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Forecasting Australian Transport: A Review of Past Bureau Forecasts

Bureau of Infrastructure, Transport and Regional Economics

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Foreword

The Bureau of Infrastructure, Transport and Regional Economics (and its many earlier namesakes, including the Commonwealth Bureau of Roads) has been producing forecasts of Australian Transport since the 1960s.

A common rational for the making of these forecasts is the need to anticipate the growth of transport activity and the demand it will place on transport infrastructure. Anticipation of this demand allows for forward planning of needed improvements/additions to key parts of the networks.

As such, it is useful to examine how close past Bureau forecasts were to predicting this growth, and to learn from any obvious errors.

This is the aim of the current report.

This project was undertaken by Dr. David Gargett.

Gary Dolman
Head of Bureau
Bureau of Infrastructure, transport and Regional Economics
June 2018

At a glance

This report provides an overview of a plethora of past Bureau forecasts. These are grouped into eight major categories (Road Traffic, Vehicle Numbers, Passenger Travel, Freight, Airports, Ports, Congestion, and Emissions), but each category contains numerous component series.

This review of past forecasts by the Bureau seeks to look at some of the major types of errors in past forecasts and to try to draw relevant lessons for forecasting.

The aim of the analysis is to promote less error, through encouraging the right approach to transport forecasting.

In spite of progress over the decades in the technology and techniques of forecasting, it remains the case that accurate long-term forecasting relies principally on assembling long-term standardised datasets for the structural components of the phenomenon of interest, and then modelling how the components fit together.

The importance of understanding the dynamics of the independent variables that drive the structural components (such as population growth, fares, petrol prices, etc.) is also crucial to forecast success.

Using long time series of aggregates of transport activity and their components allows one to better visualise how the long-term trends emerge.

Looking at past forecasting efforts alongside these trends allows a better understanding of what works and what doesn't work in the process of forecasting Australian transport.

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Executive summary

As the research arm of the federal department responsible for Australian Transport, the Bureau of Infrastructure, Transport and Regional Economics (BITRE and its many earlier namesakes, including the Commonwealth Bureau of Roads) has long been responsible for assembling, modelling and forecasting statistics related to transport activity and its determinants.

Predictions of transport activity have served to inform policy makers about the challenges for future infrastructure provision.

However, as Niels Bohr (Nobel prize winning physicist) once remarked, "Predictions are always difficult, especially about the future". And this is especially true for Australia, where black swans are the norm, rather than the exception.

This review of past forecasts by the Bureau seeks to look at some of these difficulties and to try to draw lessons from the success or otherwise of past forecast efforts.

The transport activity forecasts derived from past BITRE modelling are in eight categories:

1. Road traffic
2. Vehicle numbers
3. Passenger travel
4. Freight
5. Airports
6. Ports
7. Congestion, and
8. Emissions

Also examined were the accuracy of the assumptions/projections of the determining variables that were input to the BITRE models to derive the forecasts. These fell into several major categories:

1. Population
2. GDP
3. Overseas GDP
4. Exchange rates
5. Petrol prices
6. Unemployment
7. Interstate road freight rates
8. Fares

The aim of the analysis is to promote less error, through encouraging the right approach to transport forecasting.

There were several major types of errors that became apparent as the past forecasts were examined:

1. Errors in Structural Frameworks – Missing crucial structural components can result in forecasts going wrong.
2. Errors in Independent Variables – Where independent variables radically changed trend – for example population growth with radical changes in immigration affecting traffic forecasts, or surges in the cost of living increasing the demand for Urban Public Transport (UPT)– even proper structural model forecasts were in error.
3. Errors due to Structural Change – Forecasters need to try to imagine different possible future industry structures, rather than rely entirely on estimated equations.
4. Errors due to Radical Change – These changes in structure are "black swan" events – events that couldn't be predicted. Such changes can only be dealt with in advance, using scenarios that consider unlikely scenarios.
5. Errors due to Accepting Short-term Growth Trends – Some Bureau forecasts, especially the earlier non-structural ones, were overly influenced by the short-term past trend.
6. No Error, Due to Compensating Errors – Good luck – it has to happen sometime! But a forecast can be good for the wrong reasons.

In spite of progress over the decades in the technology and techniques of forecasting, it remains the case that accurate long-term forecasting relies principally on assembling long-term standardised datasets for the structural components of the phenomenon of interest, and then modelling how the components fit together. The importance of understanding the dynamics of the independent variables that drive the structural components (such as population growth, fares, