	151.0
2004	54.6	34.5	67.6	156.7
2005	57.6	35.6	73.0	166.3
2006	60.7	37.0	75.6	173.3
2007	64.7	38.4	79.3	182.5
Forecasts				
2008	70.4	40.2	80.9	191.5
2009	71.4	40.2	80.3	191.9
2010	73.8	40.3	78.0	192.1
2011	77.0	41.3	79.0	197.3
2012	81.6	43.2	82.7	207.4
2013	85.8	44.8	86.0	216.6
2014	90.3	46.3	88.4	225.0
2015	94.9	47.8	90.8	233.5
2016	100.1	49.6	93.5	243.2
2017	105.8	51.4	96.3	253.5
2018	110.5	53.0	98.7	262.2
2019	114.9	54.3	100.8	269.9
2020	118.8	55.6	102.6	277.0
2021	123.0	56.8	104.4	284.2
2022	127.1	58.1	106.1	291.2
2023	130.9	59.2	107.6	297.6
2024	134.8	60.2	109.0	304.0
2025	138.8	61.3	110.3	310.4
2026	142.8	62.4	111.6	316.8
2027	146.8	63.5	112.9	323.2
2028	150.8	64.5	114.1	329.4
2029	154.9	65.5	115.2	335.6
2030	159.1	66.6	116.4	342.0

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

Table 2.2 also provides average annual forecast growth of road freight tasks for the next 22 years, from 2008 to 2030, for 'interstate', 'all capitals' and 'rest of state' components, as well as the national total. The average annual forecast growth rate of interstate freight is 3.8 per cent, which is far below the 35 year historical (1972–2007) average annual growth rate of 7.4 per cent. The average annual forecast growth rates of road freight in all capitals and rest of state are 2.3 per cent 1.7 per cent per annum. Overall, the forecast average annual growth rate of total road freight in Australia is 2.7 per cent between 2008 and 2030. The combination of lower GDP growth and reducing responsiveness to this growth (growing saturation in per person freight) results in the lower freight growth rates in the forecast period compared to the historical road freight growth rates.

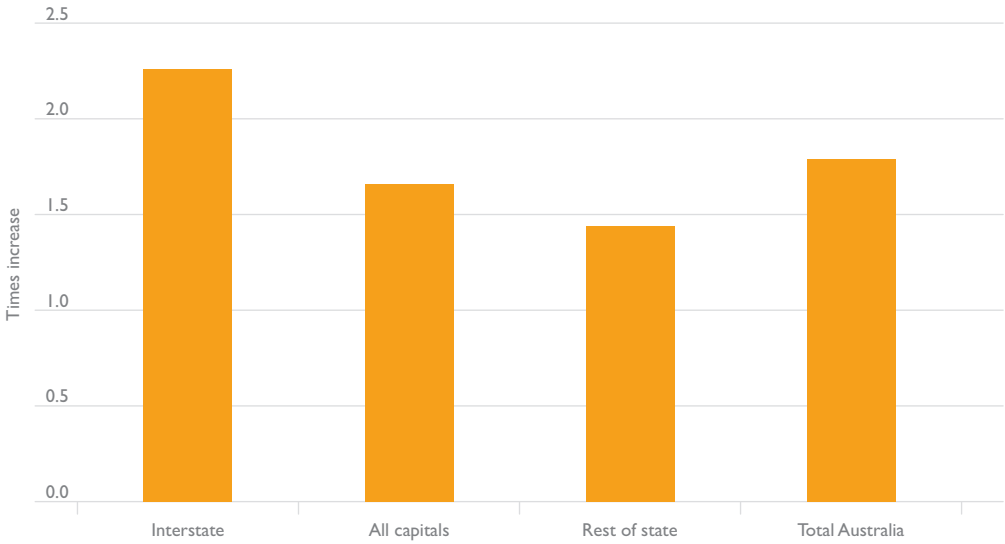
T2.2 Average annual growth rates (per cent) of interstate (sum of 'from', 'to' and 'through'), capital cities and rest of state road freight estimates and forecasts, Australia, 1972–2030

Year	Interstate	All capitals	Rest of state	Total Australia
1972–2007 (estimates)	7.4	4.6	5.1	5.6
2008–2030 (forecasts)	3.8	2.3	1.7	2.7

Source: BITRE estimates.

In other words, by 2030 the interstate road freight task in Australia is expected to be 2.3 times the 2008 level, capital cities 1.7 times, rest of state 1.4 times and the total national road freight task 1.8 times, as shown in Figure 2.3.

F2.3 Ratios of 2030 task to 2008 task for interstate, capital cities and rest of state as well as national road freight tasks, 2008–30



Source: BITRE estimates.

The total road freight task in Australia is projected to grow much faster (2.67 per cent per annum) than the rate of national population growth (1.58 per cent per annum), but similar to the average GDP growth in Australia (2.79 per cent per annum) (Table 2.3), although with

road freight per person beginning to saturate with respect to GDP per person, the differential will be reducing over time.

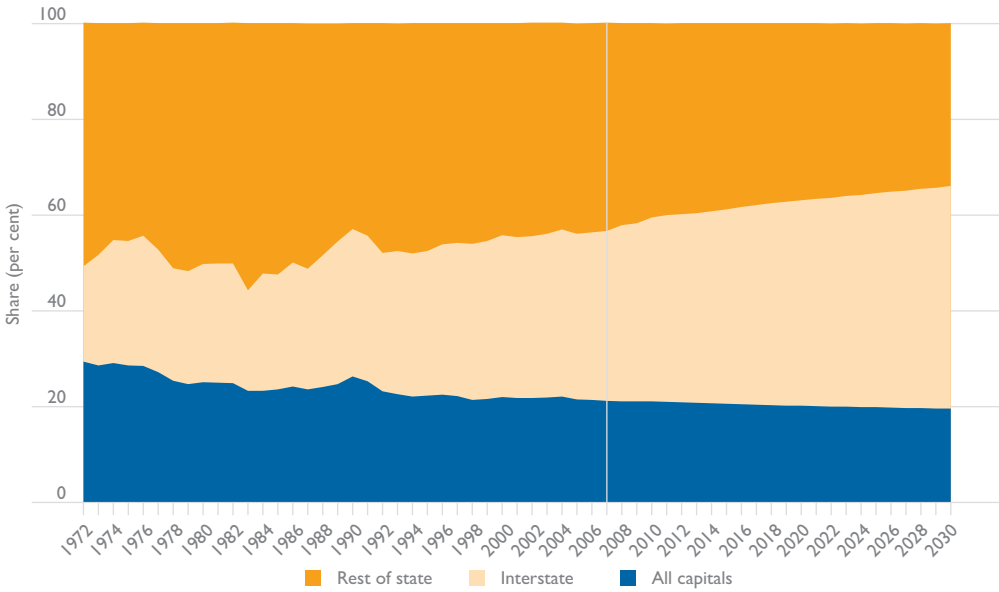
T2.3 Comparison of projected average annual growth rate of total freight task in Australia, national average real GDP growth and national population growth

Parameters	Period	Per cent
Average annual growth rate of total road freight tasks in Australia	2008–30	2.67
Average real GDP growth in Australia	2008–30	2.79
National population growth	2006–26	1.58

Sources: ABS (2008a), BITRE estimates, estimates from the Treasury and Access Economy.

The proportions of national road freight by interstate, all capitals and rest of state from 1972 to 2030 are illustrated in Figure 2.4. Between 1972 and 2007, interstate road freight's proportion increased from 20 per cent to 36 per cent, and is forecast to continue to increase to 47 per cent by 2030. This increase is driven partly by the tendency to centralise production in a few locations and distribute nationally (e.g. fertiliser), and also by the increasing frequency of national distribution from local production centres (e.g. wines).

F2.4 Interstate (sum of 'from', 'to' and 'through'), capital cities and rest of state road freight proportion (per cent), Australia, 1972–2030



Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

By contrast to the increasing proportion of interstate road freight, capital city road freight share was 29 per cent in 1972 and it decreased to 21 per cent in 2007. This share is forecast to decrease further to 19 per cent in 2030. Similarly, rest of state road freight share decreased from 51 per cent in 1972 to 43 per cent in 2007. This share is forecast to decrease further to 34 per cent in 2030. Thus the decrease in share for 'rest of state' will be steeper than for the 'capital cities'.

2.3 Road freight estimates and forecasts, states and territories, 1972–2030

Table 2.4 to Table 2.11 assemble 'interstate' ('from', 'to', 'through' and total), 'capital cities', 'rest of state' and 'total state' road freight tasks in billion tonne-kilometres (billion tkm) for each of the state and territory between 1972 and 2030.

Between 1972 and 2007, 'rest of state' road freight dominated, when compared to 'capital cities' and 'interstate' road freight, in Queensland (Table 2.6), Western Australia (Table 2.8) and Tasmania (with interstate assumed zero) (Table 2.9). On the other hand, rest of state road freight dominated in the early period, while interstate road freight dominated in the later period in New South Wales (Table 2.4), Victoria (Table 2.5) and South Australia (Table 2.7). In the Northern Territory, interstate road freight dominated compared to capital city and rest of state (Table 2.10). In the Australian Capital Territory, 'rest of state' has assumed to be zero (Table 2.11).

The interstate road freight tasks between 2008 and 2030 are forecast to be larger than either capital city or rest of state road freight tasks, except for Queensland (Table 2.6) and Western Australia (Table 2.8), where the road freight task is forecast to be dominated in the future by 'rest of state' movement. On the other hand, rest of state road freight task is forecast to dominate by interstate during the early period in the Northern Territory, while rest of state is forecast to dominate in the later period (Table 2.10).

Irrespective of states and territories, most of the interstate road freight movements during 1972 to 2007 occurred 'from' and 'to' (except Tasmania, where interstate freight is assumed to be all by sea). The same pattern can be seen during the forecast period.

T2.4 Road freight estimates and forecasts (billion tkm), New South Wales, 1972–2030

Year	Interstate				Sydney	Rest of state	Total NSW
	From	To	Through	Total			
Estimates							
1972	1.05	1.06	0.63	2.75	3.12	4.38	10.25
1973	1.30	1.30	0.75	3.35	3.20	4.40	10.96
1974	1.53	1.51	0.87	3.91	3.42	4.33	11.66
1975	1.64	1.61	0.92	4.17	3.51	4.55	12.22
1976	1.85	1.81	1.01	4.68	3.64	4.65	12.96
1977	1.96	1.90	1.06	4.92	3.84	5.50	14.26
1978	1.99	1.93	1.08	5.00	3.89	6.56	15.45
1979	2.20	2.12	1.18	5.49	4.09	7.22	16.80
1980	2.48	2.38	1.31	6.18	4.45	7.53	18.16
1981	2.68	2.56	1.41	6.64	4.73	8.04	19.41
1982	2.87	2.73	1.50	7.10	4.98	8.61	20.70
1983	2.59	2.47	1.36	6.43	4.96	10.21	21.60
1984	3.20	3.02	1.66	7.88	5.24	10.18	23.30
1985	3.31	3.12	1.71	8.14	5.59	10.85	24.58
1986	3.71	3.48	1.91	9.09	5.94	10.77	25.80
1987	3.77	3.52	1.93	9.22	6.00	11.48	26.70
1988	4.24	3.94	2.17	10.35	6.34	11.27	27.96
1989	4.68	4.32	2.38	11.38	6.61	10.84	28.83
1990	4.92	4.53	2.51	11.96	7.15	10.47	29.58
1991	4.99	4.58	2.54	12.10	6.97	11.05	30.13
1992	5.06	4.64	2.57	12.27	6.85	12.79	31.91
1993	5.51	5.03	2.81	13.34	7.10	13.52	33.96
1994	5.88	5.34	2.99	14.20	7.34	14.54	36.08
1995	6.26	5.66	3.18	15.11	7.83	15.20	38.14
1996	6.92	6.23	3.51	16.67	8.26	15.51	40.44
1997	7.47	6.71	3.79	17.97	8.52	16.16	42.65
1998	8.05	7.20	4.08	19.32	8.56	16.96	44.85
1999	8.72	7.78	4.42	20.91	8.99	17.00	46.91
2000	9.35	8.40	4.76	22.50	9.28	16.54	48.32
2001	9.65	8.71	4.92	23.28	9.47	16.57	49.32
2002	10.25	9.22	5.23	24.70	9.72	16.66	51.08
2003	10.94	9.81	5.60	26.34	10.03	16.38	52.76
2004	11.59	10.37	5.95	27.90	10.38	15.96	54.25
2005	12.19	10.89	6.28	29.36	10.64	16.51	56.50
2006	12.83	11.48	6.64	30.95	10.85	16.34	58.14
2007	13.72	12.24	7.13	33.08	11.20	16.33	60.61
Forecasts							
2008	14.41	13.30	8.44	36.15	11.69	16.39	64.24
2009	14.65	13.69	8.42	36.76	11.70	16.01	64.46
2010	15.18	14.11	8.67	37.96	11.70	15.29	64.96
2011	15.89	14.69	9.02	39.60	11.96	15.22	66.79
2012	16.88	15.52	9.51	41.91	12.50	15.66	70.07
2013	17.80	16.31	9.92	44.03	12.96	16.01	73.00
2014	18.80	17.16	10.36	46.33	13.37	16.17	75.87
2015	19.84	18.05	10.81	48.70	13.80	16.30	78.80
2016	21.02	19.04	11.32	51.38	14.28	16.48	82.14
2017	22.28	20.12	11.86	54.26	14.79	16.66	85.71
2018	23.39	21.05	12.28	56.72	15.22	16.74	88.68
2019	24.40	21.89	12.66	58.95	15.59	16.76	91.29
2020	25.35	22.66	12.99	61.00	15.91	16.72	93.63
2021	26.32	23.44	13.34	63.10	16.25	16.67	96.02
2022	27.31	24.21	13.68	65.20	16.57	16.59	98.37
2023	28.24	24.94	13.99	67.17	16.86	16.47	100.50
2024	29.18	25.67	14.29	69.15	17.15	16.32	102.62
2025	30.15	26.42	14.60	71.17	17.43	16.16	104.76
2026	31.15	27.17	14.91	73.23	17.71	15.99	106.93
2027	32.14	27.93	15.21	75.27	17.99	15.80	109.05
2028	33.13	28.68	15.50	77.31	18.26	15.59	111.15
2029	34.15	29.44	15.79	79.38	18.52	15.36	113.26
2030	35.21	30.22	16.09	81.52	18.79	15.13	115.44

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

T2.5 Road freight estimates and forecasts (billion tkm), Victoria, 1972–2030

Year	Interstate				Melbourne	Rest of state	Total VIC
	From	To	Through	Total			
Estimates							
1972	0.75	0.54	0.07	1.36	2.18	3.23	6.78
1973	0.91	0.67	0.09	1.66	2.26	3.27	7.18
1974	1.05	0.79	0.10	1.94	2.43	3.23	7.60
1975	1.11	0.84	0.11	2.06	2.52	3.42	8.00
1976	1.23	0.95	0.12	2.31	2.64	3.51	8.46
1977	1.30	1.01	0.12	2.43	2.82	4.18	9.43
1978	1.32	1.03	0.12	2.47	2.90	5.02	10.39
1979	1.44	1.13	0.14	2.71	3.10	5.56	11.37
1980	1.61	1.29	0.15	3.04	3.41	5.84	12.29
1981	1.72	1.39	0.16	3.27	3.66	6.27	13.21
1982	1.83	1.49	0.17	3.50	3.90	6.72	14.12
1983	1.66	1.34	0.16	3.16	3.93	7.95	15.04
1984	2.02	1.67	0.19	3.87	4.19	7.92	15.98
1985	2.07	1.72	0.20	4.00	4.53	8.43	16.95
1986	2.30	1.94	0.22	4.46	4.89	8.20	17.54
1987	2.33	1.96	0.22	4.51	5.03	8.56	18.10
1988	2.59	2.22	0.25	5.05	5.40	8.24	18.68
1989	2.82	2.45	0.27	5.54	5.71	7.75	19.01
1990	2.95	2.57	0.29	5.81	6.28	7.33	19.42
1991	2.97	2.61	0.29	5.87	6.22	7.56	19.65
1992	3.00	2.64	0.29	5.94	6.17	8.56	20.67
1993	3.24	2.88	0.32	6.44	6.47	8.83	21.74
1994	3.42	3.07	0.34	6.83	6.77	9.27	22.87
1995	3.61	3.27	0.36	7.24	7.30	9.46	24.00
1996	3.94	3.63	0.38	7.96	7.74	9.41	25.11
1997	4.21	3.94	0.40	8.55	8.03	9.55	26.12
1998	4.48	4.26	0.42	9.16	8.11	9.76	27.03
1999	4.83	4.64	0.44	9.91	8.65	10.06	28.61
2000	5.15	5.03	0.46	10.64	9.13	10.06	29.83
2001	5.30	5.23	0.47	11.00	9.30	10.39	30.69
2002	5.60	5.57	0.49	11.66	9.76	10.78	32.19
2003	5.95	5.96	0.51	12.42	10.01	10.95	33.38
2004	6.27	6.33	0.54	13.14	10.34	11.05	34.53
2005	6.57	6.67	0.56	13.80	10.55	11.84	36.19
2006	6.88	7.06	0.59	14.52	10.85	12.18	37.55
2007	7.31	7.57	0.62	15.50	11.20	12.67	39.36
Forecasts							
2008	7.93	8.31	0.64	16.88	11.70	12.82	41.40
2009	8.06	8.29	0.65	17.00	11.71	12.62	41.34
2010	8.28	8.62	0.67	17.58	11.72	12.16	41.45
2011	8.60	9.07	0.69	18.37	11.98	12.21	42.56
2012	9.07	9.69	0.72	19.48	12.51	12.67	44.67
2013	9.51	10.21	0.75	20.47	12.98	13.08	46.52
2014	9.98	10.78	0.77	21.53	13.41	13.33	48.27
2015	10.47	11.37	0.80	22.64	13.82	13.57	50.02
2016	11.02	12.03	0.83	23.88	14.31	13.85	52.04
2017	11.61	12.74	0.86	25.22	14.83	14.14	54.19
2018	12.12	13.31	0.89	26.32	15.25	14.37	55.93
2019	12.57	13.83	0.91	27.32	15.62	14.53	57.47
2020	12.97	14.32	0.94	28.23	15.96	14.66	58.85
2021	13.38	14.84	0.96	29.18	16.32	14.79	60.29
2022	13.78	15.37	0.99	30.14	16.65	14.89	61.68
2023	14.16	15.86	1.01	31.02	16.95	14.96	62.93
2024	14.53	16.36	1.03	31.91	17.24	15.01	64.17
2025	14.90	16.87	1.05	32.82	17.53	15.05	65.41
2026	15.29	17.39	1.07	33.75	17.82	15.09	66.66
2027	15.66	17.90	1.10	34.66	18.11	15.12	67.88
2028	16.03	18.42	1.12	35.57	18.39	15.13	69.08
2029	16.41	18.95	1.14	36.49	18.66	15.13	70.28
2030	16.79	19.49	1.16	37.45	18.94	15.13	71.51

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

T2.6 Road freight estimates and forecasts (billion tkm), Queensland, 1972–2030

Year	Interstate				Brisbane	Rest of state	Total QLD
	From	To	Through	Total			
Estimates							
1972	0.16	0.28	0.00	0.44	0.71	2.87	4.02
1973	0.20	0.33	0.00	0.53	0.76	2.88	4.17
1974	0.24	0.38	0.00	0.62	0.84	2.84	4.30
1975	0.26	0.40	0.00	0.66	0.90	2.99	4.55
1976	0.30	0.44	0.00	0.74	0.97	3.06	4.77
1977	0.31	0.46	0.00	0.78	1.12	3.63	5.53
1978	0.32	0.47	0.00	0.79	1.23	4.34	6.37
1979	0.36	0.51	0.00	0.86	1.41	4.79	7.06
1980	0.41	0.56	0.00	0.97	1.63	5.01	7.61
1981	0.44	0.60	0.00	1.04	1.84	5.36	8.24
1982	0.48	0.64	0.00	1.11	2.06	5.74	8.92
1983	0.43	0.58	0.00	1.01	2.07	6.81	9.89
1984	0.54	0.70	0.00	1.24	2.22	6.79	10.24
1985	0.56	0.72	0.00	1.28	2.39	7.23	10.90
1986	0.63	0.80	0.00	1.43	2.56	7.18	11.17
1987	0.64	0.81	0.00	1.45	2.61	7.67	11.72
1988	0.73	0.89	0.00	1.62	2.77	7.54	11.93
1989	0.81	0.97	0.00	1.78	2.91	7.26	11.95
1990	0.86	1.02	0.00	1.88	3.16	7.02	12.05
1991	0.87	1.03	0.00	1.90	3.10	7.41	12.41
1992	0.88	1.04	0.00	1.93	3.07	8.59	13.58
1993	0.97	1.12	0.00	2.09	3.22	9.08	14.39
1994	1.04	1.19	0.00	2.23	3.36	9.78	15.37
1995	1.12	1.26	0.00	2.38	3.62	10.23	16.23
1996	1.25	1.38	0.00	2.63	3.89	10.45	16.97
1997	1.36	1.48	0.00	2.84	4.09	10.90	17.83
1998	1.48	1.59	0.00	3.06	4.19	11.45	18.71
1999	1.61	1.71	0.00	3.33	4.66	13.56	21.55
2000	1.75	1.84	0.00	3.59	5.00	13.94	22.53
2001	1.81	1.91	0.00	3.72	5.26	14.76	23.74
2002	1.94	2.02	0.00	3.95	5.70	15.70	25.35
2003	2.02	2.08	0.00	4.10	6.12	16.35	26.57
2004	2.16	2.20	0.00	4.36	6.57	16.91	27.83
2005	2.28	2.31	0.00	4.59	6.97	18.57	30.13
2006	2.42	2.43	0.00	4.85	7.23	19.57	31.65
2007	2.61	2.59	0.00	5.20	7.47	20.84	33.51
Forecasts							
2008	2.99	2.76	0.00	5.75	7.80	21.40	34.95
2009	3.08	2.81	0.00	5.89	7.85	21.37	35.11
2010	3.18	2.91	0.00	6.09	7.90	20.88	34.87
2011	3.32	3.04	0.00	6.36	8.13	21.27	35.77
2012	3.52	3.23	0.00	6.75	8.55	22.40	37.69
2013	3.71	3.40	0.00	7.11	8.91	23.45	39.47
2014	3.92	3.59	0.00	7.51	9.25	24.25	41.01
2015	4.14	3.78	0.00	7.92	9.59	25.04	42.55
2016	4.38	4.00	0.00	8.39	9.98	25.94	44.31
2017	4.65	4.24	0.00	8.89	10.40	26.88	46.16
2018	4.88	4.44	0.00	9.32	10.76	27.70	47.78
2019	5.08	4.63	0.00	9.71	11.08	28.44	49.23
2020	5.27	4.81	0.00	10.08	11.39	29.11	50.58
2021	5.47	4.99	0.00	10.45	11.70	29.80	51.95
2022	5.66	5.17	0.00	10.83	12.01	30.46	53.29
2023	5.84	5.34	0.00	11.18	12.29	31.05	54.52
2024	6.02	5.51	0.00	11.54	12.57	31.63	55.74
2025	6.21	5.69	0.00	11.90	12.85	32.20	56.96
2026	6.40	5.87	0.00	12.28	13.13	32.77	58.18
2027	6.59	6.06	0.00	12.65	13.42	33.33	59.39
2028	6.78	6.24	0.00	13.02	13.69	33.86	60.57
2029	6.97	6.43	0.00	13.40	13.97	34.38	61.75
2030	7.17	6.62	0.00	13.79	14.26	34.91	62.96

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

T2.7 Road freight estimates and forecasts (billion tkm), South Australia, 1972–2030

Year	Interstate				Adelaide	Rest of state	Total SA
	From	To	Through	Total			
Estimates							
1972	0.19	0.17	0.13	0.48	0.74	1.54	2.76
1973	0.24	0.21	0.18	0.62	0.76	1.49	2.88
1974	0.28	0.25	0.23	0.76	0.82	1.41	2.99
1975	0.30	0.27	0.26	0.83	0.84	1.42	3.10
1976	0.33	0.29	0.22	0.85	0.88	1.39	3.12
1977	0.35	0.31	0.24	0.91	0.93	1.58	3.42
1978	0.36	0.32	0.25	0.92	0.95	1.80	3.67
1979	0.40	0.35	0.29	1.04	1.01	1.88	3.93
1980	0.45	0.40	0.36	1.22	1.03	1.86	4.10
1981	0.49	0.44	0.41	1.34	1.02	1.87	4.23
1982	0.53	0.47	0.46	1.46	1.00	1.72	4.18
1983	0.48	0.42	0.38	1.28	1.00	1.81	4.10
1984	0.62	0.53	0.53	1.69	1.07	1.58	4.34
1985	0.66	0.55	0.55	1.76	1.15	1.45	4.36
1986	0.78	0.64	0.64	2.06	1.23	1.40	4.69
1987	0.81	0.65	0.64	2.10	1.25	1.46	4.82
1988	0.96	0.76	0.75	2.47	1.34	1.40	5.21
1989	1.12	0.86	0.86	2.84	1.40	1.31	5.55
1990	1.23	0.92	0.90	3.05	1.51	1.24	5.80
1991	1.28	0.95	0.87	3.09	1.48	1.27	5.84
1992	1.35	0.98	0.86	3.19	1.45	1.43	6.08
1993	1.59	1.12	1.00	3.70	1.51	1.47	6.68
1994	1.72	1.20	0.98	3.91	1.56	1.54	7.01
1995	1.94	1.32	1.03	4.29	1.67	1.56	7.52
1996	2.13	1.47	1.00	4.60	1.77	1.54	7.91
1997	2.28	1.58	0.94	4.80	1.84	1.55	8.20
1998	2.44	1.70	0.88	5.03	1.86	1.58	8.47
1999	2.49	1.80	0.83	5.12	1.94	1.72	8.78
2000	2.35	2.07	0.78	5.20	1.99	2.34	9.53
2001	2.23	2.22	0.72	5.17	2.01	2.66	9.84
2002	2.31	2.31	0.71	5.33	2.08	3.01	10.43
2003	2.35	2.25	0.70	5.31	2.19	3.33	10.83
2004	2.49	2.39	0.74	5.63	2.29	3.63	11.54
2005	2.64	2.54	0.80	5.99	2.42	4.19	12.59
2006	2.64	2.83	0.83	6.30	2.53	4.61	13.45
2007	2.81	3.00	0.86	6.67	2.61	5.03	14.31
Forecasts							
2008	3.01	3.14	1.00	7.15	2.73	5.17	15.05
2009	3.04	3.20	0.99	7.22	2.72	5.17	15.11
2010	3.15	3.31	1.02	7.48	2.70	5.06	15.25
2011	3.31	3.46	1.06	7.83	2.75	5.17	15.75
2012	3.53	3.68	1.11	8.32	2.87	5.45	16.64
2013	3.72	3.88	1.15	8.75	2.96	5.71	17.43
2014	3.94	4.10	1.19	9.23	3.04	5.92	18.18
2015	4.15	4.33	1.24	9.72	3.12	6.12	18.96
2016	4.40	4.59	1.29	10.27	3.21	6.35	19.83
2017	4.67	4.86	1.34	10.87	3.31	6.59	20.77
2018	4.89	5.11	1.38	11.37	3.39	6.80	21.56
2019	5.09	5.33	1.41	11.83	3.45	7.00	22.28
2020	5.28	5.54	1.45	12.26	3.51	7.17	22.95
2021	5.48	5.75	1.48	12.71	3.56	7.35	23.62
2022	5.68	5.96	1.52	13.16	3.61	7.53	24.30
2023	5.87	6.16	1.55	13.58	3.66	7.69	24.93
2024	6.07	6.37	1.58	14.02	3.70	7.84	25.55
2025	6.26	6.58	1.62	14.46	3.74	7.99	26.19
2026	6.47	6.79	1.65	14.91	3.78	8.15	26.83
2027	6.67	7.00	1.68	15.35	3.81	8.30	27.47
2028	6.87	7.22	1.72	15.81	3.85	8.44	28.10
2029	7.08	7.43	1.75	16.26	3.88	8.58	28.73
2030	7.30	7.66	1.78	16.74	3.92	8.73	29.38

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

T2.8 Road freight estimates and forecasts (billion tkm), Western Australia, 1972–2030

Year	Interstate				Perth	Rest of state	Total WA
	From	To	Through	Total			
Estimates							
1972	0.08	0.09	0.00	0.17	0.88	1.44	2.49
1973	0.11	0.14	0.00	0.25	0.91	1.54	2.71
1974	0.14	0.20	0.00	0.34	0.98	1.62	2.94
1975	0.15	0.23	0.00	0.38	1.02	1.81	3.21
1976	0.12	0.20	0.00	0.32	1.07	1.96	3.35
1977	0.13	0.23	0.00	0.36	1.14	2.45	3.95
1978	0.13	0.24	0.00	0.37	1.18	3.09	4.64
1979	0.15	0.28	0.00	0.43	1.26	3.58	5.28
1980	0.19	0.35	0.00	0.54	1.39	3.93	5.85
1981	0.21	0.41	0.00	0.62	1.49	4.39	6.50
1982	0.24	0.46	0.00	0.70	1.58	4.99	7.28
1983	0.20	0.38	0.00	0.58	1.57	6.14	8.29
1984	0.28	0.56	0.00	0.85	1.65	6.33	8.83
1985	0.30	0.60	0.00	0.90	1.76	6.98	9.64
1986	0.36	0.75	0.00	1.11	1.89	7.09	10.09
1987	0.37	0.77	0.00	1.14	1.92	7.74	10.80
1988	0.45	0.96	0.00	1.41	2.05	7.78	11.24
1989	0.53	1.15	0.00	1.68	2.17	7.65	11.50
1990	0.58	1.27	0.00	1.85	2.39	7.56	11.79
1991	0.59	1.28	0.00	1.87	2.36	8.15	12.38
1992	0.61	1.35	0.00	1.96	2.33	9.64	13.93
1993	0.74	1.65	0.00	2.39	2.44	10.39	15.22
1994	0.77	1.73	0.00	2.50	2.53	11.41	16.44
1995	0.86	1.94	0.00	2.80	2.72	12.17	17.70
1996	0.90	2.02	0.00	2.92	2.88	12.67	18.48
1997	0.92	2.04	0.00	2.96	2.99	13.45	19.40
1998	0.94	2.07	0.00	3.02	3.02	14.40	20.43
1999	0.92	1.96	0.00	2.88	3.18	13.67	19.74
2000	1.20	1.55	0.00	2.75	3.38	13.70	19.83
2001	1.37	1.24	0.00	2.61	3.46	14.52	20.59
2002	1.36	1.23	0.00	2.59	3.64	15.45	21.68
2003	1.37	1.23	0.00	2.60	3.77	16.11	22.48
2004	1.45	1.30	0.00	2.75	4.10	16.68	23.52
2005	1.56	1.41	0.00	2.97	4.23	18.33	25.53
2006	1.91	1.23	0.00	3.13	4.57	19.33	27.03
2007	1.99	1.28	0.00	3.27	5.09	20.61	28.96
Forecasts							
2008	2.04	1.40	0.00	3.44	5.31	21.17	29.92
2009	2.02	1.43	0.00	3.44	5.33	21.15	29.93
2010	2.09	1.47	0.00	3.56	5.35	20.68	29.59
2011	2.19	1.52	0.00	3.72	5.50	21.08	30.30
2012	2.33	1.60	0.00	3.93	5.76	22.21	31.90
2013	2.45	1.67	0.00	4.12	6.00	23.26	33.37
2014	2.58	1.74	0.00	4.32	6.21	24.06	34.60
2015	2.71	1.82	0.00	4.53	6.43	24.86	35.82
2016	2.86	1.91	0.00	4.76	6.68	25.77	37.21
2017	3.02	2.00	0.00	5.02	6.95	26.71	38.68
2018	3.14	2.08	0.00	5.22	7.17	27.55	39.94
2019	3.26	2.15	0.00	5.42	7.37	28.29	41.08
2020	3.37	2.22	0.00	5.59	7.55	28.98	42.12
2021	3.49	2.29	0.00	5.77	7.75	29.68	43.20
2022	3.60	2.36	0.00	5.96	7.93	30.35	44.24
2023	3.71	2.42	0.00	6.13	8.10	30.96	45.19
2024	3.82	2.48	0.00	6.30	8.27	31.55	46.12
2025	3.93	2.55	0.00	6.48	8.44	32.13	47.05
2026	4.05	2.61	0.00	6.66	8.60	32.71	47.98
2027	4.16	2.68	0.00	6.84	8.77	33.28	48.89
2028	4.28	2.74	0.00	7.02	8.93	33.83	49.78
2029	4.39	2.81	0.00	7.20	9.10	34.37	50.66
2030	4.51	2.88	0.00	7.39	9.27	34.91	51.56

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

T2.9 Road freight estimates and forecasts (billion tkm), Tasmania, 1972–2030

Year	Interstate				Hobart	Rest of state	Total TAS
	From	To	Through	Total			
Estimates							
1972	0.00	0.00	0.00	0.00	0.13	0.29	0.42
1973	0.00	0.00	0.00	0.00	0.14	0.30	0.44
1974	0.00	0.00	0.00	0.00	0.15	0.30	0.45
1975	0.00	0.00	0.00	0.00	0.17	0.32	0.49
1976	0.00	0.00	0.00	0.00	0.18	0.34	0.52
1977	0.00	0.00	0.00	0.00	0.19	0.41	0.61
1978	0.00	0.00	0.00	0.00	0.20	0.51	0.71
1979	0.00	0.00	0.00	0.00	0.22	0.57	0.79
1980	0.00	0.00	0.00	0.00	0.23	0.61	0.84
1981	0.00	0.00	0.00	0.00	0.24	0.67	0.91
1982	0.00	0.00	0.00	0.00	0.25	0.72	0.97
1983	0.00	0.00	0.00	0.00	0.27	0.87	1.13
1984	0.00	0.00	0.00	0.00	0.30	0.88	1.18
1985	0.00	0.00	0.00	0.00	0.33	0.96	1.29
1986	0.00	0.00	0.00	0.00	0.34	0.98	1.32
1987	0.00	0.00	0.00	0.00	0.34	1.07	1.40
1988	0.00	0.00	0.00	0.00	0.35	1.07	1.42
1989	0.00	0.00	0.00	0.00	0.36	1.05	1.41
1990	0.00	0.00	0.00	0.00	0.38	1.04	1.42
1991	0.00	0.00	0.00	0.00	0.36	1.12	1.49
1992	0.00	0.00	0.00	0.00	0.34	1.33	1.67
1993	0.00	0.00	0.00	0.00	0.33	1.43	1.76
1994	0.00	0.00	0.00	0.00	0.32	1.57	1.90
1995	0.00	0.00	0.00	0.00	0.32	1.68	2.00
1996	0.00	0.00	0.00	0.00	0.31	1.74	2.06
1997	0.00	0.00	0.00	0.00	0.29	1.85	2.14
1998	0.00	0.00	0.00	0.00	0.26	1.98	2.24
1999	0.00	0.00	0.00	0.00	0.27	2.08	2.35
2000	0.00	0.00	0.00	0.00	0.28	2.12	2.40
2001	0.00	0.00	0.00	0.00	0.28	2.23	2.51
2002	0.00	0.00	0.00	0.00	0.30	2.35	2.65
2003	0.00	0.00	0.00	0.00	0.31	2.44	2.74
2004	0.00	0.00	0.00	0.00	0.34	2.50	2.84
2005	0.00	0.00	0.00	0.00	0.35	2.73	3.08
2006	0.00	0.00	0.00	0.00	0.36	2.86	3.22
2007	0.00	0.00	0.00	0.00	0.36	3.03	3.39
Forecasts							
2008	0.00	0.00	0.00	0.00	0.38	3.11	3.49
2009	0.00	0.00	0.00	0.00	0.38	3.11	3.49
2010	0.00	0.00	0.00	0.00	0.38	3.05	3.43
2011	0.00	0.00	0.00	0.00	0.39	3.11	3.50
2012	0.00	0.00	0.00	0.00	0.39	3.28	3.67
2013	0.00	0.00	0.00	0.00	0.41	3.44	3.84
2014	0.00	0.00	0.00	0.00	0.42	3.56	3.98
2015	0.00	0.00	0.00	0.00	0.43	3.68	4.11
2016	0.00	0.00	0.00	0.00	0.45	3.82	4.26
2017	0.00	0.00	0.00	0.00	0.45	3.96	4.41
2018	0.00	0.00	0.00	0.00	0.46	4.09	4.55
2019	0.00	0.00	0.00	0.00	0.47	4.20	4.68
2020	0.00	0.00	0.00	0.00	0.48	4.31	4.79
2021	0.00	0.00	0.00	0.00	0.49	4.42	4.90
2022	0.00	0.00	0.00	0.00	0.49	4.52	5.01
2023	0.00	0.00	0.00	0.00	0.50	4.62	5.11
2024	0.00	0.00	0.00	0.00	0.50	4.71	5.21
2025	0.00	0.00	0.00	0.00	0.51	4.80	5.31
2026	0.00	0.00	0.00	0.00	0.51	4.89	5.40
2027	0.00	0.00	0.00	0.00	0.51	4.98	5.49
2028	0.00	0.00	0.00	0.00	0.52	5.07	5.58
2029	0.00	0.00	0.00	0.00	0.52	5.15	5.67
2030	0.00	0.00	0.00	0.00	0.53	5.24	5.76

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

T2.10 Road freight estimates and forecasts (billion tkm), Northern Territory, 1972–2030

Year	Interstate				Darwin	Rest of state	Total NT
	From	To	Through	Total			
Estimates							
1972	0.07	0.10	0.00	0.17	0.05	0.04	0.27
1973	0.08	0.12	0.00	0.20	0.05	0.05	0.31
1974	0.09	0.13	0.00	0.23	0.06	0.06	0.34
1975	0.10	0.14	0.00	0.24	0.06	0.07	0.36
1976	0.11	0.15	0.00	0.26	0.06	0.07	0.40
1977	0.11	0.16	0.00	0.27	0.06	0.10	0.43
1978	0.11	0.16	0.00	0.28	0.06	0.13	0.46
1979	0.12	0.18	0.00	0.30	0.06	0.15	0.50
1980	0.13	0.19	0.00	0.33	0.09	0.17	0.59
1981	0.14	0.20	0.00	0.35	0.13	0.19	0.67
1982	0.15	0.22	0.00	0.37	0.18	0.19	0.73
1983	0.14	0.20	0.00	0.34	0.18	0.24	0.76
1984	0.16	0.23	0.00	0.40	0.19	0.25	0.84
1985	0.17	0.24	0.00	0.41	0.21	0.28	0.90
1986	0.18	0.26	0.00	0.45	0.22	0.32	0.98
1987	0.19	0.27	0.00	0.45	0.21	0.38	1.04
1988	0.20	0.29	0.00	0.50	0.21	0.41	1.12
1989	0.22	0.32	0.00	0.54	0.23	0.43	1.19
1990	0.23	0.33	0.00	0.56	0.25	0.45	1.26
1991	0.23	0.33	0.00	0.57	0.25	0.51	1.33
1992	0.24	0.34	0.00	0.57	0.23	0.63	1.44
1993	0.25	0.36	0.00	0.61	0.23	0.72	1.56
1994	0.27	0.38	0.00	0.65	0.22	0.82	1.69
1995	0.29	0.40	0.00	0.68	0.23	0.91	1.82
1996	0.31	0.44	0.00	0.75	0.24	0.98	1.96
1997	0.34	0.46	0.00	0.80	0.24	1.07	2.12
1998	0.36	0.50	0.00	0.86	0.24	1.19	2.28
1999	0.39	0.53	0.00	0.92	0.23	1.32	2.48
2000	0.42	0.57	0.00	0.99	0.23	1.24	2.46
2001	0.44	0.59	0.00	1.02	0.21	1.18	2.41
2002	0.46	0.62	0.00	1.08	0.19	1.12	2.39
2003	0.26	0.53	0.00	0.78	0.18	1.02	1.99
2004	0.27	0.55	0.00	0.82	0.19	0.92	1.93
2005	0.28	0.58	0.00	0.86	0.21	0.86	1.93
2006	0.29	0.61	0.00	0.90	0.27	0.76	1.93
2007	0.31	0.64	0.00	0.95	0.26	0.79	2.00
Forecasts							
2008	0.32	0.71	0.00	1.03	0.28	0.84	2.15
2009	0.32	0.70	0.00	1.02	0.28	0.87	2.17
2010	0.33	0.72	0.00	1.06	0.28	0.88	2.22
2011	0.35	0.76	0.00	1.11	0.29	0.93	2.32
2012	0.37	0.80	0.00	1.17	0.29	1.01	2.47
2013	0.39	0.83	0.00	1.22	0.31	1.08	2.61
2014	0.41	0.86	0.00	1.27	0.32	1.15	2.74
2015	0.43	0.90	0.00	1.33	0.33	1.22	2.88
2016	0.45	0.94	0.00	1.39	0.35	1.30	3.04
2017	0.48	0.98	0.00	1.46	0.36	1.38	3.20
2018	0.50	1.01	0.00	1.51	0.37	1.46	3.34
2019	0.53	1.03	0.00	1.56	0.39	1.53	3.48
2020	0.55	1.06	0.00	1.61	0.40	1.60	3.61
2021	0.57	1.09	0.00	1.65	0.41	1.68	3.74
2022	0.59	1.11	0.00	1.71	0.42	1.75	3.88
2023	0.61	1.14	0.00	1.75	0.43	1.82	4.00
2024	0.64	1.16	0.00	1.80	0.44	1.89	4.13
2025	0.66	1.19	0.00	1.85	0.45	1.97	4.26
2026	0.68	1.21	0.00	1.90	0.46	2.04	4.39
2027	0.71	1.24	0.00	1.94	0.47	2.11	4.52
2028	0.73	1.26	0.00	1.99	0.47	2.18	4.65
2029	0.75	1.29	0.00	2.04	0.48	2.25	4.78
2030	0.78	1.32	0.00	2.10	0.49	2.33	4.92

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: BITRE estimates.

T2.11 Road freight estimates and forecasts (billion tkm), Australian Capital Territory, 1972–2030

Year	Interstate				Canberra	Rest of state	Total ACT
	From	To	Through	Total			
Estimates							
1972	0.00	0.00	0.00	0.01	0.11	0.00	0.12
1973	0.00	0.00	0.00	0.01	0.12	0.00	0.12
1974	0.00	0.01	0.00	0.01	0.12	0.00	0.13
1975	0.00	0.01	0.00	0.01	0.13	0.00	0.14
1976	0.00	0.01	0.00	0.01	0.14	0.00	0.14
1977	0.00	0.01	0.00	0.01	0.14	0.00	0.15
1978	0.00	0.01	0.00	0.01	0.15	0.00	0.16
1979	0.00	0.01	0.00	0.01	0.16	0.00	0.17
1980	0.00	0.01	0.00	0.01	0.17	0.00	0.18
1981	0.00	0.01	0.00	0.01	0.18	0.00	0.20
1982	0.00	0.01	0.00	0.01	0.20	0.00	0.21
1983	0.00	0.01	0.00	0.01	0.20	0.00	0.21
1984	0.00	0.01	0.00	0.01	0.21	0.00	0.22
1985	0.00	0.01	0.00	0.01	0.22	0.00	0.24
1986	0.00	0.01	0.00	0.01	0.24	0.00	0.25
1987	0.00	0.01	0.00	0.01	0.24	0.00	0.26
1988	0.00	0.01	0.00	0.02	0.26	0.00	0.27
1989	0.00	0.01	0.00	0.02	0.27	0.00	0.29
1990	0.00	0.01	0.00	0.02	0.29	0.00	0.31
1991	0.00	0.01	0.00	0.02	0.29	0.00	0.31
1992	0.00	0.01	0.00	0.02	0.27	0.00	0.28
1993	0.00	0.02	0.00	0.02	0.26	0.00	0.28
1994	0.00	0.02	0.00	0.02	0.25	0.00	0.27
1995	0.00	0.02	0.00	0.02	0.24	0.00	0.27
1996	0.01	0.02	0.00	0.02	0.25	0.00	0.27
1997	0.01	0.02	0.00	0.03	0.24	0.00	0.27
1998	0.01	0.02	0.00	0.03	0.24	0.00	0.26
1999	0.01	0.02	0.00	0.03	0.24	0.00	0.27
2000	0.01	0.03	0.00	0.03	0.25	0.00	0.28
2001	0.01	0.03	0.00	0.03	0.23	0.00	0.26
2002	0.01	0.03	0.00	0.04	0.24	0.00	0.28
2003	0.01	0.03	0.00	0.04	0.25	0.00	0.29
2004	0.01	0.03	0.00	0.04	0.27	0.00	0.31
2005	0.01	0.03	0.00	0.04	0.28	0.00	0.32
2006	0.01	0.03	0.00	0.04	0.30	0.00	0.34
2007	0.01	0.04	0.00	0.05	0.26	0.00	0.30
Forecasts							
2008	0.01	0.04	0.00	0.05	0.27	0.00	0.32
2009	0.01	0.04	0.00	0.05	0.27	0.00	0.32
2010	0.01	0.04	0.00	0.05	0.26	0.00	0.32
2011	0.01	0.04	0.00	0.05	0.27	0.00	0.32
2012	0.01	0.04	0.00	0.05	0.28	0.00	0.34
2013	0.01	0.04	0.00	0.06	0.29	0.00	0.35
2014	0.01	0.05	0.00	0.06	0.30	0.00	0.36
2015	0.01	0.05	0.00	0.06	0.31	0.00	0.37
2016	0.02	0.05	0.00	0.06	0.32	0.00	0.38
2017	0.02	0.05	0.00	0.07	0.33	0.00	0.40
2018	0.02	0.05	0.00	0.07	0.34	0.00	0.41
2019	0.02	0.06	0.00	0.07	0.35	0.00	0.42
2020	0.02	0.06	0.00	0.08	0.35	0.00	0.43
2021	0.02	0.06	0.00	0.08	0.36	0.00	0.44
2022	0.02	0.06	0.00	0.08	0.37	0.00	0.45
2023	0.02	0.06	0.00	0.08	0.37	0.00	0.45
2024	0.02	0.06	0.00	0.08	0.38	0.00	0.46
2025	0.02	0.06	0.00	0.09	0.38	0.00	0.47
2026	0.02	0.07	0.00	0.09	0.39	0.00	0.48
2027	0.02	0.07	0.00	0.09	0.39	0.00	0.48
2028	0.02	0.07	0.00	0.09	0.40	0.00	0.49
2029	0.02	0.07	0.00	0.09	0.40	0.00	0.50
2030	0.02	0.07	0.00	0.10	0.41	0.00	0.50

Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
Source: BITRE estimates.

Table 2.12 presents the average annual growth rates for the road freight estimates (1972–2007) and forecasts (2008–30) of interstate ('from', 'to', 'through, and 'total'), 'capital city', 'rest of state' and 'total state' (i.e. sum of interstate, capital city and rest of state) for each state and territory, while Figure 2.5 shows the comparison of average annual growth rates (per cent) of 'total state' road freight estimates and forecasts for each state and territory.

The forecast growth rates (2008–30) of road freight are expected to be slower in all states and territories when compared to the historical growth rates (e.g. 1972–2007). This is due to the lower assumed economic growth rate and the growing saturation effect.

In terms of total interstate (sum of 'from', 'to' and 'through') road freight growth, Western Australia had the highest growth (8.7 per cent per annum) between 1972 and 2007 than other states and territories, partly due to the mining boom. On the other hand, future interstate road freight growth is forecast to be highest in Queensland (4.1 per cent per annum) between 2008 and 2030.

In terms of capital city road freight growth, Brisbane had the higher growth rate during 1972 to 2007 and it is also forecast to grow faster between 2008 and 2030 compared to other capital cities.

T2.12 Average annual growth rates (per cent) of road freight estimates and forecast by states/territories, 1972–2030

Years	Interstate				Capital city	Rest of state	Total state
	From	To	Through	Total			
New South Wales							
1972–2007	7.6	7.2	7.2	7.4	3.7	3.8	5.2
2008–2030	4.1	3.8	3.0	3.8	2.2	–0.4	2.7
Victoria							
1972–2007	6.7	7.9	6.3	7.2	4.8	4.0	5.2
2008–2030	3.5	3.9	2.8	3.7	2.2	0.8	2.5
Queensland							
1972–2007	8.3	6.6	nd	7.3	6.9	5.8	6.2
2008–2030	4.1	4.1	nd	4.1	2.8	2.2	2.7
South Australia							
1972–2007	8.0	8.6	5.6	7.8	3.7	3.4	4.8
2008–2030	4.1	4.1	2.7	3.9	1.7	2.4	3.1
Western Australia							
1972–2007	9.5	7.9	nd	8.7	5.2	7.9	7.3
2008–2030	3.7	3.3	nd	3.5	2.6	2.3	2.5
Tasmania							
1972–2007	nd	nd	nd	nd	3.0	7.0	6.2
2008–2030	nd	nd	nd	nd	1.5	2.4	2.3
Northern Territory							
1972–2007	4.2	5.4	nd	5.0	4.8	8.6	5.9
2008–2030	4.2	2.8	nd	3.3	2.7	4.7	3.8
Australian Capital Territory							
1972–2007	6.9	6.4	nd	6.5	2.4	nd	2.8
2008–2030	3.6	3.0	nd	3.2	1.9	nd	2.2

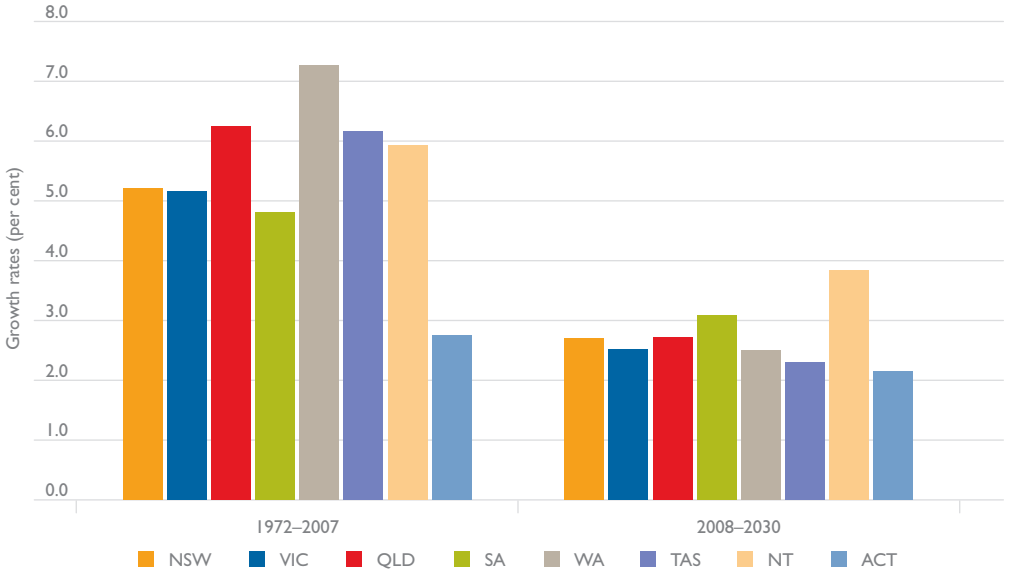
Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
nd: Not determined.
Source: Tables 2.4 to 2.11.

Between 1972 and 2007, the average annual growth rates of the 'rest of state' road freight task estimates among the five mainland states and territories show that Western Australia had the highest growth (7.9 per cent per annum) compared to other states and territories. On the other hand, South Australia (3.4 per cent per annum) had the lowest 'rest of state' road freight growth. In the forecast period (2008–30), the growth pattern changes somewhat. Among the

five mainland states, 'rest of state' road freight growth is expected to be higher in Queensland, South Australia and Western Australia (2.2 to 2.4 per cent per annum) between 2008 and 2030.

The average annual growth rate of total road freight (sum of all components, i.e. 'total state') from 1972 to 2007 was much higher for Western Australia compared to other states and territories. However, the fastest future growth rate is forecast to be in South Australia and the Northern Territory (although the future freight task will be very small) between 2008 and 2030 (Table 2.12 and Figure 2.5).

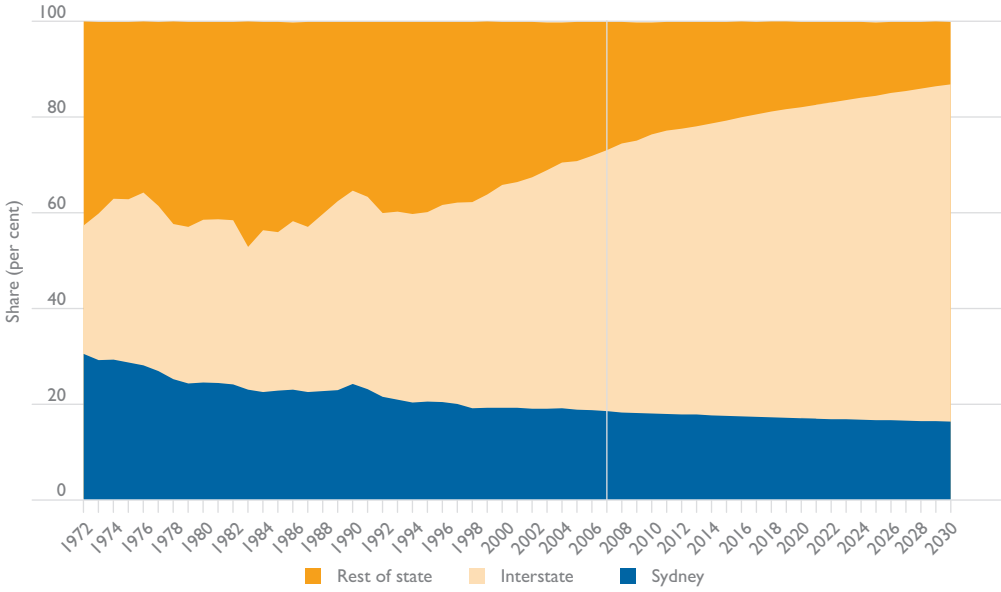
F2.5 Comparison of average annual growth rates (per cent) of total road freight (sum of all components, i.e. 'total state') estimates (1972–2007) and forecasts (2008–30) between states and territories



Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
Source: Table 2.12 (last column).

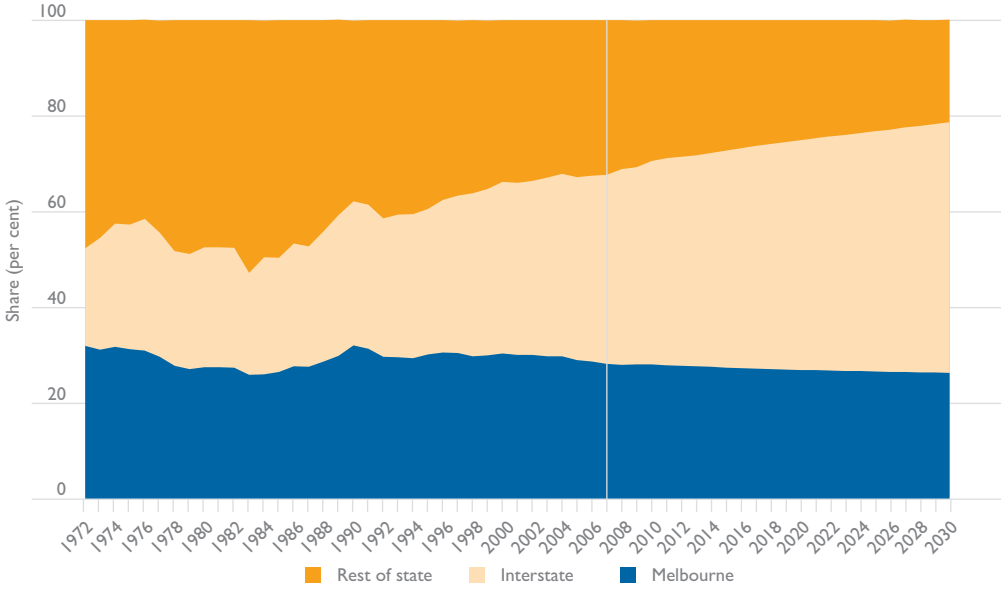
Figure 2.6 to Figure 2.13 show the interstate, capital city and rest of state road freight proportions of 'total state' road freight for each state and territory between 1972 and 2030. Generally, the interstate road freight proportion is forecast to grow positively in each state and territory from 2008 to 2030, while the rest of state road freight proportion is forecast to decline.

F2.6 Road freight share (per cent), New South Wales, 1972–2030



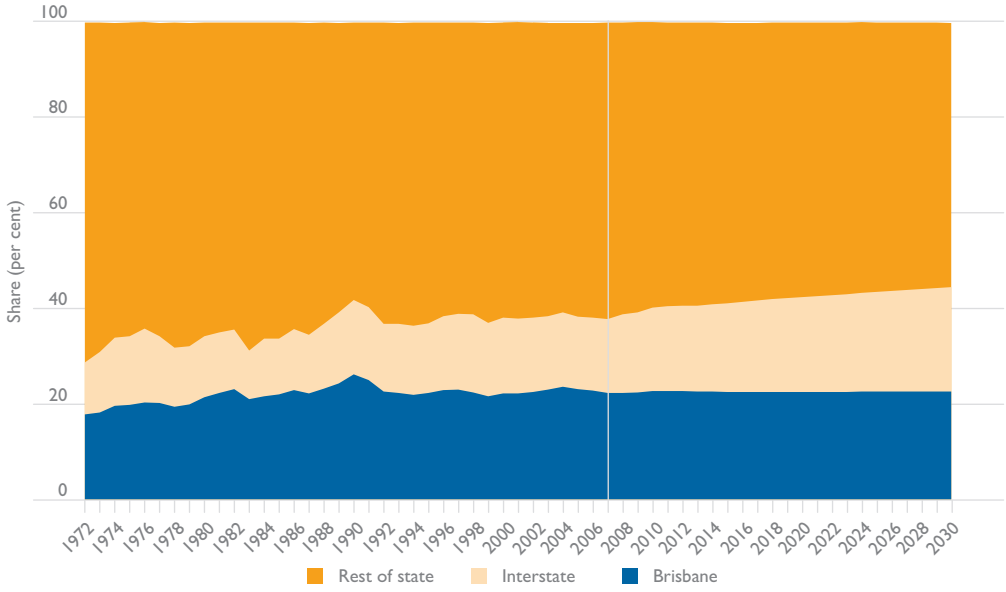
Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
Source: Table 2.4.

F2.7 Road freight share (per cent), Victoria, 1972–2030



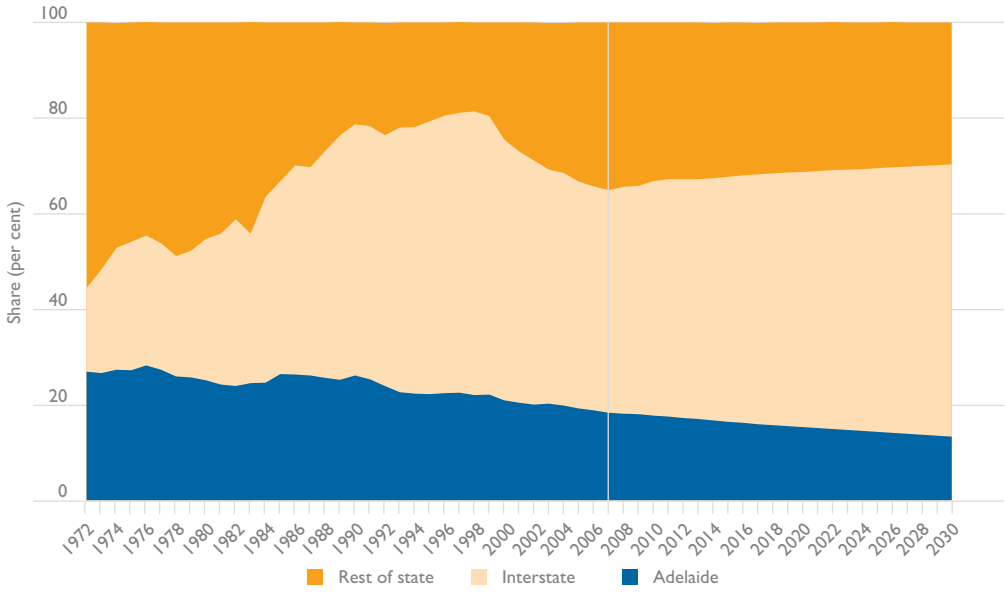
Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
Source: Table 2.5.

F2.8 Road freight share (per cent), Queensland, 1972–2030



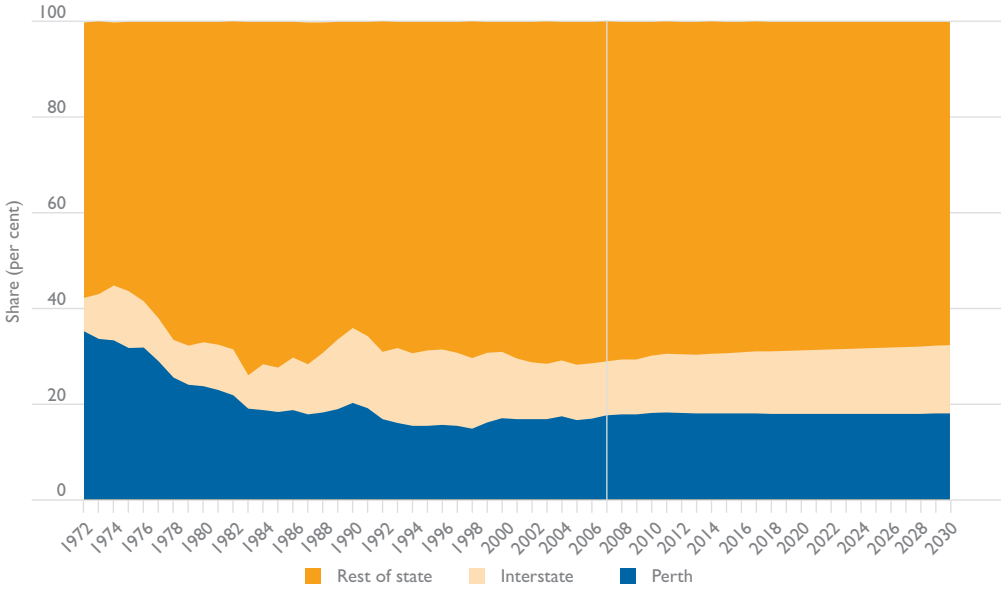
Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
Source: Table 2.6.

F2.9 Road freight share (per cent), South Australia, 1972–2030



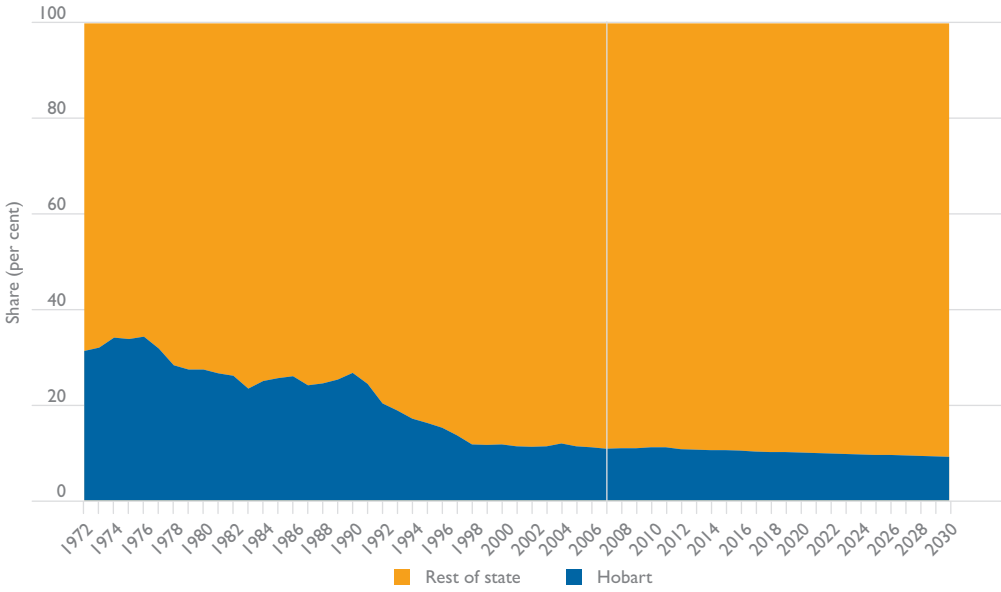
Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
Source: Table 2.7.

F2.10 Road freight share (per cent), Western Australia, 1972–2030



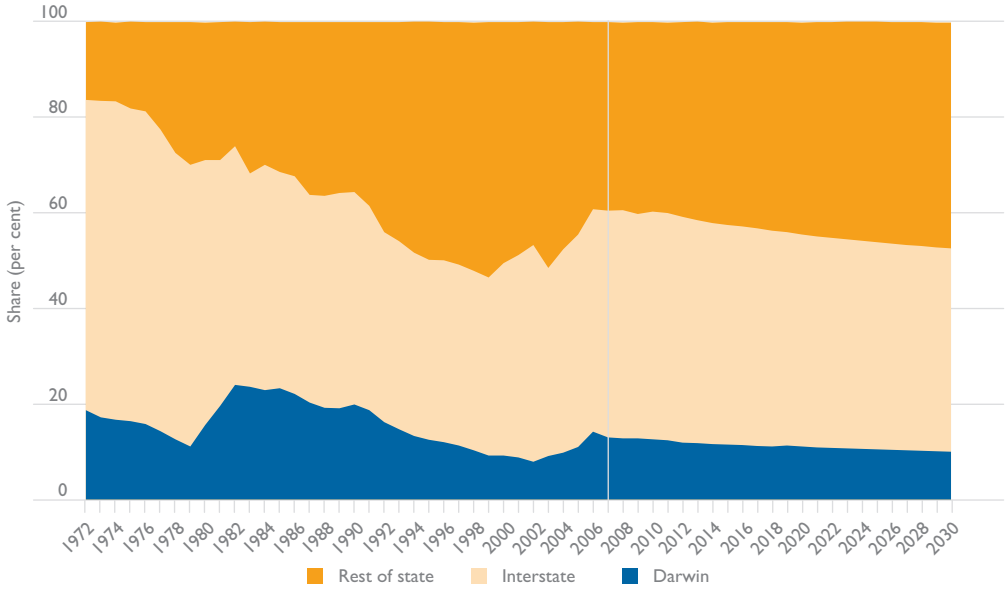
Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
Source: Table 2.8.

F2.11 Road freight share (per cent), Tasmania, 1972–2030



Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.
Note: No interstate data.
Source: Table 2.9.

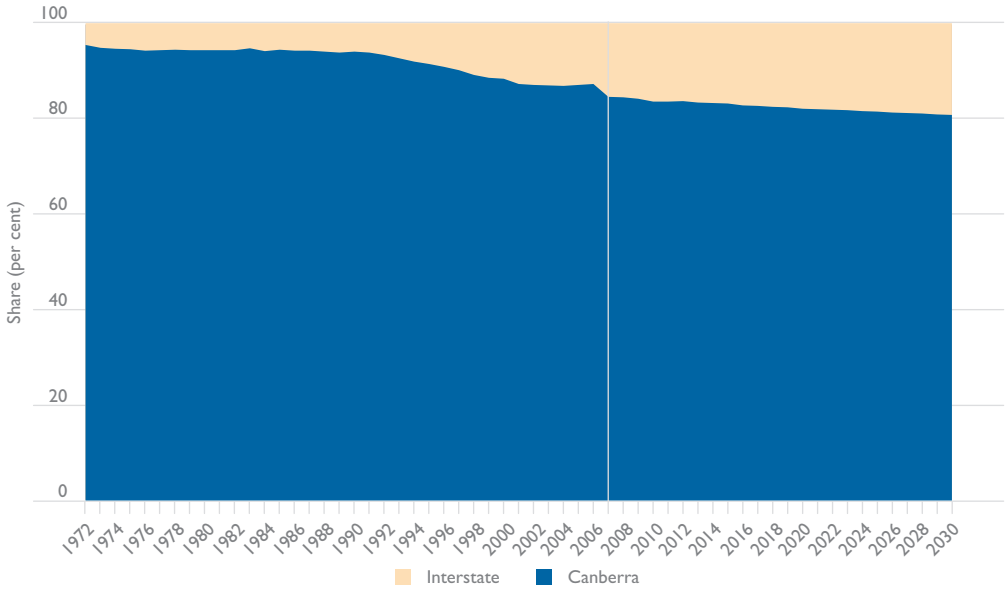
F2.12 Road freight share (per cent), Northern Territory, 1972–2030



Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Source: Table 2.10.

F2.13 Road freight share (per cent), Australian Capital Territory, 1972–2030



Note: From 1972 to 2007, estimates; while from 2008–30, forecasts.

Note: No 'rest of state' data.

Source: Table 2.11.

CHAPTER 3

Estimating interstate road freight, 1972–2007

Summary

A methodology for estimating interstate road freight movement over the period 1972 to 2007, based on origin–destination (OD) matrix, is reported.

The origin–destination (OD) matrices derived for multiple years from 1972 to 2007, allow for logical control over the definition of interstate freight. These new OD matrix based estimates allow, for the first time, estimates of the interstate freight task performed on each state's roads. Moreover, it is possible to derive detailed estimates of interstate road freight flows within states/territories, incorporating interstate 'from', 'to', and 'through' estimates.

Using the OD matrix basis, rough annual updates of the OD matrix can be derived from each new ABS Survey of Motor Vehicle Use (SMVU). In addition, the time series estimates can be used as the basis for forecasting the matrix into the future, and thus generating forecasts of the volume of interstate freight on states' roads which are presented in the next chapter (Chapter 4).

3.1 Background

Road is the predominant interstate non-bulk freight transport mode in Australia and also represents a vital link in various logistics chains for other modes. This is because road freight transport is most suitable for short distances as well as the cheapest for tonne per kilometre, most accessible, can provide door-to-door service, and affordable to small businesses and to small volumes of freight.

In 2007, modal share of the interstate freight task in tonne–kilometre (tkm) is estimated at 67 per cent by road, 26 per cent rail and 7 per cent coastal shipping (BITRE 2010, p.19). However, the total interstate road freight task in Australia is forecast to grow more than double over the next twenty-three years, from 70.4 billion tkm in 2008 to 159.1 billion tkm in 2030 (BITRE 2010, p.18). In a recent study, BITRE also reported that light and heavy vehicle traffic will grow for next 25 years on the interstate and rest of state corridors (BITRE 2009c).

Previously the interstate road freight task was estimated from 1971–72 to 2005–06 (Gargett and Hossain 2008). This chapter extends the estimates of interstate road freight data from

1971–72 to 2006–07 and presents the processes followed to estimate origin–destination (OD) matrices as was done earlier (see Gargett et al 2006). The interest in this chapter is focussed on interstate road freight. Readers interested in all modes (road, rail and coastal shipping) interstate freight can consult BITRE Report 120, *Interstate freight in Australia* (BITRE 2010).

Firstly, this chapter provides a brief overview of methodology available in the literature for estimating the freight task (Section 3.2). Then it provides a short account on the past estimates of interstate road freight movements in Australia based on origin–destination (OD) matrices (Section 3.3). Data problems in each estimate are examined in Section 3.4. Section 3.5 gives the 'final origin–destination-based interstate road freight flow estimates'.

3.2 Methodologies for estimating freight tasks: a brief overview of previous studies

The methods applied in the field of freight transport modelling have been, up to recent times, largely inspired from those designed for and used in passenger transport modelling. However, despite efforts in recent years, freight demand modelling is still less advanced than passenger demand modelling approaches. This is because freight research is extremely complex and heterogeneous because of the diverse nature of vehicles, the different types of commodities, and the multiple modes of transport, etc. (Ogden 1992). Furthermore, lack of reliable data is a crucial problem in most freight studies. Data for freight movement has lagged behind significantly in terms of both availability and quality compared with data for personal trips (Spasovic et al 1999). Hwang (2005) listed several reasons for modelling freight. These are:

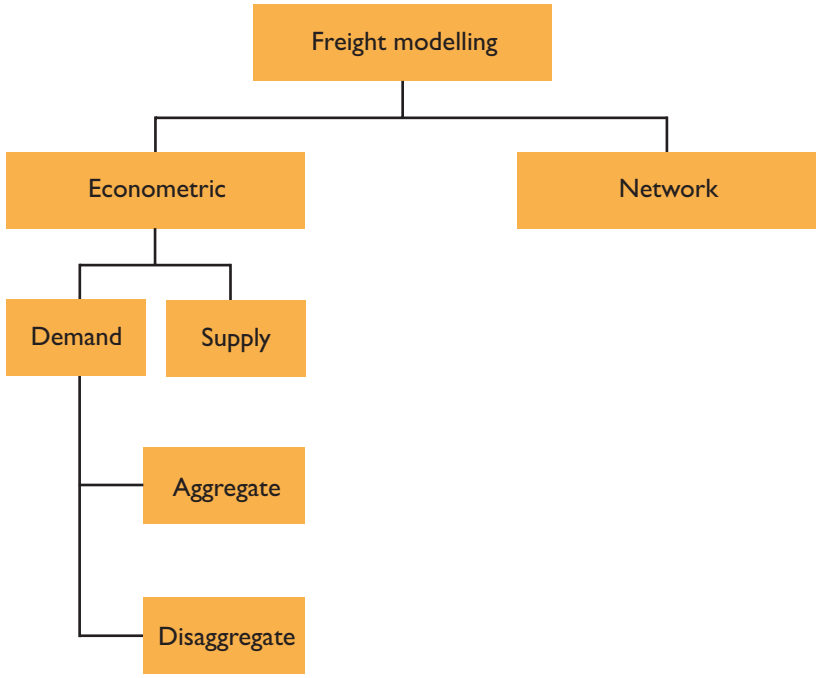
- growth in freight transportation activity
- patterns of merchandise trade and economic growth potential
- volumes of traffic
- markets served by different modes of transportation and intermodal combinations
- safety aspect
- energy usage and environmental impact
- effects on national economic system
- impact on policies of different areas.

Freight transport models may be classified by their geographic scope and the degree of complexity with which they consider drivers of demand. There are several different types of 'freight model', each suited to a different group of applications, and none of which are suitable for all. Reviews over recent years have been oriented towards either national or urban transport planning (Pendyala et al 2000, Southworth 2002 and WSP 2003).

In recent years, specific models have been developed to address the modelling of the freight transportation system. Strong et al (1996) divided freight mode split models into econometric models and network-based models. They define economic models as those that attempt to identify and analyse cause-and-effect and correlative relationships between freight demand and various factors and network models as those that apply and optimisation rule to an objective function, governed by a system of equations with an appropriate set of data, in order to predict the distribution of freight traffic at some point in the future.

An illustrative typology of some of the major categories of 'freight models' available in the literature is shown in Figure 3.1.

F3.1 Typology of freight models



Source: Redrawn from Hwang (2005).

Freight demand models are one of the key components of transportation planning at the strategic, tactical and operational levels. Depending on the nature of the data employed, the microeconomic (also called econometric) models of freight demand have been classified into two broad categories—aggregate freight demand modelling and disaggregate freight demand modelling (Winston 1983). In the aggregate models, data consist of total flows by mode at the regional or national level, while in the disaggregate models the data consists of information relating to individual shipments.

The great majority of freight demand models applied in practice have been of the aggregate demand kind (see Van Es 1982, Friesz et al 1983 and Harker 1985). Ortuzar and Willumsen (2006) outlined aggregate freight demand modelling approach involving:

- estimation of freight generations and attractions by zone
- distribution of general volumes of satisfy 'trip-end' generation and attraction constraints using either liner programming or gravity model, and
- assignment of origin–destination (OD) movements to modes and routes.

Perry and Gargett (1998) made the first aggregate estimates and forecasts of interstate freight in Australia. However, this estimates have been updated and published by the then BTRE (see BTRE 2006, Chapter 5).

On the other hand, disaggregate approaches have been developed for acquisition models (urban trip-chaining) for light goods vehicle movements (Russo and Comi 2003). Several theoretical and empirical disaggregate models of freight transport demand have been suggested in the literature since the late 1970s. But disaggregate data has a number of advantages over aggregate data for the analysis of the behaviour of individual decision-makers (e.g. Winston 1983). Disaggregated models are, however, better-rooted on individual behaviour but aggregate models can be more useful in the context of large-scale (regional or national) analyses of freight flows if the objective is forecasting or policy analysis (Anas 1981).

In Australia, Gargett and Cregan (2005) developed a road freight tonne-kilometres time series from 1971 to 2003 by using a 'disaggregation correction' framework. This was done due to data problems (details are discussed in Section 3.4) associated with the Survey of Motor Vehicle Use (SMVU). Subsequently, Gargett et al (2006) used disaggregate methodology for estimating interstate road freight tasks in Australia which was based on 56 state-to-state origin–destination (OD) matrices. Later this disaggregate methodology was expanded to separate interstate road freight tasks into 'from', 'to' and 'through' the states/territories (Gargett and Hossain 2008).

Freight forecasting models can be generated by various methods. In reviewing the freight modelling approaches, Beavis et al (2005) identified several categories, which include general equilibrium, time series, commodity based, zonal truck trip or extrapolations.

3.3 Past interstate origin–destination (OD) road freight matrices in Australia

This section provides an overview of four past estimates of interstate road freight movements in Australia based on origin–destinations (ODs). These are included in the following Bureau of Transport Economics (BTE) and the Australian Bureau of Statistics (ABS) publications, based on various freight movement surveys:

1. BTE Estimates of Australian interregional freight movements, 1971–72 (Commonwealth of Australia 1976).
2. Interstate Freight Movement, Australia; 1980–81, based on the 1980–81 Interstate Freight Movement Survey (IFMS) (ABS 1982).
3. Experimental Estimates of Freight Movements, based on the 1994–95 Freight Movements Survey (FMS 1994–95) (ABS 1996).
4. Freight Movements, Australia, based on the 2000–01 Freight Movements Survey (FMS 2000–01) (ABS 2002).

3.3.1 BTE Estimates of Australian Interregional Freight Movements, 1971–72

This publication sets out Bureau of Transport Economics (BTE) estimates of the directions and magnitudes of the longer-distance freight movements undertaken in Australia by the various transport modes. Interregional freight estimates were made for 1971–72. These estimates were the first of their kind ever compiled on an Australia-wide basis. However, road freight estimates were subject to more error than for other modes (i.e. rail, sea and air).

During the estimation of interregional freight movements (that is, Estimates of Australian Interregional Freight Movements, 1971–72), an experimental method was used to derive the interstate road freight matrix. This might have overestimated road freight flows, but the data have not been adjusted. The Survey of Motor Vehicle Use (SMVU) raw data is presented in Appendix A (Table A.1). The figures should be used as indicators of the relative level of movements between various regions, rather than as absolute measures of movements.

3.3.2 ABS Interstate Freight Movement Survey, 1980–81

This ABS survey, which was conducted during 1980–81, generated statistics on interstate freight movements by road, rail, sea and air within Australia. This survey was based on the 'Interstate Freight Movement Survey' (IFMS) for the year ended June 1981 (i.e. financial year). The survey was 'business-based' (i.e. statistics were compiled from data provided by a sample of transport operators and other private and government-owned organisations involved in moving freight by road within Australia).

Interstate road freight movements were collected by means of a census of approximately 16 000 enterprises. The scope of the IFMS included enterprise units undertaking 20 000 tonnes or more of interstate road freight movements in a year, either by hire and reward under prime contract arrangements or on their own account. Freight moved under subcontract arrangements was excluded. Data produced by the IFMS included tonnage data for capital cities and some more specific areas by origin and destination.

Despite these limitations and problems associated with the survey framework, the IFMS 1980–81, was one of the best and reliable surveys of interstate freight movement. Therefore, no adjustment has been made to the estimates. The data is presented in Appendix A (Table A.1).

3.3.3 ABS Experimental Estimates of Freight Movements, 1994–95

This ABS publication provided statistics on tonnes of freight moved in Australia based on the Freight Movements Survey of 1994–95 (FMS 1994–95). This survey collected freight movements by commodity group, mode (including road, rail, sea, and air), weight and origin–destination.

Prime contract movements undertaken by businesses which were the registered owners of rigid and articulated trucks with a gross vehicle mass or gross combination mass of 3.5 tonnes or more, respectively, were included in the survey. Moreover, the survey was done on operators rather than trucks. Freight moved under subcontractual arrangements was attempted to be excluded as it was covered under the prime contract. However, some freight moved under these arrangements was reported.

Estimates from the FMS 1994–95 were labelled experimental because initial results raised concerns over their quality and the underlying methodology of the road component. Watson and Greig (2002) listed several major limitations, including:

- coverage of the survey framework
- the small sample size relative to the population size leading to estimates with large relative standard errors (RSEs)
- the use of subquarterly (two weeks in the middle of the quarter) reporting periods to represent the quarter, and
- some freight moved under subcontractual arrangements was included, although subcontractors were not supposed to report it.

3.3.4 ABS Freight Movements Survey, 2000–01

This ABS publication presents results from the Freight Movements Survey of 2000–01 (FMS 2000–01) and provides estimates of freight moved by road, rail, sea and air for the period 1 April 2000 to 31 March 2001. A sample of approximately 14 000 articulated vehicles (almost a quarter of the Australian total) was selected to report over 26 fortnightly periods within the reference year.

The statistics for the road component of the collection were based on a sample survey of articulated vehicles (with gross vehicle/combination mass of 4.5 tonnes or more) that were registered with a motor vehicle registry (i.e. the road component of the survey is 'vehicle-based'). Rigid trucks and other commercial vehicles were excluded from the scope of the survey.

The statistics related to goods transported via road by all industries and sectors of the Australian economy whether they were carried by transport operators (hire and reward) or moved by ancillary operators (i.e. manufacturers, retailers, wholesalers, etc, moving goods on their own account). Goods moved by vehicles belonging to the defence forces and by pipeline were excluded from the survey. Freight carried under subcontractual arrangements was included as there was no danger of double counting since the vehicles themselves were the selection units.

Watson and Greig (2002) discussed the road freight movements of the FMS 2000–01, including investigation conducted, subsequent development of the survey and operational experiences encountered by the ABS in conducting the survey.

3.4 Road freight data problems

Since the introduction of SMVU by the ABS in early 1970s, the ABS has used a limited concept of the interstate road freight task. This interstate road freight task is defined as the amount of tonne-kilometres done by other states' trucks on a state's road.

From 1971 to 1995, the SMVU was conducted every three to five years. Since 1998, it has been conducted annually. Because there is no overlap between the samples selected in consecutive years, it has not been specifically designed to measure the change between years. Moreover, this major methodological adjustment in 1998 complicates the use of the data in computing growth rates in road freight. Thus, the ABS warns that 'Caution must be used when using the SMVU to measure change'.

Given the importance of growth in Australian road freight, and to overcome the problem of methodological adjustment that complicates the use of the data in computing growth rates,

the BTRE has recently completed a major exercise in adjusting past SMVU freight data to make it comparable to the current SMVU methodology (BTRE 2006). This exercise detailed the adjustments for road freight time series for Australia for constructing a standardised time series out of the disjointed and non-comparable data from different years' surveys. The method of standardisation is termed 'disaggregation correction'. It was first used in an earlier paper by BTRE authors (e.g. Cosgrove and Mitchell 2001). Details of the disaggregation correction can be found in BTRE (2006).

To overcome the problem of the ABS definition of interstate road freight task, it is necessary to derive a more logical and acceptable definition. The amount of freight task (in terms of tonne-kilometres) by all states' trucks on a state's road is essentially linked to origin–destination (OD) matrices. Therefore, BITRE had to rely on a range of exercises based on anecdotal experience to correct interstate freight flows. The exercises are:

1. factor up or down the level of interstate freight task,
2. amend the pattern of the SMVU freight data and base table, and
3. interpolate interstate freight data.

Based on these exercises, a detailed methodology for estimating interstate road freight task (in terms of tonne-kilometres) over the period 1972 to 2007 has been given in Appendix B. However, previous attempts to estimates road freight tasks between 1971 and 2003 for each state and territory in Australia was reported earlier (see Gargett et al 2006), based on adjusted national aggregates from the ABS SMVU (Gargett and Cregan 2005).

In addition, data for interstate road freight movements (in terms of kilotonnes) by origin–destination (OD) routes are presented in Appendix C. The estimated tonnage data is derived by dividing tonne–kilometre (tkm) data (see Appendix B, Table B.8) with OD route specific distance (see Table C.1)

3.5 Final origin–destination (OD) based interstate road freight flow estimates

3.5.1 States and territories

Interstate road freight tasks provide estimates of the amount of different types of interstate freight carried on each state and territory's roads (except Tasmania, where interstate road freight is assumed to be all by sea. These estimates were calculated to include 'from', 'to' and 'through' road freight movements and the results are presented in Table 3.1 to Table 3.4.

Different states and territories showed different patterns. For example, share of interstate 'from' road freight gradually decreased in Victoria and Western Australia and to some extent in the Northern Territory which was captured by interstate 'to' road freight share. It is interesting to note that interstate 'through' road freight share remained relatively stable in all states and territories, except South Australia during 1990 to 2007 (which showed a sharp decrease when single and continuous voyage permits shifted East–West road traffic to coastal shipping).

T3.1 Final interstate road freight estimates ('from', 'to', 'through' and 'total') (million tkm), New South Wales and Victoria, 1972–2007

Year	New South Wales				Victoria			
	From	To	Through	Total	From	To	Through	Total
1972	1 053	1 060	633	2 747	750	536	74	1 360
1973	1 302	1 297	754	3 353	905	666	89	1 660
1974	1 533	1 513	865	3 912	1 048	787	102	1 937
1975	1 641	1 611	916	4 168	1 114	842	109	2 065
1976	1 854	1 806	1 014	4 675	1 234	955	117	2 305
1977	1 959	1 900	1 063	4 922	1 297	1 009	122	2 428
1978	1 991	1 930	1 078	4 999	1 315	1 026	124	2 466
1979	2 196	2 117	1 176	5 488	1 437	1 134	135	2 706
1980	2 483	2 379	1 313	6 176	1 607	1 286	151	3 045
1981	2 679	2 556	1 407	6 642	1 723	1 390	162	3 274
1982	2 873	2 729	1 500	7 103	1 834	1 492	173	3 499
1983	2 590	2 475	1 363	6 428	1 664	1 343	157	3 164
1984	3 200	3 023	1 658	7 880	2 017	1 666	191	3 873
1985	3 309	3 120	1 710	8 139	2 075	1 724	197	3 995
1986	3 711	3 477	1 907	9 095	2 301	1 937	219	4 457
1987	3 765	3 522	1 933	9 220	2 325	1 965	222	4 512
1988	4 240	3 939	2 166	10 346	2 588	2 216	248	5 052
1989	4 677	4 319	2 383	11 379	2 824	2 446	272	5 543
1990	4 922	4 530	2 505	11 957	2 951	2 575	286	5 811
1991	4 985	4 583	2 536	12 104	2 975	2 608	288	5 870
1992	5 056	4 640	2 573	12 268	3 004	2 642	292	5 939
1993	5 511	5 027	2 805	13 343	3 241	2 878	321	6 439
1994	5 876	5 340	2 987	14 202	3 421	3 074	336	6 831
1995	6 260	5 664	3 183	15 107	3 610	3 274	357	7 242
1996	6 920	6 232	3 513	16 666	3 938	3 635	383	7 955
1997	7 473	6 707	3 790	17 970	4 207	3 940	402	8 549
1998	8 047	7 197	4 080	19 324	4 484	4 256	422	9 163
1999	8 716	7 779	4 418	20 914	4 826	4 639	441	9 906
2000	9 346	8 399	4 756	22 501	5 149	5 029	462	10 639
2001	9 650	8 712	4 922	23 284	5 305	5 226	470	11 001
2002	10 249	9 222	5 232	24 703	5 604	5 567	488	11 659
2003	10 937	9 812	5 596	26 344	5 949	5 961	511	12 420
2004	11 589	10 368	5 946	27 903	6 270	6 330	535	13 136
2005	12 194	10 885	6 277	29 356	6 567	6 673	560	13 800
2006	12 827	11 485	6 639	30 951	6 879	7 059	586	14 524
2007	13 716	12 238	7 126	33 080	7 312	7 569	617	15 498

Source: BITRE estimates.

T3.2 Final interstate road freight estimates ('from', 'to', 'through' and 'total') (million tkm), Queensland and South Australia, 1972–2007

Year	Queensland				South Australia			
	From	To	Through	Total	From	To	Through	Total
1972	159	278	0	437	191	167	127	484
1973	201	330	0	531	237	210	178	625
1974	240	377	0	617	281	250	234	765
1975	258	399	0	657	302	267	264	833
1976	295	442	0	737	334	295	219	848
1977	313	462	0	776	354	311	242	906
1978	319	469	0	788	360	316	248	925
1979	355	509	0	864	398	352	293	1 043
1980	406	564	0	971	452	403	361	1 216
1981	441	602	0	1 043	489	438	412	1 339
1982	476	638	0	1 115	527	473	462	1 462
1983	425	585	0	1 010	484	422	376	1 282
1984	536	700	0	1 236	623	533	529	1 685
1985	556	721	0	1 277	663	553	546	1 763
1986	630	796	0	1 426	777	636	645	2 057
1987	640	805	0	1 446	812	654	637	2 102
1988	729	893	0	1 622	962	758	755	2 474
1989	812	973	0	1 785	1 117	859	861	2 837
1990	859	1 017	0	1 876	1 227	925	901	3 053
1991	871	1 029	0	1 900	1 278	949	868	3 095
1992	884	1 041	0	1 925	1 349	982	863	3 195
1993	971	1 122	0	2 093	1 588	1 115	999	3 702
1994	1 042	1 189	0	2 232	1 724	1 204	982	3 910
1995	1 117	1 258	0	2 375	1 935	1 321	1 035	4 291
1996	1 248	1 380	0	2 628	2 131	1 465	1 003	4 599
1997	1 359	1 482	0	2 841	2 282	1 582	940	4 803
1998	1 476	1 587	0	3 063	2 443	1 705	881	5 029
1999	1 613	1 712	0	3 326	2 487	1 798	833	5 118
2000	1 746	1 842	0	3 587	2 354	2 070	777	5 201
2001	1 811	1 907	0	3 718	2 227	2 221	724	5 172
2002	1 936	2 017	0	3 953	2 312	2 311	709	5 332
2003	2 023	2 080	0	4 103	2 353	2 254	702	5 309
2004	2 158	2 197	0	4 356	2 493	2 392	741	5 626
2005	2 284	2 306	0	4 590	2 645	2 541	800	5 986
2006	2 419	2 430	0	4 849	2 639	2 831	833	6 303
2007	2 607	2 590	0	5 197	2 806	3 005	863	6 673

Source: BITRE estimates.

T3.3 Final interstate road freight estimates ('from', 'to', 'through' and 'total') (million tkm), Western Australia and Northern Territory, 1972–2007

Year	Western Australia				Northern Territory			
	From	To	Through	Total	From	To	Through	Total
1972	84	91	0	174	73	102	0	174
1973	114	140	0	254	84	119	0	202
1974	142	197	0	339	94	134	0	227
1975	149	233	0	382	98	140	0	239
1976	124	199	0	323	108	155	0	262
1977	127	229	0	355	112	161	0	273
1978	130	235	0	366	113	163	0	276
1979	152	282	0	434	122	176	0	297
1980	186	353	0	539	134	193	0	327
1981	210	405	0	616	142	205	0	346
1982	236	460	0	696	149	216	0	365
1983	199	382	0	581	138	199	0	337
1984	282	565	0	846	163	235	0	398
1985	298	603	0	900	167	241	0	408
1986	360	746	0	1 106	183	264	0	447
1987	370	769	0	1 138	185	267	0	452
1988	451	958	0	1 409	204	293	0	497
1989	532	1 149	0	1 681	222	317	0	538
1990	581	1 265	0	1 846	232	330	0	561
1991	587	1 282	0	1 869	234	333	0	567
1992	612	1 346	0	1 958	237	337	0	574
1993	736	1 652	0	2 388	255	360	0	615
1994	772	1 727	0	2 499	270	380	0	650
1995	860	1 944	0	2 803	285	400	0	685
1996	902	2 022	0	2 924	313	435	0	748
1997	920	2 041	0	2 961	337	465	0	802
1998	943	2 072	0	3 016	362	496	0	858
1999	918	1 964	0	2 882	392	532	0	924
2000	1 203	1 552	0	2 755	422	568	0	990
2001	1 371	1 243	0	2 614	437	586	0	1 023
2002	1 360	1 225	0	2 585	463	618	0	1 082
2003	1 372	1 229	0	2 600	256	526	0	782
2004	1 452	1 301	0	2 754	269	553	0	822
2005	1 565	1 406	0	2 971	281	578	0	859
2006	1 906	1 225	0	3 131	294	605	0	899
2007	1 989	1 279	0	3 269	311	640	0	951

Source: BITRE estimates.

T3.4 Final interstate road freight estimates ('from', 'to', 'through' and 'total') (million tkm), Australian Capital Territory and Australia, 1972–2007

Year	Australian Capital Territory				Australia			
	From	To	Through	Total	From	To	Through	Total
1972	1	4	0	5	2 310	2 238	833	5 382
1973	1	5	0	6	2 844	2 766	1 020	6 631
1974	1	5	0	7	3 338	3 263	1 202	7 803
1975	1	6	0	7	3 564	3 497	1 289	8 350
1976	2	6	0	8	3 951	3 858	1 350	9 159
1977	2	7	0	8	4 163	4 078	1 427	9 669
1978	2	7	0	8	4 231	4 146	1 451	9 828
1979	2	7	0	9	4 661	4 576	1 603	10 841
1980	2	8	0	10	5 271	5 186	1 825	12 282
1981	2	8	0	11	5 687	5 604	1 980	13 271
1982	2	9	0	11	6 098	6 018	2 134	14 251
1983	2	8	0	10	5 503	5 414	1 896	12 813
1984	3	10	0	12	6 822	6 731	2 378	15 931
1985	3	10	0	13	7 070	6 971	2 453	16 494
1986	3	11	0	14	7 966	7 866	2 770	18 602
1987	3	11	0	14	8 101	7 993	2 791	18 884
1988	3	12	0	16	9 179	9 069	3 169	21 416
1989	4	13	0	17	10 188	10 076	3 516	23 780
1990	4	14	0	18	10 775	10 655	3 692	25 123
1991	4	14	0	18	10 934	10 797	3 692	25 424
1992	4	14	0	18	11 146	11 002	3 728	25 877
1993	4	15	0	20	12 307	12 169	4 125	28 601
1994	4	16	0	21	13 109	12 931	4 305	30 345
1995	5	17	0	22	14 072	13 878	4 575	32 525
1996	5	19	0	24	15 458	15 188	4 899	35 545
1997	6	20	0	26	16 584	16 236	5 132	37 953
1998	6	22	0	28	17 761	17 336	5 384	40 480
1999	7	23	0	30	18 959	18 449	5 692	43 100
2000	7	25	0	32	20 226	19 485	5 995	45 705
2001	7	26	0	33	20 808	19 922	6 115	46 844
2002	8	27	0	35	21 932	20 988	6 430	49 349
2003	8	29	0	37	22 898	21 891	6 808	51 597
2004	9	31	0	39	24 241	23 173	7 222	54 636
2005	9	32	0	41	25 545	24 421	7 637	57 603
2006	9	34	0	43	26 974	25 667	8 058	60 700
2007	10	36	0	46	28 752	27 356	8 606	64 715

Source: BITRE estimates.

Table 3.5 presents the average annual growth rates for the total interstate road freight tasks as well as 'from', 'to' and 'through' between 1972 and 2007. Irrespective of states and territories, most of the interstate road freight movements occurred 'from' and 'to' (except Tasmania, where interstate road freight is assumed to be all by sea). However, interstate road freight grew faster in Western Australia (8.7 per cent per annum) and slower in the Northern Territory (5.0 per cent per annum) during 1972 to 2007 (the latter's road traffic being cut following the opening of the Alice Spring to Darwin rail link).

T3.5 Average annual growth rates (per cent) of estimated interstate ('from', 'to' and 'through') road freight tasks, 1972– 2007

States/ territories	Interstate road freight growth rate (per cent)			
	From	To	Through	Total
NSW	7.6	7.2	7.2	7.4
VIC	6.7	7.9	6.3	7.2
QLD	8.3	6.6	0.0	7.3
SA	8.0	8.6	5.6	7.8
WA	9.5	7.9	nd	8.7
NT	4.2	5.4	nd	5.0
ACT	6.9	6.4	nd	6.5
Australia	7.5	7.4	6.9	7.4

nd: not determined due to either no data or too small.

Source: Table 3.1 to Table 3.4.

3.5.2 National level

Once all the component tasks for each cell of one year's OD matrix are sorted by 'from', 'to' and 'through', and are cumulated, national interstate road freight task is produced. It gives an estimate of the amount of interstate freight being carried on each state's roads.

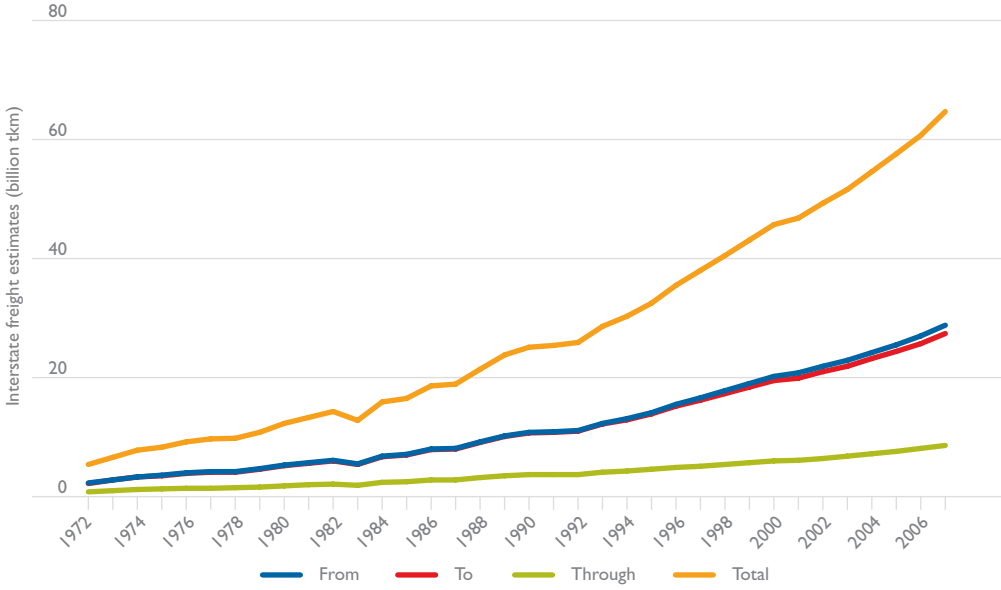
Figure 3.2 shows the trends in total interstate as well as component of 'from', 'to' and 'through' road freight estimates from 1972 to 2007. Data underlying this figure is given in Table 3.4.

In 1972, the total 'from' interstate road freight estimate in Australia was 2.3 billion tonne-kilometres (tkm) and this increased an estimated to 28.8 billion tkm in 2007. Similarly, the total 'to' interstate road freight tasks was 2.24 billion tkm in 1972, and it increased to 27.4 billion tkm in 2007. On the other hand, total 'through' interstate road freight estimate was 0.8 billion tkm in 1972, and it increased to 8.6 billion tkm in 2007. Thus, the total road freight estimate at national level (i.e. sum of all three components of interstate road freight) was 5.4 billion tkm in 1972 and 64.7 billion tkm in 2007. Two plateaus, in early 1980s and 1990s, are due to economic slowdowns during those two periods (Figure 3.2).

In Australia, interstate 'from' and interstate 'to' estimates grew at very similar growth rates (7.5 per cent and 7.4 per cent per annum between 1972 and 2007, respectively), while interstate 'through' estimate grew at a slower rate (6.9 per cent per annum between 1972 and 2007) (Table 3.5).

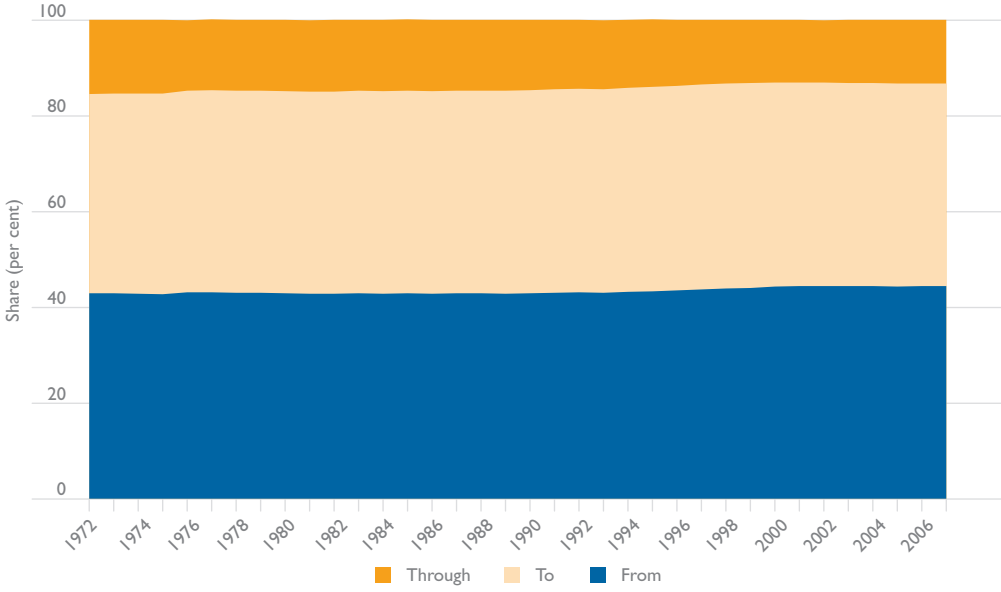
Between 1972 and 2007, the proportions of 'from' interstate road freight and 'to' interstate road freight increased slightly, which was mirrored in a reduced share of 'through' interstate road freight (Figure 3.3).

F3.2 Interstate road freight estimates ('from', 'to', 'through' and 'total'), Australia, 1972–2007



Source: Table 3.4 (where data presented as million tkm).

F3.3 Interstate 'from', 'to' and 'through 'road freight proportions, Australia, 1972–2007



Source: Table 3.4.

CHAPTER 4

Interstate road freight forecast, 2008–30

Summary

This chapter provides interstate road freight forecasts, which are 'business-as-usual' forecasts, between 2008 and 2030 by OD route, by state and territory, as well as at the national level.

Several key findings in this chapter include:

Interstate road freight tasks on some of the routes will grow faster than other routes.

Generally, interstate road freight task is forecast to continued to be dominated by 'from' and 'to' components rather than 'through' in all states and territories.

The average annual growth rates of 'from' interstate road freight tasks are expected to be higher than 'to' interstate road freight in some states and territories.

Although the global financial crisis will dampen total interstate road freight growth during the early years of forecast period, it is forecast to increase at an average annual growth rate of 3.8 per cent from 2008 to 2030. However, some routes will grow faster than other routes over the next 22 years.

Although there will be an increase in interstate road freight movements, there are several possibilities for radical changes from assumed future conditions, the main ones being markedly lower or higher economic activity in the country, and/or marked changes in the mode share patterns.

4.1 Background

An updated methodology for deriving estimates of the interstate road freight task in tonne-kilometres between 1972 and 2007 was described in Chapter 2. This chapter provides interstate road freight forecasts (tonne-kilometres) from 2008 to 2030. The chapter is organised as follows:

- methodology for forecasting interstate road freight by origin–destination (OD) route.
- interstate road freight forecasts by OD routes
- interstate road freight forecasts by states and territories.

Finally, this chapter includes a summary of the main findings.

4.2 Methodology for forecasting interstate road freight by origin–destination (OD) route

The methodology for forecasting interstate road freight between 2008 and 2030 was defined in a BITRE report entitled: 'Interstate freight in Australia' (BITRE 2010). In this section, the method is described briefly.

The forecasts were made using regression analysis. Regressions were done on total (all modes) interstate freight flows (tonnes) for each of the 56 origin–destination (OD) routes (see BITRE 2010). Previous BITRE research (see Soames et al 2007) outlined how road, rail and coastal shipping data were estimated for each OD route. For the all-modes OD regression analyses, non-farm national Gross Domestic Product (GDP) and change in GDP (see Appendix D, Table D.1) were the major explanators. Minor variables were a dummy for 1979 to 1988 and some route-specific dummies.

The assumptions about future GDP growth were drawn by the BITRE from the 2009 Treasury Budget (2007–08 to 2016–17), Access Economics April 2009 (2017–18 to 2019–20) and Treasury's long-term projections (2020–21 to 2029–30). The assumed rates of economic growth taper off over the years.

Two changes have been made to the route forecasts. Firstly, after 2010, the maximum income elasticity[1] has been set to 1.9. Some of the origin–destination (OD) routes (i.e. QLD–NSW, QLD–VIC, VIC–SA, WA–QLD, SA–WA and WA–SA routes) have huge elasticities (more than 2.0) and unless these OD routes are constrained, they result in unreliable forecasts. For example, QLD–VIC route has an income elasticity of 2.816 (see Table 4.2). After 2010, this has been set to 1.90 in deriving the route forecasts. This assumes that the anomalous outliers will converge on more normal growth rates. If the origin–destination elasticities were not constrained, the resulting summed interstate freight forecast would be 10 per cent higher, and no longer agree with a model using the aggregate interstate freight task itself (which has proven robust in the past).

Secondly, the raw forecasts coming out of the regression equations have been progressively reduced in volume over the years to match an assumed 'saturation effect' in per person non-bulk freight in Australia. Figure 4.1 shows that per person non-bulk freight is assumed to proceed toward saturation by about 2050.

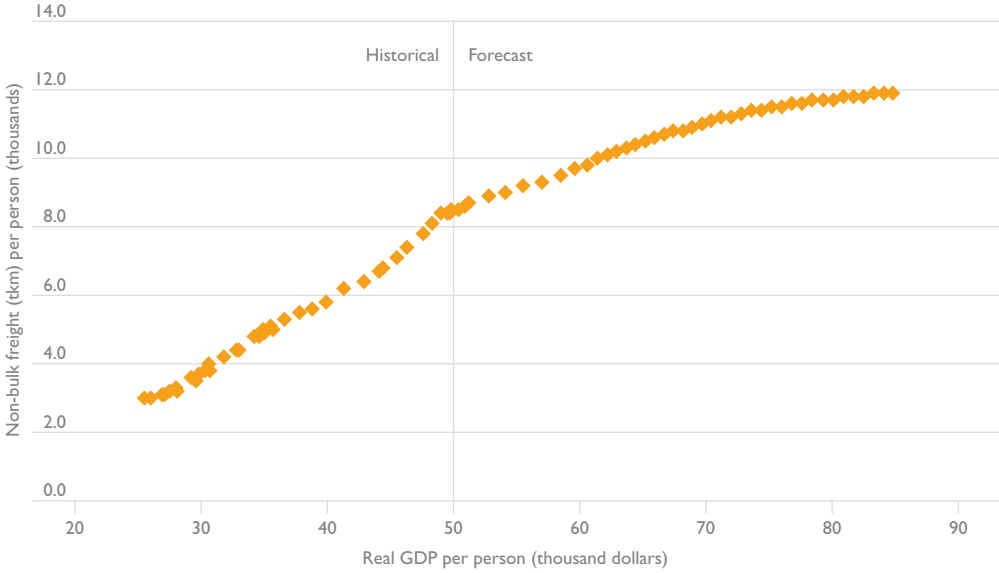
In 2030, at the end of the forecast period for this report, there is assumed to have been a substantial shallowing of the curve. Table 4.1 gives the correction factors that, when applied to the unconstrained freight forecasts (all modes interstate), give freight forecasts that conform to this shallowing trend.

Two sets of forecasting equations were derived for total (all transport modes, i.e. road, rail and coastal shipping) freight flows (in tonnes). First, forecasting equations were derived on 48 individual OD routes and these are presented in Table 4.2.

Secondly, sets of forecasting equations were derived on eight OD routes from and to eastern states (NSW, VIC, QLD and SA) and Western Australia and these are presented in Table 4.3.

1 'Responsiveness to'. That is, an income elasticity for freight of 2.0 would imply that a 10 per cent increase in income would produce a 20 per cent increase in freight moved.

F4.1 Relationship of per capita non-bulk freight to per capita income between 1972 and 2050



Source: BITRE estimates.

T4.1 Correction factors

Year	Correction factor
2008	1.000
2009	1.002
2010	1.010
2011	1.007
2012	0.998
2013	0.982
2014	0.968
2015	0.953
2016	0.941
2017	0.931
2018	0.921
2019	0.913
2020	0.905
2021	0.898
2022	0.890
2023	0.881
2024	0.872
2025	0.862
2026	0.853
2027	0.844
2028	0.834
2029	0.824
2030	0.815

Source: BITRE estimates.

T4.2 Equations for the log of all modes tonnages for 48 individual origin–destination (OD) routes.

Route	Years	Constant	GDP	Change GDP	Dummy 1979–88	Dummy 2	Dummy 2 defined as:
NSW–VIC	72–07	–12.530	1.605	0.007	–0.036		
VIC–NSW	72–07	–14.028	1.716	–0.003	0.041	–0.071	99–02=1.0; 03–07=1.5
NSW–QLD	72–07	–17.206	1.925	–0.003	0.044	–0.068	00–01=1.0; 03–07=1.5
QLD–NSW	72–07	–21.425	2.225	–0.009	0.078	–0.088	99–02=1.0; 03–04=1.5; 05–07=2.0
NSW–SA	72–96	–19.375	1.994	0.005	–0.021		
	97–07	–3.698	0.839	–0.005		0.019	06–07=1.0
SA–NSW	72–96	–15.494	1.694	0.000	0.079		
	97–07	–7.649	1.105	–0.004		0.017	07=1.0
NSW–ACT	72–00	–9.624	1.252	0.019	–0.106		
	01–07	–11.656	1.413	–0.009			
ACT–NSW	72–00	–23.554	2.202	–0.009	0.085		
	01–07	–16.454	1.674	–0.005			
NSW–NT	72–88	20.312	–1.293	0.010	–0.095		
	89–07	1.177	0.158	0.026			
NT–NSW	72–07	–3.374	0.401	0.014	–0.163		
NSW–TAS	72–07	Set to 40					
TAS–NSW	72–07	Set to 100					
VIC–QLD	72–07	–12.821	1.503	0.007	–0.112	0.102	07=1.0
QLD–VIC	72–07	–30.895	2.816	0.003	–0.045	–0.050	03–07=1.0
VIC–SA	72–07	–20.539	2.138	–0.004	0.037	–0.092	03–07=1.0
SA–VIC	72–07	–18.202	1.968	0.004	0.022	–0.012	03–07=1.0
VIC–ACT	72–07	14.671	–0.762	–0.001	0.082		
ACT–VIC	72–07	–14.778	1.388	–0.006	0.185		
VIC–NT	72–07	Set to 14					
NT–VIC	72–07	14.236	–0.954	0.015	–0.636	0.872	01–07=1.0
VIC–TAS	72–07	3.049	0.276	0.042	–0.479	0.651	00–02=0.3; 03=0.4; 04=0.65; 05–07=0.8
TAS–VIC	72–07	–14.379	1.595	0.016	–0.106	0.052	04–07=1.0
QLD–SA	72–89	–28.001	2.508	0.012	–0.086		
	90–07	–15.713	1.595	–0.013			
SA–QLD	72–90	–15.738	1.626	0.006	0.040		
	91–07	–3.999	0.747	0.022			
QLD–ACT	72–07	Set to 0					
ACT–QLD	72–07	Set to 0					
QLD–NT	72–07	–16.433	1.597	–0.002	0.054	–0.167	85–95=1.0; 03–07=1.0
NT–QLD	72–07	–10.420	1.138	–0.010	0.084	–0.202	00–04=1.0; 05–07=2.0
QLD–TAS	72–07	Set to 6					
TAS–QLD	72–07	Set to 10					
SA–ACT	72–07	Set to 0					
ACT–SA	72–07	Set to 0					
SA–NT	72–07	–13.576	1.454	0.013	–0.062		
NT–SA	72–07	–18.940	1.820	0.010	–0.074	–1.505	03–05=0.2; 06–07=.0.5
SA–TAS	72–07	Set to 0					
TAS–SA	72–07	Set to 10					
WA–ACT	72–07	Set to 0					
ACT–WA	72–07	Set to 0					
WA–NT	72–07	–16.405	1.550	0.013	0.000		
NT–WA	72–07	–10.995	1.127	–0.015	–0.170	0.790	98=0.5; 04=1.0
WA–TAS	72–07	Set to 8					
TAS–WA	72–07	Set to 50					
ACT–NT	72–07	Set to 0					
NT–ACT	72–07	Set to 0					
ACT–TAS	72–07	Set to 0					
TAS–ACT	72–07	Set to 0					
NT–TAS	72–07	Set to 0					
TAS–NT	72–07	Set to 0					

T4.3 Equations for the log of all modes tonnages for eastern states (NSW, VIC, QLD and SA) to Western Australia individual origin–destination (OD) routes.

Route	Years	Constant	GDP	Change GDP	Dummy 1979–88	Dummy 2	Dummy 2 defined as:
NSW–WA	72–94	–14.875	1.598	0.019	–0.074		
	95–07	–2.640	0.698	–0.010		–0.092	99–07=1.0
WA–NSW	72–07	–12.989	1.387	0.009	–0.252	0.338	03–07=1.0
VIC–WA	72–91	–10.043	1.251	0.019	–0.133		
	92–07	–11.924	1.386	0.000			
WA–VIC	72–07	–10.727	1.222	–0.002	–0.221	0.470	03–07=1.0
QLD–WA	72–07	–14.955	1.436	0.044	–0.555	0.536	93=0.25; 94=0.5; 95=0.75; 96–06=1.0; 07=1.25
WA–QLD	72–07	–29.681	2.561	0.005	–0.740	–0.132	00–07=1.0
SA–WA	72–07	–27.453	2.582	–0.005	–0.221	–0.833	99=0.3; 00=0.6; 01–04=0.9; 05=1.2; 06–07=1.5
WA–SA	72–07	–27.372	2.495	0.010	–0.144	–0.029	97=0.25; 98=0.5; 99–01=0.75; 02–05=1.0; 06–07=1.5

After deriving forecasts for each of the 56 OD routes, these all modes interstate freight forecasts were separated into mode forecasts using 'business-as-usual' transport mode share trends for each OD route (see Appendix E, Table E.1).

The separated interstate road freight forecast results and the average annual growth rates for each OD route as well as total all routes are presented in Table 4.4.

4.3 Interstate road freight forecast by OD routes

Generally, due to different levels of responsiveness to economic activity, some routes are forecast to grow faster than other routes during the 22 years from 2008 to 2030. Interstate road freight tasks on several OD routes are forecast to grow at a moderate rate (4.0–5.0 per cent per year) (Table 4.4). However, interstate road freight on some of the OD routes is projected to grow faster than other routes. For example, interstate road freight tasks on the NT–SA route is expected to grow more than 6.0 per cent per year during 2008 to 2030. On the other hand, interstate road freight tasks on the NT–NSW and NSW–WA OD routes are forecast to grow less than 2.0 per cent. Interstate road freight tasks on the NSW–NT, VIC–NT, NT–VIC and VIC–ACT as well as other OD routes with very small traffic are forecast to grow negatively (Table 4.4). However, these forecast growth rates are expected to be slower than the historical growth rates (e.g. 1972–2007) (see Appendix B, Table B.8). The aggregate interstate road freight forecast for all OD routes (i.e. total Australia) is forecast to grow at 3.8 per cent per year between 2008 and 2030.

T4.4 Interstate road freight forecast (million tkm) by OD routes, 1972–2007

Year	NSW–VIC	VIC–NSW	NSW–QLD	QLD–NSW	NSW–SA	SA–NSW	VIC–SA	SA–VIC	NSW–NT	NT–NSW	VIC–NT	NT–VIC	QLD–NT	NT–QLD	SA–NT	NT–SA	NSW–ACT	ACT–NSW	VIC–QLD	QLD–VIC	VIC–ACT	ACT–VIC
2008	9 966	9 520	8 824	8 032	2 183	2 401	3 803	3 737	109	40	29	13	634	330	631	249	733	209	4 418	5 671	37	55
2009	9 900	9 684	9 050	8 370	2 268	2 460	3 900	3 748	101	39	29	13	645	343	610	251	762	209	4 340	5 679	37	56
2010	10 300	9 922	9 388	8 676	2 339	2 520	4 036	3 911	105	40	30	13	664	348	633	269	778	216	4 468	5 832	36	58
2011	10 840	10 258	9 856	9 102	2 406	2 585	4 227	4 142	109	41	29	13	690	353	665	291	796	227	4 647	6 061	36	59
2012	11 564	10 764	10 529	9 708	2 486	2 672	4 501	4 466	112	42	29	12	727	362	706	321	824	242	4 893	6 403	34	61
2013	12 145	11 265	11 209	10 283	2 565	2 756	4 760	4 756	111	42	29	12	761	372	733	347	857	254	5 070	6 717	33	64
2014	12 774	11 805	11 950	10 907	2 651	2 847	5 040	5 072	110	42	28	11	799	384	762	375	893	268	5 260	7 055	31	66
2015	13 420	12 358	12 726	11 556	2 736	2 938	5 332	5 402	109	42	28	10	837	395	791	405	929	281	5 451	7 402	30	69
2016	14 151	12 982	13 601	12 288	2 833	3 042	5 660	5 776	109	42	28	10	881	408	824	439	970	297	5 669	7 794	29	72
2017	14 933	13 649	14 548	13 078	2 935	3 153	6 014	6 180	108	43	27	9	927	422	859	476	1 014	313	5 901	8 212	27	75
2018	15 533	14 237	15 409	13 763	3 038	3 257	6 319	6 513	106	42	27	9	968	436	880	507	1 058	326	6 056	8 556	27	78
2019	16 100	14 744	16 196	14 390	3 131	3 347	6 596	6 825	104	42	27	9	1 005	449	900	537	1 096	339	6 196	8 854	26	81
2020	16 628	15 195	16 931	14 971	3 218	3 430	6 851	7 117	103	42	27	8	1 038	459	918	567	1 130	350	6 319	9 117	25	83
2021	17 195	15 643	17 681	15 569	3 306	3 512	7 112	7 424	102	42	26	8	1 072	469	940	599	1 162	362	6 452	9 383	24	85
2022	17 772	16 080	18 436	16 171	3 390	3 591	7 375	7 739	102	42	26	8	1 105	478	962	633	1 193	374	6 585	9 645	24	88
2023	18 301	16 483	19 166	16 743	3 469	3 664	7 623	8 036	101	42	26	7	1 137	487	980	666	1 222	385	6 696	9 880	23	90
2024	18 846	16 877	19 906	17 323	3 545	3 734	7 874	8 342	101	42	26	7	1 168	495	1 000	700	1 251	396	6 809	10 113	22	92
2025	19 402	17 277	20 668	17 919	3 622	3 804	8 132	8 658	100	42	25	7	1 200	503	1 019	736	1 279	408	6 922	10 348	22	94
2026	19 968	17 679	21 452	18 528	3 698	3 875	8 394	8 983	99	42	25	7	1 232	511	1 038	773	1 308	419	7 033	10 584	21	96
2027	20 516	18 076	22 244	19 136	3 777	3 946	8 655	9 303	98	42	25	7	1 264	519	1 056	810	1 337	431	7 134	10 811	21	98
2028	21 078	18 462	23 042	19 748	3 851	4 014	8 917	9 631	98	42	24	6	1 296	527	1 075	848	1 365	442	7 237	11 033	20	100
2029	21 648	18 849	23 859	20 374	3 926	4 082	9 184	9 968	97	42	24	6	1 328	534	1 093	888	1 393	454	7 338	11 254	19	102
2030	22 236	19 245	24 709	21 021	4 002	4 152	9 461	10 317	96	41	24	6	1 361	542	1 112	930	1 422	466	7 440	11 480	19	104
Average annual growth rates (per cent)																						
	3.7	3.3	4.8	4.5	2.8	2.5	4.2	4.7	–0.6	0.1	–0.9	–3.6	3.5	2.3	2.6	6.2	3.1	3.7	2.4	3.3	–3.0	3.0

(continued)

T4.4 Interstate road freight forecast (million tkm) by OD routes, 1972–2007 (continued)

Year	QLD–SA	SA–QLD	WA–NT	NT–WA	NSW–WA	WA–NSW	VIC–WA	WA–VIC	QLD–WA	WA–QLD	SA–WA	WA–SA	QLD–ACT	ACT–QLD	SA–ACT	ACT–SA	WA–ACT	ACT–WA	ACT–NT	NT–ACT	Total Australia
2008	1 029	852	474	212	465	906	570	322	383	400	1 284	1 900	1	1	1	1	4	4	5	5	70 446
2009	1 090	861	462	224	482	891	576	327	339	402	1 327	1 877	1	1	1	1	4	4	5	5	71 375
2010	1 118	904	482	227	486	924	593	335	364	417	1 375	1 945	1	1	1	1	4	4	5	5	73 771
2011	1 153	955	510	229	488	967	613	345	398	437	1 442	2 040	1	1	1	1	4	4	5	5	77 033
2012	1 204	1 011	546	232	491	1 024	641	358	441	466	1 538	2 175	1	1	1	1	4	4	5	5	81 609
2013	1 269	1 034	571	239	496	1 064	666	369	459	493	1 628	2 303	1	1	1	1	4	4	5	5	85 756
2014	1 340	1 060	598	246	503	1 107	693	382	479	523	1 727	2 443	1	1	1	1	4	4	4	4	90 252
2015	1 413	1 084	626	253	509	1 151	720	394	499	554	1 829	2 587	1	1	1	1	4	4	4	4	94 890
2016	1 495	1 113	658	262	517	1 200	752	409	522	589	1 945	2 751	1	1	1	1	4	4	4	4	100 137
2017	1 584	1 144	692	271	525	1 253	785	424	546	627	2 069	2 927	1	1	1	1	4	4	4	4	105 770
2018	1 677	1 153	714	281	535	1 290	813	437	549	660	2 177	3 079	1	1	1	1	4	4	4	4	110 531
2019	1 759	1 167	736	289	543	1 325	838	449	557	690	2 276	3 219	1	1	1	1	4	4	4	4	114 861
2020	1 834	1 182	757	296	550	1 357	861	459	565	717	2 367	3 348	1	1	1	1	4	4	4	4	118 841
2021	1 908	1 203	780	303	556	1 393	884	470	578	746	2 461	3 481	1	1	1	1	4	4	4	4	122 952
2022	1 979	1 226	803	309	561	1 429	907	480	594	774	2 556	3 615	1	1	1	1	4	4	4	4	127 071
2023	2 049	1 243	825	314	565	1 461	928	489	606	802	2 646	3 742	1	1	1	1	4	4	4	4	130 916
2024	2 118	1 263	847	319	568	1 493	949	498	620	829	2 737	3 871	1	1	1	1	4	4	4	4	134 800
2025	2 188	1 282	869	324	571	1 526	970	507	634	858	2 830	4 003	1	1	1	1	4	4	4	4	138 768
2026	2 260	1 301	892	329	574	1 560	991	516	649	886	2 926	4 138	1	1	1	1	4	4	4	4	142 807
2027	2 335	1 317	913	335	578	1 591	1 012	525	661	915	3 021	4 273	1	1	1	1	3	3	4	4	146 799
2028	2 407	1 336	936	340	580	1 623	1 032	534	675	944	3 117	4 409	1	1	1	1	3	3	4	4	150 808
2029	2 481	1 354	958	344	583	1 656	1 053	543	689	974	3 215	4 547	1	1	1	1	3	3	4	4	154 878
2030	2 557	1 372	981	349	585	1 689	1 074	551	703	1 005	3 316	4 691	1	1	1	1	3	3	4	4	159 078
Average annual growth rates (per cent)																					
	4.2	2.2	3.4	2.3	1.1	2.9	2.9	2.5	2.8	4.3	4.4	4.2	–0.9	–0.9	–0.9	–0.9	–0.9	–0.9	–0.9	–0.9	3.8

Source: BITRE estimates.

4.4 Interstate road freight forecasts by states and territories

Interstate road freight tasks provide estimates of the amount of different types of interstate freight being carried on each state's roads, which included 'from', 'to' and 'through' freight movements.

Table 4.5 shows the interstate (split by 'from', 'to' and 'through' as well as 'total') road freight forecasts (in million tkm) for each state and territory (except Tasmania, which is assumed to be done by coastal shipping) between 2008 and 2030.

The interstate road freight task is forecast to be dominated by 'from' and 'to' components rather than 'through' in all states and territories between 2008 and 2030. This forecast growth rate pattern is similar to the historical growth rate pattern (see Chapter 3, Table 3.4).

The average annual growth rates of 'from' interstate road freight tasks are expected to be higher in NSW, WA and NT than 'to' these state and territories. On the other hand, the average annual growth rates of 'from' interstate road freight tasks are expected to be lower in VIC and ACT than 'to' these state and territory. QLD and SA will have similar average annual growth rates between 'from' and 'to' components of interstate road freight tasks.

Overall, the total interstate road freight tasks are expected to grow at very similar rates in all states and territories (between 3.2 per cent and 4.1 per cent per annum).

T4.5 Interstate road freight forecasts (million tkm) by states and territories, 2008–30

Year	New South Wales				Victoria				Queensland				South Australia			
	From	To	Through	Total	From	To	Through	Total	From	To	Through	Total	From	To	Through	Total
2008	14 411	13 301	8 437	36 149	7 933	8 315	637	16 885	2 989	2 762	0	5 751	3 006	3 144	996	7 146
2009	14 647	13 691	8 417	36 755	8 059	8 290	655	17 004	3 077	2 808	0	5 885	3 035	3 195	985	7 216
2010	15 184	14 112	8 667	37 963	8 285	8 617	674	17 576	3 178	2 907	0	6 085	3 152	3 309	1 017	7 478
2011	15 895	14 689	9 018	39 602	8 602	9 069	695	18 366	3 319	3 041	0	6 360	3 311	3 462	1 058	7 831
2012	16 879	15 516	9 514	41 908	9 067	9 690	721	19 478	3 521	3 228	0	6 749	3 531	3 675	1 112	8 319
2013	17 802	16 306	9 922	44 030	9 507	10 213	745	20 466	3 714	3 400	0	7 114	3 725	3 878	1 151	8 755
2014	18 804	17 163	10 363	46 329	9 983	10 781	771	21 535	3 924	3 587	0	7 511	3 935	4 099	1 193	9 228
2015	19 843	18 046	10 811	48 700	10 471	11 368	797	22 636	4 140	3 781	0	7 922	4 154	4 327	1 236	9 717
2016	21 017	19 044	11 320	51 381	11 023	12 030	827	23 880	4 385	4 001	0	8 386	4 401	4 585	1 285	10 272
2017	22 281	20 116	11 863	54 260	11 615	12 742	858	25 215	4 648	4 238	0	8 886	4 668	4 863	1 338	10 869
2018	23 386	21 052	12 283	56 721	12 122	13 307	887	26 317	4 877	4 444	0	9 320	4 887	5 107	1 376	11 370
2019	24 402	21 891	12 658	58 950	12 570	13 834	913	27 318	5 083	4 631	0	9 714	5 091	5 329	1 412	11 832
2020	25 348	22 657	12 991	60 996	12 973	14 324	937	28 234	5 272	4 806	0	10 078	5 281	5 536	1 445	12 262
2021	26 325	23 437	13 338	63 100	13 381	14 842	962	29 185	5 466	4 986	0	10 452	5 480	5 748	1 481	12 710
2022	27 307	24 213	13 683	65 203	13 784	15 368	986	30 138	5 659	5 167	0	10 826	5 682	5 961	1 518	13 161
2023	28 240	24 941	13 988	67 169	14 157	15 855	1 008	31 020	5 841	5 339	0	11 180	5 872	6 163	1 550	13 585
2024	29 184	25 671	14 294	69 149	14 527	16 356	1 030	31 913	6 024	5 513	0	11 537	6 066	6 367	1 583	14 015
2025	30 154	26 416	14 603	71 172	14 904	16 868	1 052	32 823	6 211	5 691	0	11 902	6 265	6 576	1 616	14 457
2026	31 145	27 173	14 912	73 230	15 285	17 390	1 073	33 748	6 402	5 874	0	12 276	6 468	6 789	1 650	14 908
2027	32 136	27 926	15 207	75 269	15 661	17 899	1 096	34 655	6 592	6 056	0	12 648	6 669	7 003	1 682	15 354
2028	33 135	28 676	15 500	77 311	16 032	18 419	1 117	35 568	6 781	6 240	0	13 021	6 873	7 217	1 715	15 805
2029	34 153	29 437	15 792	79 382	16 406	18 948	1 138	36 493	6 974	6 427	0	13 401	7 082	7 435	1 748	16 265
2030	35 207	30 221	16 090	81 519	16 791	19 494	1 160	37 445	7 173	6 622	0	13 794	7 298	7 660	1 782	16 740
Average annual growth rates (per cent)																
	4.1	3.8	3.0	3.8	3.5	3.9	2.8	3.7	4.1	4.1	0.0	4.1	4.1	4.1	2.7	3.9

(continued)

T4.5 Interstate road freight forecasts (million tkm) by states and territories, 2008–30 (continued)

Year	Western Australia				Northern Territory				Australian Capital Territory				Australia			
	From	To	Through	Total	From	To	Through	Total	From	To	Through	Total	From	To	Through	Total
2008	2 044	1 398	0	3 442	315	711	0	1 026	11	37	0	48	30 708	29 668	10 071	70 447
2009	2 017	1 427	0	3 444	322	699	0	1 022	11	39	0	50	31 169	30 150	10 057	71 376
2010	2 092	1 469	0	3 561	335	724	0	1 058	12	39	0	51	32 237	31 178	10 358	73 772
2011	2 194	1 523	0	3 717	350	756	0	1 106	12	40	0	52	33 683	32 580	10 771	77 034
2012	2 333	1 600	0	3 932	370	799	0	1 168	13	42	0	55	35 714	34 549	11 347	81 610
2013	2 450	1 668	0	4 119	388	830	0	1 218	14	43	0	57	37 600	36 339	11 818	85 758
2014	2 578	1 743	0	4 321	409	863	0	1 272	14	45	0	59	39 646	38 281	12 327	90 254
2015	2 709	1 820	0	4 528	430	897	0	1 327	15	47	0	62	41 762	40 285	12 845	94 892
2016	2 857	1 907	0	4 764	454	935	0	1 390	16	49	0	65	44 153	42 553	13 433	100 139
2017	3 016	2 001	0	5 017	481	977	0	1 457	17	51	0	68	46 724	44 989	14 060	105 772
2018	3 144	2 081	0	5 224	504	1 006	0	1 510	17	53	0	71	48 937	47 049	14 546	110 533
2019	3 262	2 153	0	5 415	526	1 033	0	1 559	18	55	0	73	50 952	48 927	14 983	114 862
2020	3 372	2 219	0	5 591	547	1 058	0	1 605	18	57	0	75	52 812	50 657	15 374	118 843
2021	3 487	2 287	0	5 775	569	1 086	0	1 655	19	58	0	78	54 727	52 445	15 782	122 954
2022	3 604	2 355	0	5 960	592	1 114	0	1 705	20	60	0	80	56 648	54 239	16 186	127 072
2023	3 712	2 419	0	6 131	613	1 138	0	1 752	20	61	0	82	58 455	55 917	16 546	130 918
2024	3 822	2 482	0	6 305	635	1 164	0	1 799	21	63	0	84	60 280	57 615	16 907	134 802
2025	3 935	2 547	0	6 482	658	1 189	0	1 847	21	64	0	86	62 149	59 351	17 271	138 770
2026	4 050	2 613	0	6 663	682	1 215	0	1 897	22	66	0	88	64 054	61 119	17 635	142 809
2027	4 162	2 678	0	6 840	706	1 239	0	1 945	23	67	0	90	65 948	62 868	17 985	146 801
2028	4 276	2 743	0	7 019	730	1 264	0	1 994	23	69	0	92	67 851	64 628	18 332	150 810
2029	4 392	2 809	0	7 201	755	1 290	0	2 044	24	70	0	94	69 786	66 415	18 679	154 880
2030	4 511	2 878	0	7 389	781	1 315	0	2 096	24	71	0	96	71 785	68 262	19 033	159 080
Average annual growth rates (per cent)																
	3.7	3.3	nd	3.5	4.2	2.8	nd	3.3	3.6	3.0	nd	3.2	3.9	3.9	2.9	3.8

Note: Due to rounding, 'Total Australia' in Table 4.5 slightly differs from Table 4.4.
Source: BITRE estimates.

Table 4.6 shows the proportions of the total interstate ('from', 'to', and 'through') road freight task forecast in Australia (i.e. sum of all states and territories) between 2008 and 2030. It appears that the proportion of 'from' and 'to' will increase slightly, while that of 'through' will decrease.

On average, each state's share of interstate road freight is expected to remain steady during forecast period, at around 51 per cent (NSW), 24 per cent (VIC), 9 per cent (QLD), 10 per cent (SA), 5 per cent (WA), 2 per cent (NT) and 0.1 per cent (ACT).

T4.6 Share (per cent) of interstate 'from', 'to' and 'through' road freight forecasts of total tasks, 2008–30

Year	Share (per cent)		
	From	To	Through
2008	43.6	42.1	14.3
2009	43.7	42.2	14.1
2010	43.7	42.3	14.0
2011	43.7	42.3	14.0
2012	43.8	42.3	13.9
2013	43.8	42.4	13.8
2014	43.9	42.4	13.7
2015	44.0	42.5	13.5
2016	44.1	42.5	13.4
2017	44.2	42.5	13.3
2018	44.3	42.6	13.2
2019	44.4	42.6	13.0
2020	44.4	42.6	12.9
2021	44.5	42.7	12.8
2022	44.6	42.7	12.7
2023	44.6	42.7	12.6
2024	44.7	42.7	12.5
2025	44.8	42.8	12.4
2026	44.9	42.8	12.3
2027	44.9	42.8	12.3
2028	45.0	42.9	12.2
2029	45.1	42.9	12.1
2030	45.1	42.9	12.0

Source: Table 4.5.

CHAPTER 5

Road freight estimates and forecasts: 'capital cities', 1972–2030

Summary

An aggregate model of the Australian 'metropolitan' road freight task was updated using data from 1972 to 2007; extending earlier estimates from 1971 to 2003 data (see BTRE 2006). The extended estimation showed a very good fit to actual data.

Between 1972 and 2007, the growth rate of 'capital city' road freight has been substantial and it increased at an average rate of 4.6 per cent per annum, from 7.93 billion tkm to 38.45 billion tkm. Among the states and territories, Brisbane had the highest growth and Canberra had the lowest growth during this period. 'Capital city' road freight grew faster in Melbourne than in Sydney since 1990.

Overall, total road freight task in all capital cities is forecast to increase by two-thirds between 2008 and 2030, from 40.15 billion tkm to 66.60 billion tkm, an average growth rate of 2.33 per cent per annum. Among individual capital cities, Brisbane, Darwin and Perth are forecast to more than double, while Adelaide is forecast to grow at a slower rate than other capital cities.

5.1 Background

The growing significance of urban freight transport and logistics is related to increased population and sustained economic growth in urban areas.

In Australia, all capital cities are projected to experience higher percentage growth in population than their respective state or territory balances, resulting in further concentration of nation's population within the capital cities. At 30 June 2007, 64 per cent of Australians lived in a capital city, while this proportion is projected to increase to 67 per cent by 2056 (ABS 2008a).

As the majority of the population in Australia lives in urban areas and the bulk of industrial production is despatched to these areas, the result is an increased demand for freight transport. Furthermore, as urban freight transport deals primarily with the distribution of goods at the end of the supply chain, many deliveries tend to be made in small loads and in frequent trips, thus resulting in many vehicle kilometres.

In Australia, between 1990 and 2000 capital city freight flows grew at 1.5 times the growth rate of the national economy and this growth of urban freight movement was largely carried by road transportation (BTRE 2003b).

This chapter provides the estimates of road freight tasks from 1972 to 2007 and forecasts from 2008 to 2030 by individual capital city as well as the total of all eight capital cities. It also provides capital city road freight estimates and forecasting modelling results.

5.2 Methodology: an aggregate model

The underlying methodology for estimating road freight tasks by capital cities is given in Appendix E.

The model is based on the estimation of road freight for the eight capital cities by aggregating the tonne-kilometre (tkm) freight tasks. This produced a total Australia capital city road freight task. The original urban road freight model was used by BITRE using data from 1971 to 2003 (see BTRE 2006, Chapter 3).

The model was re-run using road freight tkm data for the eight capital cities, extended time period from 1972 to 2007, and the results are presented in this section.

In this current exercise, two separate regressions were done. First one was from 1971 to 1997 which was regressed against real national-level GDP, real road freight rates and a dummy variable for 1990 onwards. The second regression was done from 1998 to 2007 which was regressed against GDP only.

The assumptions about future GDP growth were drawn by the BITRE from the 2009 Treasury Budget (2008–09 to 2016–17), Access Economics April 2009 (2017–18 to 2019–20) and Treasury's long-term projections (2020–21 to 2029–30). Freight rates were assumed to remain constant in real terms over the forecast period.

The aggregate model results are presented in Table 5.1, while ANOVA results are given in Table 5.2. The model results have been used to generate the capital city freight estimates annually from 1972 to 2007.

The regression equation for forecasting capital city road freight tasks was of the form:

log (aggregate capital city freight) = –6.317 + 1.217 * log(GDP) (Table 5.1).

The raw aggregate freight forecasts coming from the regression equation has been progressively reduced in volume over the years to match an assumed 'saturation effect' in per person non-bulk freight in Australia (see Chapter 4).

T5.1 Aggregate urban road freight model: Ordinary Least Squares parameter estimates

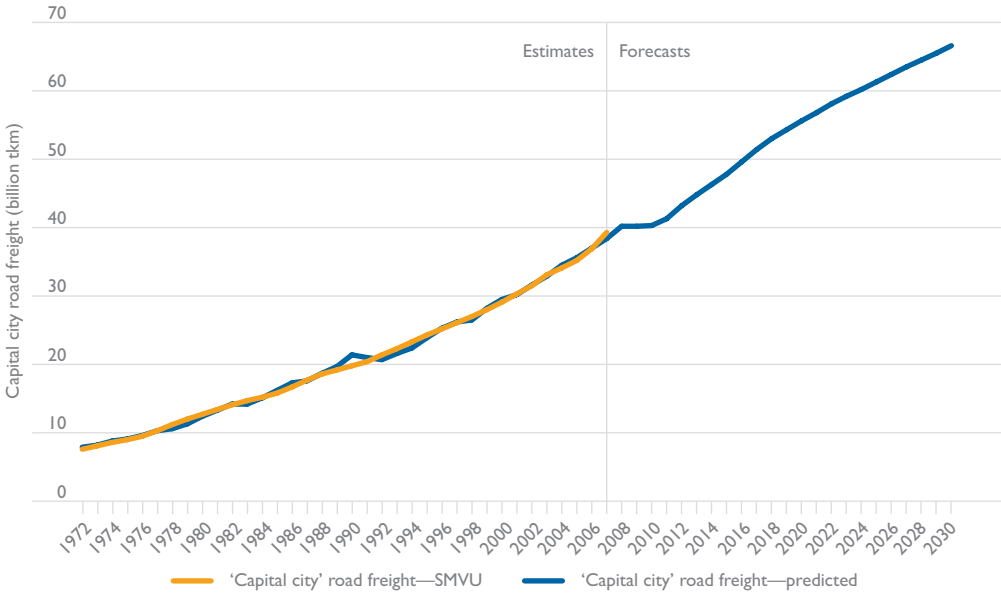
	Regression results			
	1971 to 1997		1998 to 2007	
		Standard errors		Standard errors
No. of observations	26		10	
R-squared	0.993		0.990	
Constant	–3.120	1.922	–6.317	0.606
GDP	1.053	0.134	1.217	0.044
Real freight rate	–0.658	0.107		
Dum90on	0.037	0.033		

T5.2 ANOVA for 'capital city' road freight forecasts

Year		df	SS	MS	F	Significance F
1972–1997	Regression	3	3.5219	1.1740	1015.9311	9.87509E-24
	Residual	22	0.0254	0.0012		
	Total	25	3.5474			
1998–2007	Regression	1	0.1339	0.1339	759.1642	3.24702E-09
	Residual	8	0.0014	0.0002		
	Total	9	0.1353			

Figure 5.1 shows the fit to the capital city aggregate model data between 1972 and 2007, as well as the projection to 2030.

F5.1 'Aggregate' model data and fit



Source: BITRE estimates.

After correction, the aggregate metropolitan forecast was separated into capital city freight forecasts using the share assumptions (see Appendix F, Table F.7) and the results are presented in Appendix F (see Table F.8).

5.3 'Capital city' road freight task estimates and forecasts, 1972–2030

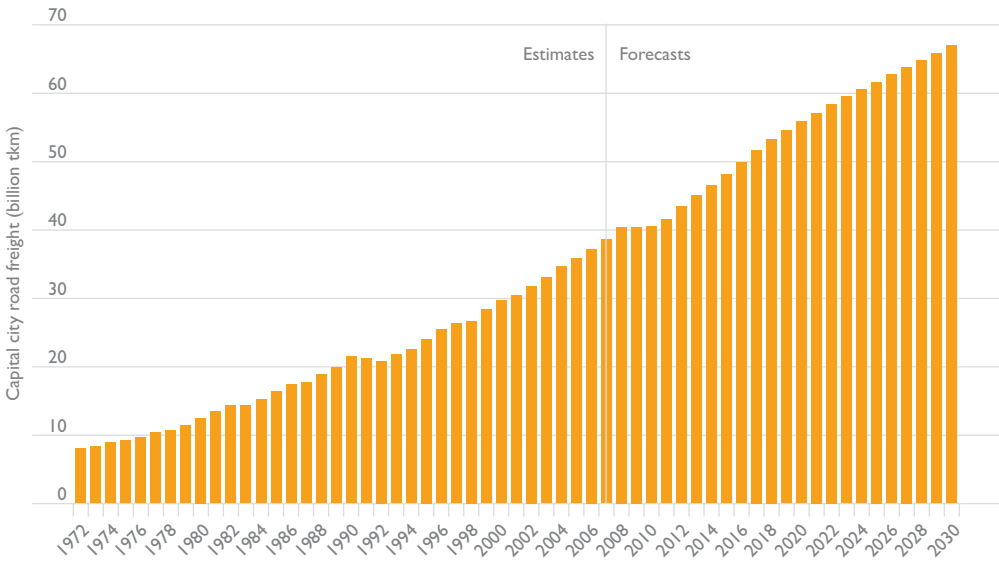
5.3.1 Total 'capital city' road freight tasks

Figure 5.2 shows the estimate and forecast of total 'capital city' freight tasks in Australia from 1972 to 2030. Data underlying this figure is given in Table 5.3.

Between 1972 and 2007, 'capital city' road freight in tonne-kilometres (tkm) increased from 7.93 billion tkm to 38.45 billion tkm, an average annual growth rate of 4.6 per cent. Due to recession during early 1990s, the growth was negative, but then it increased gradually up to 2007.

The aggregate road freight task for all capital cities is forecast to increase from 40.15 billion tkm in 2008 to 66.60 billion tkm in 2030 (Figure 5.2), an average annual growth rate of 4.6 per cent. Part of the explanation for this increase lies in increased population growth in the capital cities during the next two decades. In 2006, there were 13.16 million people (63.6 per cent of total Australia) living in all capital cities. This is expected to increase to 17.62 million people in 2026 (ABS 2008a). Thus, the projected population growth in capital cities is a key indicator of the expected increase in urban road freight tasks during next two decades.

F5.2 Total 'capital city' road freight estimates and forecasts, 1972–2030



Source: BITRE estimates.

But income growth is also a factor in the expected growth in 'capital city' road freight. Figure 4.2 shows a drop in the forecast road freight growth during 2008 and 2010. This growth pause is due to the global financial crisis. However, after 2010, the road freight tasks in all capital cities will continue to increase, as GDP growth resumes.

5.3.2 'Capital city' road freight estimates and forecast by individual capital city

Figures 5.3 and 5.4 show 'capital city' road freight estimates (1972–2007) and forecasts (2008–30), while data underlying these figures are presented in Table 5.3. Figure 5.5 presents average annual growth rates of 'capital city' road freight estimates and forecasts, while Table 4.4 data underlying Figure 5.5.

Among eight capital cities, road freight tasks were much higher in two major capital cities (i.e. Sydney and Melbourne), followed by Brisbane, Perth and Adelaide. On the other hand, road freight tasks were lowest in three small capital cities (i.e. Hobart, Darwin and Canberra). Since 1990, 'capital city' road freight grew faster in Melbourne than in Sydney.

Average annual growth rate of estimated road freight task by individual capital city from 1972 to 2007 shows that Brisbane had the highest growth (6.9 per cent per annum) compared to other states and territories (Figure 5.4 and Table 5.3). On the other hand, Canberra had the lowest growth (2.4 per cent per annum) in road freight task during this period.

As to individual capital cities, Sydney and Melbourne had similar estimates in 2008 (11.69 billion tkm and 11.70 billion tkm, respectively—see Table 4.3) and also will grow to 2030 at very similar rates (2.18 per cent per annum and 2.22 per cent per annum for Sydney and Melbourne respectively—see Figure 4.5). However, the fastest growth is expected to occur in Brisbane, from 7.80 billion tkm in 2008 to 14.26 billion tkm in 2030, an average annual growth rate of 2.8 per cent during this forecast period, while the lowest growth is expected to occur in Hobart (1.5 per cent per annum—see Figure 5.5).

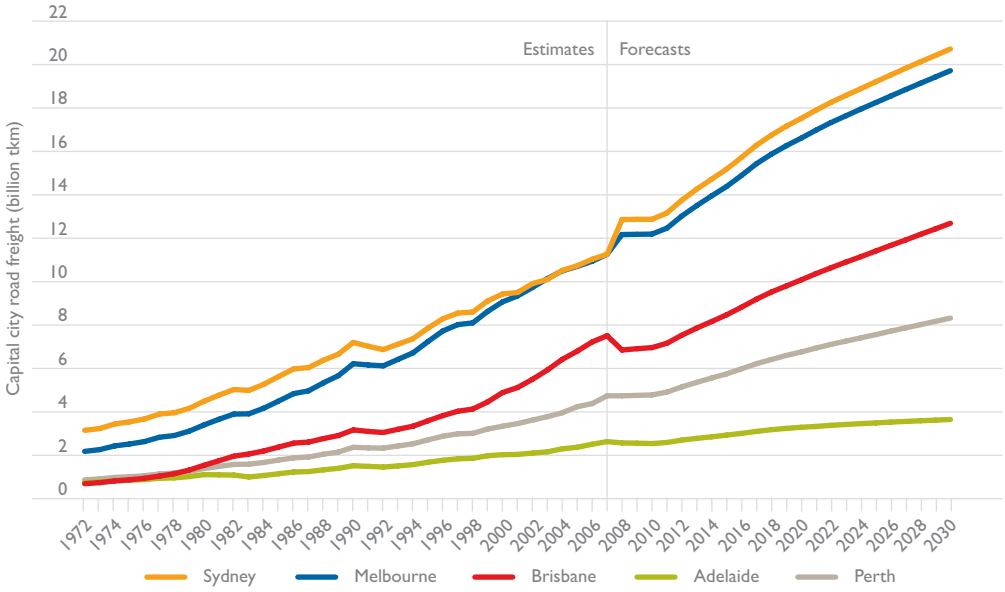
Between 2008 and 2030, the overall road freight task in all capital cities is forecast to increase by 1.7 times. However, Brisbane (1.9 times) and Darwin (1.8 times) are forecast to increase above average (i.e. all capital cities), while Adelaide and Hobart (each 1.4 times) is forecast to grow less than the other capital cities.

According to the ABS (ABS 2008a), among the various capital cities, Brisbane, Perth and Darwin are expected to have higher rates of population growth during the next decade and beyond. Melbourne should be somewhere around the national average, while population growth rates in Sydney, Canberra, Adelaide and Hobart should be below the national average (ABS 2008a).

The Survey of Motor Vehicle Use (SMVU) from the ABS reports total commercial vehicle kilometres travelled within the capital cities.

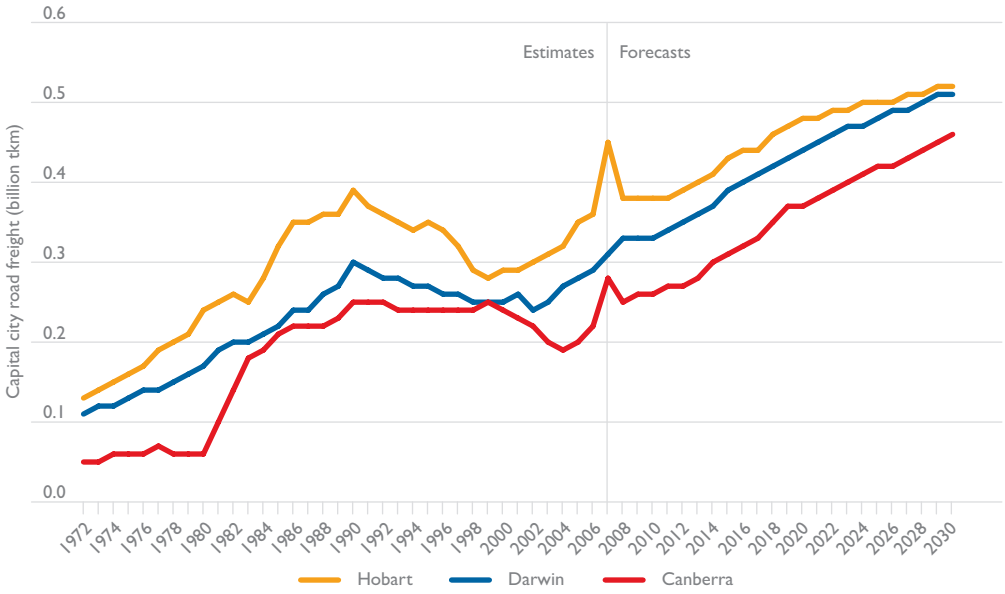
In terms of capital city traffic levels, according to the SMVU, commercial vehicles make up around 19.7 per cent of the capital city traffic stream in the 12 months ended 31 October 2007 (ABS 2008b).

F5.3 'Capital city' road freight tasks by major capital cities, 1972–2030



Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.
Source: BITRE estimates.

F5.4 'Capital city' road freight tasks by minor capital cities, 1972–2030



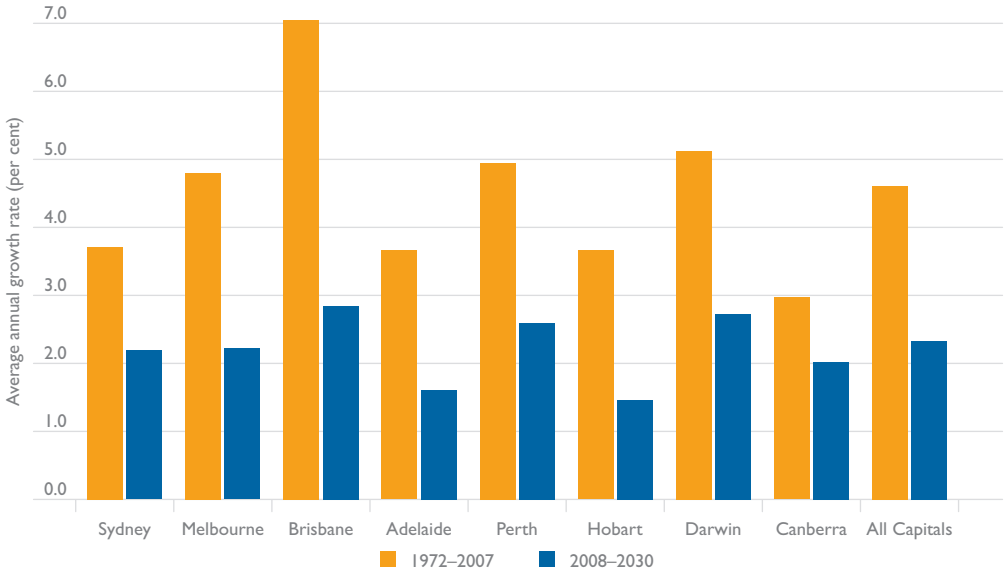
Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.
Source: BITRE estimates.

T5.3 Capital city road freight estimates and forecasts (billion tkm) by individual capital city and sum of all capital cities, 1972–2030

Year	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra	All capitals
Estimates									
1972	3.12	2.18	0.71	0.74	0.88	0.13	0.05	0.11	7.93
1973	3.20	2.26	0.76	0.76	0.91	0.14	0.05	0.12	8.20
1974	3.42	2.43	0.84	0.82	0.98	0.15	0.06	0.12	8.82
1975	3.51	2.52	0.90	0.84	1.02	0.17	0.06	0.13	9.14
1976	3.64	2.64	0.97	0.88	1.07	0.18	0.06	0.14	9.56
1977	3.84	2.82	1.12	0.93	1.14	0.19	0.06	0.14	10.26
1978	3.89	2.90	1.23	0.95	1.18	0.20	0.06	0.15	10.57
1979	4.09	3.10	1.41	1.01	1.26	0.22	0.06	0.16	11.30
1980	4.45	3.41	1.63	1.03	1.39	0.23	0.09	0.17	12.40
1981	4.73	3.66	1.84	1.02	1.49	0.24	0.13	0.18	13.30
1982	4.98	3.90	2.06	1.00	1.58	0.25	0.18	0.20	14.15
1983	4.96	3.93	2.07	1.00	1.57	0.27	0.18	0.20	14.18
1984	5.24	4.19	2.22	1.07	1.65	0.30	0.19	0.21	15.07
1985	5.59	4.53	2.39	1.15	1.76	0.33	0.21	0.22	16.19
1986	5.94	4.89	2.56	1.23	1.89	0.34	0.22	0.24	17.31
1987	6.00	5.03	2.61	1.25	1.92	0.34	0.21	0.24	17.61
1988	6.34	5.40	2.77	1.34	2.05	0.35	0.21	0.26	18.71
1989	6.61	5.71	2.91	1.40	2.17	0.36	0.23	0.27	19.65
1990	7.15	6.28	3.16	1.51	2.39	0.38	0.25	0.29	21.41
1991	6.97	6.22	3.10	1.48	2.36	0.36	0.25	0.29	21.03
1992	6.85	6.17	3.07	1.45	2.33	0.34	0.23	0.27	20.72
1993	7.10	6.47	3.22	1.51	2.44	0.33	0.23	0.26	21.56
1994	7.34	6.77	3.36	1.56	2.53	0.32	0.22	0.25	22.36
1995	7.83	7.30	3.62	1.67	2.72	0.32	0.23	0.24	23.94
1996	8.26	7.74	3.89	1.77	2.88	0.31	0.24	0.25	25.35
1997	8.52	8.03	4.09	1.84	2.99	0.29	0.24	0.24	26.25
1998	8.56	8.11	4.19	1.86	3.02	0.26	0.24	0.24	26.48
1999	8.99	8.65	4.66	1.94	3.18	0.27	0.23	0.24	28.16
2000	9.28	9.13	5.00	1.99	3.38	0.28	0.23	0.25	29.54
2001	9.47	9.30	5.26	2.01	3.46	0.28	0.21	0.23	30.22
2002	9.72	9.76	5.70	2.08	3.64	0.30	0.19	0.24	31.63
2003	10.03	10.01	6.12	2.19	3.77	0.31	0.18	0.25	32.86
2004	10.38	10.34	6.57	2.29	4.10	0.34	0.19	0.27	34.47
2005	10.64	10.55	6.97	2.42	4.23	0.35	0.21	0.28	35.65
2006	10.85	10.85	7.23	2.53	4.57	0.36	0.27	0.30	36.96
2007	11.20	11.20	7.47	2.61	5.09	0.36	0.26	0.26	38.45
Forecasts									
2008	11.69	11.70	7.80	2.73	5.31	0.38	0.28	0.27	40.15
2009	11.70	11.71	7.85	2.72	5.33	0.38	0.28	0.27	40.24
2010	11.70	11.72	7.90	2.70	5.35	0.38	0.28	0.26	40.30
2011	11.96	11.98	8.13	2.75	5.50	0.39	0.29	0.27	41.28
2012	12.50	12.51	8.55	2.87	5.76	0.39	0.29	0.28	43.16
2013	12.96	12.98	8.91	2.96	6.00	0.41	0.31	0.29	44.81
2014	13.37	13.41	9.25	3.04	6.21	0.42	0.32	0.30	46.32
2015	13.80	13.82	9.59	3.12	6.43	0.43	0.33	0.31	47.83
2016	14.28	14.31	9.98	3.21	6.68	0.45	0.35	0.32	49.57
2017	14.79	14.83	10.40	3.31	6.95	0.45	0.36	0.33	51.42
2018	15.22	15.25	10.76	3.39	7.17	0.46	0.37	0.34	52.96
2019	15.59	15.62	11.08	3.45	7.37	0.47	0.39	0.35	54.33
2020	15.91	15.96	11.39	3.51	7.55	0.48	0.40	0.35	55.56
2021	16.25	16.32	11.70	3.56	7.75	0.49	0.41	0.36	56.83
2022	16.57	16.65	12.01	3.61	7.93	0.49	0.42	0.37	58.05
2023	16.86	16.95	12.29	3.66	8.10	0.50	0.43	0.37	59.16
2024	17.15	17.24	12.57	3.70	8.27	0.50	0.44	0.38	60.24
2025	17.43	17.53	12.85	3.74	8.44	0.51	0.45	0.38	61.32
2026	17.71	17.82	13.13	3.78	8.60	0.51	0.46	0.39	62.41
2027	17.99	18.11	13.42	3.81	8.77	0.51	0.47	0.39	63.47
2028	18.26	18.39	13.69	3.85	8.93	0.52	0.47	0.40	64.51
2029	18.52	18.66	13.97	3.88	9.10	0.52	0.48	0.40	65.54
2030	18.79	18.94	14.26	3.92	9.27	0.53	0.49	0.41	66.60

Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.
Source: BITRE estimates.

F5.5 Average annual growth rates (per cent) 'capital city' road freight estimates and forecasts by individual capital city, 1972–2030



Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.

Source: BITRE estimates.

T5.4 Average annual growth rates (per cent) 'capital city' road freight estimates and forecasts by individual capital city, 1972–2030

Year	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra	All capitals
1972–2007	3.7	4.8	6.9	3.7	5.2	3.0	4.8	2.4	4.6
2008–2030	2.2	2.2	2.8	1.7	2.6	1.5	2.7	1.9	2.3

Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.

Source: BITRE estimates.

CHAPTER 6

Road freight estimates and forecasts: 'rest of state', 1972–2030

Summary

Total Australia-level (sum of all states and territories) 'rest of state' road freight estimates (1972–2007) and forecasts (2008–30) were calculated as: 'total Australia' road freight task, minus the total 'interstate' freight task, minus the total 'capital city' road freight task. 'Rest of state' road freight estimates and forecasts for each state and territory were calculated using share assumptions.

The total 'rest of state' road freight task increased from 13.8 billion tonne-kilometres (tkm) in 1972 to 79.3 billion tkm in 2007, an average annual growth rate of 5.1 per cent.

Despite the negative impact of recession during late 1980s and early 1990s, among the five mainland states, the 'rest of state' road freight task increased sharply in Western Australia and Queensland.

The total 'rest of state' road freight task in Australia is projected to grow by nearly 50 per cent, from 80.9 billion tkm in 2008 to 116.4 billion tkm in 2030, a growth rate of 1.7 per cent per annum.

Similarly, among the five mainland states, 'rest of state' road freight growth is expected to be higher in Queensland, South Australia and Western Australia (2.2 to 2.4 per cent per annum) between 2008 and 2030, while the average annual growth is forecast to be negative in New South Wales (0.4 per cent per annum).

6.1 Background

This chapter provides estimates of 'rest of state' road freight from 1972 to 2007 and forecast from 2008 to 2030 by states and territories as well as total of all states and territories (i.e. Australia-level).

The chapter is organised as:

- The methodology for estimating total Australia-level (sum of all states and territories) 'rest of state' road freight estimates and forecasts as well as for each state and territory.
- A national level estimate and forecast for aggregate 'rest of state' road freight.
- 'Rest of state' road freight estimates and forecasts for each state and territory.

6.2 Methodology for estimating and forecasting 'rest of state` road freight tasks

Estimating aggregate (sum of all states and territories) 'rest of state' road freight estimates (1972–2007) and forecasts (2008–30) is a simple procedure. The total 'rest of state' road freight task is the 'total all states' road freight task, minus the total 'interstate' freight task, minus the total 'capital city' road freight task, i.e.

> Total 'rest of state' road freight task = 'total all states' road freight task minus the 'interstate' road freight task minus the 'capital city' road freight task.

After estimating (1972–2007) and forecasting (2008–30) Australia-level 'rest of state' road freight, these 'rest of state' road freight tasks were separated into each state and territory using the share assumptions (see Appendix G, Tables G.5 and G.7). The final results are presented in Appendix G (see Tables G.6 and G.8).

6.3 'Rest of state` road freight estimates and forecasts, 1972–2030

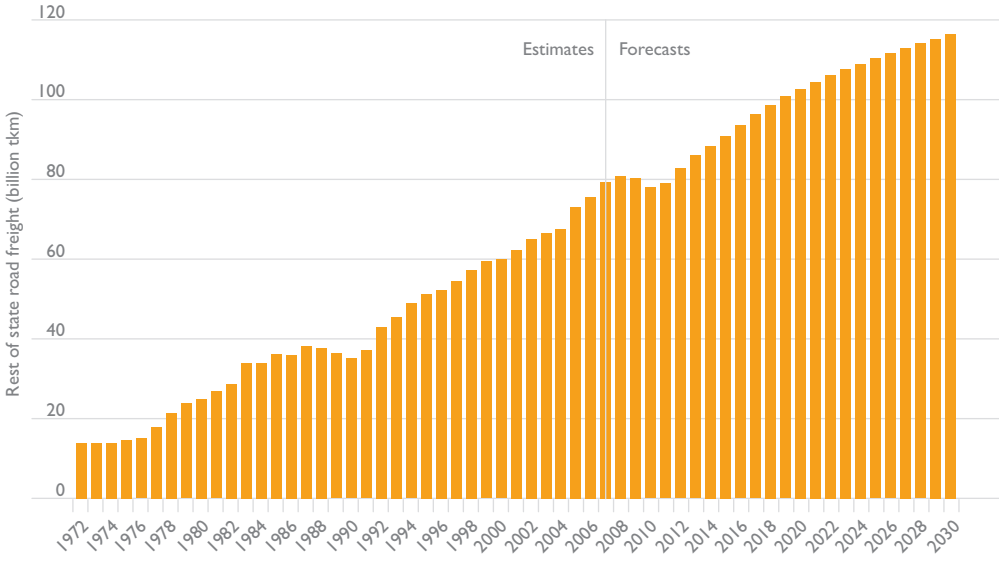
This section presents the results of total (sum of all states and territories) 'rest of state' road freight estimates (1972–2007) and forecasts (2008–30) and separate this Australian-level aggregate into individual state and territory estimates.

6.3.1 Total 'rest of state' road freight estimates and forecast, 1972–2030

Figure 6.1 shows the total (Australian-level aggregate) 'rest of state' (sum of all states and territories) road freight estimates between 1972 and 2007 and forecasts between 2008 and 2030. Data underlying this figure is given in Table 6.1 (last column, which flows from the estimates/ forecasts of the first three columns). Growth rates presented in Table 6.4 (last column)

Between 1972 and 2007, the aggregate 'rest of state' road freight estimate in tonne-kilometres (tkm) increased from 13.8 billion tkm to 79.3 billion tkm (see Table 6.2, last column), an average annual growth rate of 5.1 per cent. The growth of total 'rest of state' road freight task was negative during late 1980s and early 1990s, due to recession, but then recovered through to 2007.

F6.1 Total 'rest of state' road freight estimates and forecasts, 1972–2030



Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.

Source: BITRE estimates.

Between 2008 and 2030, total 'rest of state' road freight task at national level is forecast to grow from 80.9 billion tkm to 116.4 billion tkm (see Table 6.1, last column), an average annual growth rate of 1.7 per cent (Table 6.4, last column). In other words, the total 'rest of state' road freight task is expected to grow by nearly 50 per cent over the forecast period (2008–30).

The forecast growth rate of 1.7 per cent per annum between 2008 and 2030 is much less than the historical growth of 5.1 per cent per annum between 1972 and 2007. Much of the explanation for the lower forecast growth rate lies in assumed lower economic growth, plus the growing freight per person saturation effect.

The aggregate 'rest of state' road freight task is projected to grow more slowly than the national average of GDP growth and slightly faster than the rate of population growth in Australia (Table 6.2).

T6.1 Aggregate 'rest of state' road freight estimates and forecasts (billion tkm), Australia, 1972–2030

Year	Australia	Interstate	All capitals	Rest of state
Estimates				
1972	27.1	5.4	7.9	13.8
1973	28.8	6.6	8.2	13.9
1974	30.4	7.8	8.8	13.8
1975	32.1	8.3	9.1	14.6
1976	33.7	9.2	9.6	15.0
1977	37.8	9.7	10.3	17.9
1978	41.8	9.8	10.6	21.4
1979	45.9	10.8	11.3	23.8
1980	49.6	12.3	12.4	24.9
1981	53.4	13.3	13.3	26.8
1982	57.1	14.3	14.2	28.7
1983	61.0	12.8	14.2	34.0
1984	64.9	15.9	15.1	33.9
1985	68.9	16.5	16.2	36.2
1986	71.8	18.6	17.3	35.9
1987	74.8	18.9	17.6	38.3
1988	77.8	21.4	18.7	37.7
1989	79.7	23.8	19.7	36.3
1990	81.6	25.1	21.4	35.1
1991	83.5	25.4	21.0	37.1
1992	89.6	25.9	20.7	43.0
1993	95.6	28.6	21.6	45.4
1994	101.6	30.3	22.4	48.9
1995	107.7	32.5	23.9	51.2
1996	113.2	35.5	25.3	52.3
1997	118.7	38.0	26.2	54.5
1998	124.3	40.5	26.5	57.3
1999	130.7	43.1	28.2	59.4
2000	135.2	45.7	29.5	59.9
2001	139.4	46.8	30.2	62.3
2002	146.0	49.3	31.6	65.1
2003	151.0	51.6	32.9	66.6
2004	156.7	54.6	34.5	67.6
2005	166.3	57.6	35.6	73.0
2006	173.3	60.7	37.0	75.6
2007	182.5	64.7	38.4	79.3
Forecasts				
2008	191.5	70.4	40.2	80.9
2009	191.9	71.4	40.2	80.3
2010	192.1	73.8	40.3	78.0
2011	197.3	77.0	41.3	79.0
2012	207.4	81.6	43.2	82.7
2013	216.6	85.8	44.8	86.0
2014	225.0	90.3	46.3	88.4
2015	233.5	94.9	47.8	90.8
2016	243.2	100.1	49.6	93.5
2017	253.5	105.8	51.4	96.3
2018	262.2	110.5	53.0	98.7
2019	269.9	114.9	54.3	100.8
2020	277.0	118.8	55.6	102.6
2021	284.2	123.0	56.8	104.4
2022	291.2	127.1	58.1	106.1
2023	297.6	130.9	59.2	107.6
2024	304.0	134.8	60.2	109.0
2025	310.4	138.8	61.3	110.3
2026	316.8	142.8	62.4	111.6
2027	323.2	146.8	63.5	112.9
2028	329.4	150.8	64.5	114.1
2029	335.6	154.9	65.5	115.2
2030	342.0	159.1	66.6	116.4

Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.

Source: BITRE estimates.

T6.2 Comparison of projected average annual growth rate of total 'rest of state' road freight forecast, national average GDP growth and population growth in Australia

Parameters	Period	Per cent
Average annual growth rate of aggregate 'rest of state' road freight forecast	2008–30	1.67
Average GDP growth in Australia	2008–30	2.79
National population growth	2006–26	1.58

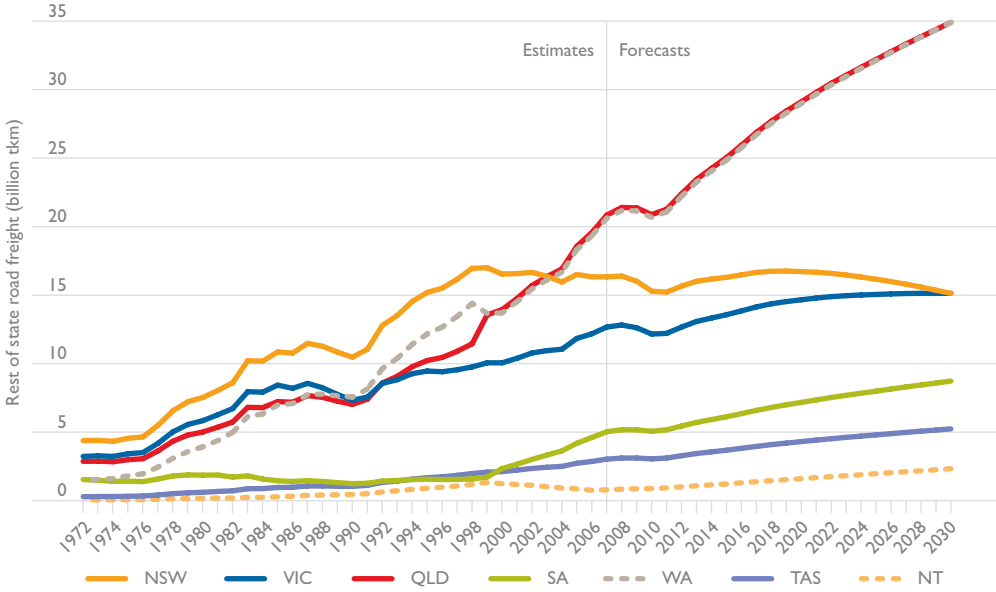
Sources: ABS (2008a) and BITRE estimates (sourced from the Treasury and Access Economy).

6.3.1 *'Rest of state' road freight estimates and forecasts by states and territories, 1972–2030*

This Australia-level aggregate 'rest of state' total is split into state/territory estimates/forecasts using a share analysis (see Appendix G).

Figure 6.2 shows the resulting 'rest of state' estimates (1972–2007) and forecasts (2008–30) by states and territories. Data underlying this figure is presented in Table 6.3.

F6.2 'Rest of state' road freight tasks by states and territories, 1972–2030



Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.
Source: BITRE estimates.

Despite the negative impact of recession during late 1980s and early 1990s, the 'rest of state' road freight task increased sharply in Western Australia, from 1.4 billion tkm in 2007 to 20.6 billion tkm in 2007, followed by Queensland, from 2.8 billion tkm in 1972 to 20.8 billion tkm in 2007 (Table 6.3). New South Wales and Victoria showed very similar 'rest of state' road freight tasks.

Between 2008 and 2030, 'rest of state' road freight is also expected to dominate in Western Australia (from 21.2 billion tkm in 2008 to 34.9 billion tkm in 2030) and Queensland (from 21.4 billion tkm in 2008 to 34.9 billion tkm in 2030) (Table 6.3). On the other hand, 'rest of state' road freight in New South Wales is forecast to be slightly negative (from 16.4 billion tkm in 2008 to 15.1 billion tkm in 2030) (Table 6.3).

T6.3 'Rest of state' road freight estimates and forecasts (billion tkm) by states and territories and sum of all states/territories, 1972–2030

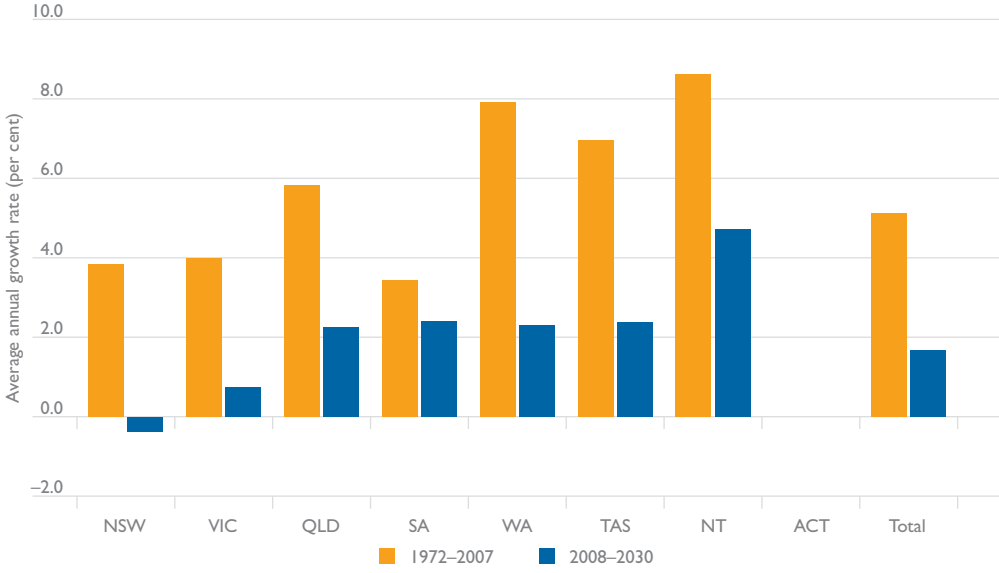
Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
Estimates									
1972	**4.38**	3.23	2.87	1.54	1.44	0.29	0.04	0.00	13.79
1973	4.40	3.27	2.88	1.49	1.54	0.30	0.05	0.00	13.93
1974	4.33	3.23	2.84	1.41	1.62	0.30	0.06	0.00	13.79
1975	4.55	3.42	2.99	1.42	1.81	0.32	0.07	0.00	14.58
1976	4.65	3.51	3.06	1.39	1.96	0.34	0.07	0.00	15.00
1977	5.50	4.18	3.63	1.58	2.45	0.41	0.10	0.00	17.86
1978	6.56	5.02	4.34	1.80	3.09	0.51	0.13	0.00	21.44
1979	7.22	5.56	4.79	1.88	3.58	0.57	0.15	0.00	23.76
1980	7.53	5.84	5.01	1.86	3.93	0.61	0.17	0.00	24.95
1981	8.04	6.27	5.36	1.87	4.39	0.67	0.19	0.00	26.80
1982	8.61	6.72	5.74	1.72	4.99	0.72	0.19	0.00	28.70
1983	10.21	7.95	6.81	1.81	6.14	0.87	0.24	0.00	34.03
1984	10.18	7.92	6.79	1.58	6.33	0.88	0.25	0.00	33.94
1985	10.85	8.43	7.23	1.45	6.98	0.96	0.28	0.00	36.17
1986	10.77	8.20	7.18	1.40	7.09	0.98	0.32	0.00	35.93
1987	11.48	8.56	7.67	1.46	7.74	1.07	0.38	0.00	38.35
1988	11.27	8.24	7.54	1.40	7.78	1.07	0.41	0.00	37.71
1989	10.84	7.75	7.26	1.31	7.65	1.05	0.43	0.00	36.30
1990	10.47	7.33	7.02	1.24	7.56	1.04	0.45	0.00	35.10
1991	11.05	7.56	7.41	1.27	8.15	1.12	0.51	0.00	37.07
1992	12.79	8.56	8.59	1.43	9.64	1.33	0.63	0.00	42.97
1993	13.52	8.83	9.08	1.47	10.39	1.43	0.72	0.00	45.44
1994	14.54	9.27	9.78	1.54	11.41	1.57	0.82	0.00	48.92
1995	15.20	9.46	10.23	1.56	12.17	1.68	0.91	0.00	51.20
1996	15.51	9.41	10.45	1.54	12.67	1.74	0.98	0.00	52.31
1997	16.16	9.55	10.90	1.55	13.45	1.85	1.07	0.00	54.54
1998	16.96	9.76	11.45	1.58	14.40	1.98	1.19	0.00	57.32
1999	17.00	10.06	13.56	1.72	13.67	2.08	1.32	0.00	59.42
2000	16.54	10.06	13.94	2.34	13.70	2.12	1.24	0.00	59.94
2001	16.57	10.39	14.76	2.66	14.52	2.23	1.18	0.00	62.31
2002	16.66	10.78	15.70	3.01	15.45	2.35	1.12	0.00	65.06
2003	16.38	10.95	16.35	3.33	16.11	2.44	1.02	0.00	66.57
2004	15.96	11.05	16.91	3.63	16.68	2.50	0.92	0.00	67.64
2005	16.51	11.84	18.57	4.19	18.33	2.73	0.86	0.00	73.03
2006	16.34	12.18	19.57	4.61	19.33	2.86	0.76	0.00	75.65
2007	16.33	12.67	20.84	5.03	20.61	3.03	0.79	0.00	79.29
Forecasts									
2008	16.39	12.82	21.40	5.17	21.17	3.11	0.84	0.00	80.91
2009	16.01	12.62	21.37	5.17	21.15	3.11	0.87	0.00	80.32
2010	15.29	12.16	20.88	5.06	20.68	3.05	0.88	0.00	78.01
2011	15.22	12.21	21.27	5.17	21.08	3.11	0.93	0.00	78.99
2012	15.66	12.67	22.40	5.45	22.21	3.28	1.01	0.00	82.67
2013	16.01	13.08	23.45	5.71	23.26	3.44	1.08	0.00	86.02
2014	16.17	13.33	24.25	5.92	24.06	3.56	1.15	0.00	88.44
2015	16.30	13.57	25.04	6.12	24.86	3.68	1.22	0.00	90.79
2016	16.48	13.85	25.94	6.35	25.77	3.82	1.30	0.00	93.50
2017	16.66	14.14	26.88	6.59	26.71	3.96	1.38	0.00	96.33
2018	16.74	14.37	27.70	6.80	27.55	4.09	1.46	0.00	98.71
2019	16.76	14.53	28.44	7.00	28.29	4.20	1.53	0.00	100.75
2020	16.72	14.66	29.11	7.17	28.98	4.31	1.60	0.00	102.55
2021	16.67	14.79	29.80	7.35	29.68	4.42	1.68	0.00	104.38
2022	16.59	14.89	30.46	7.53	30.35	4.52	1.75	0.00	106.09
2023	16.47	14.96	31.05	7.69	30.96	4.62	1.82	0.00	107.57
2024	16.32	15.01	31.63	7.84	31.55	4.71	1.89	0.00	108.95
2025	16.16	15.05	32.20	7.99	32.13	4.80	1.97	0.00	110.31
2026	15.99	15.09	32.77	8.15	32.71	4.89	2.04	0.00	111.62
2027	15.80	15.12	33.33	8.30	33.28	4.98	2.11	0.00	112.91
2028	15.59	15.13	33.86	8.44	33.83	5.07	2.18	0.00	114.09
2029	15.36	15.13	34.38	8.58	34.37	5.15	2.25	0.00	115.22
2030	15.13	15.13	34.91	8.73	34.91	5.24	2.33	0.00	116.36

Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.

Source: BITRE estimates.

Between 1972 and 2007, the average annual growth rates of the 'rest of state' road freight task estimates among the five mainland states and territories show that Western Australia had the highest growth (7.9 per cent per annum) compared to other states and territories. On the other hand, South Australia (3.4 per cent per annum) had the lowest 'rest of state' road freight growth. In the forecast period, the pattern changes somewhat. Among the five mainland states, 'rest of state' road freight growth is expected to be higher in Queensland, South Australia and Western Australia (2.2 to 2.4 per cent per annum) between 2008 and 2030 (Figure 6.3 and Table 6.4).

F6.3 Average annual growth rates (per cent) 'rest of state' road freight estimates and forecasts by states and territories, 1972–2030



Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts. For ACT, no data.
Source: BITRE estimates.

T6.4 Average annual growth rates (per cent) 'rest of state' road freight estimates and forecasts by states and territories, 1972–2030

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
1972–2007	3.8	4.0	5.8	3.4	7.9	7.0	8.6	nd	5.1
2008–2030	–0.4	0.8	2.2	2.4	2.3	2.4	4.7	nd	1.7

Note: From 1972 to 2007, estimates, while from 2008 to 2030, forecasts.
nd: Not determined due to no data.
Source: BITRE estimates.

CHAPTER 7
Discussion and concluding remarks

Summary

A previously-developed BITRE methodology for 'correcting' estimates of state/territory road freight has been applied to update road freight measurements to 2006–07 (the year of the last SMVU data).

Historical growth rates in road freights have been high (doubling times typically in the range of 10 to 16 years for the various components).

Forecast growth rates for road freight are expected to be lower (doubling time 19 to 42 years), due mainly to two reasons: lower expected economic growth rates, and an expected gradual 'tapering off' in the trend growth in freight per person.

However, even at lower growth rates, the expected growth in the volume of road freight poses many challenges. Two examples are increased truck movements in capital cities, and increased road damage from more heavy vehicle traffic.

7.1 Update of methodology for estimating road freight tasks

In estimating state/territory road freight tasks, one of the major difficulties lies in the ABS definition of interstate freight. Since the introduction of the Survey of Motor Vehicle Use (SMVU) by the ABS in early 1970s, the ABS has used a limited concept of the interstate road freight task. This interstate road freight task was defined as the amount of tonne-kilometres done by other states' trucks on a State's road. To overcome the problem of the ABS definition of interstate road freight task, BITRE (former BTRE) developed a methodology for estimating interstate road freight estimates (state–to–state origin–destination (OD) time series from 1971–72 to 2003–04) (Gargett et al 2006). In this method, interstate road freight tasks were split into three components, e.g. 'from', 'to' and 'through', which allows us to derive the first estimates of the concept 'the interstate freight task performed on each state's roads'.

Later, the method was extended to include the SMVU data up to 2005–06 and also included 'capital city' and 'rest of state' road freight tasks which provided total road freight task for each state and territory (Gargett and Hossain 2008). The major advantage of using this method is that the method allows us to continually update the road freight estimates from future SMVUs. In addition, the time series estimates, rough as they are, can be used as the basis for forecasting

the matrix into the future, and thus generating forecasts of the volume of interstate freight on states' roads.

The disaggregate method for estimating road freight task was updated and the results are presented in this report. This updated method included the SMVU data up to 2006–07 (which is the latest data). It is important to note that the next SMVU will include data for November 2009 to October 2010. The publication will be released around September 2011.

7.2 Historical trends of road freight tasks, 1972–2007

Historical trend over the past 35 years showed that national road freight task in Australia has increased from 27.1 billion tkm in 1972 to 182.5 billion tkm in 2007—averaging growth of 5.6 per cent per annum. This increase, however, over the past 35 years is most likely to be related to the importance of road freight to modern economies and also by continuing development of road networks and vehicle technology advances. However, there were two short-term negative growth periods in the early 1980s and early 1990s. These periods of negative growth were due to economic slowdowns. However, ongoing growth is the dominant trend.

Between 1972 and 2007, the total 'interstate' road freight estimate in Australia increased from 5.4 billion tonne-kilometres (tkm) to 64.7 billion tkm, at an average growth rate of 7.4 per cent per annum. During the same period, the total road freight task in the eight 'capital cities' increased from 7.9 billion tkm to 38.4 billion tkm (an average annual growth rate of 4.6 per cent) and 'rest of state' road freight increased from 13.8 billion tkm to 79.1 billion tkm (an average annual growth rate of 5.1 per cent).

The various components of 'interstate' (i.e. 'from', 'to' and 'through') road freight estimates between 1972 and 2007 showed that the 'from' interstate and 'to' interstate road freight increased at very similar rate (7.5 per cent and 7.4 per cent per annum, respectively), while the total 'through' interstate road freight increased at a similar pace (7.0 per cent per annum). Between 1972 and 2007, the total 'from' interstate road freight estimate in Australia increased from 2.3 billion tkm to 28.7 billion tkm. Similarly, the total 'to' interstate road freight estimates increased from 2.2 billion tkm to 27.4 billion tkm and the total 'through' interstate road freight estimates increased from 0.81 billion tkm to 8.6 billion tkm.

7.3 Forecast trends of road freight tasks, 2008–30

Over the 22 years from 2008 to 2030, the total road freight task in Australia is forecast to nearly double (1.8 times), from 191.5 billion tkm to 342.03 billion tkm, albeit with short-term negative impact in the early forecast period (i.e. 2008–10) due to the impact of the global financial crisis. The forecast average annual growth rate of total road freight (sum of interstate, capital city and rest of state) in Australia is 2.7 per cent between 2008 and 2030. In a recent study, BITRE has noted that domestic demand for manufactured goods underpinning much of road freight's future growth (BITRE 2009c).

Between 2008 and 2030, the total 'interstate' road freight task in Australia is forecast to increase from 70.4 billion tkm to 159.1 billion tkm (an average growth rate of 3.6 per cent per annum), the road freight task in 'capital cities' is forecast to increase from 40.2 billion tkm to 66.6 billion tkm (an average growth rate of 2.3 per cent per annum) and the 'rest of state' road freight task

is forecast to increase from 80.7 billion tkm to 116.1 billion tkm (an average growth rate of 1.7 per cent per annum). This projected increase in the road transport task to 2030 is a significant challenge for the country.

The various components of total 'interstate' road freight task (i.e. 'from', 'to' and 'through') between 2008 and 2030 show the total 'from' interstate road freight task in Australia is forecast to increase from 30.7 billion tkm to 71.8 billion tkm (an average annual growth rate of 3.9 per cent), the total 'to' interstate road freight task is forecast to increase from 29.7 billion tkm to 68.3 billion tkm (an average annual growth rate of 3.9 per cent) and the total 'through' rest of state road freight from 10.1 billion tkm to 19.0 billion tkm (an average annual growth rate of 2.9 per cent).

Between 2008 and 2030, the 'interstate' road freight task is expected to increase by 2.3 times, 'capital cities' by 1.7 times, 'rest of state' by 1.4 times and the total national road freight task by 2.2 times.

It is forecast that the combination of lower GDP growth and reducing responsiveness to this growth (growing saturation in per person freight) results in the lower freight growth rates in the forecast period compared to the historical road freight growth rates. However, the overall tonne-kilometre total road freight task in Australia is projected to grow much faster (2.67 per cent per annum) than the rate of national population growth (1.58 per cent per annum), but similar to the average GDP growth in Australia (2.79 per cent per annum) (Table 2.3), although with road freight beginning to saturate with respect to GDP, the differential will be reducing over time.

7.4 Challenges of future growth in the road freight task

The forecast growth rate of the domestic road freight task raises a valid question is just how this increase is going to be accommodated on the Australian road network. RARE Consulting (2009) reports that the industry is favouring an increase in vehicle length and weights. However, such change has the potential to increase road damage and have adverse road safety impacts.

There are also potential environmental consequences of increased truck movements—in terms of increased road noise in urban areas, increased air pollution in all capital cities, and the potential increase in greenhouse emissions.

RARE Consulting (2009) reports that potential solutions are likely to include the use of cleaner fuels for heavy vehicles, the improvement of rail freight to such a point that it becomes competitive with road freight, and the implementation of innovative freight 'hubbing'.

Further, infrastructure investment can also improve the efficiency of freight transport by roads in Australia.

APPENDIX A

Interstate road freight tasks: SMVU raw data and origin–destination (OD) road distance

This appendix provides interstate road freight raw data (in million tonne-kilometres) sourced from the ABS Survey of Motor Vehicle Use (SMVU) (various years). The data in the SMVU is presented as 'state/territory of registration by state/territory of operation'.

TA.1 SMVU raw data: interstate road freight task to an origin–destination (OD) matrix, various years

State of registration	State of operation								Australia
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
	Tonne-kilometres (million)								
1972									
NSW	523	1 070	730	325	41	0	23	251	2 962
VIC	1 080	386	354	219	96	0	0	86	2 221
QLD	809	107	342	101	14	0	113	0	1 485
SA	378	227	165	183	33	0	142	0	1 128
WA	48	25	13	47	171	0	22	0	326
TAS	0	0	0	0	0	34	0	0	34
NT	14	2	111	27	13	0	5	0	172
ACT	24	5	0	0	0	0	0	0	29
Australia	2 875	1 821	1 715	902	369	34	305	338	8 359
1980–81									
NSW	1 355	1 581	1 002	458	349	0	157	70	4 971
VIC	1 967	1 265	1 170	480	428	0	0	51	5 361
QLD	794	508	1 470	144	62	0	99	4	3 080
SA	500	356	284	385	51	0	180	4	1 760
WA	124	120	31	59	822	0	13	0	1 168
TAS	0	0	0	0	0	174	0	0	174
NT	9	4	0	7	1	0	40	0	62
ACT	30	19	14	2	0	0	0	1	65
Australia	4 778	3 852	3 971	1 535	1 712	174	488	130	16 640
1982									
NSW	1 992	1 067	516	152	8	1	30	5	3 770
VIC	1 556	1 133	375	263	52	3	1	7	3 388
QLD	290	46	339	38	6	1	22	3	744
SA	278	330	77	340	31	1	3	1	1 059
WA	16	32	18	65	93	1	14	1	238
TAS	1	1	1	1	1	1	1	1	1
NT	4	1	63	15	45	1	87	1	214
ACT	144	18	5	6	1	1	1	15	188
Australia	4 280	2 629	1 393	880	237	10	160	33	9 601
1985									
NSW	2 377	1 168	735	225	56	1	24	14	4 600
VIC	1 580	1 338	453	311	15	3	10	8	3 717
QLD	530	105	400	53	7	1	23	1	1 119
SA	543	426	70	813	331	1	18	1	2 200
WA	60	28	14	101	243	1	59	1	506
TAS	1	1	1	1	1	1	1	1	0
NT	9	5	121	7	43	1	142	1	327
ACT	49	11	1	1	1	1	1	7	70
Australia	5 149	3 082	1 795	1 512	696	10	278	34	12 538

(continued)

TA.1 SMVU raw data: interstate road freight task to an origin–destination (OD) matrix, various years (continued)

State of registration	State of operation								Australia
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
	Tonne-kilometres (million)								
1998									
NSW	23 890	1 563	1 040	192	149	–	1	85	26 921
VIC	7 413	22 286	688	2 000	697	460	–	42	33 585
QLD	4 342	787	17 440	317	138	1	106	2	23 134
SA	1 101	2 198	151	6 369	1 424	10	151	1	11 406
WA	141	40	74	405	14 418	–	57	–	15 135
TAS	9	7	5	–	–	2 016	–	–	2 039
NT	26	3	304	491	43	–	2 314	1	3 182
ACT	511	32	13	10	8	–	–	171	746
Australia	37 434	26 917	19 715	9 786	16 877	2 487	2 630	302	116 147
1999									
NSW	27 782	1 853	1 799	338	274	–	23	89	32 158
VIC	8 139	22 149	1 473	2 323	620	3	20	42	34 767
QLD	4 505	720	20 573	422	265	–	643	4	27 133
SA	1 651	2 667	439	7 103	1 232	–	112	–	13 204
WA	150	15	87	167	15 198	–	233	–	15 850
TAS	37	47	18	1	–	2 112	–	2	2 217
NT	22	7	336	589	74	1	2 678	–	3 707
ACT	534	52	38	5	2	–	10	198	838
Australia	42 820	27 510	24 763	10 948	17 664	2 116	3 719	334	129 874
2000									
NSW	27 131	2 166	1 539	449	89	–	–	126	31 500
VIC	10 240	23 767	2 358	2 594	560	2	10	21	39 551
QLD	5 052	610	21 053	633	318	–	405	0	28 071
SA	2 044	2 013	494	8 338	371	–	632	57	13 950
WA	147	30	58	278	14 366	–	96	0	14 974
TAS	13	24	2	–	1	2 455	–	0	2 496
NT	40	0	166	530	63	–	2 101	–	2 900
ACT	583	60	43	16	–	–	0	234	937
Australia	45 250	28 671	25 711	12 838	15 769	2 457	3 244	438	134 378
2001									
NSW	26 538	2 006	1 346	683	–	–	4	116	30 693
VIC	9 318	25 348	1 276	2 268	638	35	23	71	38 978
QLD	6 318	828	21 172	199	60	2	322	–	28 901
SA	1 906	2 070	372	7 344	618	1	246	8	12 565
WA	419	158	201	599	13 790	–	62	–	15 229
TAS	9	20	4	–	–	2 609	–	1	2 642
NT	18	1	69	579	162	–	1 953	–	2 783
ACT	348	36	16	4	–	–	–	228	633
Australia	44 874	30 466	24 457	11 677	15 268	2 646	2 610	425	132 422

(continued)

TA.1 SMVU raw data: interstate road freight task to an origin–destination (OD) matrix, various years (continued)

State of registration	State of operation								Australia
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
	Tonne-kilometres (million)								
2002									
NSW	27 716	1 829	1 503	492	131	–	100	101	31 873
VIC	9 403	23 831	1 881	2 121	292	–	28	40	37 594
QLD	5 338	981	25 246	157	120	–	836	1	32 679
SA	3 356	2 987	591	8 145	578	58	267	4	15 985
WA	303	62	107	434	15 594	–	48	–	16 547
TAS	12	17	9	4	2	2 670	–	–	2 712
NT	7	1	95	491	82	–	1 929	–	2 605
ACT	580	110	35	11	1	–	–	206	944
Australia	46 715	29 817	29 466	11 855	16 800	2 727	3 206	353	140 938
2003									
NSW	27 780	2 599	1 515	669	187	20	29	201	33 000
VIC	9 215	27 691	2 285	2 178	77	110	8	17	41 580
QLD	7 243	1 326	24 898	295	78	–	157	–	33 997
SA	4 968	2 646	457	8 876	678	–	49	1	17 675
WA	330	207	158	594	18 487	–	238	–	20 014
TAS	16	21	1	–	–	2 623	–	–	2 662
NT	64	1	116	463	167	–	2 228	–	3 038
ACT	408	102	39	10	–	–	–	252	811
Australia	50 022	34 592	29 471	13 085	19 674	2 753	2 709	472	152 777
2004									
NSW	30 010	1 747	1 774	595	9	2	–	146	34 284
VIC	11 012	28 452	1 705	2 298	225	74	40	12	43 818
QLD	6 516	1 419	26 679	1 206	45	–	2 366	9	38 239
SA	2 392	2 027	319	8 957	336	60	197	21	14 309
WA	338	16	158	429	19 568	23	64	–	20 597
TAS	18	36	12	–	–	3 185	8	–	3 261
NT	46	31	97	250	214	–	1 622	–	2 260
ACT	510	91	31	2	–	–	–	267	900
Australia	50 842	33 820	30 775	13 737	20 398	3 344	4 297	455	157 668
2005									
NSW	30 316	2 147	2 929	289	41	1	9	157	35 890
VIC	11 665	32 140	1 582	3 351	588	–	–	12	49 339
QLD	8 075	1 773	28 057	779	583	–	322	2	39 591
SA	2 471	2 152	324	9 617	844	–	264	–	15 672
WA	143	166	32	634	16 873	–	61	–	17 909
TAS	4	11	1	3	–	3 086	–	–	3 106
NT	6	1	203	177	60	–	1 700	–	2 147
ACT	394	67	14	8	5	–	–	253	741
Australia	53 074	38 457	33 143	14 858	18 994	3 088	2 356	424	164 394

(continued)

TA.1 SMVU raw data: interstate road freight task to an origin–destination (OD) matrix, various years (continued)

State of registration	State of operation								Australia
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
	Tonne-kilometres (million)								
2006									
NSW	28 432	2 352	2 505	437	61	0	71	172	34 030
VIC	12 937	28 752	2 016	2 645	712	223	27	22	47 334
QLD	7 778	1 628	33 839	351	96	5	819	18	44 534
SA	2 176	1 786	792	9 562	184	0	995	3	15 498
WA	458	99	150	480	19 703	0	28	1	20 919
TAS	32	33	17	5	6	2 643	0	0	2 736
NT	32	6	107	210	367	4	1 360	0	2 086
ACT	415	70	13	2	0	0	0	300	800
Australia	52 259	34 726	39 440	13 692	21 129	2 875	3 300	515	167 937
2007									
NSW	31 123	2 991	1 905	474	59	0	24	218	36 794
VIC	13 605	33 949	3 157	3 396	266	105	27	36	54 541
QLD	8 444	1 537	33 683	713	79	11	58	0	44 525
SA	1 787	2 456	332	10 337	546	0	247	2	15 707
WA	369	149	196	685	24 624	0	123	0	26 146
TAS	6	12	23	0	0	3 351	0	0	3 392
NT	17	13	172	215	49	0	1 574	0	2 040
ACT	530	93	28	12	0	0	0	265	928
Australia	55 880	41 200	39 497	15 832	25 623	3 467	2 052	521	184 073

– Nil (including null cells).

Source: ABS SMVU (various years).

APPENDIX B

Methodology for estimating interstate road freight based on origin–destination (OD) matrix

Due to the issues with the ABS definition of interstate road freight task (see Chapter 3), it is necessary to derive a more logical and acceptable definition of interstate road freight movement. Thus this Appendix provides a methodology for estimating interstate road freight movement over the period 1971 to 2007, based on origin–destination (OD) matrix.

The Appendix is organised as:

- corrections to compensate underestimation and/or overestimation of interstate road freight task
- interpolation of data and cell-by-cell OD matrix modelling
- splitting OD road freight flows by states and territories.

B.1 Corrections to compensate underestimation and/or overestimation of interstate road freight task

The amount of freight task (in terms of tonne-kilometres) by all states' trucks on a state's road is essentially linked to origin–destination (OD) matrices.

From a consistency point of view, there are three major problem areas that need adjustment. These problem areas are:

1. adjusting vehicle stock numbers
2. adjusting for overstating of vehicle kilometres travelled in the recall surveys before 1998, and
3. correcting the proportion of laden vehicles (especially in 1998 and 1999).

To estimate long-time interstate freight flows, two sets of data are needed:

1. to put together long-time series of interstate freight flow data on road, rail and coastal shipping. This is because, in the past freight data, especially road, are not available for every year, and
2. to estimate origin–destination matrices.

For example, for road, we needed to estimate a series of OD matrices over 35 years.

However, road freight data are only available for 1972, 1981, 1982, 1985, 1995 and 1998 to 2007.

Using the adjusted SMVU data, a basic six-step approach was taken to develop the road freight series for each of: the total by state of operation, interstate by state of operation, capital city, and rest of state. This six-step approach for getting the final adjusted estimates for each level of measurement is:

1. Adjust the Australia-level aggregate for SMVU years.
2. Regress the adjusted national SMVU data (with straight line interpolation) against income (and freight rates where applicable) to generate a final adjusted national estimate that varies over the economic cycle.
3. Calculate 'raw' state or city shares from the unadjusted freight data for SMVU years.
4. Smooth these shares to a believable trend, not worrying if the total goes above or below 100 per cent.
5. Interpolate these shares between SMVU years and normalise to add to 100 per cent, giving the final share estimates.
6. Multiply the final share estimate by the final adjusted national series from (2) to give a 33-year time series for each state, interstate, capital city and rest of state.

B.1.1 ABS Freight Movements Survey, 1994–95

There are two potential sources of overcounting in the Freight Movements Survey 1994–95. There are:

1. the units of measure are individual movements, hence loads transported with more than one operator may be counted more than once, and
2. the exclusion of light commercial vehicles (less than 3.5 tonnes) and short movements (less than 25 kilometres).

These two factors inflated the estimation of road freight task. To overcome these sources of overestimating, estimates of freight task were adjusted downwards using a factor of 0.87. The estimated interstate road freight task for 1994–95 is presented in Table B.1.

TB.1 Estimated interstate road freight task (million tkm) on an OD matrix basis, 1994–95[a]

Origin	Destination							Total
	NSW+ACT [b]	VIC	QLD	SA	WA	TAS	NT	
NSW+ACT [b]		4 217	3 558	1 543	0	0	0	9 318
VIC	4 380		4 245	2 066	0	0	0	10 690
QLD	3 059	2 523		447	784	0	55	6 869
SA	1 390	1 419	594		344	0	253	4 000
WA	0	0	0	0		0	0	0
TAS	0	0	0	0	0		0	0
NT	0	0	0	0	0	0		0
Total	8 828	8 160	8 397	4 055	1 128	0	308	30 877

a Data adjusted for overestimation for using a factor of 0.87.

b NSW and ACT combined.

Source: Gargett et. el. (2006).

B.1.2 ABS Freight Movements Survey, 2000–01

In the 2000–01 Freight Movements Survey (FMS 2000–01), the estimates on freight moved by road have been adjusted using a factor of 1.15 to compensate for underreporting by respondents and for the non-inclusion of rigid trucks (minor for interstate). The estimated interstate road freight task for 2001 is presented in Table B.2.

TB.2 Estimated interstate road freight task (million tkm) on an OD matrix basis, 2000–01[a]

Origin	Destination								Total
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
NSW		7 119	5 522	2 171	501	0	238	518	16 068
VIC	6 757		2 773	2 507	480	0	0	65	12 581
QLD	5 153	2 332		588	333	0	662	37	9 105
SA	2 029	2 694	800		1 082	0	928	57	7 590
WA	579	374	350	1 051		0	292	0	2 645
TAS	0	0	0	0	0		0	0	0
NT	36	19	240	455	200	0		0	951
ACT	163	30	22	17	0	0	0		233
Total	14 717	12 569	9 707	6 789	2 595	0	2 119	678	49 174

a Data adjusted for underestimation for using a factor of 1.15.

Source: Gargett et. el. (2006).

B.1.3 Amend the pattern of SMVU data

B.1.3.1 SMVU data, 1982 and 1985

A protocol was used to derive the 1982 and 1985 matrices based on using the 1981 OD matrix in the scaling factor. The protocol for calculating estimates of the interstate road freight task on states' roads is as follows:

1. For 1982 SMVU raw data, we multiplied 1982 raw SMVU data by the ratio of 1981 (FMS) OD interstate road freight estimates to 1982 total interstate OD road freight estimates.
2. Similarly, for 1985 SMVU raw data, we multiplied 1985 raw SMVU data by the ratio of 1981 (FMS) OD interstate road freight estimates to 1982 total interstate OD road freight estimates.

3. These estimates were then averaged, and finally
4. Divided by 1981 FMS OD data.

Table B.3 provides the adjustment factors for 1982 and 1985 SMVU data to correct the interstate road freight estimates. For example, from NSW to Victoria, the correction factor is 1.75, while from Victoria to NSW, the factor is 1.54.

TB.3 Correction factors for SMVU data, 1982 and 1985

State of registration	State of destination							
	NSW	VIC	Qld	SA	WA	TAS	NT	ACT
NSW		1.75	2.02	3.06	14.98	0.00	6.97	9.50
VIC	1.54		3.52	2.08	14.65	0.00	0.00	8.83
Qld	2.47	8.68		3.99	12.54	0.00	5.43	2.33
SA	1.57	1.18	4.73		0.39	0.00	23.52	4.83
WA	4.39	4.82	2.37	0.90		0.00	0.46	0.00
TAS	0.00	0.00	0.00	0.00	0.00		0.00	0.00
NT	1.86	1.93	0.00	0.79	0.04	0.00		0.00
ACT	0.36	1.51	5.65	0.66	0.00	0.00	0.00	

Source: BITRE estimates.

Using correction factors presented in Table B.3, the estimated interstate road freight task on an OD matrix for 1982 and 1985 is presented in Table B.4.

TB.4 Estimated interstate road freight task (million tkm) on an OD matrix basis, 1982 and 1985

Origin	Destination								Total
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
1982									
NSW		1 867	1 041	467	114	0	211	51	3 750
VIC	2 403		1 319	547	765	0	0	58	5 091
QLD	719	403		152	72	0	120	6	1 472
SA	435	389	364		12	0	72	5	1 277
WA	68	155	42	59		0	7	0	331
TAS	0	0	0	0	0		0	0	0
NT	7	2	0	12	2	0		0	22
ACT	51	27	26	4	0	0	0		108
Total	3 683	2 843	2 791	1 241	964	0	410	119	12 051
1985									
NSW		2 045	1 482	688	840	0	169	132	5 356
VIC	2 440		1 595	647	214	0	0	70	4 967
QLD	1 312	915		210	83	0	124	2	2 645
SA	851	501	331		128	0	415	5	2 231
WA	262	137	33	91		0	27	0	550
TAS	0	0	0	0	0		0	0	0
NT	16	9	0	6	2	0		0	32
ACT	18	17	6	1	0	0	0		41
Total	4 899	3 624	3 447	1 642	1 267	0	735	209	15 823

Source: Gargett et. el. (2006).

B.1.3.2 SMVU data cube (Table 18), 1998–2007

It is necessary to amend the SMVU base table (Table 18) between 1998 and 2007 to estimate road freight OD matrices. This is because Table 18 in the SMVU gives what is termed a 'State of registration to State of destination' data.

Data in Table 18 of SMVU includes freight carried mostly within, say NSW, by trucks registered in Victoria, but excludes a portion of interstate tkm performed by NSW trucks within NSW as they head to, say Victoria.

Therefore, a correction matrix is needed to compensate for this problem.

BITRE has amended the SMVU base table using a correction matrix (Table B.5). This correction matrix was derived from a comparison of the SMVU data cube Table 18 average for 2000, 2001 and 2002 with the ABS 2001 Freight Movement Survey (FMS) OD tables. The result of the multiplication is an estimated interstate road freight OD correction matrix for each year between 1998 and 2007 of SMVU data.

TB.5 Correction factors for SMVU Table 18, 1998–2007

State of registration	State of destination							
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
NSW		3.56	3.78	4.01	6.79	0.00	6.79	4.53
VIC	0.70		1.51	1.08	0.97	0.00	1.00	1.48
QLD	0.93	2.89		1.78	2.00	0.00	1.27	1.00
SA	0.83	1.14	1.65		2.07	0.00	2.43	2.50
WA	2.00	4.49	2.87	2.40		0.00	4.25	1.00
TAS	0.00	0.00	0.00	0.00	0.00		0.00	0.00
NT	1.67	1.00	2.19	0.85	1.96	0.00		1.00
ACT	0.32	0.44	0.72	1.61	1.00	0.00	1.00	

Source: Soames et al (2007).

The protocol for calculating the estimates of the interstate road freight task on states' roads is as follows:

1. We take three years average of SMVU 2000, 2001 and 2002 (Table 18 of the data cube, which is 'State/Territory of Registration' by 'State/Territory of Operation'), centred at 2001.
2. We then calculate a cell factor for scaling, equal to the 2001 Freight Measurement Survey (FMS) cell tonne-kilometres divided by the 2001 SMVU cell tonne-kilometres.
3. Then we use this scaling factor on that OD cell in each of the SMVU matrices of 1998 to 2007.

For example, from NSW to Victoria, the correction factor is 3.56, while from Victoria to NSW, the factor is 0.70 (Table B.5).

Using the SMVU raw data origin–destination (OD) matrices (see Appendix A, Table A.1), ABS data for OD road freight tasks for the years 1998 to 2007 were estimated by multiplying by the correction factors presented in Table B.5. The corrected OD matrix based estimates for these years are presented in Table B.6.

Revised SMVU tonne–kilometre[2] data presented in Tables B.4 and B.6 can be used to calculate tonnages by dividing by the origin–destination (OD) road distance given in Appendix C (Table C.1).

2 Tonne-kilometre is the number of tonnes moved multiplied by the distance travelled in kilometres (e.g. 25 tonnes of freight moved a distance of 100 kilometres is 2500 tonne-kilometres.

TB.6 Estimated interstate road freight task (million tkm) on an OD matrix basis, 1998 to 2007

Origin	Destination								IS Total
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
1998									
NSW		5 562	3 926	770	1 012	0	7	385	11 663
VIC	5 188		1 038	2 154	673	0	0	62	9 115
QLD	4 017	2 276		566	277	0	135	111	7 382
SA	917	2 513	249		2 950	0	367	2	6 998
WA	282	180	212	974		0	242	0	1 889
TAS	0	0	0	0	0		0	0	0
NT	44	87	664	419	84	0		0	1 298
ACT	166	14	9	16	0	0	0		205
Total	10 614	10 631	6 098	4 899	4 996	0	751	562	38 550
1999									
NSW		6 594	6 791	1 356	1 862	0	156	403	17 163
VIC	5 696		2 222	2 502	599	0	0	62	11 081
QLD	4 168	2 082		753	531	0	817	223	8 574
SA	1 375	3 049	723		2 552	0	272	2	7 974
WA	300	67	250	401		0	989	0	2 007
TAS	0	0	0	0	0		0	0	0
NT	37	202	734	503	145	0		0	1 621
ACT	173	23	27	8	0	0	0		232
Total	11 750	12 018	10 747	5 523	5 688	0	2 235	691	48 652
2000									
NSW		7 708	5 810	1 801	605	0	7	571	16 502
VIC	7 167		3 556	2 794	541	0	0	31	14 089
QLD	4 674	1 764		1 129	638	0	515	0	8 720
SA	1 703	2 301	814		769	0	1 537	142	7 265
WA	294	135	166	668		0	408	0	1 671
TAS	0	0	0	0	0		0	0	0
NT	67	0	363	453	123	0		0	1 005
ACT	189	27	31	26	0	0	0		272
Total	14 094	11 935	10 740	6 870	2 675	0	2 466	745	49 524
2001									
NSW		7 139	5 081	2 740	7	0	27	526	15 520
VIC	6 522		1 925	2 442	616	0	0	105	11 610
QLD	5 846	2 394		355	120	0	409	56	9 180
SA	1 588	2 366	613		1 280	0	598	20	6 465
WA	837	710	577	1 440		0	263	0	3 827
TAS	0	0	0	0	0		0	0	0
NT	30	29	151	494	317	0		0	1 021
ACT	113	16	11	6	0	0	0		147
Total	14 935	12 654	8 357	7 478	2 340	0	1 298	707	47 770

(continued)

TB.6 Estimated interstate road freight task (million tkm) on an OD matrix basis, 1998 to 2007 (continued)

Origin	Destination								IS Total
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
2002									
NSW		6 509	5 674	1 973	890	0	679	458	16 184
VIC	6 581		2 837	2 284	282	0	0	59	12 044
QLD	4 939	2 837		280	241	0	1 062	56	9 414
SA	2 796	3 415	974		1 197	0	649	10	9 040
WA	605	279	307	1 043		0	204	0	2 438
TAS	0	0	0	0	0		0	0	0
NT	12	29	208	419	160	0		0	828
ACT	188	49	25	18	0	0	0		280
Total	15 121	13 117	10 024	6 018	2 770	0	2 595	583	50 228
2003									
NSW		9 249	5 719	2 683	1 271	0	197	911	20 031
VIC	6 450		3 446	2 346	74	0	0	25	12 341
QLD	6 702	3 834		526	156	0	199	56	11 474
SA	4 139	3 025	753		1 404	0	119	2	9 442
WA	659	930	453	1 428		0	1 010	0	4 481
TAS	0	0	0	0	0		0	0	0
NT	107	29	253	395	327	0		0	1 111
ACT	132	45	28	16	0	0	0		222
Total	18 189	17 113	10 653	7 395	3 232	0	1 526	995	59 102
2004									
NSW		6 217	6 697	2 387	61	0	0	662	16 024
VIC	7 707		2 572	2 475	217	0	0	18	12 989
QLD	6 029	4 103		2 152	90	0	3 006	502	15 882
SA	1 993	2 317	525		696	0	479	52	6 063
WA	675	72	453	1 031		0	272	0	2 504
TAS	0	0	0	0	0		0	0	0
NT	77	895	212	213	419	0		0	1 816
ACT	165	40	22	3	0	0	0		231
Total	16 647	13 645	10 481	8 261	1 483	0	3 757	1 234	55 508
2005									
NSW		7 641	11 057	1 159	279	0	61	712	20 908
VIC	8 164		2 386	3 609	568	0	0	18	14 745
Qld	7 471	5 127		1 390	1 169	0	409	111	15 678
SA	2 059	2 460	534		1 748	0	642	0	7 443
WA	286	746	92	1 524		0	259	0	2 906
TAS	0	0	0	0	0		0	0	0
NT	10	29	444	151	117	0		0	751
ACT	128	30	10	13	0	0	0		180
Total	18 118	16 032	14 522	7 846	3 881	0	1 371	841	62 611

(continued)

TB.6 Estimated interstate road freight task (million tkm) on an OD matrix basis, 1998 to 2007 (continued)

Origin	Destination								IS Total
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	
2006									
NSW		8 370	9 456	1 753	414	0	482	780	21 256
VIC	9 055		3 041	2 848	687	0	27	33	15 691
Qld	7 197	4 708		626	192	0	1 041	1 003	14 767
SA	1 813	2 042	1 305		381	0	2 420	7	7 967
WA	915	445	430	1 154		0	119	0	3 063
TAS	0	0	0	0	0		0	0	0
NT	54	173	234	179	718	0		0	1 358
ACT	135	31	9	3	0	0	0		178
Total	19 167	15 769	14 475	6 564	2 393	0	4 088	1 823	64 280
2007									
NSW		10 644	7 191	1 901	401	0	163	988	21 289
VIC	9 522		4 761	3 657	257	0	27	53	18 278
Qld	7 813	4 445		1 272	158	0	74	0	13 761
SA	1 489	2 808	547		1 131	0	601	5	6 580
WA	737	669	562	1 647		0	522	0	4 138
TAS	0	0	0	0	0		0	0	0
NT	28	375	376	184	96	0		0	1 059
ACT	172	41	20	19	0	0	0		253
Total	19 761	18 982	13 458	8 680	2 043	0	1 387	1 047	65 358

Source: Gargett et el (2006) and BITRE estimates.

B.2 Interpolation of data and cell-by-cell origin–destination (OD) matrix modelling

Interpolation of interstate road freight estimates data are needed due to missing data. For this reason, interstate road freight data points were interpolated using regression analysis for each of the OD pairs.

Two sets of regressions were done due to the nature of the data. The first set contains all OD routes, except eastern states (i.e. NSW, VIC, QLD and SA) to WA and WA to eastern states, which were done separately (see section B.2.2).

Cell-by-cell OD road freight task modelling was done from 1972 to 2007 between OD pairs by means of the most representative trucking time series available, i.e. the number of trucks passing through the Hume Highway at Marulan or travelling the Eyre Highway. In many cases, a time trend was included, depending on the nature of data.

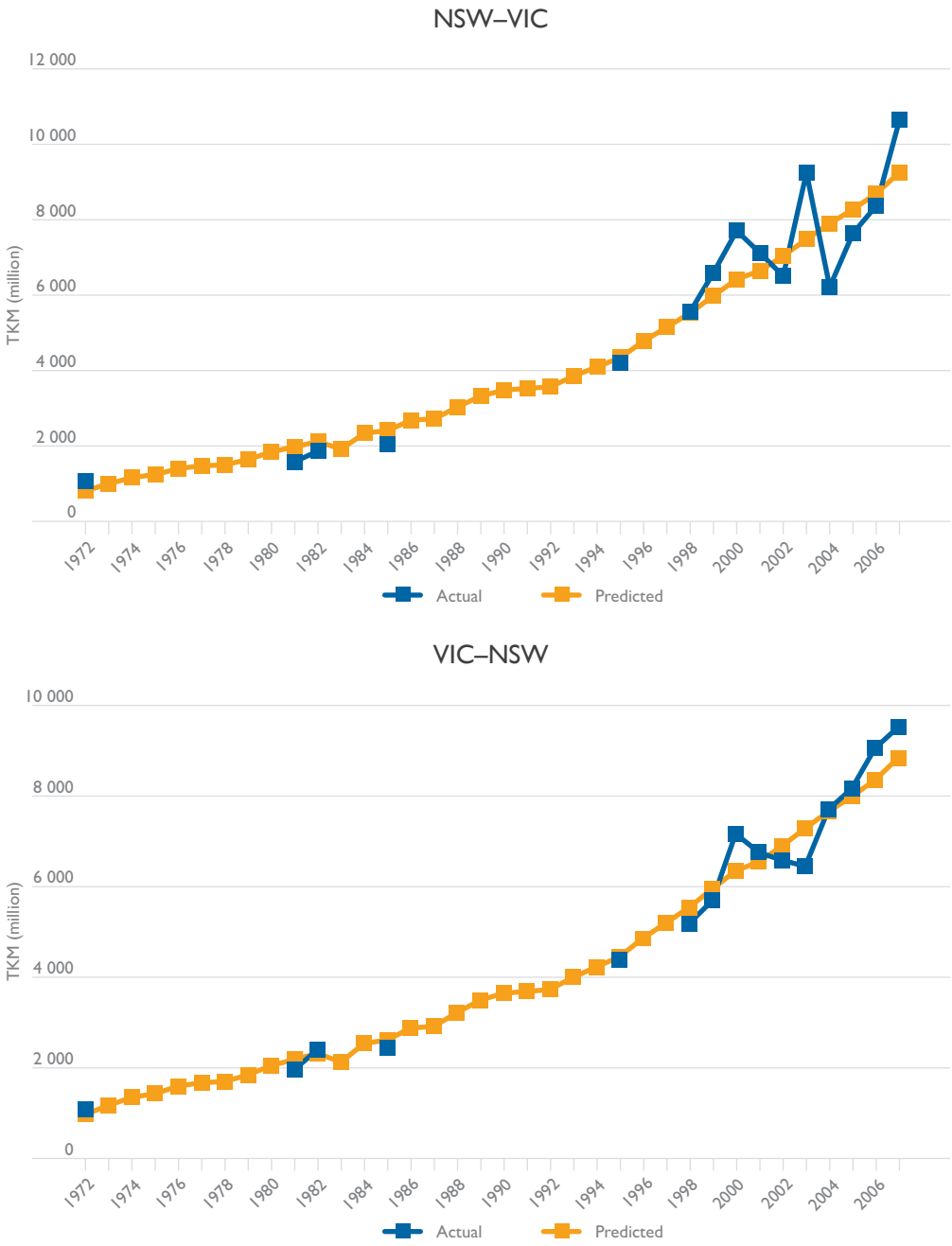
For the regressions between the road freight task and the number of trucks passing through Marulan, 'Log' transformation was done for smoothing the data. Eyre highway truck counts were used as a dummy for eastern states to WA.

B.2.1 Cell-by-cell OD matrices: 26 origin–destination (OD) routes (excluding eastern states–WA and WA–eastern states)

The actual and predicted road freight task (million tonne-kilometres) between 1972 and 2007 for each of the OD pairs are shown in Figures B.2.1 to B.13. However, regression interpolations were not done for the following routes due to low traffic volumes: NSW–TAS, TAS–NSW, VIC–TAS, TAS–VIC, QLD–TAS, TAS–QLD, SA–TAS, TAS–SA, WA–ACT, ACT–WA, TAS–NT, NT–TAS, TAS–ACT, ACT–TAS, WA–TAS, TAS–WA, ACT–NT, NT–ACT, QLD–ACT, ACT–QLD, SA–ACT and ACT–SA. The coefficients of regression analysis for various routes are given in Table B.7. However, some of the years' data for some routes were omitted from the regression due to large variability in the data set. These are mentioned in the footnotes of Table B.7.

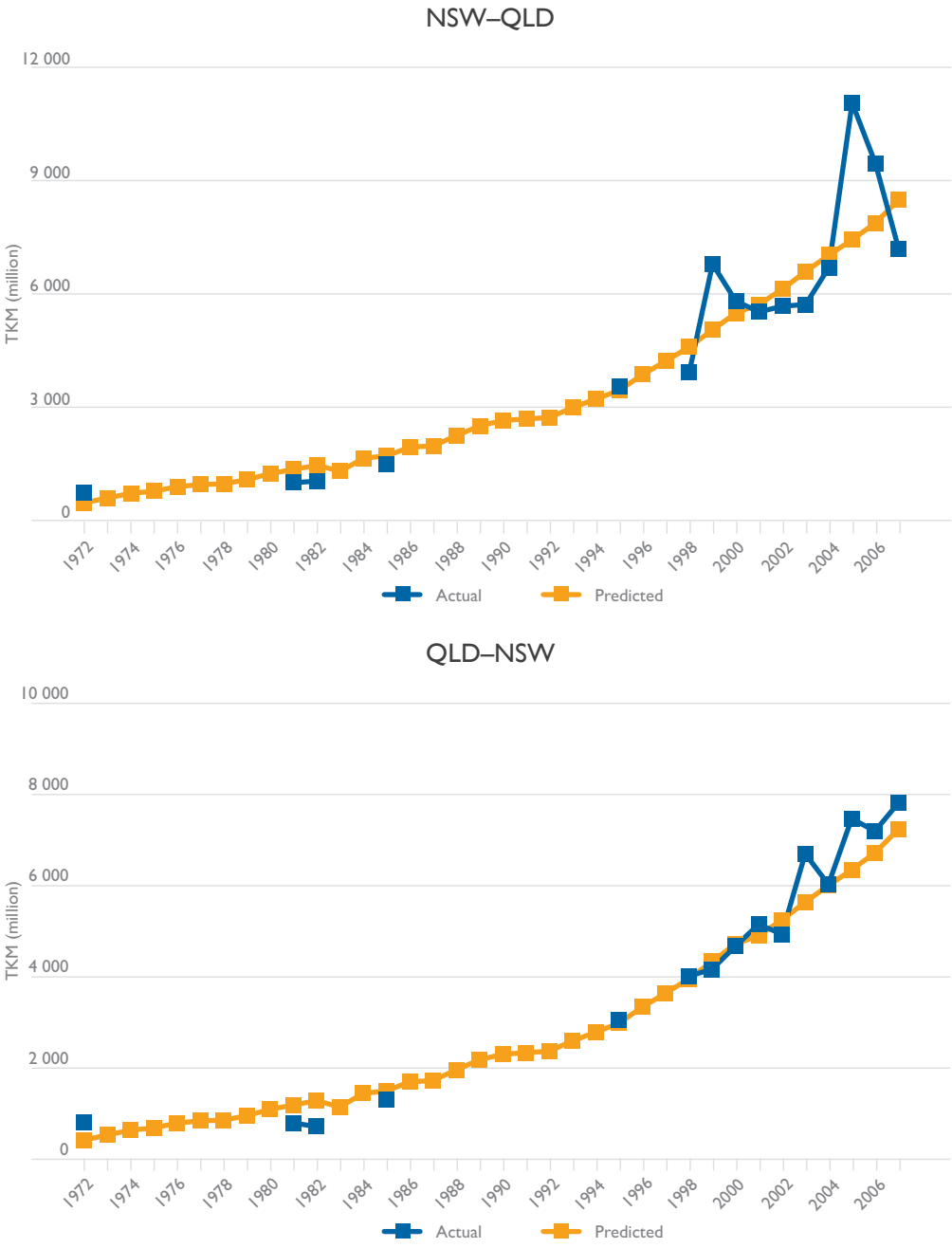
All OD pairs showed a fair agreement in the predicted road freight task with the actual road freight task, except for VIC–NT route (Figure B.6), VIC–QLD route (Figure B.10), and VIC–ACT and ACT–VIC routes (Figure B.11).

FB.1 Interstate road freight data points (actual) and interpolation (predicted), NSW–VIC and VIC–NSW origin–destination matrices, 1972–2007



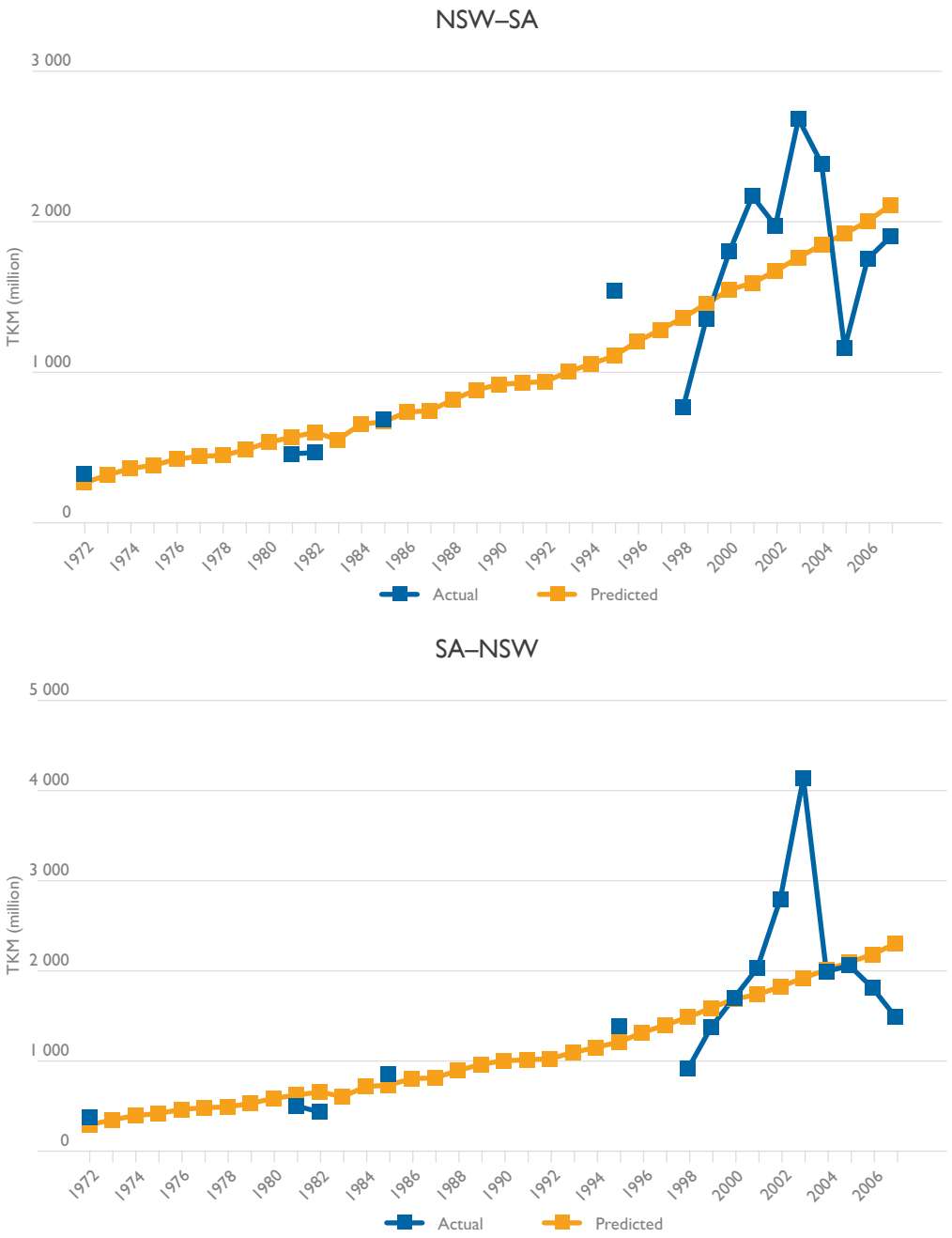
Source: BITRE estimates.

FB.2 Interstate road freight data points (actual) and interpolation (predicted), NSW–QLD and QLD–NSW origin–destination matrices, 1972–2007



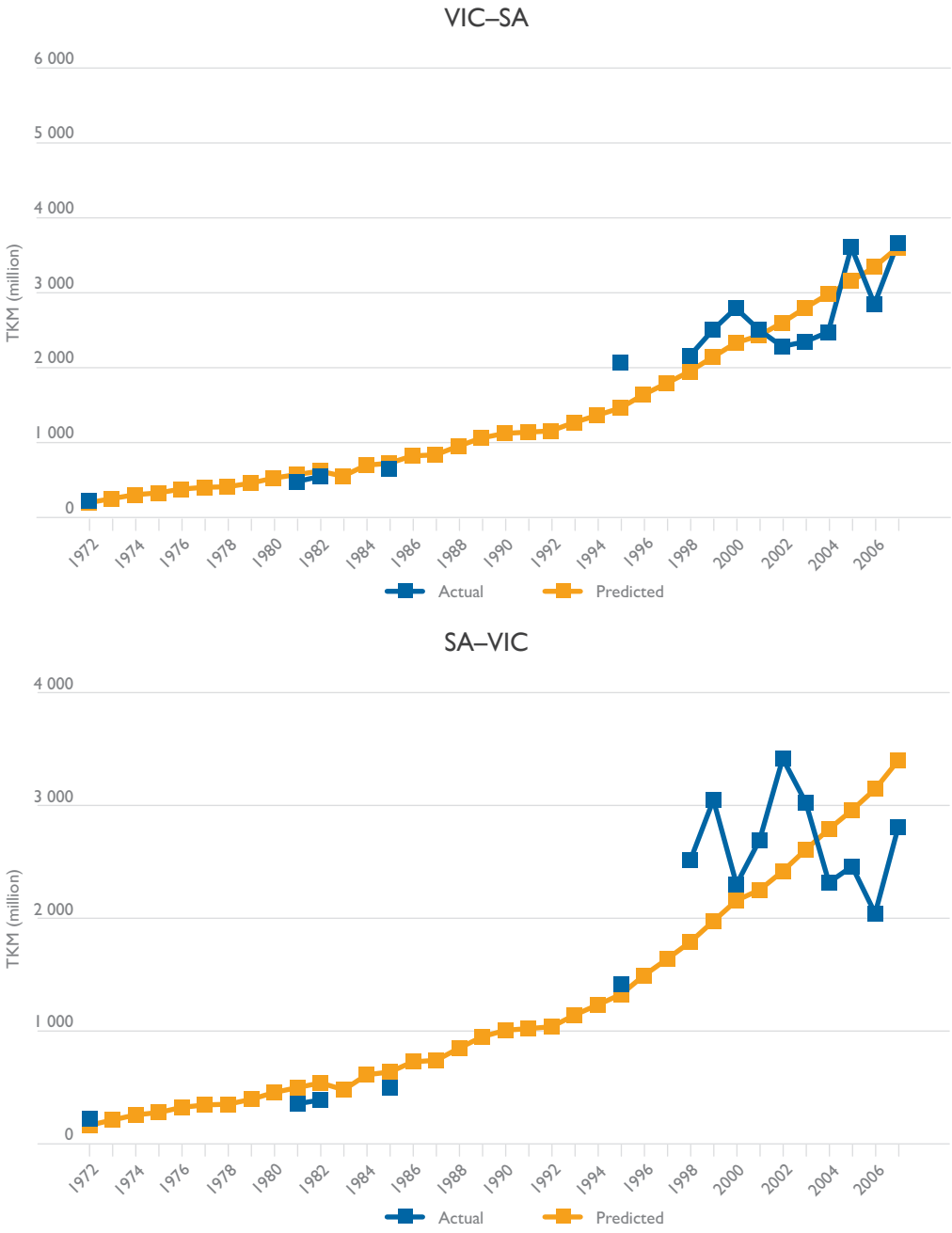
Source: BITRE estimates.

FB.3 Interstate road freight data points (actual) and interpolation (predicted), NSW–SA and SA–NSW origin–destination matrices, 1972–2007



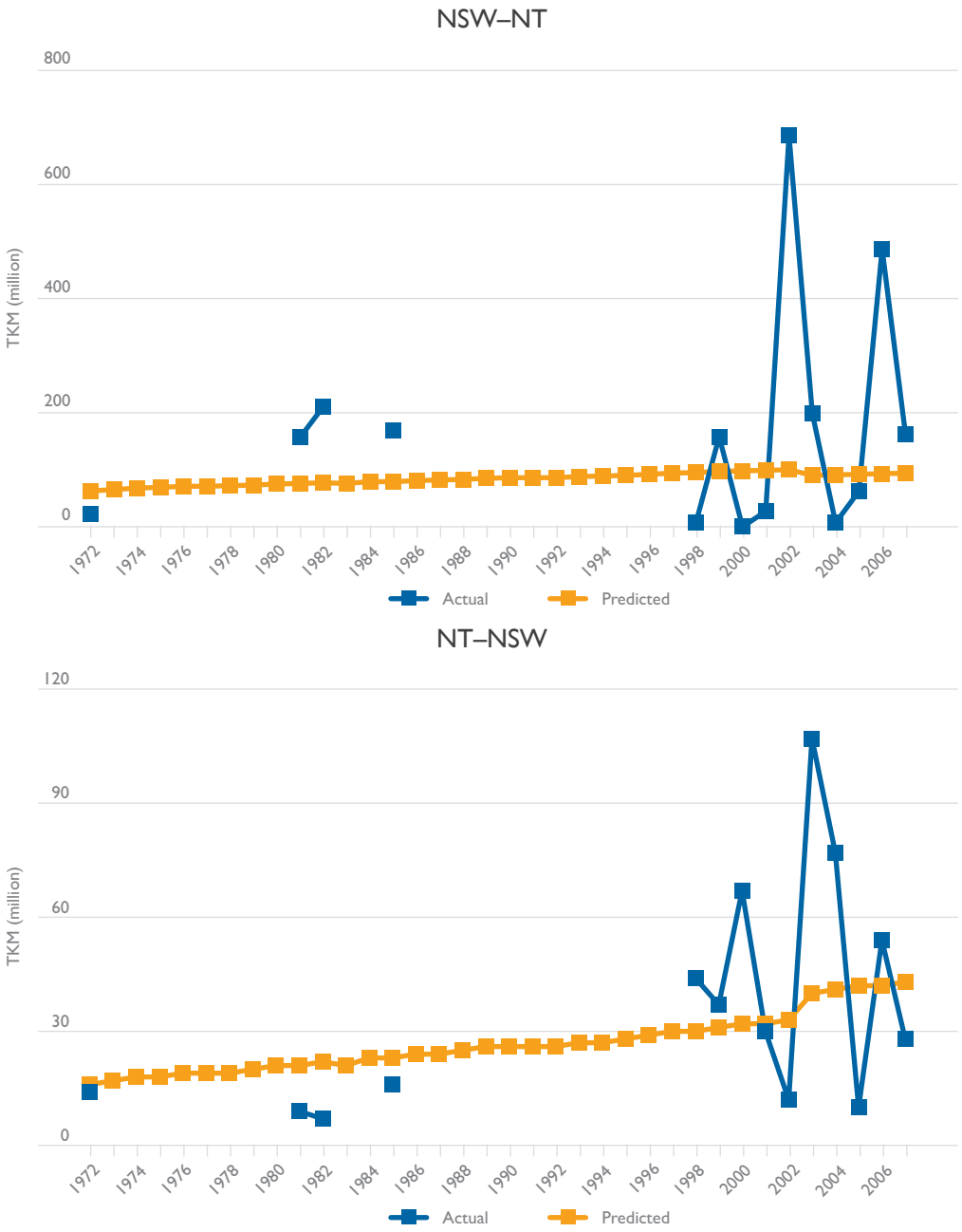
Source: BITRE estimates.

FB.4 Interstate road freight data points (actual) and interpolation, VIC–SA and SA–VIC origin–destination matrices, 1972–2007



Source: BITRE estimates.

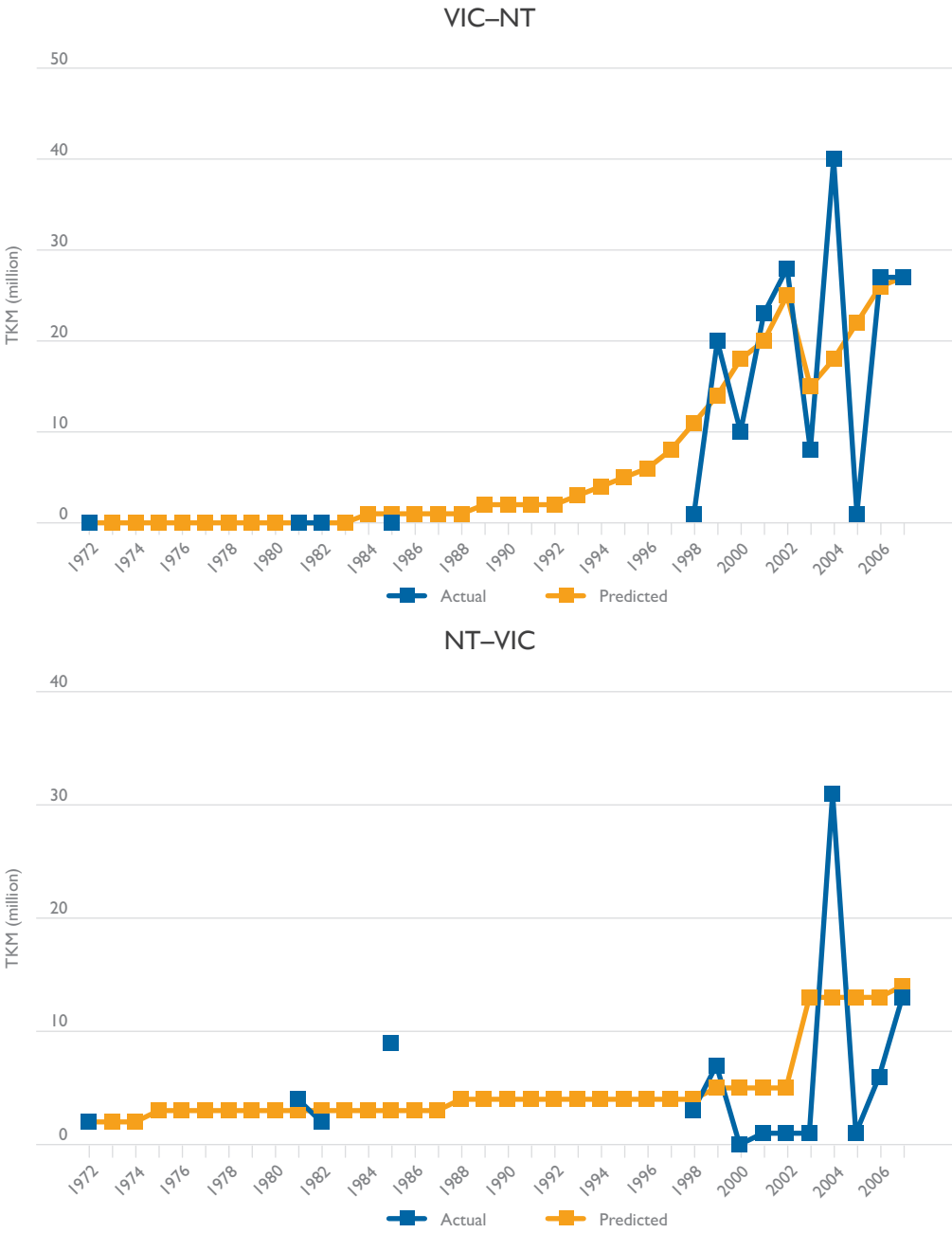
FB.5 Interstate road freight data points (actual) and interpolation (predicted), NSW–NT and NT–NSW origin–destination matrices, 1972–2007



Notes: Omitted years 1981, 1982 and 1985 for NSW–NT and NT–NSW. Rail dummy was used for NSW–NT and NT–NSW.

Source: BITRE estimates.

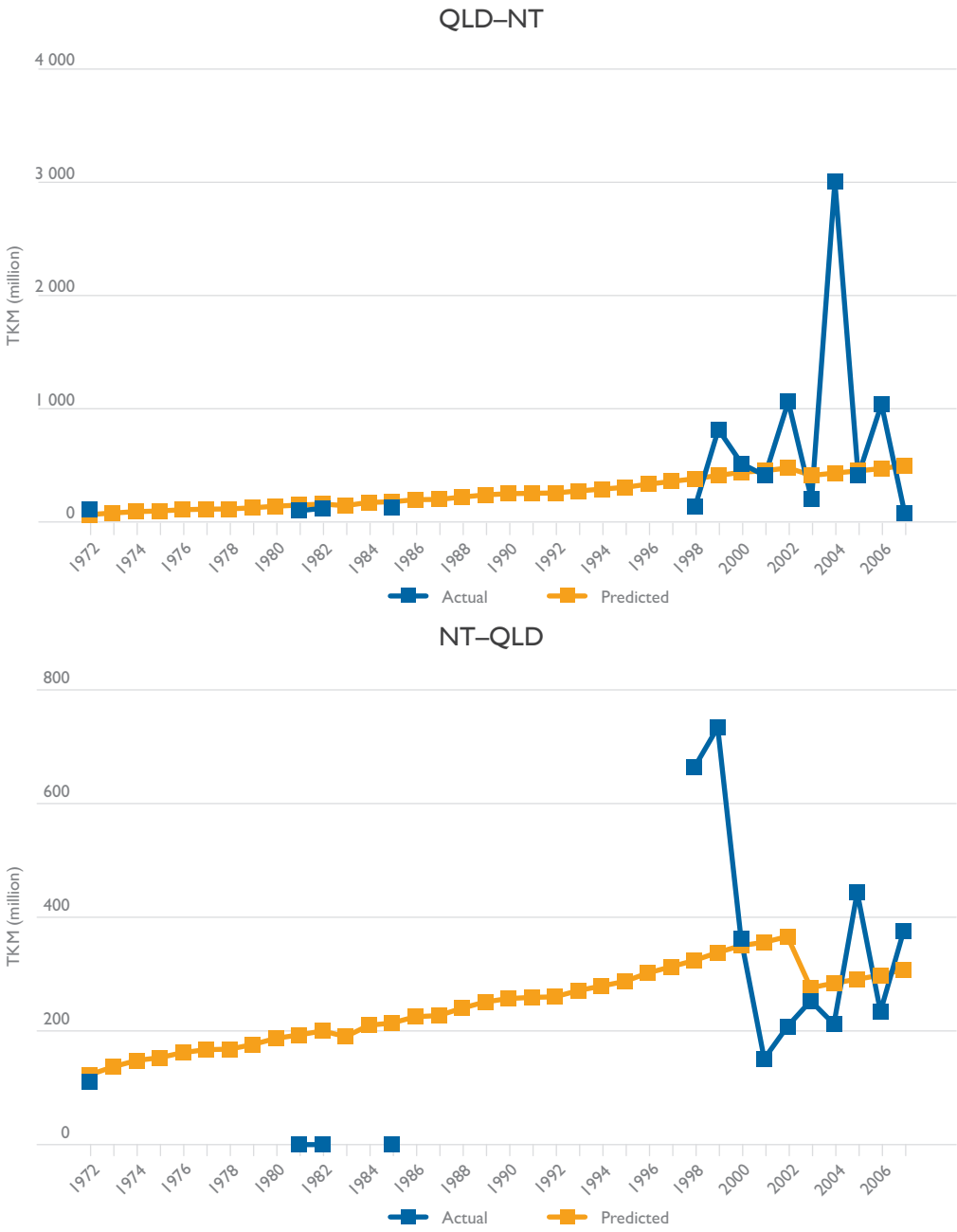
FB.6 Interstate road freight data points (actual) and interpolation (predicted), VIC–NT and NT–VIC origin–destination matrices, 1972–2007



Notes: Omitted years 1981, 1982 and 1985 for VIC–NT, and 1981, 1982, 1985 and 2000. Rail dummy was used for VIC–NT and NT–VIC.

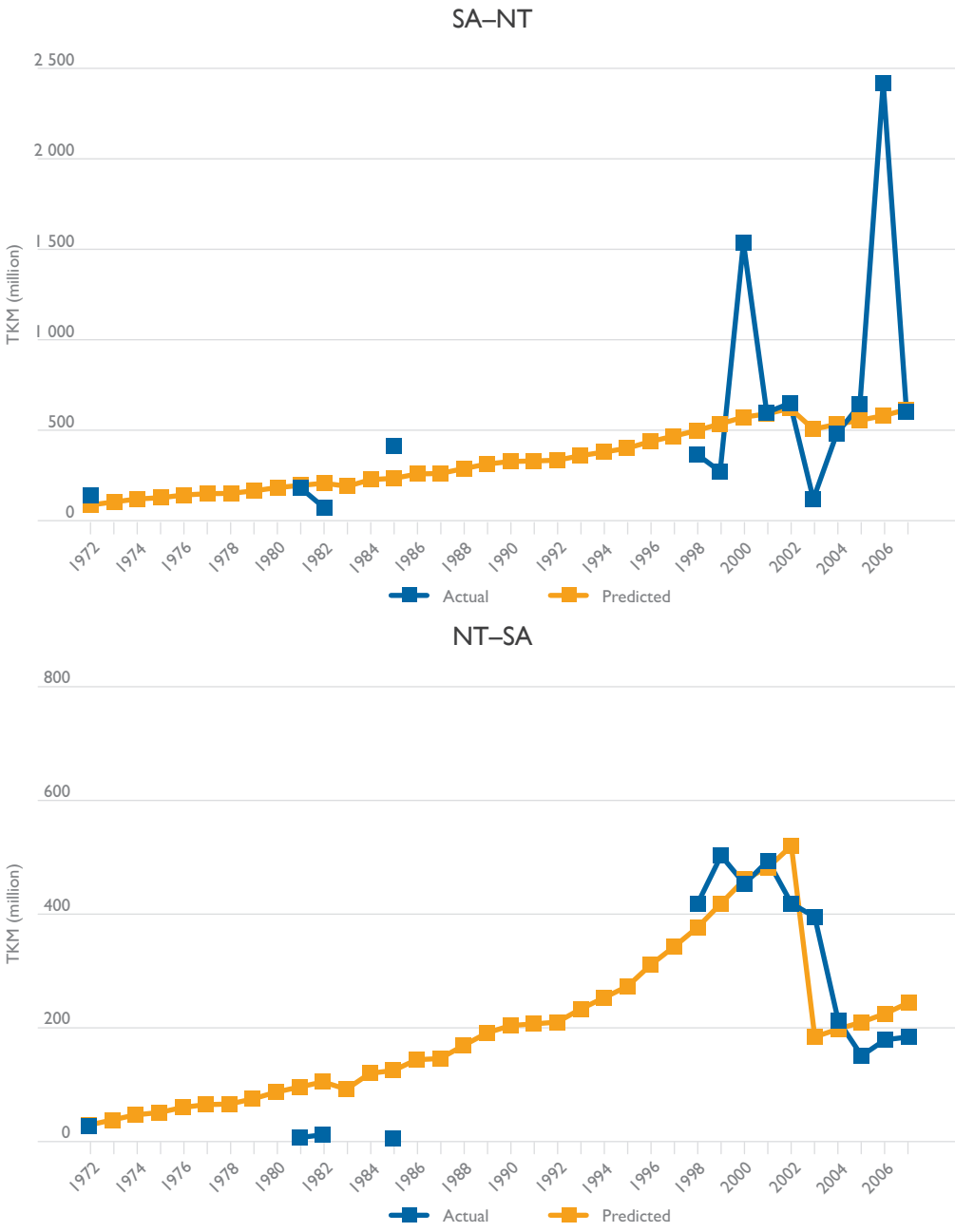
Source: BITRE estimates.

FB.7 Interstate road freight data points (actual) and interpolation (predicted), QLD–NT and NT–QLD origin–destination matrices, 1972–2007



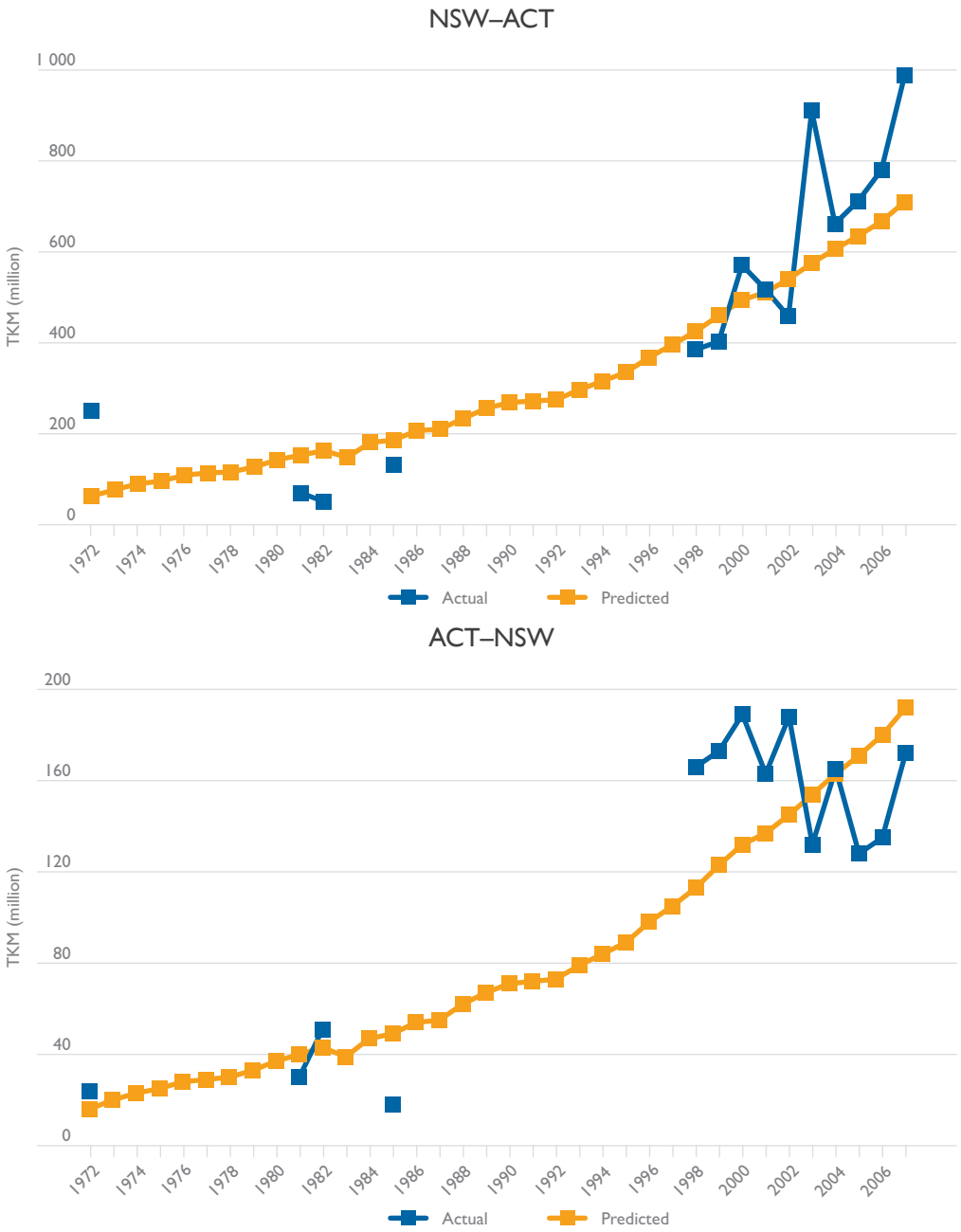
Notes: Omitted years 1981, 1982 and 1985 for NT–QLD. Rail dummy was used for QLD–NT and NT–QLD.
Source: BITRE estimates.

FB.8 Interstate road freight data points (actual) nd interpolation (predicted), SA–NT and NT–SA origin–destination matrices, 1972–2007



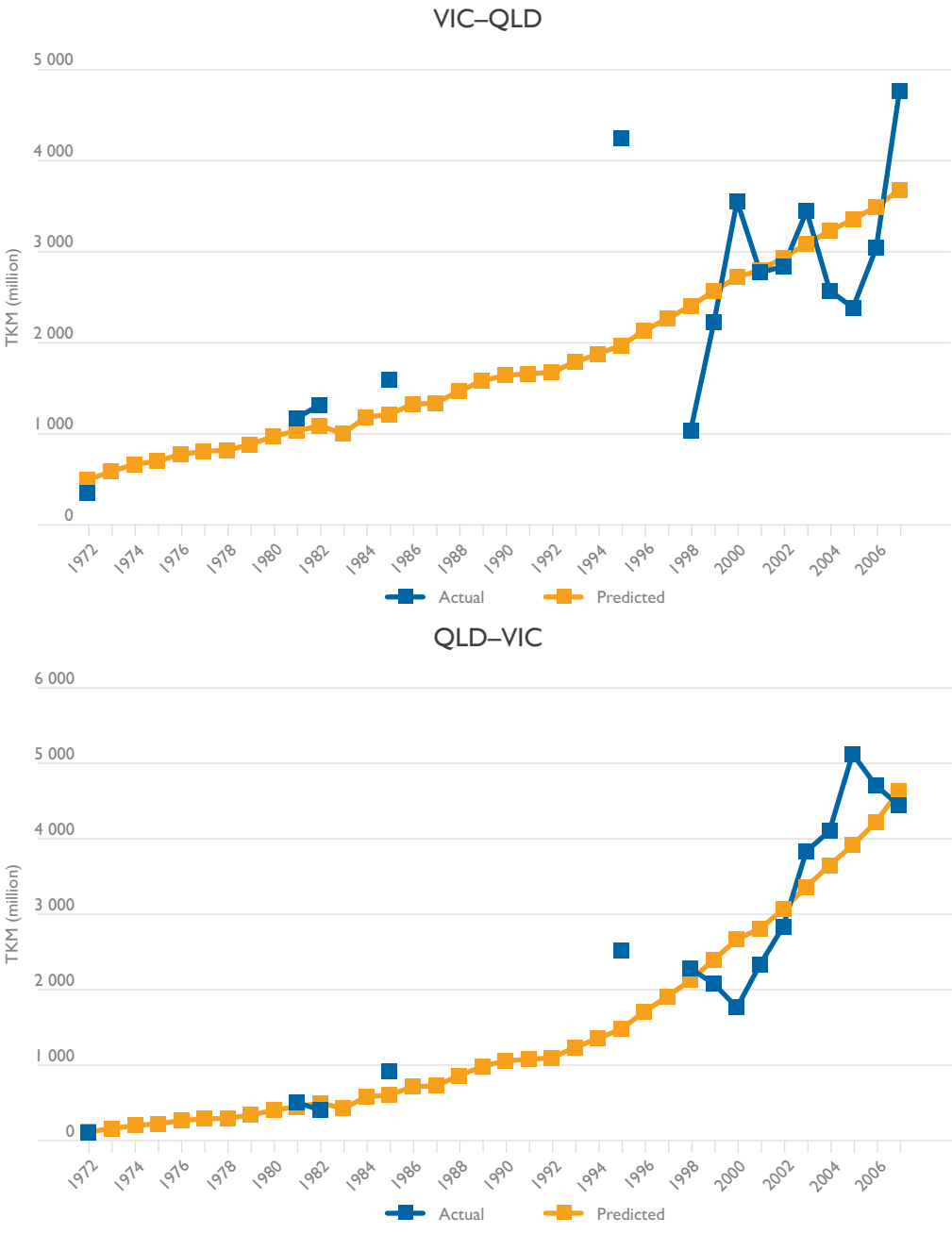
Notes: 1981, 1982 and 1985 for NT–SA was omitted. Rail dummy was used for SA–NT and NT–SA.
Source: BITRE estimates.

FB.9 Interstate road freight data points (actual) and interpolation (predicted), NSW–ACT and ACT–NSW origin–destination matrices



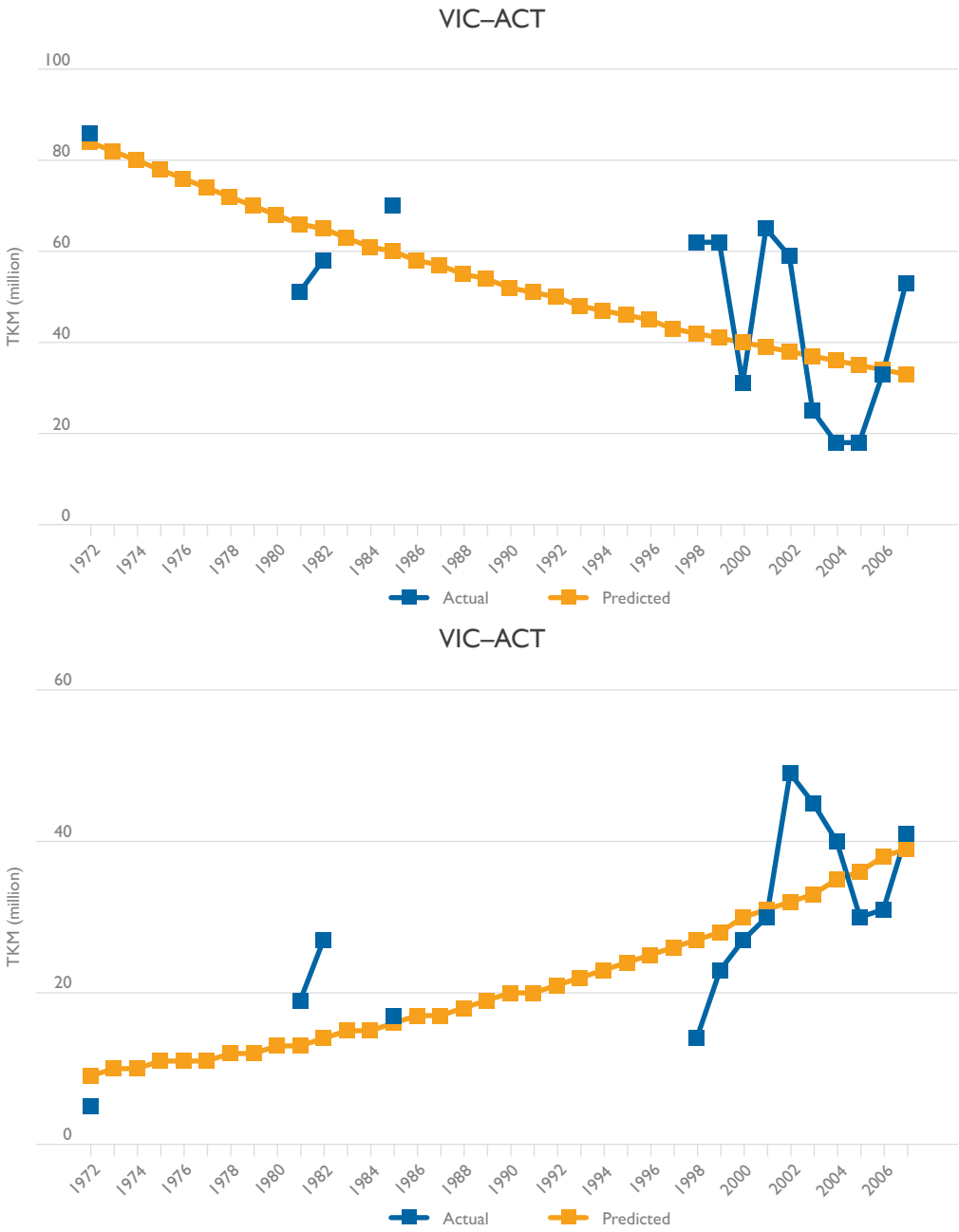
Source: BITRE estimates.

FB.10 Interstate road freight data points (actual) and interpolation (predicted), VIC–QLD and QLD–VIC origin–destination matrices



Notes: Omitted years 1995 and 1998 for VIC–QLD and QLD–VIC.
Source: BITRE estimates.

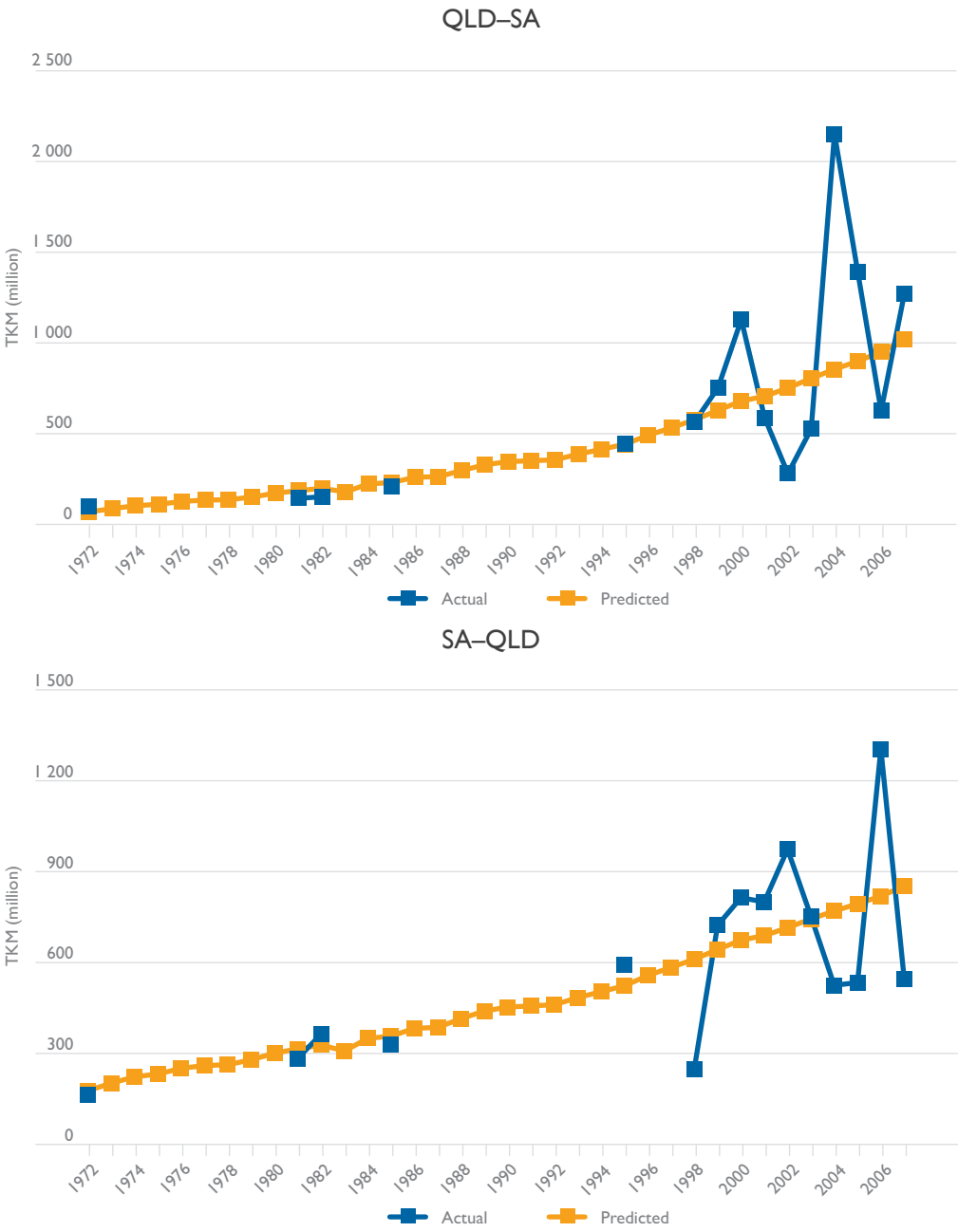
FB.11 Interstate road freight data points (actual) and interpolation (predicted), VIC–ACT and ACT–VIC origin–destination matrices



Notes: Marulan truck counts were not used for VIC–ACT.

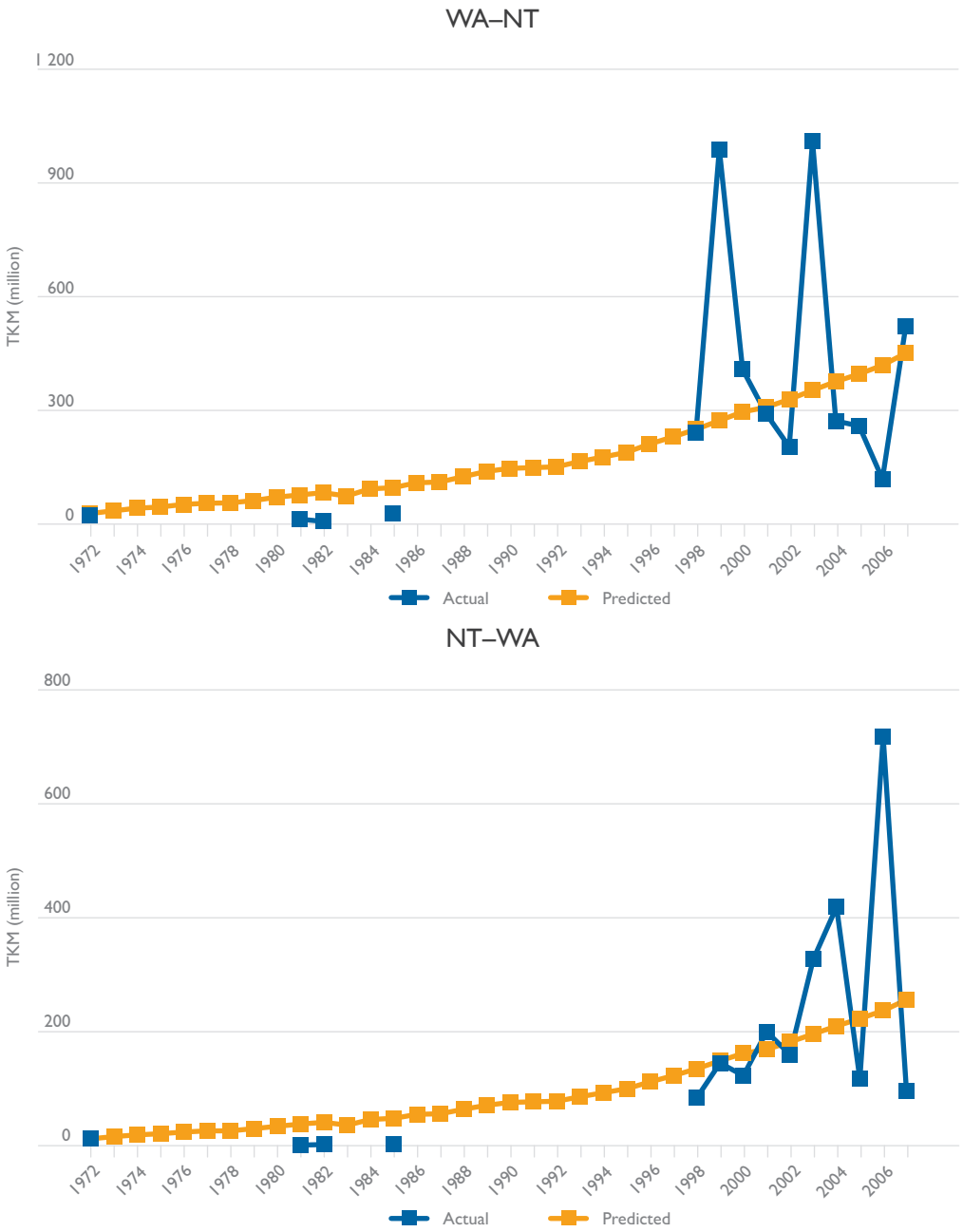
Source: BITRE estimates.

FB.12 Interstate road freight data points (actual) and interpolation (predicted), QLD–SA and SA–QLD origin–destination matrices, 1972–2007



Notes: Omitted yea 1998 for SA–QLD.
Source: BITRE estimates.

FB.13 Interstate road freight data points (actual) and interpolation (predicted), WA–NT and NT–WA origin–destination matrices, 1972–2007



Notes: Omitted years 1981, 1982 and 1985 for WA–NT and NT–WA.

Source: BITRE estimates.

Using the equations from the regression analysis (see Table B.7), road freight data was interpolated from 1972 to 2007 for each of the 26 OD pairs. Table B.8 shows the results of regression interpolation for each of the OD pair examined. Interstate road freight tonnage data for these 34 OD routes are presented in Appendix D (Table D.1), along with route distance in kilometres. These road distances have been derived from the 2001 Freight Movement Survey of the Australian Bureau of Statistics (ABS 2001; Table 4 divided by Table 3).

TB.7 Regression equations for 26 individual OD routes, 1972–2007

OD route [a]	Omitted years [b]	Coefficient			
		Constant (intercept)	Traffic counts [c]	Rail dummy	Time dummy
NSW–VIC		–0.662	0.984		
VIC–NSW		0.211	0.891		
NSW–QLD		–2.623	1.172		
QLD–NSW		–2.580	1.152		
NSW–SA		–0.683	0.838		
SA–NSW		–0.581	0.836		
VIC–SA		–3.498	1.174		
SA–VIC		–4.064	1.225		
NSW–NT	2000	2.534	0.214	–0.119	
NT–NSW	1981–82, '85	0.255	0.335	0.179	
VIC–NT	1972, '81–82, '85, '98, '05	–30.428	3.476	–0.712	
NT–VIC	1981–82, '85, '01–03, '05	–2.026	0.373	0.936	
QLD–NT		–2.596	0.906	–0.207	
NT–QLD	1981–82, '85	1.104	0.496	–0.313	
SA–NT		–2.263	0.898	–0.261	
NT–SA	1981–82, '85	–6.450	1.313	–1.121	
NSW–ACT		–3.175	0.978		
ACT–NSW		–4.732	1.003		
VIC–QLD	1995, '98	0.124	0.812		
QLD–VIC	1995, '98	–6.378	1.489		
VIC–ACT [d]		4.462			–0.027
ACT–VIC [d]		2.187			0.041
QLD–SA		–3.889	1.086		
SA–QLD	1998	0.410	0.637		
WA–NT	1981–82, '85	–5.126	1.129		
NT–WA	1981–82, '85	–6.655	1.225		

a Regressions were not done for the following OD routes due to low or no traffic volume: NSW–TAS, TAS–NSW, VIC–TAS, TAS–VIC, QLD–TAS, TAS–QLD, SA–TAS, TAS–SA, WA–ACT, ACT–WA, TAS–NT, NT–TAS, TAS–ACT, ACT–TAS, WA–TAS, TAS–WA, ACT–NT, NT–ACT, QLD–ACT, ACT–QLD, SA–ACT and ACT–SA.

b Regressions included the years 1972, 1981, 1982, 1985, 1995, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006 and 2007, except for the omitted years for each regression.

c Truck traffic counts on the Hume Highway near Marulan.

d Marulan truck counts were not used in the regression.

Source: BITRE estimates.

TB.8 Results of regression interpolation for OD pair interstate road freight task (million tkm) for 26 OD routes, 1972–2007

Year	NSW–VIC	VIC–NSW	NSW–QLD	QLD–NSW	NSW–SA	SA–NSW	VIC–SA	SA–VIC	NSW–NT	NT–NSW	VIC–NT	NT–VIC
1972	813	976	468	420	266	292	198	165	63	16	0	2
1973	997	1 173	597	533	317	347	252	212	65	17	0	2
1974	1 164	1 351	718	639	362	395	304	257	68	18	0	2
1975	1 241	1 431	775	688	382	417	328	278	69	18	0	3
1976	1 401	1 597	895	793	423	463	379	324	71	19	0	3
1977	1 475	1 674	952	843	442	483	403	345	71	19	0	3
1978	1 498	1 698	970	858	448	490	410	352	72	19	0	3
1979	1 643	1 846	1 083	956	485	530	458	395	73	20	0	3
1980	1 845	2 050	1 243	1 095	535	585	526	456	75	21	0	3
1981	1 981	2 187	1 353	1 190	569	621	573	499	76	21	0	3
1982	2 114	2 320	1 462	1 285	601	657	619	541	77	22	0	3
1983	1 919	2 125	1 302	1 147	553	605	551	479	76	21	0	3
1984	2 338	2 541	1 648	1 445	655	715	698	613	79	23	1	3
1985	2 412	2 614	1 711	1 499	672	734	724	637	79	23	1	3
1986	2 684	2 880	1 943	1 699	736	804	823	728	81	24	1	3
1987	2 720	2 915	1 974	1 725	745	813	836	740	82	24	1	3
1988	3 037	3 220	2 250	1 962	818	893	953	849	83	25	1	4
1989	3 324	3 495	2 506	2 181	883	964	1 062	950	85	26	2	4
1990	3 483	3 647	2 650	2 304	919	1 003	1 123	1 007	86	26	2	4
1991	3 526	3 687	2 688	2 337	929	1 014	1 139	1 022	86	26	2	4
1992	3 570	3 728	2 728	2 371	939	1 025	1 156	1 038	86	26	2	4
1993	3 857	4 000	2 992	2 596	1 003	1 094	1 268	1 143	88	27	3	4
1994	4 100	4 227	3 218	2 789	1 056	1 152	1 364	1 233	89	27	4	4
1995	4 344	4 454	3 447	2 984	1 109	1 210	1 461	1 325	90	28	5	4
1996	4 783	4 860	3 866	3 340	1 204	1 314	1 639	1 494	92	29	6	4
1997	5 151	5 198	4 223	3 643	1 283	1 399	1 791	1 639	94	30	8	4
1998	5 530	5 544	4 596	3 958	1 363	1 486	1 949	1 790	95	30	11	4
1999	5 980	5 951	5 045	4 338	1 456	1 588	2 140	1 974	97	31	14	5
2000	6 424	6 350	5 494	4 718	1 548	1 688	2 331	2 158	98	32	18	5
2001	6 646	6 548	5 721	4 909	1 593	1 737	2 427	2 251	99	32	20	5
2002	7 037	6 896	6 124	5 248	1 673	1 824	2 599	2 417	100	33	25	5
2003	7 484	7 292	6 590	5 640	1 763	1 922	2 797	2 609	90	40	15	13
2004	7 898	7 657	7 027	6 008	1 846	2 012	2 982	2 790	91	41	18	13
2005	8 278	7 990	7 431	6 347	1 921	2 094	3 155	2 958	92	42	22	13
2006	8 695	8 354	7 880	6 723	2 003	2 183	3 345	3 145	93	42	26	13
2007	9 255	8 841	8 488	7 233	2 112	2 302	3 604	3 399	94	43	27	14

(continued)

TB.8 Results of regression interpolation for OD pair interstate road freight task (million tkm) for 26 OD routes, 1972–2007 (continued)

Year	QLD–NT	NT–QLD	SA–NT	NT–SA	NSW–ACT	ACT–NSW	VIC–QLD	QLD–VIC	VIC–ACT	ACT–VIC	QLD–SA	SA–QLD
1972	65	123	87	29	63	16	494	117	84	9	69	177
1973	79	137	104	38	77	20	585	159	82	10	87	202
1974	91	148	120	47	90	23	664	201	80	10	103	223
1975	97	153	127	51	96	25	700	222	78	11	111	232
1976	108	162	142	60	109	28	774	266	76	11	127	251
1977	113	167	149	65	114	29	808	288	74	11	134	260
1978	115	168	151	66	116	30	818	295	72	12	136	263
1979	125	176	165	75	127	33	883	339	70	12	151	279
1980	139	187	183	87	143	37	972	404	68	13	172	301
1981	149	193	195	96	153	40	1 031	450	66	13	186	315
1982	158	200	207	105	163	43	1 088	497	65	14	199	328
1983	144	190	190	92	148	39	1 004	429	63	15	179	308
1984	173	210	227	120	181	47	1 182	579	61	15	223	350
1985	178	214	234	125	186	49	1 213	606	60	16	231	357
1986	197	225	258	144	207	54	1 324	713	58	17	260	383
1987	199	227	261	146	210	55	1 339	727	57	17	263	386
1988	220	240	288	169	234	62	1 466	859	55	18	297	415
1989	239	251	313	191	256	67	1 580	985	54	19	329	440
1990	250	257	327	203	269	71	1 642	1 057	52	20	346	453
1991	253	259	331	207	272	72	1 659	1 077	51	20	351	457
1992	256	260	334	210	275	73	1 676	1 097	50	21	356	461
1993	274	271	359	233	297	79	1 786	1 234	48	22	387	484
1994	290	279	379	253	316	84	1 879	1 353	47	23	414	504
1995	306	287	400	273	335	89	1 971	1 477	46	24	442	523
1996	335	302	437	311	368	98	2 133	1 708	45	25	491	557
1997	358	313	467	343	396	105	2 268	1 911	43	26	533	584
1998	382	325	499	377	425	113	2 405	2 128	42	27	577	611
1999	411	338	535	419	460	123	2 566	2 395	41	28	629	643
2000	439	350	572	461	494	132	2 722	2 669	40	30	680	674
2001	453	356	590	482	511	137	2 799	2 810	39	31	706	689
2002	477	366	621	520	540	145	2 935	3 064	38	32	752	715
2003	411	276	506	184	575	154	3 088	3 363	37	33	805	744
2004	432	284	532	198	606	163	3 228	3 648	36	35	855	770
2005	451	291	555	210	635	171	3 356	3 917	35	36	900	794
2006	472	298	581	225	667	180	3 495	4 220	34	38	950	819
2007	499	308	615	244	710	192	3 680	4 638	33	39	1 018	853

(continued)

TB.8 Results of regression interpolation for OD pair interstate road freight task (million tkm) for 26 OD routes, 1972–2007 (continued)

Year	WA–NT	NT–WA	QLD–ACT	ACT–QLD	SA–ACT	ACT–SA	WA–ACT	ACT–WA	ACT–NT	NT–ACT	Total Australia
1972	28	12	1	1	0	1	0	2	2	2	5 380
1973	35	16	1	1	0	1	0	2	2	2	6 629
1974	42	19	1	1	0	1	0	2	2	2	7 801
1975	45	21	1	1	0	1	0	2	2	2	8 347
1976	52	24	1	1	0	1	0	2	2	2	9 157
1977	55	26	1	1	0	1	0	2	2	2	9 667
1978	56	26	1	1	0	1	0	2	2	2	9 825
1979	62	30	1	1	0	1	0	2	2	2	10 839
1980	71	34	1	1	0	1	0	2	2	2	12 280
1981	77	38	1	1	0	1	0	2	2	2	13 269
1982	83	41	1	1	0	1	0	2	2	2	14 249
1983	74	36	1	1	0	1	0	2	2	2	12 811
1984	93	46	1	1	0	1	0	2	2	2	15 928
1985	96	48	1	1	0	1	0	2	2	2	16 491
1986	109	55	1	1	0	1	0	2	2	2	18 599
1987	111	56	1	1	0	1	0	2	2	2	18 882
1988	125	64	1	1	0	1	0	2	2	2	21 414
1989	139	71	1	1	0	1	0	2	2	2	23 777
1990	147	76	1	1	0	1	0	2	2	2	25 120
1991	149	77	1	1	0	1	0	2	2	2	25 421
1992	151	78	1	1	0	1	0	2	2	2	25 874
1993	165	86	1	1	1	1	2	2	2	2	28 598
1994	177	93	1	1	1	1	2	2	2	2	30 342
1995	189	100	1	1	1	1	2	2	2	2	32 523
1996	211	112	1	1	1	1	2	2	2	2	35 542
1997	230	123	1	1	1	1	2	2	2	2	37 950
1998	250	135	1	1	1	1	2	2	2	2	40 478
1999	273	149	1	1	1	1	2	2	2	2	43 097
2000	296	162	1	1	1	1	2	2	2	2	45 703
2001	308	169	1	1	1	1	2	2	2	2	46 843
2002	329	182	1	1	1	1	2	2	2	2	49 348
2003	353	196	1	1	1	1	2	2	2	2	51 594
2004	376	210	1	1	1	1	2	2	2	2	54 633
2005	396	223	1	1	1	1	2	2	2	2	57 601
2006	419	237	1	1	1	1	2	2	2	2	60 698
2007	450	256	1	1	1	1	2	2	2	2	64 713

Source: BITRE estimates.

B.2.2 Cell-by-cell OD matrices: eastern states–WA and WA–eastern states origin–destination routes

Road freight estimates of eastern states–WA and WA–eastern states were done separately using a different approach. Prior to splitting to each individual OD route, road freight tasks (both ways, i.e. 'to' and 'from') from 1972 to 2007 were combined.

Two separate regressions were done to smooth actual SMVU data, i.e. to interpolate between what is scattered eastern states–WA and WA–eastern states road freight estimates.

The first regression was done for 1972, 1981, 1982 and 1985 which was regressed against combined (both ways, i.e. eastern states–WA and WA–eastern states) 'Log' transformed road

freight task (dependent variable) and the number of trucks passing through Hume Highway at Marulan (independent variable) ('Log' transformed). The Marulan traffic data was used in the absence of Eyre Highway traffic data. In this regression, a dummy variable for 1981, 1982 and 1985 was used to capture the effect of the coastal shipping on Eyre Highway traffic.

In the second regression, combined (both ways, i.e. eastern states–WA and WA–eastern states) 'Log' transformed road freight task (dependent variable) was regressed against 'Log' transformed Eyre Highway truck traffic.

Regression results and ANOVA of these two regressions are presented in Table B.9 and Table B.10.

TB.9 Regression results for 'total eastern states–Western Australia (both ways combined)' road freight task

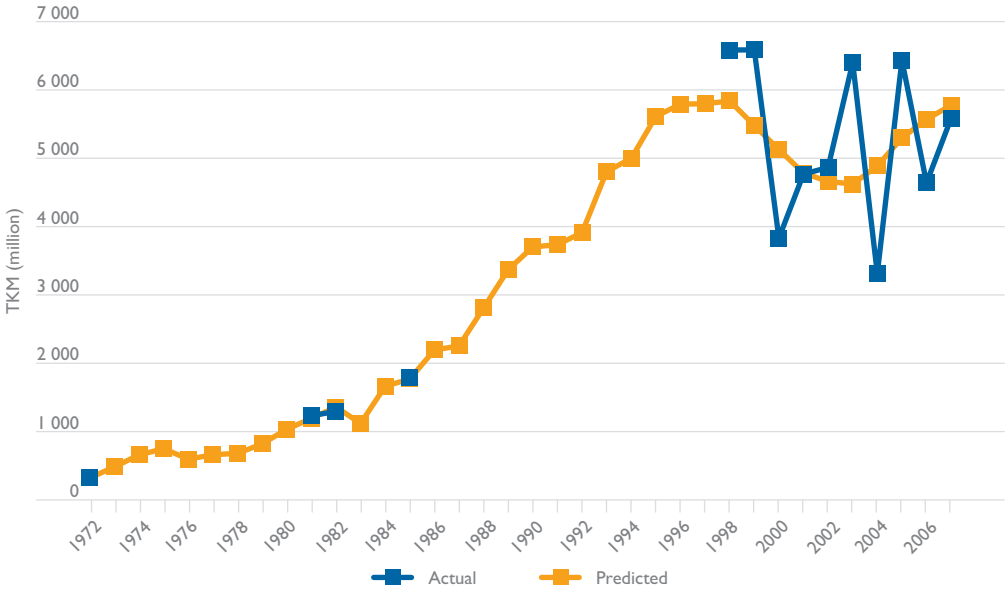
	Regression results			
	1972, 1981, 1982 and 1985		1998–2007	
Regression statistics				
Multiple R	0.9990		0.3286	
R Square	0.9979		0.1080	
Adjusted R Square	0.9938		–0.0195	
Standard Error	0.0602		0.2577	
Observations	4		9	
	Coefficients	Standard Error	Coefficients	Standard Error
Intercept	–9.0623	3.1281	–0.2771	9.5772
Hume Highway (Marulan)	1.9802	0.4179		
Eyre dummy	–0.4745	0.4211		
Eyre Highway traffic			0.6594	0.7164

TB.10 ANOVA for 'total eastern states–Western Australia (both ways combined)' road freight task

	df	SS	MS	F	Significance F
1972, 1981, 1982, 1985					
Regression	2	1.7544	0.87720	241.7245	0.0454
Residual	1	0.0036	0.00363		
Total	3	1.7580			
1998–2007					
Regression	1	0.0563	0.0563	0.8472	0.3880
Residual	7	0.4650	0.0664		
Total	8	0.5213			

Combining these two sets of data show the good fit of data points and interpolation between eastern states and WA (both ways) (Figure B.14).

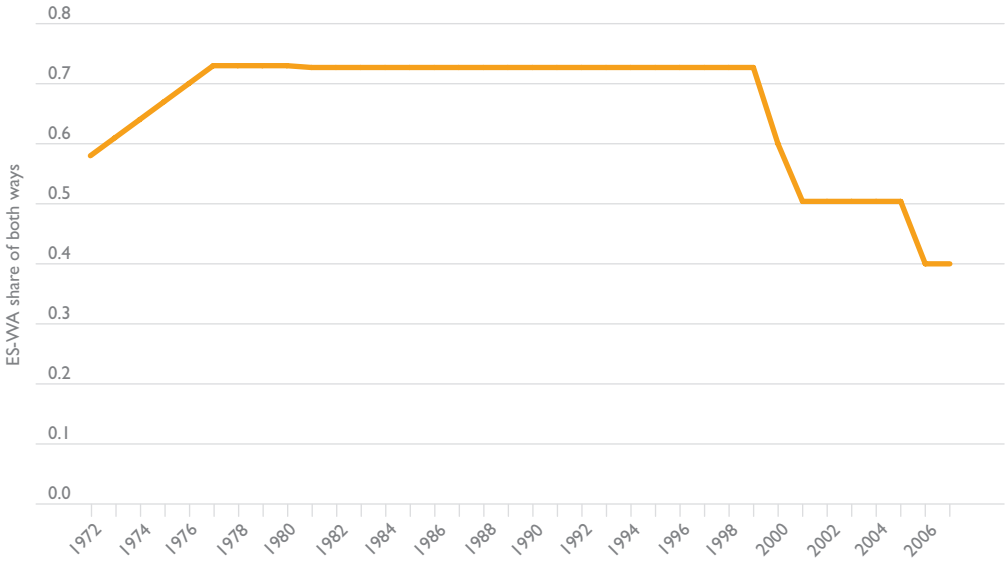
FB.14 Interstate road freight data points (actual) and interpolation (predicted), eastern states to and from Western Australia, 1972–2007



Source: BITRE estimates.

This both ways predicted data was separated for each route (i.e. eastern states–WA and WA–eastern states) using the historical shares. Figure B.15 shows the ES–WA share of both ways traffic generated between 1972 and 2007. Several changes happened during this period. Firstly, coastal shipping dropped away during mid-1970s and came back after 2000 with the single and multiple voyage permits. Secondly, since 2006, rail is probably benefiting from infrastructure updates and also more competitive pricing.

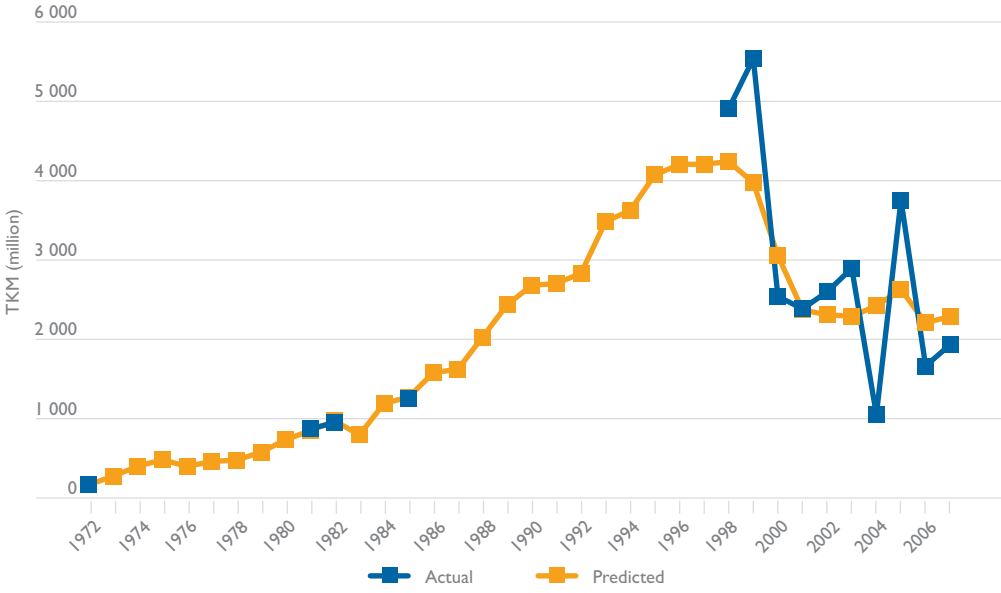
FB.15 Eastern states to WA route share of both ways (eastern states–WA and WA–eastern states), 1972–2007



Source: BITRE estimates.

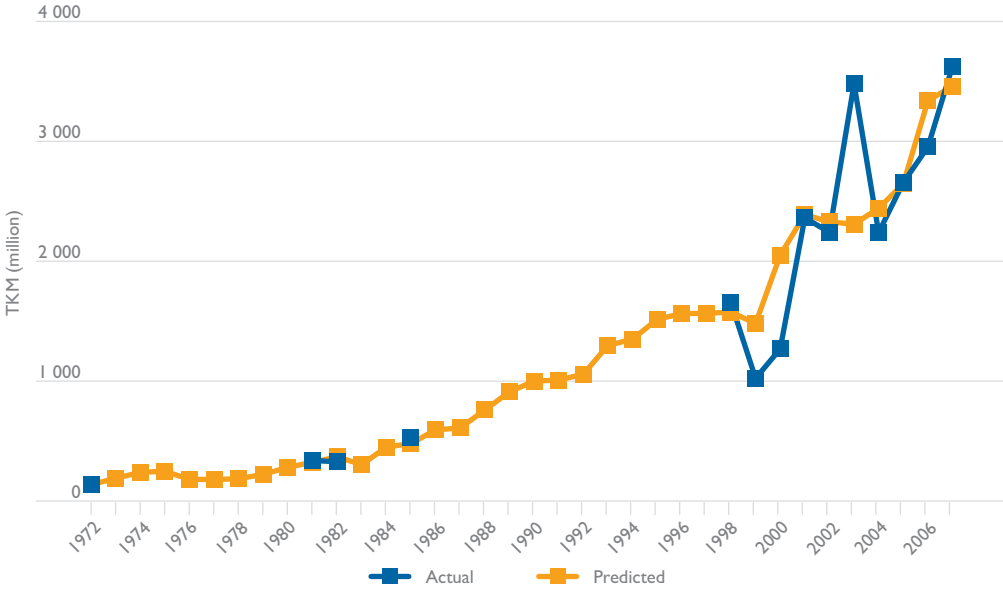
Using these shares for each route (i.e. ES–WA and WA–ES), road freight task was estimated and the actual and predicted (interpolated) road freight estimates are shown in Figure B.16 and Figure B.17.

FB.16 Interstate road freight data points (actual) and interpolation (predicted), eastern states–WA origin–destination route, 1972–2007



Source: BITRE estimates.

FB.17 Interstate road freight data points (actual) and interpolation (predicted), WA–eastern states origin–destination route, 1972–2007



Source: BITRE estimates.

Table B.11 shows the predicted and normalised share (per cent) of origin–destination (OD) routes between eastern states–WA and WA–eastern states from 1972 to 2007, based on the nature of the road freight task carried out during this period. These shares were used to separate total road freight estimates for eastern states–WA and WA–eastern states routes into individual OD routes and the final road freight results are presented in Table B.12.

These final road freight results were plotted against actual road freight task (in million tkm) between 1972 and 2007 for the individual OD routes and shown in Figure B.18 to Figure B.21.

TB.11 Predicted and normalised share (per cent), eastern states–WA and WA–eastern states, 1972–2007

Year	Eastern states–Western Australia					Western Australia–eastern states				
	NSW	VIC	QLD	SA	Total	NSW	VIC	QLD	SA	Total
1972	40	30	10	20	100	20	60	10	10	100
1973	40	30	10	20	100	20	60	10	10	100
1974	40	30	10	20	100	20	60	10	10	100
1975	40	30	10	20	100	20	60	10	10	100
1976	40	30	10	20	100	20	60	10	10	100
1977	40	30	10	20	100	20	60	10	10	100
1978	40	30	10	20	100	20	60	10	10	100
1979	40	30	10	20	100	20	60	10	10	100
1980	40	30	10	20	100	20	60	10	10	100
1981	40	30	10	20	100	20	60	10	10	100
1982	40	30	10	20	100	21	59	10	10	100
1983	40	30	10	20	100	21	56	10	13	100
1984	40	30	10	20	100	21	54	10	15	100
1985	40	30	10	20	100	21	51	10	18	100
1986	39	29	10	22	100	21	48	10	21	100
1987	38	27	10	25	100	21	46	10	23	100
1988	37	26	10	27	100	21	43	10	26	100
1989	36	24	10	30	100	21	40	10	29	100
1990	35	23	10	32	100	21	38	10	31	100
1991	34	21	10	35	100	21	35	10	34	100
1992	33	20	10	37	100	21	32	10	37	100
1993	32	18	10	40	100	21	29	10	39	100
1994	31	17	10	42	100	21	27	10	42	100
1995	30	15	10	45	100	21	24	10	45	100
1996	29	14	10	47	100	21	21	10	47	100
1997	27	12	10	50	100	21	19	11	50	100
1998	26	11	11	53	100	21	16	11	53	100
1999	26	11	11	53	100	21	16	11	53	100
2000	26	11	11	53	100	21	16	11	53	100
2001	26	11	11	53	100	21	16	11	53	100
2002	26	11	11	53	100	21	16	11	53	100
2003	26	11	11	53	100	21	16	11	53	100
2004	26	11	11	53	100	21	16	11	53	100
2005	26	11	11	53	100	21	16	11	53	100
2006	26	11	11	53	100	21	16	11	53	100
2007	26	11	11	53	100	21	16	11	53	100

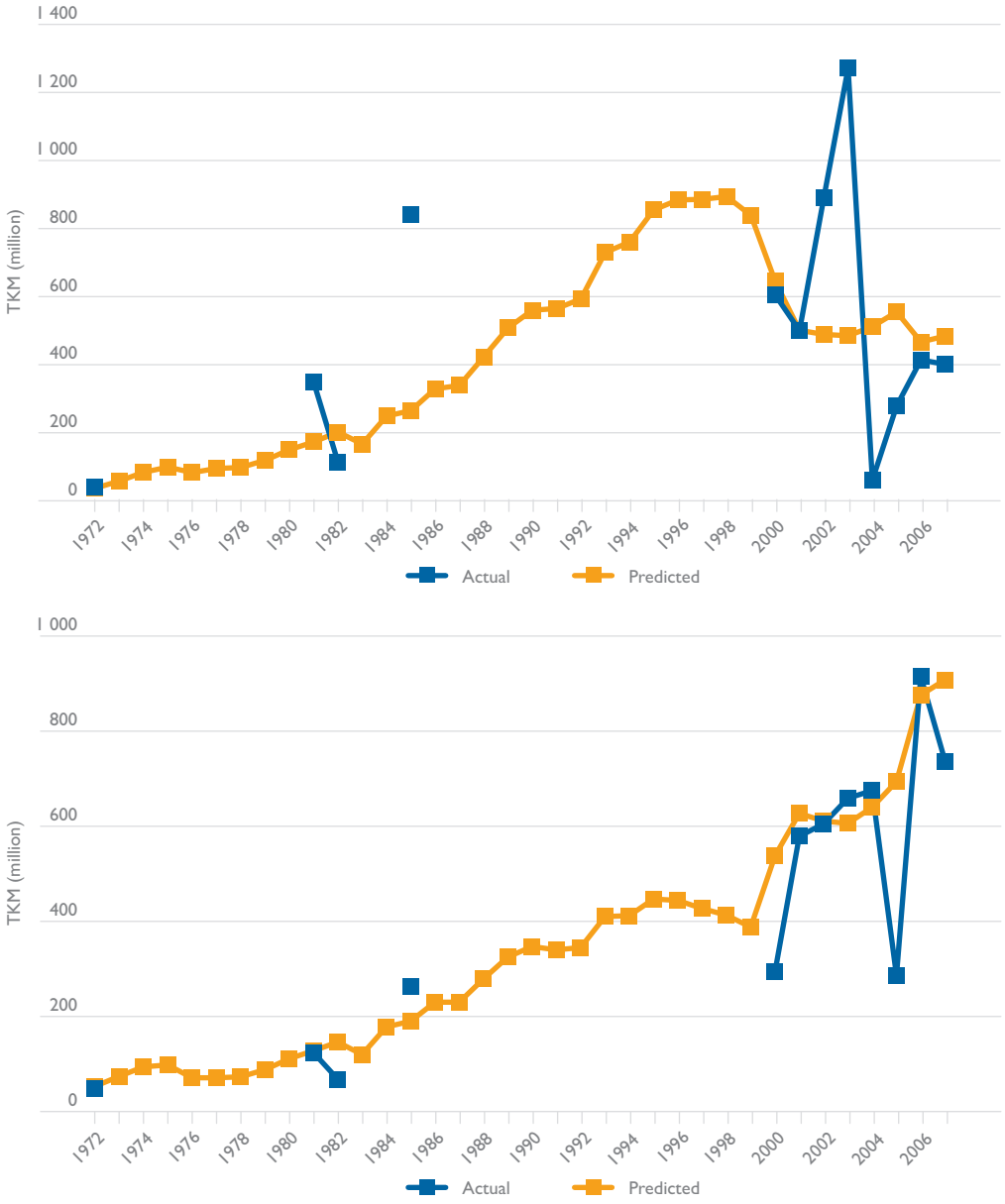
Source: BITRE estimates.

TB.12 Road freight estimates (million tkm), ES–WA and WA–ES, 1972–2007

Year	Eastern states–Western Australia					Western Australia–eastern states				
	NSW	VIC	QLD	SA	Total	NSW	VIC	QLD	SA	Total
1972	37	110	18	18	184	53	40	13	27	133
1973	58	175	29	29	291	74	56	19	37	186
1974	84	251	42	42	418	94	70	23	47	235
1975	99	298	50	50	497	98	73	24	49	245
1976	83	248	41	41	413	71	53	18	35	177
1977	95	286	48	48	477	71	53	18	35	177
1978	98	295	49	49	492	73	55	18	36	182
1979	119	356	59	59	593	88	66	22	44	219
1980	150	449	75	75	749	111	83	28	55	277
1981	173	519	86	86	864	128	96	32	64	320
1982	202	580	101	101	985	146	109	36	73	364
1983	167	456	83	104	810	120	90	30	60	300
1984	249	647	124	186	1 207	178	134	45	89	446
1985	265	655	133	232	1 285	190	143	48	95	475
1986	329	770	165	329	1 593	230	168	59	132	589
1987	339	747	169	381	1 636	230	164	61	150	605
1988	423	878	212	529	2 041	279	194	76	206	755
1989	508	987	254	699	2 448	325	219	92	269	906
1990	560	1 012	280	839	2 691	347	226	101	320	995
1991	565	948	283	919	2 714	340	213	103	348	1 004
1992	593	916	297	1 038	2 843	345	208	108	391	1 052
1993	730	1 031	365	1 369	3 494	410	236	133	513	1 292
1994	760	973	380	1 520	3 633	412	225	139	568	1 344
1995	855	981	428	1 817	4 080	447	229	157	676	1 509
1996	884	897	442	1 989	4 211	444	213	163	738	1 558
1997	886	782	443	2 104	4 215	428	189	163	780	1 559
1998	894	670	447	2 234	4 245	413	165	165	826	1 570
1999	839	629	419	2 097	3 984	388	155	155	776	1 474
2000	645	484	323	1 613	3 064	538	215	215	1 075	2 043
2001	501	376	251	1 254	2 382	627	251	251	1 254	2 382
2002	489	366	244	1 221	2 321	611	244	244	1 221	2 321
2003	485	363	242	1 211	2 302	606	242	242	1 211	2 302
2004	512	384	256	1 281	2 434	640	256	256	1 281	2 434
2005	555	416	278	1 388	2 638	694	278	278	1 388	2 638
2006	467	350	234	1 168	2 219	876	350	350	1 752	3 329
2007	484	363	242	1 211	2 301	908	363	363	1 817	3 452

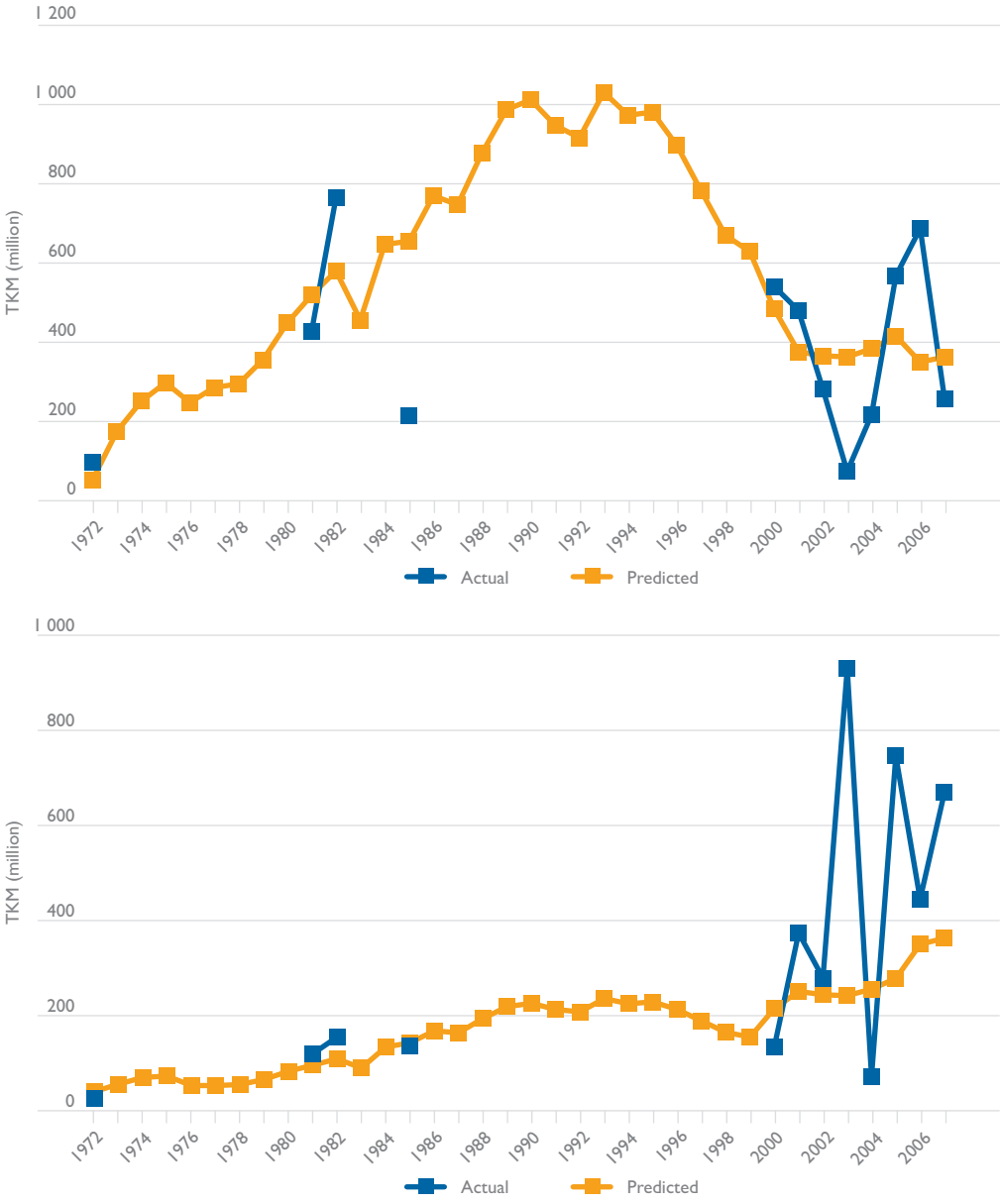
Source: BITRE estimates.

FB.18 Interstate road freight data points (actual) and interpolation (predicted), NSW–WA and WA–NSW origin–destination matrices, 1972–2007



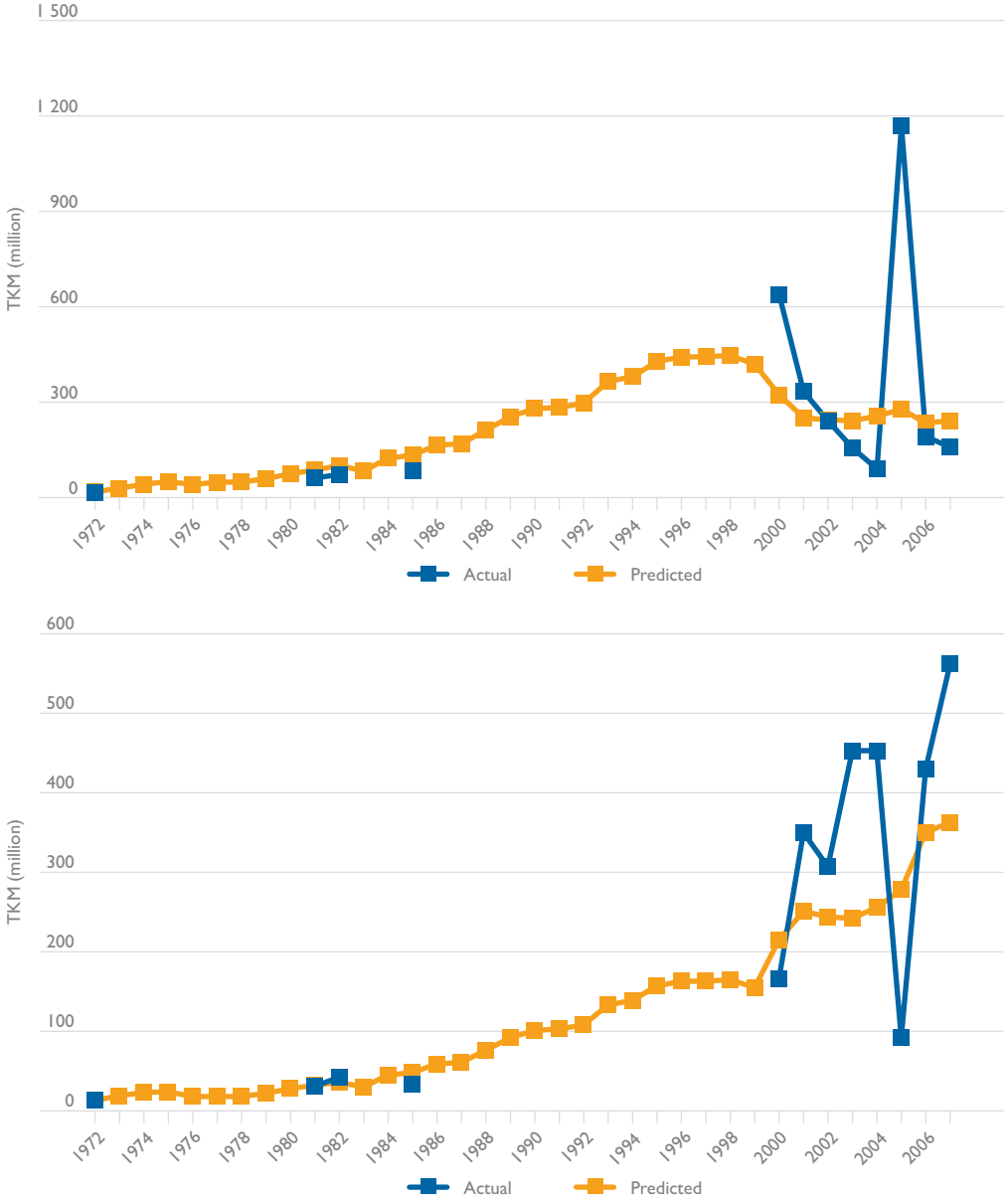
Source: BITRE estimates.

FB.19 Interstate road freight data points (actual) and interpolation (predicted), VIC–WA and WA–VIC origin–destination matrices, 1972–2007



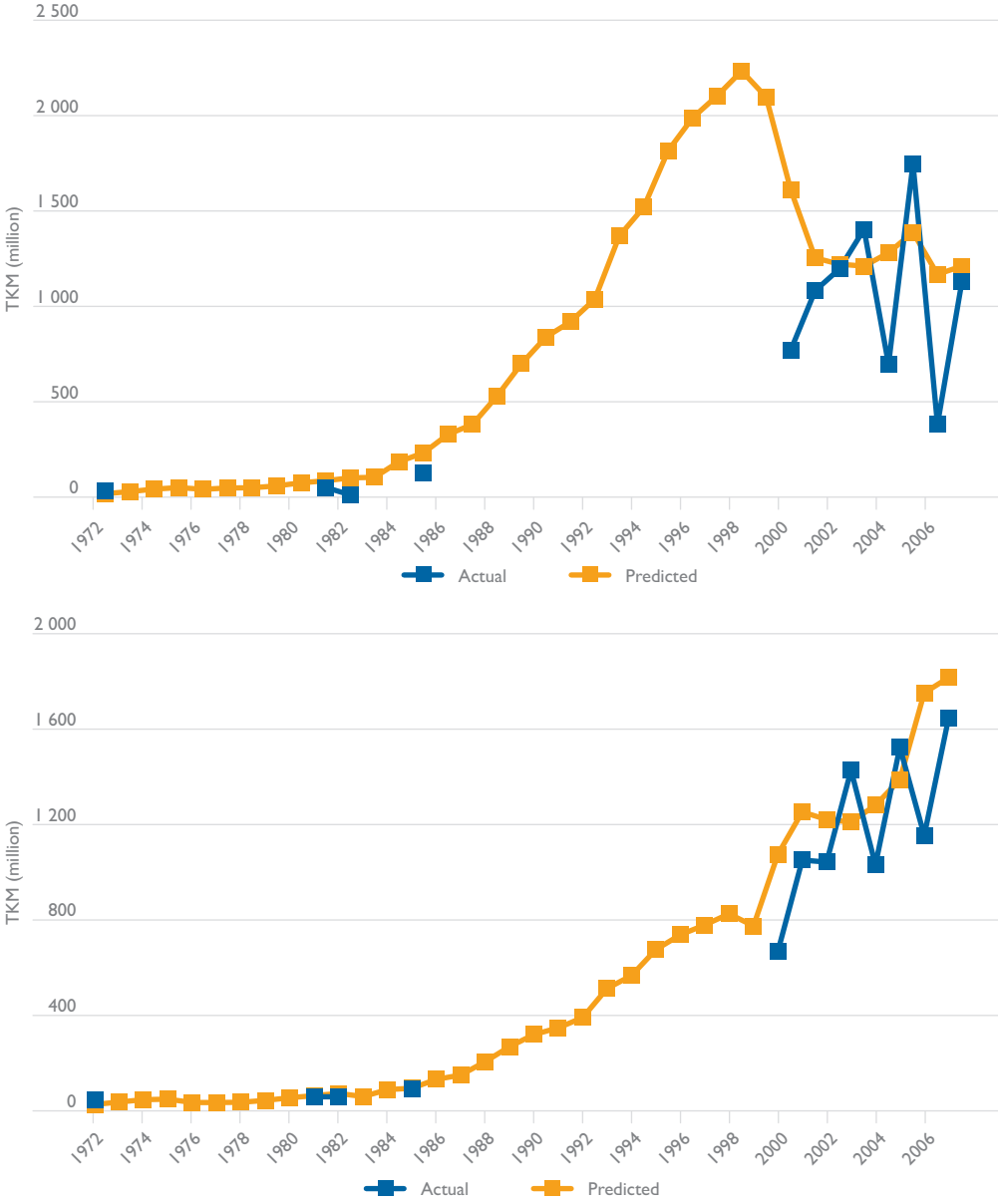
Source: BITRE estimates.

FB.20 Interstate road freight data points (actual) and interpolation (predicted), QLD–WA and WA–QLD origin–destination matrices, 1972–2007



Source: BITRE estimates.

FB.21 Interstate road freight data points (actual) and interpolation (predicted), SA–WA and WA–SA origin–destination matrices, 1972–2007



Source: BITRE estimates.

B.3 Splitting origin–destination (OD) road freight flows by states and territories

To split the road freight task (tkm) for an OD pair by the state/territory in which it is performed, we use a 'fractions by states/territories' table (Table B.13). This roughly allocates the total tkm for a specific OD by the states in which it is performed.

For example, for the South Australia to Queensland (SA–QLD) cell of the matrix, the fractions say that the task (853 million tkm in 2005 in Table B.8) should be split by the fractions 0.10 from the origin in SA to the VIC border, 0.05 through the north-west corner of VIC, 0.58 through NSW to the QLD border, and 0.27 within QLD (see Table B.13, SA–QLD row, highlighted).

The fractions presented in Table 2.13 are then multiplied by the OD cell's total freight task of 853 thousand tkm to give the tkm task split by state. Thus SA = 0.10*853 = 85, VIC = 0.05*853 = 43, NSW = 0.58*853 = 495, and QLD = 0.27*853 = 230 (see Table 2.14, SA–QLD row, highlighted).

Next these tkm OD task components are characterised as either 'from', 'through', or 'to'. Thus in example given earlier, SA 'from' = 85, VIC 'through' = 43, NSW 'through' = 495, and QLD 'to' = 230.

TB.13 Fractions of road freight task by states and territories

From	To	Interstate road freight task split by states/territories (fractions)							
		NSW	VIC	QLD	SA	WA	NT	ACT	Total
NSW–	VIC	0.50	0.50						1.00
	QLD	0.80		0.20					1.00
	SA	0.70	0.10		0.20				1.00
	WA	0.25	0.05		0.20	0.50			1.00
	TAS								0.00
	NT	0.25			0.35		0.40		1.00
	ACT	0.95						0.05	1.00
VIC–	NSW	0.50	0.50						1.00
	QLD	0.70	0.18	0.12					1.00
	SA		0.60		0.40				1.00
	WA		0.13		0.45	0.42			1.00
	TAS								0.00
	NT		0.12		0.43		0.45		1.00
	ACT	0.54	0.45					0.01	1.00
QLD–	NSW	0.80		0.20					1.00
	VIC	0.70	0.18	0.12					1.00
	SA	0.58	0.05	0.27	0.10				1.00
	WA	0.29	0.02	0.08	0.31	0.30			1.00
	TAS								0.00
	NT			0.62			0.38		1.00
	ACT	0.75		0.20				0.05	1.00
SA–	NSW	0.70	0.10		0.20				1.00
	VIC		0.60		0.40				1.00
	QLD	0.58	0.05	0.27	0.10				1.00
	WA				0.51	0.49			1.00
	TAS								0.00
	NT				0.46		0.54		1.00
	ACT	0.60	0.13		0.26			0.01	1.00
WA–	NSW	0.25	0.05		0.20	0.50			1.00
	VIC		0.13		0.45	0.42			1.00
	QLD	0.29	0.02	0.08	0.31	0.30			1.00
	SA				0.51	0.49			1.00
	TAS								0.00
	NT					0.85	0.15		1.00
	ACT	0.20	0.03		0.40	0.36		0.01	1.00
NT–	NSW	0.25			0.35		0.40		1.00
	VIC		0.12		0.43		0.45		1.00
	QLD			0.62			0.38		1.00
	SA				0.46		0.54		1.00
	WA					0.85	0.15		1.00
	TAS								0.00
	ACT	0.22	0.03		0.41		0.33	0.01	1.00
ACT–	NSW	0.95						0.05	1.00
	VIC	0.54	0.45					0.01	1.00
	QLD	0.75		0.20				0.05	1.00
	SA	0.60	0.13		0.26			0.01	1.00
	WA	0.20	0.03		0.40	0.36		0.01	1.00
	TAS								0.00
	NT	0.22	0.03		0.41		0.33	0.01	1.00

Source: Gargett et al (2006).

TB.14 Road freight task (million tkm) for 2006–07, calculated using factors

From	To	Interstate road freight task split by states/territories (million tkm)							
		NSW	VIC	QLD	SA	WA	NT	ACT	Total
NSW–	VIC	4 628	4 628						9 255
	QLD	6 790		1 698					8 488
	SA	1 479	211		422				2 112
	WA	121	24		97	242			484
	TAS								
	NT	24			33		38		94
	ACT	674						35	710
VIC–	NSW	4 420	4 420						8 841
	QLD	2 576	662	442					3 680
	SA		2 162		1 442				3 604
	WA		47		164	153			363
	TAS								
	NT		3		12		12		27
	ACT	18	15						33
QLD–	NSW	5 787		1 447					7 233
	VIC	3 247	835	557					4 638
	SA	591	51	275	102				1 018
	WA	70	5	19	75	73			242
	TAS								
	NT			310			190		499
	ACT	0.45		0.12				0.03	0.6
SA–	NSW	1 611	230		460				2 302
	VIC		2 040		1 360				3 399
	QLD	495	43	230	85				853
	WA				618	593			1 211
	TAS								
	NT				283		332		615
	ACT		0.08		0.15			0.01	0.6
WA–	NSW	227	45		182	454			908
	VIC		47		164	153			363
	QLD	105	7	29	113	109			363
	SA				926	890			1 816
	TAS								
	NT					383	68		450
	ACT		0.06		0.83	0.75		0.02	2.1
NT–	NSW	11			15		17		43
	VIC		2		6		6		14
	QLD			191			117		308
	SA				112		132		244
	WA					218	38		256
	TAS								
	ACT	0.51			0.94		0.76	0.02	2.3
ACT–	NSW	182						10	192
	VIC	21	18					0	39
	QLD	0.92		0.24				0.06	1.22
	SA		0.07		0.14			0.01	0.6
	WA		0.06		0.83	0.75		0.02	2.1
	TAS								
	NT	0.51			0.94		0.76	0.02	2.3

Source: BITRE estimates.

APPENDIX C

Interstate road freight movements by origin–destination (OD) routes

This appendix provides interstate road freight movements (in terms of kilotonnes) by major 34 origin–destination (OD) routes between 1972 and 2030 (Table B.1). The estimated tonnage data between 1972 and 2007 is derived by dividing tonne–kilometre (tkm) data (see Appendix B, Table B.8), while forecast tonnage data between 2008 and 2030 is derived by diving tkm data (see Chapter 4, Table 4.4) with OD route specific distance (see Table C.1)

The OD route specific road distances have been derived from the 2001 Freight Movement Survey of the Australian Bureau of Statistics (ABS 2001; Table 4 divided by Table 3).

TC.1 Origin–destination (OD) route specific interstate road freight movements (kilotonnes), 1972–2030

Year	NSW–VIC	VIC–NSW	NSW–QLD	QLD–NSW	NSW–SA	SA–NSW	VIC–SA	SA–VIC	NSW–ACT	ACT–NSW	VIC–QLD	QLD–VIC
Estimates												
1972	1 324	1 606	594	553	248	240	354	356	244	71	282	65
1973	1 623	1 931	757	702	295	285	451	459	299	87	333	88
1974	1 895	2 223	910	841	336	325	543	557	349	102	379	111
1975	2 020	2 355	982	906	355	344	586	603	372	109	399	123
1976	2 280	2 629	1 135	1 045	394	381	677	701	419	124	441	147
1977	2 401	2 755	1 207	1 110	412	398	720	747	441	130	460	159
1978	2 439	2 794	1 230	1 130	417	403	733	762	448	132	466	163
1979	2 675	3 038	1 373	1 259	451	436	819	855	491	145	503	188
1980	3 004	3 374	1 576	1 443	498	481	940	988	552	164	554	224
1981	3 226	3 599	1 716	1 568	529	511	1 024	1 079	592	176	587	249
1982	3 442	3 818	1 854	1 692	559	540	1 106	1 170	632	188	620	275
1983	3 124	3 496	1 651	1 510	515	498	985	1 037	574	170	572	237
1984	3 807	4 183	2 090	1 904	609	589	1 248	1 327	698	208	674	320
1985	3 927	4 302	2 169	1 974	626	604	1 295	1 379	720	215	691	336
1986	4 370	4 739	2 463	2 237	685	662	1 471	1 575	801	240	755	394
1987	4 428	4 797	2 503	2 272	693	669	1 494	1 601	811	243	763	402
1988	4 943	5 300	2 853	2 585	761	735	1 704	1 837	905	272	836	475
1989	5 410	5 752	3 177	2 873	822	794	1 898	2 055	990	298	900	545
1990	5 671	6 002	3 360	3 035	855	826	2 007	2 179	1 038	313	936	585
1991	5 740	6 068	3 409	3 079	864	834	2 036	2 212	1 050	317	945	596
1992	5 811	6 136	3 459	3 123	873	843	2 067	2 246	1 063	321	955	607
1993	6 279	6 582	3 794	3 420	933	901	2 267	2 474	1 148	347	1 018	683
1994	6 674	6 957	4 080	3 673	983	949	2 438	2 669	1 220	369	1 071	749
1995	7 071	7 331	4 371	3 930	1 032	996	2 612	2 868	1 292	392	1 123	817
1996	7 785	7 999	4 901	4 399	1 120	1 081	2 930	3 233	1 422	432	1 216	945
1997	8 385	8 555	5 355	4 798	1 194	1 152	3 201	3 546	1 531	466	1 293	1 057
1998	9 002	9 123	5 827	5 214	1 268	1 223	3 484	3 874	1 643	501	1 371	1 177
1999	9 735	9 794	6 397	5 714	1 355	1 307	3 825	4 270	1 776	543	1 462	1 325
2000	10 458	10 451	6 967	6 214	1 441	1 389	4 167	4 669	1 907	584	1 551	1 477
2001	10 819	10 777	7 254	6 465	1 483	1 430	4 339	4 870	1 972	604	1 595	1 555
2002	11 455	11 350	7 765	6 913	1 557	1 501	4 645	5 229	2 088	641	1 672	1 695
2003	12 182	12 001	8 356	7 429	1 640	1 582	4 999	5 646	2 220	682	1 760	1 861
2004	12 857	12 601	8 909	7 913	1 717	1 656	5 331	6 038	2 342	721	1 840	2 019
2005	13 476	13 150	9 423	8 361	1 787	1 723	5 638	6 402	2 454	756	1 912	2 168
2006	14 155	13 749	9 991	8 856	1 864	1 797	5 979	6 806	2 577	795	1 992	2 335
2007	15 067	14 549	10 763	9 527	1 966	1 895	6 441	7 356	2 742	847	2 097	2 566
Forecasts												
2008	16 224	15 668	11 188	10 579	2 032	1 976	6 797	8 087	2 832	925	2 518	3 138
2009	16 115	15 938	11 474	11 025	2 110	2 025	6 971	8 110	2 944	922	2 473	3 143
2010	16 768	16 328	11 904	11 427	2 176	2 074	7 213	8 462	3 004	957	2 546	3 227
2011	17 647	16 882	12 497	11 989	2 239	2 128	7 556	8 962	3 075	1 004	2 648	3 354
2012	18 825	17 715	13 351	12 788	2 313	2 199	8 045	9 663	3 184	1 069	2 789	3 543
2013	19 771	18 539	14 213	13 544	2 387	2 269	8 508	10 291	3 312	1 124	2 889	3 717
2014	20 794	19 428	15 152	14 366	2 467	2 343	9 009	10 974	3 450	1 183	2 998	3 904
2015	21 847	20 337	16 136	15 221	2 545	2 418	9 530	11 690	3 590	1 244	3 107	4 096
2016	23 035	21 365	17 245	16 186	2 636	2 504	10 117	12 498	3 749	1 312	3 231	4 313
2017	24 309	22 463	18 446	17 226	2 731	2 595	10 749	13 372	3 918	1 385	3 363	4 544
2018	25 286	23 430	19 538	18 129	2 827	2 680	11 294	14 093	4 089	1 443	3 451	4 734
2019	26 209	24 265	20 536	18 954	2 914	2 755	11 789	14 768	4 234	1 497	3 531	4 900
2020	27 069	25 006	21 468	19 719	2 995	2 823	12 244	15 400	4 364	1 547	3 601	5 045
2021	27 991	25 744	22 418	20 506	3 076	2 891	12 712	16 065	4 489	1 599	3 677	5 192
2022	28 931	26 463	23 377	21 300	3 154	2 955	13 182	16 745	4 608	1 652	3 753	5 337
2023	29 792	27 126	24 302	22 053	3 228	3 015	13 626	17 388	4 722	1 701	3 816	5 467
2024	30 679	27 775	25 240	22 817	3 299	3 073	14 074	18 051	4 831	1 751	3 880	5 596
2025	31 585	28 433	26 207	23 602	3 370	3 131	14 534	18 735	4 941	1 802	3 945	5 727
2026	32 505	29 094	27 201	24 405	3 441	3 189	15 004	19 437	5 052	1 854	4 008	5 857
2027	33 397	29 748	28 205	25 205	3 514	3 248	15 470	20 129	5 166	1 904	4 066	5 982
2028	34 313	30 383	29 216	26 012	3 584	3 304	15 939	20 840	5 274	1 956	4 124	6 105
2029	35 241	31 020	30 253	26 836	3 653	3 360	16 416	21 569	5 382	2 008	4 182	6 228
2030	36 198	31 672	31 330	27 689	3 724	3 417	16 909	22 325	5 493	2 061	4 240	6 353
Origin–destination route distance (km)												
	614	608	789	759	1 075	1 215	559	462	259	226	1 755	1 807

(continued)

TC.1 Origin–destination (OD) route specific interstate road freight movements (kilotonnes), 1972–2030 (continued)

Year	VIC–ACT	ACT–VIC	QLD–SA	SA–QLD	WA–NT	NT–WA	NSW–WA	WA–NSW	VIC–WA	WA–VIC	QLD–WA	WA–QLD
Estimates												
1972	137	15	35	92	10	6	9	13	31	11	4	3
1973	133	16	44	105	13	7	14	18	49	16	6	4
1974	130	16	52	116	15	9	20	23	70	20	9	6
1975	126	17	56	121	16	10	24	24	84	21	11	6
1976	123	18	64	131	19	11	20	18	69	15	9	4
1977	120	19	67	135	20	12	23	18	80	15	10	4
1978	117	19	69	137	20	12	24	18	83	15	11	4
1979	113	20	76	145	23	14	29	22	100	19	13	5
1980	110	21	86	156	26	16	36	28	126	23	16	7
1981	108	22	93	164	28	17	42	32	146	27	19	8
1982	105	23	100	171	30	19	49	36	163	31	22	9
1983	102	24	90	160	27	17	41	30	128	25	18	7
1984	99	25	112	182	34	21	61	44	182	38	27	11
1985	97	26	116	186	35	22	65	47	184	40	28	11
1986	94	27	130	199	40	25	80	57	216	48	35	14
1987	92	28	132	201	40	26	82	57	210	46	36	14
1988	89	29	149	216	46	30	103	69	246	55	45	18
1989	87	30	165	229	50	33	124	81	277	62	54	22
1990	85	32	174	236	53	35	136	86	284	64	60	24
1991	82	33	176	238	54	36	138	84	266	60	61	24
1992	80	34	179	240	55	36	144	86	257	59	64	26
1993	78	36	195	252	60	40	178	102	289	67	78	32
1994	76	37	208	262	64	43	185	102	273	64	81	33
1995	74	39	222	272	69	46	208	111	275	65	92	37
1996	72	41	247	290	77	52	215	110	252	60	95	38
1997	70	42	268	304	83	57	216	106	219	53	95	39
1998	68	44	290	318	91	63	218	103	188	47	96	39
1999	67	46	316	335	99	69	204	96	177	44	90	37
2000	65	48	342	351	108	76	157	134	136	61	69	51
2001	63	50	355	358	112	79	122	156	106	71	54	59
2002	61	52	378	372	119	85	119	152	103	69	52	58
2003	60	54	405	387	128	91	118	150	102	68	52	57
2004	58	57	429	401	136	98	125	159	108	72	55	61
2005	57	59	452	413	144	104	135	172	117	78	59	66
2006	55	61	478	426	152	110	114	218	98	99	50	83
2007	54	64	512	444	163	119	118	226	102	103	52	86
Forecasts												
2008	59	89	517	444	172	99	113	225	160	91	82	95
2009	59	91	548	448	168	104	117	221	162	92	73	95
2010	59	93	562	470	175	105	118	230	166	95	78	99
2011	58	96	579	497	185	106	119	240	172	97	85	103
2012	55	99	605	526	198	108	120	254	180	101	95	110
2013	53	103	638	538	207	111	121	264	187	104	98	117
2014	51	108	673	551	217	115	122	275	194	108	103	124
2015	48	112	710	564	227	118	124	286	202	111	107	131
2016	46	117	751	579	239	122	126	298	211	115	112	139
2017	44	122	796	595	251	126	128	311	220	120	117	148
2018	43	127	843	600	259	131	130	320	228	124	118	156
2019	42	131	884	608	267	135	132	329	235	127	119	163
2020	40	135	922	615	275	138	134	337	242	130	121	170
2021	39	138	959	626	283	141	135	346	248	133	124	176
2022	38	142	994	638	292	144	137	355	255	136	127	183
2023	37	145	1 030	647	299	146	138	363	260	138	130	190
2024	36	149	1 064	657	307	149	138	371	266	141	133	196
2025	35	152	1 100	667	315	151	139	379	272	143	136	203
2026	34	155	1 136	677	324	153	140	387	278	146	139	210
2027	33	159	1 173	686	331	156	141	395	284	148	141	217
2028	32	162	1 210	695	340	158	141	403	290	151	145	223
2029	31	165	1 247	705	348	160	142	411	295	153	148	230
2030	30	168	1 285	714	356	163	143	419	301	156	151	238
Origin–destination route distance (km)												
	617	617	1 990	1 922	2 756	2 148	4 106	4 027	3 564	3 538	4 668	4 228

(continued)

TC.1 Origin–destination (OD) route specific interstate road freight movements (kilotonnes), 1972–2030 (continued)

Year	SA–WA	WA–SA	NSW–NT	NT–NSW	VIC–NT	NT–VIC	QLD–NT	NT–QLD	SA–NT	NT–SA
Estimates										
1972	9	12	16	4	0	1	28	53	41	12
1973	14	17	17	4	0	1	34	59	49	16
1974	20	22	17	4	0	1	39	64	57	19
1975	24	23	18	4	0	1	41	66	60	21
1976	20	16	18	4	0	1	46	70	67	25
1977	23	16	18	4	0	1	48	72	70	26
1978	24	17	18	4	0	1	49	72	71	27
1979	29	20	19	4	0	1	53	76	78	31
1980	36	26	19	5	0	1	59	80	86	36
1981	42	30	20	5	0	1	63	83	92	39
1982	49	34	20	5	0	1	67	86	98	43
1983	50	28	19	5	0	1	61	82	90	38
1984	90	41	20	5	0	2	74	91	107	49
1985	112	44	20	5	0	2	76	92	110	51
1986	159	61	21	5	0	2	84	97	122	59
1987	184	70	21	5	0	2	85	98	123	60
1988	256	95	21	5	1	2	94	103	136	69
1989	338	125	22	6	1	2	102	108	148	78
1990	406	149	22	6	1	2	106	111	154	83
1991	444	161	22	6	1	2	108	111	156	85
1992	502	181	22	6	1	2	109	112	158	86
1993	662	238	23	6	1	2	117	117	169	95
1994	735	263	23	6	2	2	124	120	179	103
1995	879	314	23	6	2	2	130	124	189	112
1996	962	343	24	6	3	2	142	130	206	127
1997	1018	362	24	7	4	2	152	135	221	140
1998	1080	383	24	7	5	2	163	140	235	154
1999	1014	360	25	7	7	2	175	145	253	171
2000	780	499	25	7	9	2	187	151	270	188
2001	606	582	25	7	10	2	193	153	278	197
2002	591	567	26	7	12	2	203	158	293	213
2003	586	562	23	9	7	6	175	119	239	75
2004	619	594	23	9	9	6	184	122	251	81
2005	671	644	24	9	10	6	192	125	262	86
2006	565	813	24	9	12	6	201	128	274	92
2007	586	843	24	10	13	7	213	132	290	100
Forecasts										
2008	621	882	28	9	14	6	270	142	298	102
2009	642	871	26	9	14	6	274	148	288	103
2010	665	903	27	9	14	6	283	150	299	110
2011	697	947	28	9	14	6	294	152	314	119
2012	744	1 010	29	9	14	6	309	156	333	131
2013	788	1 069	28	9	14	6	324	160	346	142
2014	835	1 134	28	9	14	5	340	165	360	153
2015	885	1 201	28	9	13	5	356	170	373	166
2016	940	1 277	28	9	13	5	375	176	389	180
2017	1 001	1 358	28	9	13	5	395	182	405	195
2018	1 053	1 429	27	9	13	4	412	188	415	207
2019	1 101	1 494	27	9	13	4	428	193	425	220
2020	1 145	1 554	26	9	13	4	442	198	434	232
2021	1 190	1 616	26	9	13	4	456	202	444	245
2022	1 236	1 678	26	9	12	4	470	206	454	259
2023	1 279	1 737	26	9	12	4	484	210	463	272
2024	1 323	1 797	26	9	12	3	497	213	472	286
2025	1 369	1 858	26	9	12	3	511	217	481	301
2026	1 415	1 921	25	9	12	3	524	220	490	316
2027	1 461	1 983	25	9	12	3	538	224	499	331
2028	1 507	2 046	25	9	12	3	552	227	507	347
2029	1 555	2 111	25	9	12	3	565	230	516	363
2030	1 604	2 177	25	9	11	3	579	233	525	380
Origin–destination route distance (km)	2 068	2 155	3 901	4 505	2 092	2 092	2 349	2 322	2 118	2 445

Note: From 1972 to 2007, estimates and from 2008 to 2030, forecasts.
Source: BITRE estimates.

APPENDIX D

National Gross Domestic Product

Appendix D provides the national Gross Domestic Products (GDP) between 1972 and 2030. Forecast GDP amounts from 2008 to 2030 are 2006–07 values.

TD.1 National Gross Domestic Product (GDP), 1972–2030

Year	GDP ($ Billion)	Change (per cent)
1972	351.05	4.51
1973	360.40	2.66
1974	374.95	4.04
1975	379.44	1.20
1976	389.71	2.71
1977	403.20	3.46
1978	406.81	0.90
1979	423.86	4.19
1980	437.23	3.15
1981	451.92	3.36
1982	466.28	3.18
1983	455.23	-2.37
1984	476.52	4.68
1985	501.84	5.31
1986	524.13	4.44
1987	536.83	2.42
1988	564.55	5.16
1989	585.41	3.69
1990	608.45	3.94
1991	604.53	-0.64
1992	604.80	0.05
1993	627.18	3.70
1994	652.98	4.11
1995	681.00	4.29
1996	708.93	4.10
1997	736.57	3.90
1998	769.72	4.50
1999	809.74	5.20
2000	842.13	4.00
2001	858.13	1.90
2002	890.74	3.80
2003	919.25	3.20
2004	956.02	4.00
2005	982.79	2.80
2006	1 012.27	3.00
2007	1 045.67	3.30
2008	1 083.66	3.60
2009	1 090.16	0.60
2010	1 106.52	1.50
2011	1 136.94	2.75
2012	1 182.42	4.00
2013	1 229.72	4.00
2014	1 278.91	4.00
2015	1 330.06	4.00
2016	1 383.27	4.00
2017	1 438.60	4.00
2018	1 486.07	3.30
2019	1 529.17	2.90
2020	1 568.93	2.60
2021	1 608.15	2.50
2022	1 648.35	2.50
2023	1 687.91	2.40
2024	1 728.42	2.40
2025	1 769.91	2.40
2026	1 812.38	2.40
2027	1 854.07	2.30
2028	1 896.71	2.30
2029	1 940.34	2.30
2030	1 984.96	2.30

Source: Australian National Accounts: National Income, Expenditure and Product (ABS, Cat. No. 5206.0) (1971–72 to 2006–07) and BITRE estimates (from the 2009 Treasury Budget, 2007–08 to 2016–17; Access Economics April 2009, 2017–18 to 2019–20; and Treasury's long-term projections, 2020–21 to 2029–30.

APPENDIX E

Aggregate mode share

This appendix shows aggregate transport mode share trends for 56 interstate origin–destination routes between 1972 and 2030. These mode share forecasts were used to separate total interstate freight task into road, rail and seas freight.

TE.1 Aggregate mode share for all 56 OD routes

Year	NSW–VIC			VIC–NSW			NSW–QLD			QLD–NSW		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.473	0.463	0.064	0.696	0.281	0.023	0.440	0.485	0.075	0.596	0.347	0.057
1973	0.533	0.426	0.041	0.725	0.241	0.033	0.483	0.454	0.063	0.650	0.303	0.047
1974	0.581	0.398	0.021	0.745	0.213	0.042	0.512	0.433	0.055	0.688	0.272	0.040
1975	0.600	0.386	0.014	0.757	0.203	0.040	0.522	0.439	0.038	0.707	0.263	0.030
1976	0.633	0.360	0.007	0.778	0.185	0.037	0.550	0.427	0.023	0.738	0.242	0.020
1977	0.645	0.349	0.006	0.801	0.183	0.016	0.557	0.423	0.020	0.738	0.238	0.024
1978	0.650	0.346	0.005	0.802	0.182	0.016	0.555	0.428	0.017	0.731	0.241	0.028
1979	0.671	0.326	0.004	0.814	0.171	0.015	0.575	0.411	0.013	0.742	0.229	0.029
1980	0.696	0.301	0.003	0.829	0.158	0.013	0.602	0.387	0.010	0.758	0.212	0.030
1981	0.712	0.286	0.002	0.837	0.150	0.013	0.608	0.384	0.008	0.778	0.190	0.032
1982	0.765	0.233	0.001	0.844	0.144	0.012	0.648	0.346	0.006	0.776	0.191	0.033
1983	0.796	0.204	0.001	0.831	0.156	0.013	0.645	0.351	0.005	0.740	0.221	0.039
1984	0.800	0.199	0.001	0.860	0.140	0.000	0.677	0.316	0.008	0.810	0.165	0.025
1985	0.810	0.190	0.001	0.851	0.147	0.002	0.685	0.306	0.009	0.814	0.181	0.005
1986	0.820	0.179	0.000	0.872	0.128	0.000	0.689	0.305	0.006	0.789	0.210	0.001
1987	0.786	0.213	0.000	0.869	0.131	0.000	0.688	0.312	0.001	0.780	0.219	0.002
1988	0.817	0.182	0.000	0.864	0.136	0.000	0.695	0.304	0.000	0.814	0.185	0.001
1989	0.813	0.187	0.000	0.858	0.142	0.000	0.685	0.314	0.001	0.826	0.174	0.000
1990	0.821	0.178	0.000	0.873	0.127	0.000	0.706	0.293	0.001	0.828	0.170	0.002
1991	0.839	0.160	0.000	0.879	0.120	0.001	0.739	0.259	0.002	0.847	0.153	0.001
1992	0.842	0.157	0.000	0.910	0.089	0.000	0.756	0.243	0.001	0.845	0.154	0.001
1993	0.840	0.160	0.000	0.911	0.088	0.001	0.769	0.230	0.001	0.860	0.139	0.002
1994	0.836	0.163	0.000	0.909	0.086	0.005	0.778	0.220	0.002	0.872	0.126	0.001
1995	0.833	0.167	0.000	0.914	0.085	0.001	0.787	0.211	0.002	0.882	0.115	0.003
1996	0.826	0.173	0.000	0.926	0.071	0.003	0.808	0.189	0.004	0.898	0.101	0.001
1997	0.832	0.163	0.005	0.927	0.070	0.004	0.839	0.159	0.002	0.911	0.088	0.001
1998	0.837	0.154	0.009	0.932	0.064	0.004	0.845	0.145	0.010	0.893	0.101	0.006
1999	0.855	0.143	0.002	0.945	0.055	0.001	0.859	0.134	0.007	0.921	0.078	0.001
2000	0.850	0.144	0.007	0.946	0.051	0.002	0.878	0.113	0.009	0.921	0.074	0.005
2001	0.848	0.149	0.003	0.948	0.050	0.003	0.894	0.099	0.007	0.903	0.070	0.027
2002	0.856	0.140	0.004	0.952	0.048	0.000	0.905	0.093	0.002	0.930	0.067	0.003
2003	0.864	0.131	0.005	0.954	0.045	0.001	0.905	0.086	0.009	0.936	0.063	0.001
2004	0.875	0.124	0.001	0.955	0.043	0.001	0.903	0.080	0.017	0.920	0.058	0.022
2005	0.880	0.118	0.002	0.957	0.041	0.002	0.913	0.076	0.012	0.937	0.056	0.007
2006	0.913	0.085	0.002	0.959	0.040	0.001	0.911	0.079	0.010	0.936	0.064	0.000
2007	0.895	0.102	0.003	0.961	0.038	0.001	0.893	0.089	0.018	0.975	0.025	0.000
Forecasts												
2008	0.897	0.101	0.002	0.956	0.042	0.002	0.896	0.091	0.013	0.975	0.018	0.007
2009	0.899	0.099	0.002	0.950	0.048	0.002	0.899	0.088	0.013	0.975	0.018	0.007
2010	0.901	0.097	0.002	0.945	0.053	0.002	0.902	0.086	0.013	0.975	0.017	0.007
2011	0.903	0.095	0.002	0.939	0.059	0.002	0.904	0.083	0.013	0.976	0.017	0.007
2012	0.904	0.094	0.002	0.934	0.064	0.002	0.907	0.080	0.013	0.976	0.017	0.007
2013	0.906	0.092	0.002	0.928	0.070	0.002	0.910	0.077	0.013	0.976	0.017	0.007
2014	0.908	0.090	0.002	0.923	0.075	0.002	0.913	0.075	0.013	0.976	0.017	0.007
2015	0.910	0.088	0.002	0.917	0.080	0.002	0.916	0.072	0.013	0.976	0.016	0.007
2016	0.912	0.086	0.002	0.912	0.086	0.002	0.918	0.069	0.013	0.977	0.016	0.007
2017	0.914	0.084	0.002	0.907	0.091	0.002	0.921	0.066	0.013	0.977	0.016	0.007
2018	0.916	0.082	0.002	0.901	0.097	0.002	0.924	0.063	0.013	0.977	0.016	0.007
2019	0.918	0.080	0.002	0.896	0.102	0.002	0.927	0.061	0.013	0.977	0.015	0.007
2020	0.919	0.079	0.002	0.890	0.108	0.002	0.929	0.058	0.013	0.978	0.015	0.007
2021	0.921	0.077	0.002	0.885	0.113	0.002	0.932	0.055	0.013	0.978	0.015	0.007
2022	0.923	0.075	0.002	0.879	0.119	0.002	0.935	0.052	0.013	0.978	0.015	0.007
2023	0.925	0.073	0.002	0.874	0.124	0.002	0.938	0.050	0.013	0.978	0.015	0.007
2024	0.927	0.071	0.002	0.868	0.130	0.002	0.941	0.047	0.013	0.978	0.014	0.007
2025	0.929	0.069	0.002	0.863	0.135	0.002	0.943	0.044	0.013	0.979	0.014	0.007
2026	0.931	0.067	0.002	0.857	0.141	0.002	0.946	0.041	0.013	0.979	0.014	0.007
2027	0.933	0.065	0.002	0.852	0.146	0.002	0.949	0.038	0.013	0.979	0.014	0.007
2028	0.934	0.064	0.002	0.846	0.152	0.002	0.952	0.036	0.013	0.979	0.014	0.007
2029	0.936	0.062	0.002	0.841	0.157	0.002	0.954	0.033	0.013	0.980	0.013	0.007
2030	0.938	0.060	0.002	0.835	0.162	0.002	0.957	0.030	0.013	0.980	0.013	0.007

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	NSW–SA			SA–NSW			NSW–WA			WA–NSW		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.603	0.389	0.007	0.570	0.425	0.005	0.037	0.418	0.546	0.095	0.087	0.818
1973	0.644	0.349	0.007	0.612	0.384	0.004	0.052	0.491	0.457	0.131	0.262	0.607
1974	0.674	0.320	0.006	0.643	0.353	0.004	0.068	0.550	0.382	0.163	0.433	0.405
1975	0.685	0.309	0.006	0.657	0.343	0.000	0.077	0.620	0.303	0.158	0.566	0.276
1976	0.707	0.287	0.005	0.680	0.320	0.000	0.062	0.700	0.238	0.112	0.715	0.172
1977	0.693	0.302	0.005	0.658	0.342	0.000	0.069	0.707	0.224	0.147	0.853	0.000
1978	0.673	0.322	0.005	0.632	0.368	0.000	0.069	0.719	0.212	0.164	0.836	0.000
1979	0.670	0.326	0.004	0.624	0.376	0.000	0.080	0.721	0.199	0.210	0.790	0.000
1980	0.673	0.323	0.004	0.624	0.376	0.000	0.097	0.718	0.185	0.276	0.724	0.000
1981	0.703	0.293	0.004	0.620	0.380	0.000	0.112	0.707	0.181	0.303	0.697	0.000
1982	0.733	0.263	0.004	0.655	0.345	0.000	0.138	0.678	0.184	0.266	0.734	0.000
1983	0.731	0.255	0.014	0.647	0.334	0.018	0.126	0.677	0.197	0.190	0.810	0.000
1984	0.739	0.260	0.001	0.657	0.343	0.000	0.144	0.609	0.247	0.299	0.607	0.094
1985	0.737	0.263	0.000	0.671	0.329	0.000	0.146	0.571	0.284	0.293	0.577	0.130
1986	0.814	0.185	0.001	0.713	0.287	0.000	0.157	0.584	0.259	0.324	0.653	0.023
1987	0.693	0.307	0.000	0.713	0.287	0.000	0.178	0.666	0.156	0.346	0.654	0.000
1988	0.685	0.315	0.000	0.679	0.321	0.000	0.177	0.821	0.001	0.400	0.600	0.000
1989	0.675	0.325	0.000	0.671	0.311	0.018	0.185	0.786	0.028	0.417	0.562	0.021
1990	0.647	0.351	0.003	0.685	0.315	0.000	0.230	0.768	0.002	0.431	0.569	0.000
1991	0.675	0.322	0.003	0.738	0.262	0.000	0.240	0.749	0.011	0.448	0.552	0.000
1992	0.739	0.260	0.001	0.726	0.274	0.000	0.231	0.745	0.024	0.413	0.583	0.005
1993	0.674	0.322	0.004	0.704	0.296	0.000	0.260	0.724	0.016	0.408	0.584	0.008
1994	0.625	0.373	0.002	0.702	0.298	0.000	0.253	0.716	0.032	0.374	0.622	0.004
1995	0.586	0.412	0.002	0.701	0.299	0.000	0.254	0.675	0.071	0.358	0.629	0.013
1996	0.581	0.417	0.003	0.752	0.248	0.000	0.260	0.679	0.060	0.461	0.535	0.004
1997	0.582	0.418	0.000	0.792	0.206	0.001	0.254	0.690	0.056	0.365	0.635	0.000
1998	0.613	0.386	0.000	0.815	0.183	0.002	0.246	0.680	0.074	0.302	0.697	0.001
1999	0.623	0.377	0.000	0.836	0.164	0.000	0.251	0.747	0.002	0.232	0.748	0.019
2000	0.642	0.357	0.001	0.843	0.155	0.002	0.179	0.701	0.120	0.281	0.630	0.089
2001	0.641	0.346	0.013	0.846	0.152	0.002	0.136	0.690	0.175	0.333	0.618	0.049
2002	0.660	0.339	0.001	0.847	0.144	0.009	0.132	0.696	0.172	0.274	0.607	0.119
2003	0.670	0.327	0.004	0.860	0.139	0.001	0.127	0.682	0.191	0.235	0.597	0.167
2004	0.681	0.317	0.001	0.865	0.134	0.001	0.136	0.694	0.170	0.267	0.719	0.014
2005	0.689	0.308	0.002	0.871	0.129	0.000	0.144	0.688	0.168	0.253	0.697	0.049
2006	0.698	0.300	0.003	0.875	0.125	0.000	0.122	0.645	0.233	0.271	0.718	0.011
2007	0.701	0.295	0.003	0.881	0.119	0.000	0.109	0.628	0.263	0.335	0.644	0.021
Forecasts												
2008	0.713	0.285	0.002	0.884	0.116	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2009	0.724	0.274	0.002	0.888	0.112	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2010	0.735	0.263	0.002	0.891	0.109	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2011	0.746	0.252	0.002	0.894	0.106	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2012	0.757	0.240	0.002	0.897	0.103	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2013	0.769	0.229	0.002	0.901	0.099	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2014	0.780	0.218	0.002	0.904	0.096	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2015	0.791	0.207	0.002	0.907	0.093	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2016	0.802	0.196	0.002	0.911	0.089	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2017	0.813	0.185	0.002	0.914	0.086	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2018	0.824	0.173	0.002	0.917	0.083	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2019	0.836	0.162	0.002	0.920	0.080	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2020	0.847	0.151	0.002	0.924	0.076	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2021	0.858	0.140	0.002	0.927	0.073	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2022	0.869	0.129	0.002	0.930	0.070	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2023	0.880	0.117	0.002	0.934	0.066	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2024	0.892	0.106	0.002	0.937	0.063	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2025	0.903	0.095	0.002	0.940	0.060	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2026	0.914	0.084	0.002	0.944	0.056	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2027	0.925	0.073	0.002	0.947	0.053	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2028	0.936	0.061	0.002	0.950	0.050	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2029	0.948	0.050	0.002	0.953	0.047	0.000	0.110	0.660	0.230	0.290	0.700	0.014
2030	0.959	0.039	0.002	0.957	0.043	0.000	0.110	0.660	0.230	0.290	0.700	0.014

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	NSW–ACT			ACT–NSW			NSW–NT			NT–NSW		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.323	0.677	0.000	0.934	0.066	0.000	0.347	0.086	0.567	0.539	0.000	0.461
1973	0.408	0.592	0.000	0.946	0.054	0.000	0.374	0.089	0.537	0.537	0.036	0.428
1974	0.497	0.503	0.000	0.953	0.047	0.000	0.400	0.092	0.507	0.531	0.067	0.402
1975	0.576	0.424	0.000	0.956	0.044	0.000	0.423	0.096	0.481	0.596	0.110	0.294
1976	0.684	0.316	0.000	0.961	0.039	0.000	0.451	0.100	0.449	0.679	0.161	0.161
1977	0.700	0.300	0.000	0.963	0.037	0.000	0.478	0.104	0.418	0.811	0.189	0.000
1978	0.709	0.291	0.000	0.964	0.036	0.000	0.505	0.110	0.385	0.812	0.188	0.000
1979	0.733	0.267	0.000	0.967	0.033	0.000	0.539	0.115	0.346	0.817	0.183	0.000
1980	0.760	0.240	0.000	0.970	0.030	0.000	0.578	0.120	0.301	0.823	0.177	0.000
1981	0.781	0.219	0.000	0.972	0.028	0.000	0.619	0.127	0.254	0.826	0.174	0.000
1982	0.808	0.192	0.000	0.974	0.026	0.000	0.664	0.134	0.201	0.829	0.171	0.000
1983	0.809	0.191	0.000	0.971	0.029	0.000	0.708	0.146	0.146	0.883	0.117	0.000
1984	0.813	0.187	0.000	0.977	0.023	0.000	0.802	0.159	0.040	0.872	0.128	0.000
1985	0.812	0.188	0.000	0.977	0.023	0.000	0.836	0.164	0.000	0.878	0.122	0.000
1986	0.873	0.127	0.000	0.980	0.020	0.000	0.839	0.161	0.000	0.891	0.109	0.000
1987	0.867	0.133	0.000	0.980	0.020	0.000	0.839	0.161	0.000	0.866	0.134	0.000
1988	0.874	0.126	0.000	0.982	0.018	0.000	0.843	0.157	0.000	0.846	0.154	0.000
1989	0.887	0.113	0.000	0.984	0.016	0.000	0.845	0.155	0.000	0.850	0.150	0.000
1990	0.895	0.105	0.000	0.984	0.016	0.000	0.846	0.154	0.000	0.852	0.148	0.000
1991	0.900	0.100	0.000	0.984	0.016	0.000	0.847	0.153	0.000	0.853	0.147	0.000
1992	0.905	0.095	0.000	0.985	0.015	0.000	0.847	0.153	0.000	0.853	0.147	0.000
1993	0.922	0.078	0.000	0.986	0.014	0.000	0.849	0.151	0.000	0.856	0.144	0.000
1994	0.937	0.063	0.000	0.987	0.013	0.000	0.741	0.130	0.130	0.753	0.124	0.124
1995	0.951	0.049	0.000	0.987	0.013	0.000	0.853	0.147	0.000	0.756	0.122	0.122
1996	0.953	0.047	0.000	0.989	0.011	0.000	0.701	0.119	0.180	0.756	0.118	0.127
1997	0.950	0.050	0.000	0.989	0.011	0.000	0.652	0.109	0.239	0.868	0.132	0.000
1998	0.948	0.052	0.000	0.990	0.010	0.000	0.721	0.118	0.161	0.860	0.127	0.013
1999	0.950	0.050	0.000	0.991	0.009	0.000	0.776	0.125	0.099	0.835	0.121	0.045
2000	0.951	0.049	0.000	0.992	0.008	0.000	0.674	0.107	0.219	0.874	0.123	0.002
2001	0.950	0.050	0.000	0.992	0.008	0.000	0.750	0.118	0.132	0.878	0.122	0.000
2002	0.968	0.032	0.000	1.000	0.000	0.000	0.834	0.130	0.036	0.879	0.120	0.001
2003	0.985	0.015	0.000	1.000	0.000	0.000	0.694	0.120	0.185	0.899	0.101	0.000
2004	0.986	0.014	0.000	1.000	0.000	0.000	0.793	0.136	0.071	0.901	0.099	0.000
2005	0.986	0.014	0.000	1.000	0.000	0.000	0.719	0.122	0.159	0.881	0.095	0.024
2006	0.987	0.013	0.000	1.000	0.000	0.000	0.773	0.129	0.097	1.000	0.000	0.000
2007	0.988	0.012	0.000	1.000	0.000	0.000	0.776	0.128	0.096	1.000	0.000	0.000
Forecasts												
2008	1.000	0.000	0.000	1.000	0.000	0.000	0.880	0.053	0.068	0.947	0.043	0.011
2009	1.000	0.000	0.000	1.000	0.000	0.000	0.880	0.053	0.067	0.947	0.043	0.010
2010	1.000	0.000	0.000	1.000	0.000	0.000	0.881	0.053	0.066	0.947	0.043	0.010
2011	1.000	0.000	0.000	1.000	0.000	0.000	0.882	0.053	0.066	0.947	0.043	0.010
2012	1.000	0.000	0.000	1.000	0.000	0.000	0.882	0.052	0.065	0.947	0.043	0.010
2013	1.000	0.000	0.000	1.000	0.000	0.000	0.883	0.052	0.065	0.947	0.042	0.010
2014	1.000	0.000	0.000	1.000	0.000	0.000	0.883	0.052	0.064	0.948	0.042	0.010
2015	1.000	0.000	0.000	1.000	0.000	0.000	0.884	0.052	0.064	0.948	0.042	0.010
2016	1.000	0.000	0.000	1.000	0.000	0.000	0.885	0.052	0.063	0.948	0.042	0.010
2017	1.000	0.000	0.000	1.000	0.000	0.000	0.885	0.052	0.063	0.948	0.042	0.010
2018	1.000	0.000	0.000	1.000	0.000	0.000	0.886	0.052	0.062	0.948	0.042	0.010
2019	1.000	0.000	0.000	1.000	0.000	0.000	0.887	0.052	0.062	0.948	0.042	0.010
2020	1.000	0.000	0.000	1.000	0.000	0.000	0.887	0.052	0.061	0.948	0.042	0.010
2021	1.000	0.000	0.000	1.000	0.000	0.000	0.888	0.052	0.061	0.949	0.042	0.010
2022	1.000	0.000	0.000	1.000	0.000	0.000	0.888	0.052	0.060	0.949	0.042	0.009
2023	1.000	0.000	0.000	1.000	0.000	0.000	0.889	0.052	0.060	0.949	0.042	0.009
2024	1.000	0.000	0.000	1.000	0.000	0.000	0.890	0.051	0.059	0.949	0.042	0.009
2025	1.000	0.000	0.000	1.000	0.000	0.000	0.890	0.051	0.059	0.949	0.042	0.009
2026	1.000	0.000	0.000	1.000	0.000	0.000	0.891	0.051	0.058	0.949	0.041	0.009
2027	1.000	0.000	0.000	1.000	0.000	0.000	0.891	0.051	0.058	0.950	0.041	0.009
2028	1.000	0.000	0.000	1.000	0.000	0.000	0.892	0.051	0.057	0.950	0.041	0.009
2029	1.000	0.000	0.000	1.000	0.000	0.000	0.892	0.051	0.057	0.950	0.041	0.009
2030	1.000	0.000	0.000	1.000	0.000	0.000	0.893	0.051	0.056	0.950	0.041	0.009

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	NSW–TAS			TAS–NSW			VIC–QLD			QLD–VIC		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.000	0.000	1.000	0.000	0.000	1.000	0.457	0.214	0.329	0.424	0.281	0.295
1973	0.000	0.000	1.000	0.000	0.000	1.000	0.515	0.221	0.264	0.505	0.238	0.258
1974	0.000	0.000	1.000	0.000	0.000	1.000	0.564	0.229	0.207	0.567	0.204	0.229
1975	0.000	0.000	1.000	0.000	0.000	1.000	0.593	0.244	0.163	0.602	0.189	0.209
1976	0.000	0.000	1.000	0.000	0.000	1.000	0.633	0.251	0.116	0.657	0.165	0.178
1977	0.000	0.000	1.000	0.000	0.000	1.000	0.641	0.261	0.098	0.741	0.180	0.079
1978	0.000	0.000	1.000	0.000	0.000	1.000	0.643	0.275	0.082	0.739	0.183	0.077
1979	0.000	0.000	1.000	0.000	0.000	1.000	0.659	0.277	0.064	0.760	0.171	0.069
1980	0.000	0.000	1.000	0.000	0.000	1.000	0.679	0.274	0.047	0.786	0.155	0.060
1981	0.000	0.000	1.000	0.000	0.000	1.000	0.704	0.264	0.033	0.816	0.128	0.056
1982	0.000	0.000	1.000	0.000	0.000	1.000	0.750	0.230	0.020	0.822	0.127	0.051
1983	0.000	0.000	1.000	0.000	0.000	1.000	0.775	0.217	0.008	0.790	0.153	0.057
1984	0.000	0.000	1.000	0.000	0.000	1.000	0.782	0.209	0.009	0.751	0.164	0.084
1985	0.000	0.000	1.000	0.000	0.000	1.000	0.792	0.203	0.006	0.794	0.189	0.017
1986	0.000	0.000	1.000	0.000	0.000	1.000	0.786	0.209	0.004	0.828	0.170	0.002
1987	0.000	0.000	1.000	0.000	0.000	1.000	0.811	0.187	0.002	0.826	0.174	0.000
1988	0.000	0.000	1.000	0.000	0.000	1.000	0.798	0.202	0.000	0.848	0.152	0.000
1989	0.000	0.000	1.000	0.000	0.000	1.000	0.771	0.229	0.001	0.827	0.173	0.000
1990	0.000	0.000	1.000	0.000	0.000	1.000	0.779	0.221	0.000	0.815	0.185	0.000
1991	0.000	0.000	1.000	0.000	0.000	1.000	0.758	0.242	0.000	0.805	0.195	0.000
1992	0.000	0.000	1.000	0.000	0.000	1.000	0.690	0.308	0.003	0.764	0.236	0.000
1993	0.000	0.000	1.000	0.000	0.000	1.000	0.690	0.306	0.004	0.729	0.213	0.058
1994	0.000	0.000	1.000	0.000	0.000	1.000	0.687	0.307	0.006	0.775	0.219	0.006
1995	0.000	0.000	1.000	0.000	0.000	1.000	0.688	0.309	0.004	0.785	0.214	0.001
1996	0.000	0.000	1.000	0.000	0.000	1.000	0.715	0.276	0.010	0.824	0.169	0.006
1997	0.000	0.000	1.000	0.000	0.000	1.000	0.705	0.287	0.008	0.812	0.179	0.009
1998	0.000	0.000	1.000	0.000	0.000	1.000	0.705	0.269	0.026	0.796	0.199	0.005
1999	0.000	0.000	1.000	0.000	0.000	1.000	0.670	0.318	0.012	0.827	0.160	0.013
2000	0.000	0.000	1.000	0.000	0.000	1.000	0.665	0.301	0.035	0.820	0.168	0.012
2001	0.000	0.000	1.000	0.000	0.000	1.000	0.680	0.303	0.017	0.799	0.179	0.022
2002	0.000	0.000	1.000	0.000	0.000	1.000	0.677	0.291	0.032	0.808	0.187	0.004
2003	0.000	0.000	1.000	0.000	0.000	1.000	0.674	0.279	0.047	0.806	0.190	0.004
2004	0.000	0.000	1.000	0.000	0.000	1.000	0.657	0.262	0.081	0.805	0.193	0.002
2005	0.000	0.000	1.000	0.000	0.000	1.000	0.669	0.260	0.071	0.803	0.196	0.001
2006	0.000	0.000	1.000	0.000	0.000	1.000	0.681	0.262	0.057	0.760	0.239	0.001
2007	0.000	0.000	1.000	0.000	0.000	1.000	0.701	0.264	0.034	0.790	0.210	0.001
Forecasts												
2008	0.000	0.000	1.000	0.000	0.000	1.000	0.696	0.228	0.075	0.783	0.217	0.001
2009	0.000	0.000	1.000	0.000	0.000	1.000	0.691	0.233	0.075	0.775	0.224	0.001
2010	0.000	0.000	1.000	0.000	0.000	1.000	0.686	0.238	0.075	0.768	0.231	0.001
2011	0.000	0.000	1.000	0.000	0.000	1.000	0.681	0.243	0.075	0.761	0.238	0.001
2012	0.000	0.000	1.000	0.000	0.000	1.000	0.676	0.249	0.075	0.754	0.245	0.001
2013	0.000	0.000	1.000	0.000	0.000	1.000	0.671	0.254	0.075	0.747	0.252	0.001
2014	0.000	0.000	1.000	0.000	0.000	1.000	0.666	0.259	0.075	0.740	0.259	0.001
2015	0.000	0.000	1.000	0.000	0.000	1.000	0.661	0.264	0.075	0.733	0.266	0.001
2016	0.000	0.000	1.000	0.000	0.000	1.000	0.656	0.269	0.075	0.726	0.273	0.001
2017	0.000	0.000	1.000	0.000	0.000	1.000	0.651	0.274	0.075	0.719	0.280	0.001
2018	0.000	0.000	1.000	0.000	0.000	1.000	0.646	0.279	0.075	0.712	0.287	0.001
2019	0.000	0.000	1.000	0.000	0.000	1.000	0.641	0.284	0.075	0.705	0.294	0.001
2020	0.000	0.000	1.000	0.000	0.000	1.000	0.636	0.289	0.075	0.698	0.301	0.001
2021	0.000	0.000	1.000	0.000	0.000	1.000	0.631	0.294	0.075	0.691	0.308	0.001
2022	0.000	0.000	1.000	0.000	0.000	1.000	0.626	0.299	0.075	0.684	0.316	0.001
2023	0.000	0.000	1.000	0.000	0.000	1.000	0.620	0.304	0.075	0.677	0.323	0.001
2024	0.000	0.000	1.000	0.000	0.000	1.000	0.615	0.309	0.075	0.669	0.330	0.001
2025	0.000	0.000	1.000	0.000	0.000	1.000	0.610	0.314	0.075	0.662	0.337	0.001
2026	0.000	0.000	1.000	0.000	0.000	1.000	0.605	0.319	0.075	0.655	0.344	0.001
2027	0.000	0.000	1.000	0.000	0.000	1.000	0.600	0.324	0.075	0.648	0.351	0.001
2028	0.000	0.000	1.000	0.000	0.000	1.000	0.595	0.329	0.075	0.641	0.358	0.001
2029	0.000	0.000	1.000	0.000	0.000	1.000	0.590	0.334	0.075	0.634	0.365	0.001
2030	0.000	0.000	1.000	0.000	0.000	1.000	0.585	0.340	0.075	0.627	0.372	0.001

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	VIC–SA			SA–VIC			VIC–WA			WA–VIC		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.459	0.535	0.006	0.372	0.610	0.018	0.080	0.380	0.541	0.060	0.048	0.892
1973	0.517	0.476	0.007	0.433	0.551	0.016	0.112	0.418	0.470	0.078	0.112	0.810
1974	0.561	0.432	0.008	0.481	0.504	0.014	0.143	0.446	0.411	0.093	0.168	0.740
1975	0.573	0.412	0.015	0.505	0.488	0.007	0.174	0.531	0.295	0.116	0.276	0.608
1976	0.603	0.377	0.020	0.546	0.454	0.000	0.157	0.658	0.185	0.109	0.460	0.431
1977	0.614	0.367	0.019	0.549	0.451	0.000	0.184	0.644	0.171	0.177	0.788	0.035
1978	0.615	0.367	0.018	0.543	0.457	0.000	0.197	0.643	0.160	0.174	0.793	0.034
1979	0.637	0.346	0.017	0.560	0.440	0.000	0.237	0.620	0.143	0.194	0.775	0.031
1980	0.665	0.320	0.015	0.585	0.415	0.000	0.293	0.584	0.123	0.225	0.747	0.029
1981	0.664	0.323	0.013	0.591	0.409	0.000	0.306	0.599	0.096	0.199	0.779	0.022
1982	0.676	0.312	0.012	0.632	0.368	0.000	0.334	0.588	0.078	0.189	0.793	0.018
1983	0.646	0.342	0.012	0.627	0.371	0.002	0.286	0.644	0.070	0.140	0.843	0.017
1984	0.661	0.336	0.003	0.644	0.356	0.000	0.351	0.601	0.048	0.204	0.721	0.075
1985	0.660	0.338	0.002	0.663	0.337	0.000	0.313	0.544	0.143	0.239	0.654	0.107
1986	0.718	0.282	0.000	0.707	0.286	0.007	0.360	0.521	0.119	0.291	0.672	0.037
1987	0.721	0.279	0.000	0.691	0.309	0.000	0.339	0.577	0.084	0.244	0.725	0.032
1988	0.724	0.276	0.000	0.691	0.309	0.000	0.346	0.557	0.097	0.283	0.707	0.010
1989	0.716	0.284	0.000	0.694	0.306	0.000	0.342	0.601	0.056	0.282	0.700	0.018
1990	0.722	0.278	0.000	0.744	0.252	0.003	0.373	0.599	0.029	0.298	0.698	0.005
1991	0.715	0.285	0.000	0.759	0.241	0.000	0.378	0.607	0.015	0.270	0.721	0.009
1992	0.711	0.289	0.000	0.750	0.250	0.000	0.374	0.598	0.028	0.230	0.770	0.000
1993	0.728	0.272	0.000	0.745	0.255	0.000	0.404	0.535	0.061	0.235	0.751	0.014
1994	0.758	0.241	0.001	0.738	0.261	0.001	0.355	0.572	0.073	0.216	0.781	0.003
1995	0.787	0.212	0.001	0.733	0.267	0.000	0.321	0.579	0.101	0.205	0.782	0.013
1996	0.801	0.191	0.008	0.753	0.247	0.000	0.294	0.613	0.094	0.220	0.776	0.004
1997	0.775	0.224	0.001	0.789	0.210	0.000	0.249	0.644	0.108	0.202	0.798	0.000
1998	0.731	0.267	0.002	0.784	0.215	0.001	0.209	0.678	0.113	0.151	0.827	0.022
1999	0.754	0.245	0.001	0.834	0.166	0.000	0.183	0.678	0.139	0.133	0.854	0.013
2000	0.764	0.235	0.002	0.837	0.163	0.000	0.130	0.668	0.202	0.151	0.833	0.015
2001	0.765	0.232	0.003	0.827	0.164	0.009	0.100	0.701	0.199	0.148	0.810	0.041
2002	0.770	0.225	0.005	0.837	0.163	0.000	0.090	0.690	0.220	0.124	0.789	0.087
2003	0.779	0.217	0.004	0.840	0.160	0.000	0.081	0.655	0.265	0.105	0.752	0.144
2004	0.784	0.210	0.006	0.841	0.158	0.000	0.083	0.671	0.245	0.114	0.861	0.025
2005	0.786	0.204	0.010	0.842	0.157	0.001	0.087	0.683	0.230	0.111	0.845	0.044
2006	0.780	0.209	0.010	0.872	0.128	0.000	0.090	0.660	0.250	0.124	0.857	0.019
2007	0.786	0.199	0.015	0.872	0.128	0.000	0.079	0.703	0.217	0.112	0.867	0.021
Forecasts												
2008	0.785	0.205	0.009	0.865	0.135	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2009	0.784	0.206	0.009	0.866	0.133	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2010	0.783	0.208	0.009	0.868	0.131	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2011	0.782	0.209	0.009	0.869	0.130	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2012	0.781	0.210	0.009	0.871	0.128	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2013	0.780	0.211	0.009	0.872	0.127	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2014	0.779	0.212	0.009	0.874	0.125	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2015	0.778	0.213	0.009	0.875	0.124	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2016	0.777	0.214	0.009	0.877	0.122	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2017	0.775	0.215	0.009	0.878	0.121	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2018	0.774	0.216	0.009	0.880	0.120	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2019	0.773	0.217	0.009	0.881	0.118	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2020	0.772	0.218	0.009	0.883	0.117	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2021	0.771	0.220	0.009	0.884	0.115	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2022	0.770	0.221	0.009	0.885	0.114	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2023	0.769	0.222	0.009	0.887	0.113	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2024	0.768	0.223	0.009	0.888	0.111	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2025	0.767	0.224	0.009	0.889	0.110	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2026	0.766	0.225	0.009	0.891	0.109	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2027	0.764	0.226	0.009	0.892	0.107	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2028	0.763	0.227	0.009	0.893	0.106	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2029	0.762	0.228	0.009	0.894	0.105	0.001	0.105	0.670	0.225	0.110	0.870	0.020
2030	0.761	0.229	0.009	0.896	0.104	0.001	0.105	0.670	0.225	0.110	0.870	0.020

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	VIC–ACT			ACT–VIC			VIC–NT			NT–VIC		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.951	0.049	0.000	1.000	0.000	0.000	0.000	0.246	0.754	0.114	0.000	0.886
1973	0.945	0.055	0.000	1.000	0.000	0.000	0.001	0.282	0.717	0.129	0.000	0.871
1974	0.938	0.062	0.000	1.000	0.000	0.000	0.001	0.322	0.677	0.144	0.000	0.856
1975	0.932	0.068	0.000	1.000	0.000	0.000	0.002	0.324	0.674	0.157	0.000	0.843
1976	0.925	0.075	0.000	1.000	0.000	0.000	0.002	0.326	0.672	0.174	0.000	0.826
1977	0.917	0.083	0.000	1.000	0.000	0.000	0.003	0.328	0.670	0.192	0.000	0.808
1978	0.909	0.091	0.000	1.000	0.000	0.000	0.003	0.329	0.668	0.211	0.000	0.789
1979	0.901	0.099	0.000	1.000	0.000	0.000	0.003	0.331	0.666	0.238	0.000	0.762
1980	0.893	0.107	0.000	1.000	0.000	0.000	0.005	0.331	0.664	0.274	0.000	0.726
1981	0.885	0.115	0.000	1.000	0.000	0.000	0.006	0.329	0.665	0.314	0.000	0.686
1982	0.878	0.122	0.000	1.000	0.000	0.000	0.007	0.326	0.667	0.364	0.000	0.636
1983	0.872	0.128	0.000	1.000	0.000	0.000	0.005	0.321	0.674	0.416	0.000	0.584
1984	0.847	0.153	0.000	1.000	0.000	0.000	0.021	0.805	0.174	0.606	0.000	0.394
1985	0.836	0.164	0.000	1.000	0.000	0.000	0.027	0.973	0.000	1.000	0.000	0.000
1986	0.847	0.153	0.000	1.000	0.000	0.000	0.045	0.955	0.000	1.000	0.000	0.000
1987	0.868	0.132	0.000	1.000	0.000	0.000	0.041	0.959	0.000	0.619	0.381	0.000
1988	0.881	0.119	0.000	1.000	0.000	0.000	0.053	0.947	0.000	0.459	0.541	0.000
1989	0.888	0.112	0.000	1.000	0.000	0.000	0.066	0.934	0.000	0.467	0.533	0.000
1990	0.894	0.106	0.000	1.000	0.000	0.000	0.076	0.924	0.000	0.472	0.528	0.000
1991	0.902	0.098	0.000	1.000	0.000	0.000	0.074	0.926	0.000	0.473	0.527	0.000
1992	0.909	0.091	0.000	1.000	0.000	0.000	0.077	0.923	0.000	0.474	0.526	0.000
1993	1.000	0.000	0.000	1.000	0.000	0.000	0.091	0.909	0.000	0.382	0.618	0.000
1994	1.000	0.000	0.000	1.000	0.000	0.000	0.102	0.898	0.000	0.363	0.637	0.000
1995	1.000	0.000	0.000	1.000	0.000	0.000	0.115	0.885	0.000	0.347	0.653	0.000
1996	1.000	0.000	0.000	1.000	0.000	0.000	0.124	0.732	0.144	0.298	0.591	0.111
1997	1.000	0.000	0.000	1.000	0.000	0.000	0.189	0.811	0.000	0.408	0.592	0.000
1998	1.000	0.000	0.000	1.000	0.000	0.000	0.241	0.759	0.000	0.998	0.000	0.002
1999	1.000	0.000	0.000	1.000	0.000	0.000	0.251	0.749	0.000	0.523	0.477	0.000
2000	1.000	0.000	0.000	1.000	0.000	0.000	0.337	0.663	0.000	0.474	0.526	0.000
2001	1.000	0.000	0.000	1.000	0.000	0.000	0.410	0.590	0.000	0.426	0.560	0.015
2002	1.000	0.000	0.000	1.000	0.000	0.000	0.460	0.540	0.001	0.437	0.563	0.000
2003	1.000	0.000	0.000	1.000	0.000	0.000	0.342	0.658	0.000	0.670	0.330	0.000
2004	1.000	0.000	0.000	1.000	0.000	0.000	0.386	0.614	0.001	0.674	0.326	0.000
2005	1.000	0.000	0.000	1.000	0.000	0.000	0.426	0.574	0.000	0.678	0.322	0.000
2006	1.000	0.000	0.000	1.000	0.000	0.000	0.469	0.531	0.000	0.682	0.318	0.000
2007	1.000	0.000	0.000	1.000	0.000	0.000	0.480	0.520	0.000	1.000	0.000	0.000
Forecasts												
2008	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2009	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2010	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2011	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2012	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2013	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2014	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2015	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2016	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2017	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2018	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2019	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2020	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2021	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2022	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2023	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2024	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2025	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2026	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2027	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2028	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2029	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000
2030	1.000	0.000	0.000	1.000	0.000	0.000	0.000	1.000	0.000	0.940	0.060	0.000

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	VIC–TAS			TAS–VIC			QLD–SA			SA–QLD		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.000	0.000	1.000	0.000	0.000	1.000	0.642	0.294	0.064	0.601	0.399	0.000
1973	0.000	0.000	1.000	0.000	0.000	1.000	0.697	0.247	0.056	0.658	0.340	0.002
1974	0.000	0.000	1.000	0.000	0.000	1.000	0.737	0.213	0.050	0.707	0.290	0.003
1975	0.000	0.000	1.000	0.000	0.000	1.000	0.771	0.201	0.028	0.745	0.251	0.005
1976	0.000	0.000	1.000	0.000	0.000	1.000	0.820	0.180	0.000	0.791	0.206	0.003
1977	0.000	0.000	1.000	0.000	0.000	1.000	0.838	0.162	0.000	0.720	0.280	0.000
1978	0.000	0.000	1.000	0.000	0.000	1.000	0.851	0.149	0.000	0.658	0.342	0.000
1979	0.000	0.000	1.000	0.000	0.000	1.000	0.873	0.127	0.000	0.618	0.382	0.000
1980	0.000	0.000	1.000	0.000	0.000	1.000	0.896	0.104	0.000	0.591	0.409	0.000
1981	0.000	0.000	1.000	0.000	0.000	1.000	0.903	0.097	0.000	0.658	0.342	0.000
1982	0.000	0.000	1.000	0.000	0.000	1.000	0.944	0.056	0.000	0.688	0.312	0.000
1983	0.000	0.000	1.000	0.000	0.000	1.000	0.968	0.021	0.011	0.696	0.304	0.000
1984	0.000	0.000	1.000	0.000	0.000	1.000	0.926	0.074	0.000	0.685	0.315	0.000
1985	0.000	0.000	1.000	0.000	0.000	1.000	0.853	0.081	0.066	0.689	0.307	0.004
1986	0.000	0.000	1.000	0.000	0.000	1.000	0.916	0.084	0.000	0.732	0.268	0.000
1987	0.000	0.000	1.000	0.000	0.000	1.000	0.880	0.120	0.000	0.728	0.272	0.000
1988	0.000	0.000	1.000	0.000	0.000	1.000	0.838	0.151	0.011	0.688	0.312	0.000
1989	0.000	0.000	1.000	0.000	0.000	1.000	0.771	0.229	0.000	0.641	0.359	0.000
1990	0.000	0.000	1.000	0.000	0.000	1.000	0.677	0.280	0.043	0.593	0.407	0.000
1991	0.000	0.000	1.000	0.000	0.000	1.000	0.693	0.307	0.000	0.636	0.364	0.000
1992	0.000	0.000	1.000	0.000	0.000	1.000	0.739	0.261	0.000	0.625	0.375	0.000
1993	0.000	0.000	1.000	0.000	0.000	1.000	0.724	0.224	0.052	0.606	0.394	0.000
1994	0.000	0.000	1.000	0.000	0.000	1.000	0.774	0.214	0.011	0.588	0.412	0.000
1995	0.000	0.000	1.000	0.000	0.000	1.000	0.801	0.199	0.000	0.572	0.428	0.000
1996	0.000	0.000	1.000	0.000	0.000	1.000	0.840	0.160	0.000	0.617	0.381	0.002
1997	0.000	0.000	1.000	0.000	0.000	1.000	0.827	0.173	0.000	0.625	0.375	0.000
1998	0.000	0.000	1.000	0.000	0.000	1.000	0.833	0.167	0.000	0.635	0.363	0.002
1999	0.000	0.000	1.000	0.000	0.000	1.000	0.895	0.105	0.000	0.625	0.374	0.001
2000	0.000	0.000	1.000	0.000	0.000	1.000	0.869	0.126	0.005	0.642	0.357	0.001
2001	0.000	0.000	1.000	0.000	0.000	1.000	0.849	0.148	0.003	0.651	0.345	0.004
2002	0.000	0.000	1.000	0.000	0.000	1.000	0.855	0.145	0.000	0.667	0.326	0.007
2003	0.000	0.000	1.000	0.000	0.000	1.000	0.859	0.140	0.001	0.686	0.309	0.005
2004	0.000	0.000	1.000	0.000	0.000	1.000	0.863	0.137	0.000	0.705	0.292	0.003
2005	0.000	0.000	1.000	0.000	0.000	1.000	0.865	0.134	0.002	0.723	0.277	0.000
2006	0.000	0.000	1.000	0.000	0.000	1.000	0.858	0.129	0.013	0.739	0.260	0.002
2007	0.000	0.000	1.000	0.000	0.000	1.000	0.848	0.147	0.005	0.666	0.325	0.009
Forecasts												
2008	0.000	0.000	1.000	0.000	0.000	1.000	0.853	0.145	0.002	0.690	0.310	0.000
2009	0.000	0.000	1.000	0.000	0.000	1.000	0.859	0.140	0.002	0.740	0.260	0.000
2010	0.000	0.000	1.000	0.000	0.000	1.000	0.864	0.134	0.002	0.747	0.253	0.000
2011	0.000	0.000	1.000	0.000	0.000	1.000	0.870	0.129	0.002	0.755	0.245	0.000
2012	0.000	0.000	1.000	0.000	0.000	1.000	0.875	0.123	0.002	0.762	0.238	0.000
2013	0.000	0.000	1.000	0.000	0.000	1.000	0.881	0.118	0.002	0.769	0.231	0.000
2014	0.000	0.000	1.000	0.000	0.000	1.000	0.886	0.112	0.002	0.776	0.223	0.000
2015	0.000	0.000	1.000	0.000	0.000	1.000	0.892	0.107	0.002	0.784	0.216	0.000
2016	0.000	0.000	1.000	0.000	0.000	1.000	0.897	0.101	0.002	0.791	0.209	0.000
2017	0.000	0.000	1.000	0.000	0.000	1.000	0.903	0.095	0.002	0.798	0.202	0.000
2018	0.000	0.000	1.000	0.000	0.000	1.000	0.908	0.090	0.002	0.805	0.194	0.000
2019	0.000	0.000	1.000	0.000	0.000	1.000	0.914	0.084	0.002	0.813	0.187	0.000
2020	0.000	0.000	1.000	0.000	0.000	1.000	0.919	0.079	0.002	0.820	0.180	0.000
2021	0.000	0.000	1.000	0.000	0.000	1.000	0.925	0.073	0.002	0.827	0.173	0.000
2022	0.000	0.000	1.000	0.000	0.000	1.000	0.930	0.068	0.002	0.835	0.165	0.000
2023	0.000	0.000	1.000	0.000	0.000	1.000	0.936	0.062	0.002	0.842	0.158	0.000
2024	0.000	0.000	1.000	0.000	0.000	1.000	0.941	0.057	0.002	0.849	0.151	0.000
2025	0.000	0.000	1.000	0.000	0.000	1.000	0.947	0.051	0.002	0.856	0.143	0.000
2026	0.000	0.000	1.000	0.000	0.000	1.000	0.952	0.046	0.002	0.864	0.136	0.000
2027	0.000	0.000	1.000	0.000	0.000	1.000	0.958	0.040	0.002	0.871	0.129	0.000
2028	0.000	0.000	1.000	0.000	0.000	1.000	0.963	0.035	0.002	0.878	0.122	0.000
2029	0.000	0.000	1.000	0.000	0.000	1.000	0.969	0.029	0.002	0.885	0.114	0.000
2030	0.000	0.000	1.000	0.000	0.000	1.000	0.974	0.024	0.002	0.893	0.107	0.000

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	QLD–WA			WA–QLD			QLD–ACT			ACT–QLD		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.073	0.111	0.816	0.201	0.064	0.735	1.000	0.000	0.000	1.000	0.000	0.000
1973	0.119	0.110	0.772	0.192	0.393	0.415	1.000	0.000	0.000	1.000	0.000	0.000
1974	0.174	0.107	0.719	0.188	0.575	0.237	1.000	0.000	0.000	1.000	0.000	0.000
1975	0.253	0.125	0.623	0.164	0.709	0.128	1.000	0.000	0.000	1.000	0.000	0.000
1976	0.301	0.170	0.528	0.107	0.842	0.051	1.000	0.000	0.000	1.000	0.000	0.000
1977	0.569	0.334	0.096	0.132	0.809	0.059	1.000	0.000	0.000	1.000	0.000	0.000
1978	0.547	0.363	0.090	0.179	0.749	0.072	1.000	0.000	0.000	1.000	0.000	0.000
1979	0.566	0.357	0.077	0.300	0.608	0.092	1.000	0.000	0.000	1.000	0.000	0.000
1980	0.599	0.336	0.065	0.596	0.273	0.131	1.000	0.000	0.000	1.000	0.000	0.000
1981	0.705	0.229	0.066	0.588	0.311	0.101	1.000	0.000	0.000	1.000	0.000	0.000
1982	0.763	0.176	0.061	0.529	0.399	0.071	1.000	0.000	0.000	1.000	0.000	0.000
1983	0.757	0.170	0.073	0.415	0.527	0.059	1.000	0.000	0.000	1.000	0.000	0.000
1984	0.846	0.127	0.027	0.430	0.570	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1985	0.904	0.096	0.000	0.445	0.555	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1986	0.946	0.054	0.000	0.400	0.600	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1987	0.948	0.052	0.000	0.357	0.643	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1988	0.819	0.181	0.000	0.354	0.646	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1989	0.848	0.125	0.027	0.326	0.629	0.045	1.000	0.000	0.000	1.000	0.000	0.000
1990	0.923	0.077	0.000	0.522	0.478	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1991	0.812	0.188	0.000	0.351	0.635	0.014	1.000	0.000	0.000	1.000	0.000	0.000
1992	0.711	0.280	0.010	0.217	0.451	0.332	1.000	0.000	0.000	1.000	0.000	0.000
1993	0.676	0.317	0.007	0.342	0.658	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1994	0.578	0.343	0.080	0.325	0.675	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1995	0.572	0.374	0.054	0.325	0.666	0.009	1.000	0.000	0.000	1.000	0.000	0.000
1996	0.510	0.480	0.010	0.286	0.707	0.007	1.000	0.000	0.000	1.000	0.000	0.000
1997	0.495	0.485	0.019	0.267	0.733	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1998	0.465	0.427	0.108	0.240	0.576	0.185	1.000	0.000	0.000	1.000	0.000	0.000
1999	0.429	0.427	0.145	0.220	0.611	0.170	1.000	0.000	0.000	1.000	0.000	0.000
2000	0.343	0.452	0.205	0.304	0.639	0.058	1.000	0.000	0.000	1.000	0.000	0.000
2001	0.253	0.436	0.310	0.344	0.650	0.006	1.000	0.000	0.000	1.000	0.000	0.000
2002	0.287	0.515	0.198	0.302	0.678	0.020	1.000	0.000	0.000	1.000	0.000	0.000
2003	0.238	0.437	0.325	0.255	0.654	0.092	1.000	0.000	0.000	1.000	0.000	0.000
2004	0.206	0.364	0.429	0.252	0.685	0.064	1.000	0.000	0.000	1.000	0.000	0.000
2005	0.284	0.470	0.247	0.262	0.728	0.009	1.000	0.000	0.000	1.000	0.000	0.000
2006	0.223	0.420	0.357	0.247	0.747	0.006	1.000	0.000	0.000	1.000	0.000	0.000
2007	0.160	0.513	0.327	0.340	0.640	0.020	1.000	0.000	0.000	1.000	0.000	0.000
Forecasts												
2008	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2009	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2010	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2011	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2012	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2013	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2014	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2015	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2016	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2017	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2018	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2019	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2020	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2021	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2022	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2023	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2024	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2025	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2026	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2027	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2028	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2029	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2030	0.210	0.480	0.310	0.290	0.700	0.010	1.000	0.000	0.000	1.000	0.000	0.000

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	QLD–NT			NT–QLD			QLD–TAS			TAS–QLD		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.695	0.000	0.305	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1973	0.640	0.000	0.360	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1974	0.603	0.000	0.397	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1975	0.651	0.000	0.349	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1976	0.713	0.000	0.287	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1977	0.723	0.000	0.277	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1978	0.726	0.000	0.274	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1979	0.742	0.000	0.258	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1980	0.762	0.000	0.238	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1981	0.774	0.000	0.226	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1982	0.784	0.000	0.216	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1983	0.765	0.000	0.235	0.872	0.000	0.128	0.000	0.000	1.000	0.000	0.000	1.000
1984	0.712	0.000	0.288	0.777	0.000	0.223	0.000	0.000	1.000	0.000	0.000	1.000
1985	0.916	0.000	0.084	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1986	0.923	0.000	0.077	0.970	0.000	0.030	0.000	0.000	1.000	0.000	0.000	1.000
1987	0.934	0.000	0.066	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1988	0.969	0.000	0.031	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1989	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1990	0.991	0.000	0.009	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1991	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1992	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1993	0.992	0.000	0.008	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1994	1.000	0.000	0.000	0.992	0.000	0.008	0.000	0.000	1.000	0.000	0.000	1.000
1995	0.985	0.000	0.015	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1996	0.922	0.000	0.078	0.999	0.000	0.001	0.000	0.000	1.000	0.000	0.000	1.000
1997	0.855	0.000	0.145	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1998	0.836	0.000	0.164	0.998	0.000	0.002	0.000	0.000	1.000	0.000	0.000	1.000
1999	0.938	0.000	0.062	0.998	0.000	0.002	0.000	0.000	1.000	0.000	0.000	1.000
2000	0.862	0.000	0.138	0.995	0.000	0.005	0.000	0.000	1.000	0.000	0.000	1.000
2001	0.870	0.000	0.130	0.983	0.000	0.017	0.000	0.000	1.000	0.000	0.000	1.000
2002	0.867	0.000	0.133	0.980	0.000	0.020	0.000	0.000	1.000	0.000	0.000	1.000
2003	0.845	0.000	0.155	0.974	0.000	0.026	0.000	0.000	1.000	0.000	0.000	1.000
2004	0.854	0.000	0.146	0.910	0.000	0.090	0.000	0.000	1.000	0.000	0.000	1.000
2005	0.870	0.000	0.130	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2006	0.881	0.000	0.119	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2007	0.887	0.000	0.113	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
Forecasts												
2008	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2009	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2010	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2011	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2012	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2013	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2014	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2015	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2016	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2017	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2018	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2019	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2020	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2021	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2022	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2023	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2024	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2025	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2026	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2027	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2028	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2029	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2030	0.852	0.000	0.148	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	SA–WA			WA–SA			SA–ACT			ACT–SA		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.047	0.919	0.034	0.104	0.744	0.152	0.000	1.000	0.000	1.000	0.000	0.000
1973	0.059	0.918	0.022	0.149	0.769	0.082	0.000	1.000	0.000	1.000	0.000	0.000
1974	0.071	0.915	0.014	0.194	0.798	0.009	0.000	1.000	0.000	1.000	0.000	0.000
1975	0.072	0.916	0.012	0.199	0.796	0.004	0.000	1.000	0.000	1.000	0.000	0.000
1976	0.053	0.936	0.011	0.152	0.848	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1977	0.061	0.939	0.000	0.151	0.849	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1978	0.062	0.938	0.000	0.153	0.847	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1979	0.073	0.927	0.000	0.178	0.822	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1980	0.089	0.911	0.000	0.213	0.787	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1981	0.107	0.893	0.000	0.193	0.807	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1982	0.133	0.867	0.000	0.221	0.779	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1983	0.149	0.851	0.000	0.195	0.805	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1984	0.208	0.792	0.000	0.232	0.762	0.006	0.000	1.000	0.000	1.000	0.000	0.000
1985	0.255	0.745	0.000	0.217	0.783	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1986	0.347	0.653	0.000	0.246	0.754	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1987	0.292	0.708	0.000	0.282	0.718	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1988	0.351	0.646	0.003	0.356	0.641	0.004	0.000	1.000	0.000	1.000	0.000	0.000
1989	0.395	0.603	0.001	0.384	0.607	0.009	0.000	1.000	0.000	1.000	0.000	0.000
1990	0.401	0.599	0.000	0.440	0.560	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1991	0.452	0.546	0.002	0.481	0.519	0.000	0.000	1.000	0.000	1.000	0.000	0.000
1992	0.486	0.508	0.006	0.510	0.445	0.045	0.000	1.000	0.000	1.000	0.000	0.000
1993	0.541	0.454	0.005	0.571	0.422	0.007	1.000	0.000	0.000	1.000	0.000	0.000
1994	0.573	0.427	0.000	0.583	0.417	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1995	0.617	0.380	0.003	0.592	0.378	0.030	1.000	0.000	0.000	1.000	0.000	0.000
1996	0.615	0.382	0.003	0.626	0.364	0.010	1.000	0.000	0.000	1.000	0.000	0.000
1997	0.626	0.369	0.005	0.687	0.313	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1998	0.639	0.355	0.007	0.695	0.297	0.008	1.000	0.000	0.000	1.000	0.000	0.000
1999	0.626	0.370	0.003	0.612	0.383	0.005	1.000	0.000	0.000	1.000	0.000	0.000
2000	0.551	0.444	0.005	0.614	0.352	0.033	1.000	0.000	0.000	1.000	0.000	0.000
2001	0.469	0.509	0.022	0.623	0.370	0.007	1.000	0.000	0.000	1.000	0.000	0.000
2002	0.459	0.533	0.009	0.569	0.409	0.022	1.000	0.000	0.000	1.000	0.000	0.000
2003	0.443	0.540	0.017	0.540	0.449	0.011	1.000	0.000	0.000	1.000	0.000	0.000
2004	0.450	0.539	0.011	0.520	0.463	0.017	1.000	0.000	0.000	1.000	0.000	0.000
2005	0.459	0.527	0.014	0.518	0.473	0.009	1.000	0.000	0.000	1.000	0.000	0.000
2006	0.611	0.383	0.006	0.693	0.300	0.008	1.000	0.000	0.000	1.000	0.000	0.000
2007	0.443	0.547	0.011	0.630	0.363	0.007	1.000	0.000	0.000	1.000	0.000	0.000
Forecasts												
2008	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2009	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2010	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2011	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2012	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2013	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2014	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2015	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2016	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2017	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2018	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2019	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2020	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2021	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2022	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2023	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2024	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2025	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2026	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2027	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2028	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2029	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000
2030	0.480	0.510	0.012	0.600	0.390	0.010	1.000	0.000	0.000	1.000	0.000	0.000

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	SA–NT			NT–SA			SA–TAS			TAS–SA		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.226	0.751	0.023	0.129	0.871	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1973	0.287	0.702	0.012	0.176	0.824	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1974	0.351	0.649	0.000	0.226	0.774	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1975	0.402	0.598	0.000	0.264	0.736	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1976	0.476	0.524	0.000	0.326	0.674	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1977	0.443	0.557	0.000	0.310	0.690	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1978	0.409	0.591	0.000	0.289	0.711	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1979	0.398	0.602	0.000	0.291	0.709	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1980	0.396	0.604	0.000	0.303	0.697	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1981	0.417	0.583	0.000	0.323	0.677	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1982	0.446	0.554	0.000	0.363	0.637	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1983	0.440	0.560	0.000	0.356	0.644	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1984	0.460	0.540	0.000	0.376	0.624	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1985	0.477	0.523	0.000	0.398	0.602	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1986	0.523	0.473	0.004	0.456	0.544	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1987	0.477	0.523	0.000	0.416	0.584	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1988	0.460	0.540	0.000	0.417	0.583	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1989	0.465	0.535	0.000	0.429	0.571	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1990	0.462	0.538	0.000	0.431	0.569	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1991	0.452	0.548	0.000	0.420	0.580	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1992	0.442	0.558	0.000	0.410	0.590	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1993	0.426	0.574	0.000	0.419	0.581	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1994	0.410	0.590	0.000	0.423	0.577	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1995	0.397	0.603	0.000	0.428	0.572	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1996	0.412	0.588	0.000	0.446	0.554	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1997	0.419	0.555	0.027	0.502	0.498	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1998	0.465	0.535	0.000	0.451	0.549	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1999	0.493	0.507	0.000	0.508	0.492	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2000	0.488	0.512	0.000	0.505	0.495	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2001	0.476	0.524	0.000	0.491	0.509	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2002	0.468	0.527	0.005	0.488	0.512	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2003	0.404	0.596	0.000	0.237	0.763	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2004	0.400	0.600	0.000	0.237	0.763	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2005	0.396	0.604	0.000	0.248	0.752	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2006	0.530	0.470	0.000	0.391	0.609	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2007	0.388	0.612	0.000	0.357	0.643	0.000	0.000	0.000	1.000	0.000	0.000	1.000
Forecasts												
2008	0.374	0.626	0.000	0.366	0.634	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2009	0.373	0.627	0.000	0.375	0.625	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2010	0.371	0.629	0.000	0.384	0.616	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2011	0.370	0.630	0.000	0.393	0.607	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2012	0.368	0.632	0.000	0.402	0.598	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2013	0.367	0.633	0.000	0.411	0.589	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2014	0.365	0.635	0.000	0.420	0.580	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2015	0.364	0.636	0.000	0.429	0.571	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2016	0.362	0.638	0.000	0.438	0.562	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2017	0.361	0.639	0.000	0.447	0.553	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2018	0.359	0.641	0.000	0.456	0.544	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2019	0.358	0.642	0.000	0.465	0.535	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2020	0.356	0.644	0.000	0.474	0.526	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2021	0.355	0.645	0.000	0.483	0.517	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2022	0.353	0.647	0.000	0.492	0.508	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2023	0.352	0.648	0.000	0.501	0.499	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2024	0.350	0.650	0.000	0.510	0.490	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2025	0.349	0.651	0.000	0.519	0.481	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2026	0.347	0.653	0.000	0.528	0.472	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2027	0.346	0.654	0.000	0.537	0.463	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2028	0.345	0.655	0.000	0.546	0.454	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2029	0.343	0.657	0.000	0.555	0.445	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2030	0.342	0.658	0.000	0.564	0.436	0.000	0.000	0.000	1.000	0.000	0.000	1.000

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	WA–ACT			ACT–WA			WA–NT			NT–WA		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.000	1.000	0.000	1.000	0.000	0.000	0.334	0.000	0.666	0.211	0.000	0.789
1973	0.000	1.000	0.000	1.000	0.000	0.000	0.391	0.000	0.609	0.254	0.051	0.694
1974	0.000	1.000	0.000	1.000	0.000	0.000	0.438	0.000	0.562	0.290	0.097	0.613
1975	0.000	1.000	0.000	1.000	0.000	0.000	0.459	0.000	0.541	0.275	0.127	0.599
1976	0.000	1.000	0.000	1.000	0.000	0.000	0.498	0.000	0.502	0.278	0.147	0.575
1977	0.000	1.000	0.000	1.000	0.000	0.000	0.516	0.000	0.484	0.302	0.144	0.554
1978	0.000	1.000	0.000	1.000	0.000	0.000	0.524	0.000	0.476	0.319	0.142	0.538
1979	0.000	1.000	0.000	1.000	0.000	0.000	0.554	0.000	0.446	0.359	0.136	0.504
1980	0.000	1.000	0.000	1.000	0.000	0.000	0.590	0.000	0.410	0.409	0.128	0.463
1981	0.000	1.000	0.000	1.000	0.000	0.000	0.614	0.000	0.386	0.451	0.117	0.432
1982	0.000	1.000	0.000	1.000	0.000	0.000	0.635	0.000	0.365	0.493	0.108	0.399
1983	0.000	1.000	0.000	1.000	0.000	0.000	0.613	0.000	0.387	0.486	0.108	0.406
1984	0.000	1.000	0.000	1.000	0.000	0.000	0.640	0.000	0.360	0.754	0.176	0.070
1985	0.000	1.000	0.000	1.000	0.000	0.000	0.673	0.000	0.327	0.781	0.149	0.070
1986	0.000	1.000	0.000	1.000	0.000	0.000	0.642	0.000	0.358	0.788	0.120	0.093
1987	0.000	1.000	0.000	1.000	0.000	0.000	0.646	0.000	0.354	0.814	0.124	0.063
1988	0.000	1.000	0.000	1.000	0.000	0.000	0.728	0.000	0.272	0.832	0.112	0.056
1989	0.000	1.000	0.000	1.000	0.000	0.000	0.727	0.000	0.273	0.826	0.099	0.074
1990	0.000	1.000	0.000	1.000	0.000	0.000	0.656	0.000	0.344	0.876	0.074	0.050
1991	0.000	1.000	0.000	1.000	0.000	0.000	0.857	0.000	0.143	0.856	0.072	0.072
1992	0.000	1.000	0.000	1.000	0.000	0.000	0.846	0.000	0.154	0.802	0.066	0.132
1993	1.000	0.000	0.000	1.000	0.000	0.000	0.845	0.000	0.155	0.851	0.064	0.132
1994	1.000	0.000	0.000	1.000	0.000	0.000	0.754	0.000	0.246	0.844	0.059	0.098
1995	1.000	0.000	0.000	1.000	0.000	0.000	0.792	0.000	0.208	0.886	0.057	0.057
1996	1.000	0.000	0.000	1.000	0.000	0.000	0.814	0.000	0.186	0.909	0.052	0.039
1997	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000	1.000	0.000	0.000
1998	1.000	0.000	0.000	1.000	0.000	0.000	0.849	0.000	0.151	0.583	0.000	0.417
1999	1.000	0.000	0.000	1.000	0.000	0.000	0.832	0.000	0.168	0.948	0.000	0.052
2000	1.000	0.000	0.000	1.000	0.000	0.000	0.906	0.000	0.094	0.965	0.000	0.035
2001	1.000	0.000	0.000	1.000	0.000	0.000	0.902	0.000	0.098	0.937	0.000	0.063
2002	1.000	0.000	0.000	1.000	0.000	0.000	0.912	0.000	0.088	0.947	0.000	0.053
2003	1.000	0.000	0.000	1.000	0.000	0.000	0.902	0.000	0.098	0.938	0.000	0.062
2004	1.000	0.000	0.000	1.000	0.000	0.000	0.892	0.000	0.108	0.525	0.000	0.475
2005	1.000	0.000	0.000	1.000	0.000	0.000	0.939	0.000	0.061	0.975	0.000	0.025
2006	1.000	0.000	0.000	1.000	0.000	0.000	0.950	0.000	0.050	0.932	0.000	0.068
2007	1.000	0.000	0.000	1.000	0.000	0.000	0.942	0.000	0.058	0.983	0.000	0.017
Forecasts												
2008	1.000	0.000	0.000	1.000	0.000	0.000	0.965	0.000	0.035	0.977	0.000	0.023
2009	1.000	0.000	0.000	1.000	0.000	0.000	0.966	0.000	0.034	0.977	0.000	0.023
2010	1.000	0.000	0.000	1.000	0.000	0.000	0.966	0.000	0.034	0.977	0.000	0.023
2011	1.000	0.000	0.000	1.000	0.000	0.000	0.967	0.000	0.033	0.977	0.000	0.023
2012	1.000	0.000	0.000	1.000	0.000	0.000	0.967	0.000	0.033	0.977	0.000	0.023
2013	1.000	0.000	0.000	1.000	0.000	0.000	0.968	0.000	0.032	0.977	0.000	0.023
2014	1.000	0.000	0.000	1.000	0.000	0.000	0.968	0.000	0.032	0.977	0.000	0.023
2015	1.000	0.000	0.000	1.000	0.000	0.000	0.969	0.000	0.031	0.977	0.000	0.023
2016	1.000	0.000	0.000	1.000	0.000	0.000	0.969	0.000	0.031	0.977	0.000	0.023
2017	1.000	0.000	0.000	1.000	0.000	0.000	0.970	0.000	0.030	0.977	0.000	0.023
2018	1.000	0.000	0.000	1.000	0.000	0.000	0.970	0.000	0.030	0.977	0.000	0.023
2019	1.000	0.000	0.000	1.000	0.000	0.000	0.971	0.000	0.029	0.977	0.000	0.023
2020	1.000	0.000	0.000	1.000	0.000	0.000	0.971	0.000	0.029	0.977	0.000	0.023
2021	1.000	0.000	0.000	1.000	0.000	0.000	0.972	0.000	0.028	0.977	0.000	0.023
2022	1.000	0.000	0.000	1.000	0.000	0.000	0.972	0.000	0.028	0.977	0.000	0.023
2023	1.000	0.000	0.000	1.000	0.000	0.000	0.973	0.000	0.027	0.977	0.000	0.023
2024	1.000	0.000	0.000	1.000	0.000	0.000	0.973	0.000	0.027	0.977	0.000	0.023
2025	1.000	0.000	0.000	1.000	0.000	0.000	0.974	0.000	0.026	0.977	0.000	0.023
2026	1.000	0.000	0.000	1.000	0.000	0.000	0.974	0.000	0.026	0.977	0.000	0.023
2027	1.000	0.000	0.000	1.000	0.000	0.000	0.974	0.000	0.026	0.977	0.000	0.023
2028	1.000	0.000	0.000	1.000	0.000	0.000	0.975	0.000	0.025	0.977	0.000	0.023
2029	1.000	0.000	0.000	1.000	0.000	0.000	0.975	0.000	0.025	0.977	0.000	0.023
2030	1.000	0.000	0.000	1.000	0.000	0.000	0.976	0.000	0.024	0.977	0.000	0.023

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	WA–TAS			TAS–WA			ACT–NT			NT–ACT		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1973	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1974	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1975	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1976	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1977	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1978	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1979	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1980	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1981	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1982	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1983	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1984	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1985	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1986	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1987	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1988	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1989	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1990	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1991	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1992	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1993	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1994	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1995	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1996	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1997	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1998	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
1999	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2000	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2001	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2002	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2003	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2004	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2005	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2006	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2007	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
Forecasts												
2008	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2009	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2010	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2011	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2012	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2013	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2014	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2015	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2016	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2017	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2018	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2019	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2020	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2021	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2022	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2023	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2024	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2025	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2026	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2027	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2028	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2029	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000
2030	0.000	0.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	1.000	0.000	0.000

(continued)

TE.1 Aggregate mode share for all 56 OD routes (continued)

Year	ACT–TAS			TAS–ACT			NT–TAS			TAS–NT		
	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea	Road	Rail	Sea
Estimates												
1972	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1973	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1974	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1975	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1976	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1977	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1978	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1979	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1980	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1981	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1982	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1983	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1984	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1985	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1986	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1987	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1988	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1989	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1990	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1991	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1992	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1993	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1994	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1995	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1996	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1997	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1998	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
1999	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2000	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2001	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2002	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2003	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2004	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2005	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2006	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2007	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
Forecasts												
2008	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2009	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2010	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2011	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2012	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2013	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2014	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2015	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2016	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2017	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2018	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2019	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2020	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2021	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2022	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2023	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2024	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2025	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2026	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2027	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2028	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2029	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000
2030	1.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	1.000	0.000	0.000	1.000

Source: BITRE estimates.

APPENDIX F

Road freight by 'capital cities': estimation and forecast

F.1 Capital city road freight tasks: estimation

This section updates the methodology for estimating the 'capital cities' road freight tasks between 1971 and 2003, which was derived by BITRE (see BTRE 2006, Appendix II). The present update covers the period from 1972 to 2007.

1. The original method followed a six-step procedure (see BTRE 2006, Appendix II). The six-steps are described below:
2. First, the Australian-level aggregate for the eight capital cities' freight task is adjusted. Table F.1 shows the mechanism for adjusting aggregate capital city tonne-kilometres. It is done by vehicle type, multiplying by the ratio of adjusted to raw tonne-kilometres by vehicle type of the Australia-level adjustment. Then a final adjustment is made, for each vehicle type that seeks to smooth the series.
3. Secondly, an equation to estimate total capital city freight is derived from a regression equation of total capital city freight against GDP and real road freight rates. The equation them allows the capital city series to be interpolated between survey years, to generate a final adjusted Australia-level estimate of capital city freight tonne-kilometres. This figure is presented in Table F.6, last column. Details of the regression are given in Chapter 5 (see Table 5.1).
4. Next we calculate the raw survey shares of capital city freight from Table F.2, which gives the raw ABS survey estimates of tonne-kilometres by city. These raw shares are shown in Table F.3.
5. Then we smooth these shares to a believable trend, not worrying if the total share goes above or below 1.0. These shares are shown in Table F.4, with the changes shaded.
6. Then these shares are interpolated between survey years and normalised to add to 1.0. This is shown in Table F.5.
7. Finally, these shares are multiplied by the adjusted Australia-level eight capital city tonne-kilometres from the second step above—shown as the last column in Table F.6—to get the final adjusted freight task series for each capital city. These are shown in Table F.6.

TF.1 Adjustments to eight Capital cities total road freight (million tkm)—raw

Year	Light Commercial vehicles (LCVs)				Rigid trucks				Articulated trucks				Total	
	Raw	Ratio	Adjusted	Final	Raw	Ratio	Adjusted	Final	Raw	Ratio	Adjusted	Final	Raw	Adjusted
1971	550	0.9118	501	501	4 730	0.9317	4 407	4 407	2 415	0.9336	2 255	2 255	7 695	7 163
1976	821	0.9140	750	750	5 387	0.9255	4 986	4 986	4 092	0.9156	3 747	3 747	10 300	9 483
1979	1 230	0.8632	1 061	1 061	5 830	1.0241	5 970	5 970	5 351	0.9291	4 971	4 971	12 410	12 003
1982	1 153	0.9564	1 103	1 103	6 987	0.9864	6 892	6 892	6 412	0.9520	6 105	6 105	14 553	14 099
1985	1 430	0.8761	1 253	1 253	7 839	0.9274	7 270	7 270	7 821	0.9294	7 269	7 269	17 090	15 791
1988	2 208	0.7832	1 729	1 729	10 367	0.8607	8 923	8 562	10 007	0.9370	9 376	8 288	22 582	18 580
1991	2 338	0.8518	1 991	1 991	9 541	1.0129	9 664	9 664	9 356	0.9326	8 725	8 725	21 234	20 380
1995	2 395	0.9473	2 269	2 269	10 872	0.8769	9 534	9 534	13 764	0.9080	12 498	12 498	27 031	24 300
1998	2 732	1.0288	2 811	2 600	10 129	1.0259	10 391	9 994	15 444	1.0835	16 733	14 374	28 305	26 968
1999	2 488	0.9775	2 432	2 595	10 197	1.0252	10 454	10 454	15 743	1.0032	15 794	15 000	28 428	28 049
2000	2 744	0.9262	2 541	2 519	11 559	1.0167	11 752	11 752	14 669	1.0078	14 783	14 783	28 972	29 054
2001	2 604	0.9923	2 584	2 703	11 531	1.0594	12 216	12 216	15 384	1.0000	15 384	15 384	29 519	30 303
2002	2 802	1.0648	2 984	2 984	13 651	0.9583	13 082	13 082	14 976	1.0000	14 976	15 447	31 429	31 513
2003	3 215	0.9595	3 085	3 085	13 380	0.9252	12 379	14 000	15 870	1.0069	15 980	15 980	32 465	33 065
2004	3 178	1.0384	3 300	3 300	13 462	0.9777	13 162	14 300	16 106	0.9958	16 038	16 497	32 746	34 097
2005	4 408	1.0070	4 439	3 600	15 002	1.0037	15 058	14 600	16 786	1.0136	17 014	17 014	36 196	35 214
2006	3 916	1.0096	3 953	3 953	14 437	1.0171	14 684	14 684	17 625	1.0369	18 276	18 276	35 978	36 913
2007	3 494	1.3329	4 657	4 657	14 842	0.9671	14 354	14 800	20 119	0.9849	19 815	19 815	38 455	39 272

Source: ABS Survey of Motor Vehicle Use (SMVU), BITRE estimates.

TF.2 Road freight tonne-kilometres by capital cities—raw

Year	SYD	MEL	BNE	ADL	PER	HOB	DRW	CBR	All capitals
1971	3 099	2 148	680	734	861	125	49	135	7 829
1976	3 664	2 787	1 039	1 330	1 077	191	68	145	10 300
1979	4 506	3 417	1 551	1 111	1 393	238	61	132	12 410
1982	5 401	3 749	2 143	1 041	1 649	263	182	124	14 553
1985	5 544	4 834	2 556	1 513	1 880	353	225	185	17 090
1988	7 741	6 928	2 798	1 631	2 505	490	263	226	22 582
1991	6 240	6 257	3 519	1 863	2 429	373	256	297	21 234
1995	8 689	8 319	4 151	1 668	3 123	540	260	280	27 030
1998	9 343	8 023	4 876	2 013	3 264	339	277	171	28 306
1999	9 159	8 843	4 751	1 659	3 243	278	298	198	28 429
2000	9 135	8 352	5 247	1 959	3 512	276	256	234	28 971
2001	9 316	8 929	5 177	1 659	3 625	375	209	228	29 518
2002	9 578	9 778	5 718	2 086	3 646	268	148	206	31 428
2003	10 043	9 940	5 525	2 472	3 747	307	179	252	32 465
2004	9 683	10 573	5 905	1 885	3 928	323	182	267	32 746
2005	10 929	10 837	7 157	2 483	3 803	428	306	253	36 196
2006	9 509	9 677	8 450	2 793	4 547	428	273	300	35 977
2007	11 029	11 573	7 225	2 478	5 241	376	268	265	38 455

Source: ABS Survey of Motor Vehicle Use (SMVU), BITRE estimates.

TF.3 Road freight share by capital cities—raw

Year	SYD	MEL	BNE	ADL	PER	HOB	DRW	CBR	All capitals
1971	0.3958	0.2743	0.0869	0.0937	0.1099	0.0160	0.0062	0.0172	1.0000
1976	0.3557	0.2705	0.1009	0.1291	0.1045	0.0185	0.0066	0.0141	1.0000
1979	0.3631	0.2754	0.1250	0.0896	0.1123	0.0191	0.0049	0.0106	1.0000
1982	0.3712	0.2576	0.1473	0.0715	0.1133	0.0181	0.0125	0.0085	1.0000
1985	0.3244	0.2829	0.1496	0.0885	0.1100	0.0207	0.0131	0.0108	1.0000
1988	0.3428	0.3068	0.1239	0.0722	0.1109	0.0217	0.0116	0.0100	1.0000
1991	0.2939	0.2947	0.1657	0.0877	0.1144	0.0176	0.0120	0.0140	1.0000
1995	0.3215	0.3078	0.1536	0.0617	0.1155	0.0200	0.0096	0.0104	1.0000
1998	0.3301	0.2834	0.1723	0.0711	0.1153	0.0120	0.0098	0.0060	1.0000
1999	0.3222	0.3111	0.1671	0.0584	0.1141	0.0098	0.0105	0.0070	1.0000
2000	0.3153	0.2883	0.1811	0.0676	0.1212	0.0095	0.0088	0.0081	1.0000
2001	0.3156	0.3025	0.1754	0.0562	0.1228	0.0127	0.0071	0.0077	1.0000
2002	0.3048	0.3111	0.1819	0.0664	0.1160	0.0085	0.0047	0.0066	1.0000
2003	0.3093	0.3062	0.1702	0.0761	0.1154	0.0095	0.0055	0.0078	1.0000
2004	0.2957	0.3229	0.1803	0.0576	0.1200	0.0099	0.0056	0.0082	1.0000
2005	0.3019	0.2994	0.1977	0.0686	0.1051	0.0118	0.0085	0.0070	1.0000
2006	0.2643	0.2690	0.2349	0.0776	0.1264	0.0119	0.0076	0.0083	1.0000
2007	0.2868	0.3009	0.1879	0.0644	0.1363	0.0098	0.0070	0.0069	1.0000

Source: ABS Survey of Motor Vehicle Use (SMVU), BITRE estimates.

TF.4 Road freight share by capital cities—smoothed

Year	SYD	MEL	BNE	ADL	PER	HOB	DRW	CBR	All capitals
1971	0.3958	0.2743	0.0869	0.0937	0.1099	0.0160	0.0062	0.0141	0.9969
1976	0.3794	0.2748	0.1009	0.0916	0.1111	0.0185	0.0066	0.0141	0.9971
1979	0.3631	0.2754	0.1250	0.0896	0.1123	0.0191	0.0049	0.0140	1.0034
1982	0.3564	0.2791	0.1473	0.0715	0.1133	0.0181	0.0125	0.0140	1.0122
1985	0.3496	0.2829	0.1496	0.0719	0.1100	0.0207	0.0131	0.0140	1.0117
1988	0.3428	0.2919	0.1500	0.0722	0.1109	0.0188	0.0116	0.0140	1.0123
1991	0.3377	0.3010	0.1500	0.0716	0.1144	0.0176	0.0120	0.0140	1.0182
1995	0.3325	0.3100	0.1536	0.0710	0.1155	0.0138	0.0096	0.0104	1.0164
1998	0.3273	0.3100	0.1603	0.0711	0.1153	0.0100	0.0090	0.0090	1.0121
1999	0.3222	0.3100	0.1671	0.0694	0.1141	0.0098	0.0082	0.0085	1.0092
2000	0.3153	0.3100	0.1700	0.0676	0.1147	0.0095	0.0077	0.0085	1.0034
2001	0.3156	0.3100	0.1754	0.0670	0.1154	0.0095	0.0071	0.0077	1.0077
2002	0.3100	0.3111	0.1819	0.0664	0.1160	0.0095	0.0060	0.0077	1.0086
2003	0.3070	0.3062	0.1872	0.0670	0.1154	0.0095	0.0055	0.0078	1.0055
2004	0.3040	0.3030	0.1925	0.0670	0.1200	0.0099	0.0056	0.0078	1.0096
2005	0.3019	0.2994	0.1977	0.0686	0.1200	0.0099	0.0060	0.0080	1.0116
2006	0.3000	0.3000	0.2000	0.0700	0.1264	0.0099	0.0076	0.0083	1.0242
2007	0.3000	0.3000	0.2000	0.0700	0.1363	0.0098	0.0070	0.0069	1.0299

Source: BITRE estimates.

TF.5 Road freight share by capital cities—interpolated and normalised, 1972–2007

Year	SYD	MEL	BNE	ADL	PER	HOB	DRW	CBR	All capitals
1972	0.3937	0.2753	0.0899	0.0936	0.1105	0.0165	0.0063	0.0141	1.0000
1973	0.3904	0.2754	0.0928	0.0932	0.1107	0.0170	0.0064	0.0141	1.0000
1974	0.3871	0.2754	0.0956	0.0928	0.1110	0.0176	0.0065	0.0141	1.0000
1975	0.3838	0.2755	0.0984	0.0923	0.1112	0.0181	0.0065	0.0141	1.0000
1976	0.3805	0.2756	0.1012	0.0919	0.1114	0.0186	0.0066	0.0141	1.0000
1977	0.3743	0.2752	0.1090	0.0910	0.1116	0.0188	0.0060	0.0141	1.0000
1978	0.3681	0.2748	0.1168	0.0901	0.1117	0.0189	0.0055	0.0140	1.0000
1979	0.3619	0.2744	0.1246	0.0893	0.1119	0.0191	0.0049	0.0140	1.0000
1980	0.3586	0.2749	0.1315	0.0831	0.1119	0.0187	0.0074	0.0139	1.0000
1981	0.3553	0.2753	0.1385	0.0769	0.1119	0.0183	0.0099	0.0139	1.0000
1982	0.3521	0.2758	0.1455	0.0707	0.1119	0.0179	0.0124	0.0138	1.0000
1983	0.3499	0.2770	0.1463	0.0708	0.1109	0.0187	0.0126	0.0138	1.0000
1984	0.3477	0.2783	0.1471	0.0709	0.1098	0.0196	0.0128	0.0138	1.0000
1985	0.3455	0.2796	0.1479	0.0711	0.1087	0.0204	0.0130	0.0138	1.0000
1986	0.3432	0.2825	0.1480	0.0712	0.1090	0.0198	0.0125	0.0138	1.0000
1987	0.3409	0.2854	0.1481	0.0713	0.1093	0.0192	0.0120	0.0138	1.0000
1988	0.3386	0.2884	0.1482	0.0714	0.1096	0.0186	0.0115	0.0138	1.0000
1989	0.3363	0.2908	0.1479	0.0710	0.1105	0.0181	0.0116	0.0138	1.0000
1990	0.3340	0.2932	0.1476	0.0707	0.1114	0.0177	0.0117	0.0138	1.0000
1991	0.3316	0.2956	0.1473	0.0703	0.1123	0.0173	0.0118	0.0137	1.0000
1992	0.3305	0.2979	0.1483	0.0702	0.1127	0.0163	0.0112	0.0129	1.0000
1993	0.3294	0.3003	0.1492	0.0701	0.1130	0.0154	0.0106	0.0120	1.0000
1994	0.3283	0.3026	0.1502	0.0700	0.1133	0.0145	0.0101	0.0111	1.0000
1995	0.3271	0.3050	0.1511	0.0699	0.1137	0.0136	0.0095	0.0102	1.0000
1996	0.3259	0.3054	0.1535	0.0700	0.1138	0.0123	0.0093	0.0098	1.0000
1997	0.3247	0.3059	0.1560	0.0701	0.1138	0.0111	0.0091	0.0093	1.0000
1998	0.3234	0.3063	0.1584	0.0703	0.1139	0.0099	0.0089	0.0089	1.0000
1999	0.3192	0.3072	0.1656	0.0687	0.1130	0.0097	0.0081	0.0084	1.0000
2000	0.3143	0.3090	0.1694	0.0674	0.1143	0.0095	0.0077	0.0085	1.0000
2001	0.3132	0.3076	0.1741	0.0665	0.1145	0.0094	0.0070	0.0077	1.0000
2002	0.3073	0.3085	0.1804	0.0658	0.1150	0.0094	0.0059	0.0076	1.0000
2003	0.3053	0.3045	0.1862	0.0666	0.1148	0.0094	0.0055	0.0077	1.0000
2004	0.3011	0.3001	0.1906	0.0664	0.1188	0.0098	0.0055	0.0077	1.0000
2005	0.2985	0.2960	0.1955	0.0678	0.1186	0.0098	0.0059	0.0079	1.0000
2006	0.2935	0.2935	0.1957	0.0685	0.1236	0.0097	0.0074	0.0082	1.0000
2007	0.2913	0.2913	0.1942	0.0680	0.1323	0.0095	0.0068	0.0067	1.0000

Source: BITRE estimates.

TF.6 Road freight task (billion tkm) by capital cities—final, 1972–2007

Year	SYD	MEL	BNE	ADL	PER	HOB	DRW	CBR	All capitals
1972	3.12	2.18	0.71	0.74	0.88	0.13	0.05	0.11	7.93
1973	3.20	2.26	0.76	0.76	0.91	0.14	0.05	0.12	8.20
1974	3.42	2.43	0.84	0.82	0.98	0.15	0.06	0.12	8.82
1975	3.51	2.52	0.90	0.84	1.02	0.17	0.06	0.13	9.14
1976	3.64	2.64	0.97	0.88	1.07	0.18	0.06	0.14	9.56
1977	3.84	2.82	1.12	0.93	1.14	0.19	0.06	0.14	10.26
1978	3.89	2.90	1.23	0.95	1.18	0.20	0.06	0.15	10.57
1979	4.09	3.10	1.41	1.01	1.26	0.22	0.06	0.16	11.30
1980	4.45	3.41	1.63	1.03	1.39	0.23	0.09	0.17	12.40
1981	4.73	3.66	1.84	1.02	1.49	0.24	0.13	0.18	13.30
1982	4.98	3.90	2.06	1.00	1.58	0.25	0.18	0.20	14.15
1983	4.96	3.93	2.07	1.00	1.57	0.27	0.18	0.20	14.18
1984	5.24	4.19	2.22	1.07	1.65	0.30	0.19	0.21	15.07
1985	5.59	4.53	2.39	1.15	1.76	0.33	0.21	0.22	16.19
1986	5.94	4.89	2.56	1.23	1.89	0.34	0.22	0.24	17.31
1987	6.00	5.03	2.61	1.25	1.92	0.34	0.21	0.24	17.61
1988	6.34	5.40	2.77	1.34	2.05	0.35	0.21	0.26	18.71
1989	6.61	5.71	2.91	1.40	2.17	0.36	0.23	0.27	19.65
1990	7.15	6.28	3.16	1.51	2.39	0.38	0.25	0.29	21.41
1991	6.97	6.22	3.10	1.48	2.36	0.36	0.25	0.29	21.03
1992	6.85	6.17	3.07	1.45	2.33	0.34	0.23	0.27	20.72
1993	7.10	6.47	3.22	1.51	2.44	0.33	0.23	0.26	21.56
1994	7.34	6.77	3.36	1.56	2.53	0.32	0.22	0.25	22.36
1995	7.83	7.30	3.62	1.67	2.72	0.32	0.23	0.24	23.94
1996	8.26	7.74	3.89	1.77	2.88	0.31	0.24	0.25	25.35
1997	8.52	8.03	4.09	1.84	2.99	0.29	0.24	0.24	26.25
1998	8.56	8.11	4.19	1.86	3.02	0.26	0.24	0.24	26.48
1999	8.99	8.65	4.66	1.94	3.18	0.27	0.23	0.24	28.16
2000	9.28	9.13	5.00	1.99	3.38	0.28	0.23	0.25	29.54
2001	9.47	9.30	5.26	2.01	3.46	0.28	0.21	0.23	30.22
2002	9.72	9.76	5.70	2.08	3.64	0.30	0.19	0.24	31.63
2003	10.03	10.01	6.12	2.19	3.77	0.31	0.18	0.25	32.86
2004	10.38	10.34	6.57	2.29	4.10	0.34	0.19	0.27	34.47
2005	10.64	10.55	6.97	2.42	4.23	0.35	0.21	0.28	35.65
2006	10.85	10.85	7.23	2.53	4.57	0.36	0.27	0.30	36.96
2007	11.20	11.20	7.47	2.61	5.09	0.36	0.26	0.26	38.45

Source: BITRE estimates.

F.2 Capital city road freight tasks: forecast

The aggregate forecast results from the regression (see Chapter 5, Figure 5.1) were separated by each capital city using the share assumptions in Table F.7 and the results in tonne-kilometres (tkm) are presented in Table F.8.

TF.7 Road freight share by capital cities, 2008–30

Year	SYD	MEL	BNE	ADL	PER	HOB	DRW	CBR	All capitals
2008	0.2913	0.2913	0.1942	0.0680	0.1323	0.0095	0.0068	0.0067	1.0000
2009	0.2907	0.2910	0.1952	0.0676	0.1324	0.0095	0.0069	0.0067	1.0000
2010	0.2904	0.2907	0.1961	0.0671	0.1328	0.0094	0.0070	0.0066	1.0000
2011	0.2899	0.2902	0.1971	0.0667	0.1332	0.0094	0.0070	0.0066	1.0000
2012	0.2896	0.2900	0.1980	0.0665	0.1335	0.0091	0.0068	0.0066	1.0000
2013	0.2892	0.2896	0.1988	0.0660	0.1339	0.0091	0.0069	0.0065	1.0000
2014	0.2887	0.2894	0.1997	0.0656	0.1342	0.0090	0.0069	0.0065	1.0000
2015	0.2884	0.2889	0.2006	0.0652	0.1345	0.0090	0.0069	0.0065	1.0000
2016	0.2880	0.2888	0.2014	0.0648	0.1347	0.0090	0.0070	0.0064	1.0000
2017	0.2876	0.2884	0.2023	0.0644	0.1352	0.0088	0.0070	0.0064	1.0000
2018	0.2874	0.2880	0.2032	0.0640	0.1353	0.0087	0.0070	0.0064	1.0000
2019	0.2869	0.2876	0.2040	0.0636	0.1356	0.0087	0.0072	0.0064	1.0000
2020	0.2864	0.2873	0.2050	0.0632	0.1359	0.0087	0.0072	0.0063	1.0000
2021	0.2859	0.2872	0.2059	0.0626	0.1363	0.0085	0.0072	0.0063	1.0000
2022	0.2855	0.2868	0.2068	0.0622	0.1366	0.0085	0.0072	0.0063	1.0000
2023	0.2851	0.2865	0.2078	0.0618	0.1369	0.0084	0.0072	0.0063	1.0000
2024	0.2847	0.2862	0.2087	0.0614	0.1372	0.0083	0.0072	0.0063	1.0000
2025	0.2842	0.2859	0.2096	0.0609	0.1376	0.0083	0.0073	0.0062	1.0000
2026	0.2838	0.2856	0.2105	0.0605	0.1379	0.0082	0.0073	0.0062	1.0000
2027	0.2834	0.2853	0.2114	0.0601	0.1382	0.0081	0.0073	0.0062	1.0000
2028	0.2830	0.2850	0.2123	0.0597	0.1385	0.0080	0.0074	0.0062	1.0000
2029	0.2826	0.2847	0.2132	0.0593	0.1388	0.0080	0.0074	0.0061	1.0000
2030	0.2822	0.2844	0.2141	0.0588	0.1391	0.0079	0.0074	0.0061	1.0000

Source: BITRE estimates.

TF.8 Road freight tasks (billion tkm) by all capital cities, 2008–30

Year	SYD	MEL	BNE	ADL	PER	HOB	DRW	CBR	All capitals
2008	11.69	11.70	7.80	2.73	5.31	0.38	0.28	0.27	40.15
2009	11.70	11.71	7.85	2.72	5.33	0.38	0.28	0.27	40.24
2010	11.70	11.72	7.90	2.70	5.35	0.38	0.28	0.26	40.30
2011	11.96	11.98	8.13	2.75	5.50	0.39	0.29	0.27	41.28
2012	12.50	12.51	8.55	2.87	5.76	0.39	0.29	0.28	43.16
2013	12.96	12.98	8.91	2.96	6.00	0.41	0.31	0.29	44.81
2014	13.37	13.41	9.25	3.04	6.21	0.42	0.32	0.30	46.32
2015	13.80	13.82	9.59	3.12	6.43	0.43	0.33	0.31	47.83
2016	14.28	14.31	9.98	3.21	6.68	0.45	0.35	0.32	49.57
2017	14.79	14.83	10.40	3.31	6.95	0.45	0.36	0.33	51.42
2018	15.22	15.25	10.76	3.39	7.17	0.46	0.37	0.34	52.96
2019	15.59	15.62	11.08	3.45	7.37	0.47	0.39	0.35	54.33
2020	15.91	15.96	11.39	3.51	7.55	0.48	0.40	0.35	55.56
2021	16.25	16.32	11.70	3.56	7.75	0.49	0.41	0.36	56.83
2022	16.57	16.65	12.01	3.61	7.93	0.49	0.42	0.37	58.05
2023	16.86	16.95	12.29	3.66	8.10	0.50	0.43	0.37	59.16
2024	17.15	17.24	12.57	3.70	8.27	0.50	0.44	0.38	60.24
2025	17.43	17.53	12.85	3.74	8.44	0.51	0.45	0.38	61.32
2026	17.71	17.82	13.13	3.78	8.60	0.51	0.46	0.39	62.41
2027	17.99	18.11	13.42	3.81	8.77	0.51	0.47	0.39	63.47
2028	18.26	18.39	13.69	3.85	8.93	0.52	0.47	0.40	64.51
2029	18.52	18.66	13.97	3.88	9.10	0.52	0.48	0.40	65.54
2030	18.79	18.94	14.26	3.92	9.27	0.53	0.49	0.41	66.6

Source: BITRE estimates.

APPENDIX G

Methodology for estimating and forecasting 'rest of state' road freight tasks by states and territories

As mentioned in Chapter 6, total Australia-level (sum of all states and territories) 'rest of state' road freight estimates (1972–2007) and forecasts (2008–30) were calculated as:

Total 'rest of state' road freight task = 'total all states' road freight task minus 'interstate' road freight task minus 'capital city' road freight task.

However, to derive 'rest of state' road freight estimates and forecasts for each state and territory, a share analysis had to be developed.

Table G.1 shows the estimated diagonal (state/territory of registration by state/territory of operation) road freight data for available years which were derived from the ABS Survey of Motor Vehicle Use (SMVU) (see Appendix B). Using these diagonal road freight data, 'rest of state' road freight estimates for each state and territory were derived using the following steps:

1. First, 'capital city' road freight task (refer Table 5.3) was subtracted from the estimated diagonal road freight task[3] (Table G.1, shaded cells) and the results are treated as new 'rest of state' estimates (see Table G.2). However, diagonals in the SMVU earlier years were far too small (Table G.1) and hence, were taken as 'rest of state' estimates (without subtracting capital city estimates) (Table G.2).
2. Secondly, we have derived shares from the total diagonal (sum of all states and territories) and treated these shares as representing 'rest of state' raw shares (see Table G.3).
3. Thirdly, we smooth these shares to a believable trend, not worrying if the total share goes above or below 1.0. These shares are shown in Table G.4, with the changes shaded.
4. Then these shares are interpolated between survey years and normalised to add to 1.0. This is shown in Table G.5.
5. Finally, these shares are multiplied by the total 'rest of state' tonne-kilometres from the aggregate analysis—see Chapter 6, Table 6.1—to get the final adjusted freight estimates (1972–2007) for each state and territory. These are shown in Table G.6.
6. For the forecasts, a projection of state/territory share trends was undertaken. The assumed shares are presented in Table G.7.
7. Finally, these shares are multiplied by the total Australia-level 'rest of state' tonne-kilometres (tkm) forecast from the aggregate analysis—see Chapter 6, Table 6.1—to get the final 'rest of state' freight forecasts for each state and territory. These are shown in Table G.8.

3 Due to the problem of the ABS definition of interstate road freight task on an origin–destination basis, the ABS raw data in the Survey of Motor Vehicle Use have been corrected using the procedure described in details (see Appendix B).

TG.1 Estimated SMVU road freight data on an origin–destination basis (million tkm), various years

Origin	Destination							
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
				1972				
NSW	523	1 070	730	325	41	0	23	251
VIC	1 080	386	354	219	96	0	0	86
QLD	809	107	342	101	14	0	113	0
SA	378	227	165	183	33	0	142	0
WA	48	25	13	47	171	0	22	0
TAS	0	0	0	0	0	34	0	0
NT	14	2	111	27	13	0	5	0
ACT	24	5	0	0	0	0	0	0
				1981				
NSW	1 355	1 581	1 002	458	349	0	157	70
VIC	1 967	1 265	1 170	480	428	0	0	51
QLD	794	508	1 470	144	62	0	99	4
SA	500	356	284	385	51	0	180	4
WA	124	120	31	59	822	0	13	0
TAS	0	0	0	0	0	174	0	0
NT	9	4	0	7	1	0	40	0
ACT	30	19	14	2	0	0	0	1
				1982				
NSW	1 538	1 867	1 041	467	114	0	211	51
VIC	2 403	1 443	1 319	547	765	0	0	58
QLD	719	403	1 677	152	72	0	120	6
SA	435	389	364	295	12	0	72	5
WA	68	155	42	59	595	0	7	0
TAS	0	0	0	0	0	214	0	0
NT	7	2	0	12	2	0	39	0
ACT	51	27	26	4	0	0	0	2
				1985				
NSW	1 835	2 045	1 482	688	840	0	169	132
VIC	2 440	1 703	1 595	647	214	0	0	70
QLD	1 312	915	1 979	210	83	0	124	2
SA	851	501	331	707	128	0	415	5
WA	262	137	33	91	1 554	0	27	0
TAS	0	0	0	0	0	214	0	0
NT	16	9	0	6	2	0	63	0
ACT	18	17	6	1	0	0	0	1
				1998				
NSW	2 3432	5 562	3 926	770	1 012	0	7	385
VIC	5 188	16 663	1 038	2 154	673	0	1	62
QLD	4 017	2 276	14 235	566	277	0	135	111
SA	917	2 513	249	3 245	2 950	0	367	2
WA	282	180	212	974	15 635	0	242	0
TAS	0	0	0	0	0	2 000	0	0
NT	44	87	664	419	84	0	1 275	0
ACT	166	14	9	16	0	0	0	210
				1999				
NSW	24 760	6 594	6 791	1 356	1 862	0	156	403
VIC	5 696	15 586	2 222	2 502	599	0	20	62
QLD	4 168	2 082	16 780	753	531	0	817	223
SA	1 375	3 049	723	3 886	2 552	0	272	2
WA	300	67	250	401	16 343	0	989	0
TAS	0	0	0	0	0	2174	0	0
NT	37	202	734	503	145	0	1 377	0
ACT	173	23	27	8	0	0	0	236

(continued)

TG.1 Estimated SMVU road freight data on an origin–destination basis (million tkm), various years (continued)

Origin	Destination							
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
				2000				
NSW	2 4564	7 708	5 810	1 801	605	0	7	571
VIC	7 167	16 259	3 556	2 794	541	0	10	31
QLD	4 674	1 764	17 512	1 129	638	0	515	0
SA	1 703	2 301	814	5 263	769	0	1 537	142
WA	294	135	166	668	15 667	0	408	0
TAS	0	0	0	0	0	2 446	0	0
NT	67	0	363	453	123	0	1 340	0
ACT	189	27	31	26	0	0	0	249
				2001				
NSW	24 495	7 139	5 081	2 740	7	0	27	526
VIC	6 522	18 283	1 925	2 442	616	0	23	105
QLD	5 846	2 394	17 827	355	120	0	409	56
SA	1 588	2 366	613	4 819	1 280	0	598	20
WA	837	710	577	1 440	13 806	0	263	0
TAS	0	0	0	0	0	2 592	0	0
NT	30	29	151	494	317	0	1 230	0
ACT	113	16	11	6	0	0	0	207
				2002				
NSW	25 367	6 509	5 674	1 973	890	0	679	458
VIC	6 581	16 785	2 837	2 284	282	0	28	59
QLD	4 939	2 837	21 123	280	241	0	1 062	56
SA	2 796	3 415	974	5 316	1 197	0	649	10
WA	605	279	307	1 043	16 722	0	204	0
TAS	0	0	0	0	0	2 661	0	0
NT	12	29	208	419	160	0	1 280	0
ACT	188	49	25	18	0	0	0	246
				2003				
NSW	22 989	9 249	5 719	2 683	1 271	0	197	911
VIC	6 450	19 546	3 446	2 346	74	0	28	25
QLD	6 702	3 834	20 296	526	156	0	199	56
SA	4 139	3 025	753	6 432	1 404	0	119	2
WA	659	930	453	1 428	18 692	0	1 010	0
TAS	0	0	0	0	0	2 611	0	0
NT	107	29	253	395	327	0	1 347	0
ACT	132	45	28	16	0	0	0	231
				2004				
NSW	28 668	6 217	6 697	2 387	61	0	0	662
VIC	7 707	20 604	2 572	2 475	217	0	39	18
Qld	6 029	4 103	19 851	2 152	90	0	3 006	502
SA	1 993	2 317	525	6 788	696	0	479	52
WA	675	72	453	1 031	21 342	0	272	0
TAS	0	0	0	0	0	3 196	0	0
NT	77	895	212	213	419	0	13	0
ACT	165	40	22	3	0	0	0	272
				2005				
NSW	25 877	7 641	11 057	1 159	279	0	61	712
VIC	8 164	23 124	2 386	3 609	568	0	0	18
Qld	7 471	5 127	21 317	1 390	1 169	0	409	111
SA	2 059	2 460	534	6 632	1 748	0	642	0
WA	286	746	92	1 524	17 827	0	259	0
TAS	0	0	0	0	0	3 042	0	0
NT	10	29	444	151	117	0	985	0
ACT	128	30	10	13	0	0	0	232

(continued)

TG.1 Estimated SMVU road freight data on an origin–destination basis (million tkm), various years (continued)

Origin	Destination							
	NSW	VIC	QLD	SA	WA	TAS	NT	ACT
				2006				
NSW	23 106	8 370	9 456	1 753	414	0	482	780
VIC	9 055	20 640	3 041	2 848	687	0	27	33
Qld	7 197	4 708	26 847	626	192	0	1 041	1 003
SA	1 813	2 042	1 305	5 951	381	0	2 420	7
WA	915	445	430	1 154	21 155	0	119	0
TAS	0	0	0	0	0	2 680	0	0
NT	54	173	234	179	718	0	329	0
ACT	135	31	9	3	0	0	0	267
				2007				
NSW	26 676	10 644	7 191	1 901	401	0	163	988
VIC	9 522	23 584	4 761	3 657	257	0	27	53
Qld	7 813	4 445	27 844	1 272	158	0	74	0
SA	1 489	2 808	547	7 526	1 131	0	601	5
WA	737	669	562	1 647	26 132	0	522	0
TAS	0	0	0	0	0	3 323	0	0
NT	28	375	376	184	96	0	590	0
ACT	172	41	20	19	0	0	0	264

Source: BITRE estimates (see Appendix B for details).

TG.2 New 'rest of state' road freight task (million tkm)—raw

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
1972	523	386	342	183	171	34	5	0	1 644
1981	1 355	1 265	1 470	385	822	174	40	1	5 512
1982	1 538	1 443	1 677	295	595	214	39	2	5 802
1985	1 835	1 703	1 979	707	1 554	214	63	1	8 056
1998	14 869	8 554	10 040	1 384	12 619	1 738	1 040	-25	50 219
1999	15 478	6 460	11 775	1 895	12 966	1 893	1 150	-14	51 603
2000	15 281	7 133	12 507	3 272	12 290	2 166	1 114	-1	53 761
2001	15 029	8 985	12 566	2 810	10 346	2 307	1 017	-25	53 036
2002	15 647	7 030	15 418	3 235	13 084	2 363	1 091	5	57 873
2003	12 955	9 539	14 177	4 242	14 920	2 302	1 167	-22	59 280
2004	18 289	10 259	13 280	4 500	17 246	2 859	-177	6	66 262
2005	15 237	12 573	14 349	4 215	13 598	2 693	773	-50	63 387
2006	12 261	9 794	19 617	3 421	16 586	2 322	54	-34	64 020
2007	15 478	12 385	20 378	4 913	21 044	2 958	330	7	77 494

Note: New 'rest of state' = Diagonal SMVU (Table G.1, shaded) minus 'Capital city' (see Chapter 5, Table 5.3, corresponding years).

Source: ABS Survey of Motor Vehicle Use (SMVU), BITRE estimates.

TG.3 'Rest of state' road freight share—raw

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
1972	0.318	0.235	0.208	0.112	0.104	0.021	0.003	0.000	1.0000
1981	0.246	0.229	0.267	0.070	0.149	0.032	0.007	0.000	1.0000
1982	0.265	0.249	0.289	0.051	0.103	0.037	0.007	0.000	1.0000
1985	0.228	0.211	0.246	0.088	0.193	0.027	0.008	0.000	1.0000
1998	0.296	0.170	0.200	0.028	0.251	0.035	0.021	0.000	1.0000
1999	0.300	0.125	0.228	0.037	0.251	0.037	0.022	0.000	1.0000
2000	0.284	0.133	0.233	0.061	0.229	0.040	0.021	0.000	1.0000
2001	0.283	0.169	0.237	0.053	0.195	0.044	0.019	0.000	1.0000
2002	0.270	0.121	0.266	0.056	0.226	0.041	0.019	0.000	1.0000
2003	0.219	0.161	0.239	0.072	0.252	0.039	0.020	0.000	1.0000
2004	0.276	0.155	0.200	0.068	0.260	0.043	-0.003	0.000	1.0000
2005	0.240	0.198	0.226	0.066	0.215	0.042	0.012	-0.001	1.0000
2006	0.192	0.153	0.306	0.053	0.259	0.036	0.001	-0.001	1.0000
2007	0.200	0.160	0.263	0.063	0.272	0.038	0.004	0.000	1.0000

Source: ABS Survey of Motor Vehicle Use (SMVU), BITRE estimates.

TG.4 'Rest of state' road freight share—smoothed

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
1972	0.318	0.235	0.208	0.112	0.104	0.021	0.003	0.000	1.0000
1981	0.246	0.229	0.267	0.070	0.149	0.032	0.007	0.000	1.0000
1982	0.265	0.249	0.289	0.051	0.103	0.037	0.007	0.000	1.0000
1985	0.228	0.211	0.246	0.088	0.193	0.027	0.008	0.000	1.0000
1998	0.296	0.170	0.200	0.028	0.251	0.035	0.021	0.000	1.0000
1999	0.286	0.169	0.228	0.029	0.230	0.035	0.022	0.000	0.9997
2000	0.276	0.168	0.233	0.039	0.229	0.035	0.021	0.000	1.0004
2001	0.266	0.167	0.237	0.043	0.233	0.036	0.019	0.000	1.0003
2002	0.256	0.166	0.241	0.046	0.238	0.036	0.017	0.000	1.0002
2003	0.246	0.164	0.246	0.050	0.242	0.037	0.015	0.000	1.0002
2004	0.236	0.163	0.250	0.054	0.247	0.037	0.014	0.000	1.0001
2005	0.226	0.162	0.254	0.057	0.251	0.037	0.012	0.000	1.0000
2006	0.216	0.161	0.259	0.061	0.256	0.038	0.010	0.000	0.9999
2007	0.206	0.160	0.263	0.063	0.260	0.038	0.010	0.000	1.0004

Source: BITRE estimates.

TG.5 'Rest of state' road freight share—interpolated and normalised, 1972–2007

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
1972	0.318	0.235	0.208	0.112	0.104	0.021	0.003	0.000	1.000
1973	0.316	0.234	0.207	0.107	0.111	0.021	0.004	0.000	1.000
1974	0.314	0.234	0.206	0.102	0.117	0.022	0.004	0.000	1.000
1975	0.312	0.234	0.205	0.098	0.124	0.022	0.005	0.000	1.000
1976	0.310	0.234	0.204	0.093	0.131	0.023	0.005	0.000	1.000
1977	0.308	0.234	0.203	0.088	0.137	0.023	0.005	0.000	1.000
1978	0.306	0.234	0.203	0.084	0.144	0.024	0.006	0.000	1.000
1979	0.304	0.234	0.202	0.079	0.151	0.024	0.006	0.000	1.000
1980	0.302	0.234	0.201	0.074	0.157	0.025	0.007	0.000	1.000
1981	0.300	0.234	0.200	0.070	0.164	0.025	0.007	0.000	1.000
1982	0.300	0.234	0.200	0.060	0.174	0.025	0.007	0.000	1.000
1983	0.300	0.234	0.200	0.053	0.180	0.026	0.007	0.000	1.000
1984	0.300	0.233	0.200	0.047	0.187	0.026	0.007	0.000	1.000
1985	0.300	0.233	0.200	0.040	0.193	0.027	0.008	0.000	1.000
1986	0.300	0.228	0.200	0.039	0.197	0.027	0.009	0.000	1.000
1987	0.299	0.223	0.200	0.038	0.202	0.028	0.010	0.000	1.000
1988	0.299	0.218	0.200	0.037	0.206	0.028	0.011	0.000	1.000
1989	0.299	0.214	0.200	0.036	0.211	0.029	0.012	0.000	1.000
1990	0.298	0.209	0.200	0.035	0.215	0.030	0.013	0.000	1.000
1991	0.298	0.204	0.200	0.034	0.220	0.030	0.014	0.000	1.000
1992	0.298	0.199	0.200	0.033	0.224	0.031	0.015	0.000	1.000
1993	0.297	0.194	0.200	0.032	0.229	0.032	0.016	0.000	1.000
1994	0.297	0.190	0.200	0.031	0.233	0.032	0.017	0.000	1.000
1995	0.297	0.185	0.200	0.030	0.238	0.033	0.018	0.000	1.000
1996	0.297	0.180	0.200	0.029	0.242	0.033	0.019	0.000	1.000
1997	0.296	0.175	0.200	0.029	0.247	0.034	0.020	0.000	1.000
1998	0.296	0.170	0.200	0.028	0.251	0.035	0.021	0.000	1.000
1999	0.286	0.169	0.228	0.029	0.230	0.035	0.022	0.000	1.000
2000	0.276	0.168	0.233	0.039	0.229	0.035	0.021	0.000	1.000
2001	0.266	0.167	0.237	0.043	0.233	0.036	0.019	0.000	1.000
2002	0.256	0.166	0.241	0.046	0.238	0.036	0.017	0.000	1.000
2003	0.246	0.164	0.246	0.050	0.242	0.037	0.015	0.000	1.000
2004	0.236	0.163	0.250	0.054	0.247	0.037	0.014	0.000	1.000
2005	0.226	0.162	0.254	0.057	0.251	0.037	0.012	0.000	1.000
2006	0.216	0.161	0.259	0.061	0.256	0.038	0.010	0.000	1.000
2007	0.206	0.160	0.263	0.063	0.260	0.038	0.010	0.000	1.000

Note: Total may not add to 1.000 due to rounding.

Source: BITRE estimates.

TG.6 'Rest of state' road freight task (billion tkm) estimates—final, 1972–2007

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
1972	4.38	3.23	2.87	1.54	1.44	0.29	0.04	0.00	13.79
1973	4.40	3.27	2.88	1.49	1.54	0.30	0.05	0.00	13.93
1974	4.33	3.23	2.84	1.41	1.62	0.30	0.06	0.00	13.79
1975	4.55	3.42	2.99	1.42	1.81	0.32	0.07	0.00	14.58
1976	4.65	3.51	3.06	1.39	1.96	0.34	0.07	0.00	15.00
1977	5.50	4.18	3.63	1.58	2.45	0.41	0.10	0.00	17.86
1978	6.56	5.02	4.34	1.80	3.09	0.51	0.13	0.00	21.44
1979	7.22	5.56	4.79	1.88	3.58	0.57	0.15	0.00	23.76
1980	7.53	5.84	5.01	1.86	3.93	0.61	0.17	0.00	24.95
1981	8.04	6.27	5.36	1.87	4.39	0.67	0.19	0.00	26.80
1982	8.61	6.72	5.74	1.72	4.99	0.72	0.19	0.00	28.70
1983	10.21	7.95	6.81	1.81	6.14	0.87	0.24	0.00	34.03
1984	10.18	7.92	6.79	1.58	6.33	0.88	0.25	0.00	33.94
1985	10.85	8.43	7.23	1.45	6.98	0.96	0.28	0.00	36.17
1986	10.77	8.20	7.18	1.40	7.09	0.98	0.32	0.00	35.93
1987	11.48	8.56	7.67	1.46	7.74	1.07	0.38	0.00	38.35
1988	11.27	8.24	7.54	1.40	7.78	1.07	0.41	0.00	37.71
1989	10.84	7.75	7.26	1.31	7.65	1.05	0.43	0.00	36.30
1990	10.47	7.33	7.02	1.24	7.56	1.04	0.45	0.00	35.10
1991	11.05	7.56	7.41	1.27	8.15	1.12	0.51	0.00	37.07
1992	12.79	8.56	8.59	1.43	9.64	1.33	0.63	0.00	42.97
1993	13.52	8.83	9.08	1.47	10.39	1.43	0.72	0.00	45.44
1994	14.54	9.27	9.78	1.54	11.41	1.57	0.82	0.00	48.92
1995	15.20	9.46	10.23	1.56	12.17	1.68	0.91	0.00	51.20
1996	15.51	9.41	10.45	1.54	12.67	1.74	0.98	0.00	52.31
1997	16.16	9.55	10.90	1.55	13.45	1.85	1.07	0.00	54.54
1998	16.96	9.76	11.45	1.58	14.40	1.98	1.19	0.00	57.32
1999	17.00	10.06	13.56	1.72	13.67	2.08	1.32	0.00	59.42
2000	16.54	10.06	13.94	2.34	13.70	2.12	1.24	0.00	59.94
2001	16.57	10.39	14.76	2.66	14.52	2.23	1.18	0.00	62.31
2002	16.66	10.78	15.70	3.01	15.45	2.35	1.12	0.00	65.06
2003	16.38	10.95	16.35	3.33	16.11	2.44	1.02	0.00	66.57
2004	15.96	11.05	16.91	3.63	16.68	2.50	0.92	0.00	67.64
2005	16.51	11.84	18.57	4.19	18.33	2.73	0.86	0.00	73.03
2006	16.34	12.18	19.57	4.61	19.33	2.86	0.76	0.00	75.65
2007	16.33	12.67	20.84	5.03	20.61	3.03	0.79	0.00	79.29

Source: BITRE estimates.

TG.7 'Rest of state' road freight share—interpolated and normalised, 1972–2007

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
2008	0.203	0.158	0.264	0.064	0.262	0.038	0.010	0.000	1.000
2009	0.199	0.157	0.266	0.064	0.263	0.039	0.011	0.000	1.000
2010	0.196	0.156	0.268	0.065	0.265	0.039	0.011	0.000	1.000
2011	0.193	0.155	0.269	0.065	0.267	0.039	0.012	0.000	1.000
2012	0.189	0.153	0.271	0.066	0.269	0.040	0.012	0.000	1.000
2013	0.186	0.152	0.273	0.066	0.270	0.040	0.013	0.000	1.000
2014	0.183	0.151	0.274	0.067	0.272	0.040	0.013	0.000	1.000
2015	0.180	0.149	0.276	0.067	0.274	0.041	0.013	0.000	1.000
2016	0.176	0.148	0.277	0.068	0.276	0.041	0.014	0.000	1.000
2017	0.173	0.147	0.279	0.068	0.277	0.041	0.014	0.000	1.000
2018	0.170	0.146	0.281	0.069	0.279	0.041	0.015	0.000	1.000
2019	0.166	0.144	0.282	0.069	0.281	0.042	0.015	0.000	1.000
2020	0.163	0.143	0.284	0.070	0.283	0.042	0.016	0.000	1.000
2021	0.160	0.142	0.285	0.070	0.284	0.042	0.016	0.000	1.000
2022	0.156	0.140	0.287	0.071	0.286	0.043	0.017	0.000	1.000
2023	0.153	0.139	0.289	0.071	0.288	0.043	0.017	0.000	1.000
2024	0.150	0.138	0.290	0.072	0.290	0.043	0.017	0.000	1.000
2025	0.147	0.136	0.292	0.072	0.291	0.044	0.018	0.000	1.000
2026	0.143	0.135	0.294	0.073	0.293	0.044	0.018	0.000	1.000
2027	0.140	0.134	0.295	0.073	0.295	0.044	0.019	0.000	1.000
2028	0.137	0.133	0.297	0.074	0.297	0.044	0.019	0.000	1.000
2029	0.133	0.131	0.298	0.074	0.298	0.045	0.020	0.000	1.000
2030	0.130	0.130	0.300	0.075	0.300	0.045	0.020	0.000	1.000

Note: Total may not add to 1.000 due to rounding.

Source: BITRE estimates.

TG.8 'Rest of state' road freight forecast (billion tkm), 2008–30

Year	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	Total
2008	16.39	12.82	21.40	5.17	21.17	3.11	0.84	0.00	80.91
2009	16.01	12.62	21.37	5.17	21.15	3.11	0.87	0.00	80.32
2010	15.29	12.16	20.88	5.06	20.68	3.05	0.88	0.00	78.01
2011	15.22	12.21	21.27	5.17	21.08	3.11	0.93	0.00	78.99
2012	15.66	12.67	22.40	5.45	22.21	3.28	1.01	0.00	82.67
2013	16.01	13.08	23.45	5.71	23.26	3.44	1.08	0.00	86.02
2014	16.17	13.33	24.25	5.92	24.06	3.56	1.15	0.00	88.44
2015	16.30	13.57	25.04	6.12	24.86	3.68	1.22	0.00	90.79
2016	16.48	13.85	25.94	6.35	25.77	3.82	1.30	0.00	93.50
2017	16.66	14.14	26.88	6.59	26.71	3.96	1.38	0.00	96.33
2018	16.74	14.37	27.70	6.80	27.55	4.09	1.46	0.00	98.71
2019	16.76	14.53	28.44	7.00	28.29	4.20	1.53	0.00	100.75
2020	16.72	14.66	29.11	7.17	28.98	4.31	1.60	0.00	102.55
2021	16.67	14.79	29.80	7.35	29.68	4.42	1.68	0.00	104.38
2022	16.59	14.89	30.46	7.53	30.35	4.52	1.75	0.00	106.09
2023	16.47	14.96	31.05	7.69	30.96	4.62	1.82	0.00	107.57
2024	16.32	15.01	31.63	7.84	31.55	4.71	1.89	0.00	108.95
2025	16.16	15.05	32.20	7.99	32.13	4.80	1.97	0.00	110.31
2026	15.99	15.09	32.77	8.15	32.71	4.89	2.04	0.00	111.62
2027	15.80	15.12	33.33	8.30	33.28	4.98	2.11	0.00	112.91
2028	15.59	15.13	33.86	8.44	33.83	5.07	2.18	0.00	114.09
2029	15.36	15.13	34.38	8.58	34.37	5.15	2.25	0.00	115.22
2030	15.13	15.13	34.91	8.73	34.91	5.24	2.33	0.00	116.36

Source: BITRE estimates.

APPENDIX H
Glossary and Abbreviations

ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
ANOVA	Analysis of Variance
BITRE	Bureau of Infrastructure, Transport and Regional Economics
BTE	Bureau of Transport Economics
BTRE	Bureau of Transport and Regional Economics
DFAT	Department of Foreign Affairs and Trade
FMS	Freight Movements Survey
GDP	Gross Domestic Product
IFMS	Interstate Freight Movement Survey
NT	Northern Territory
NSW	New South Wales
OD	Origin–destination
QLD	Queensland
SA	South Australia
SMVU	Survey of Motor Vehicle Use
TAS	Tasmania
VIC	Victoria
WA	Western Australia
tkm	Tonne–kilometre, which is the number of tonnes moved, multiplied by the distance travelled in kilometres (e.g. 25 tonnes of freight moved a distance of 100 kilometres is 2500 tonne-kilometres) (BTRE 2006).

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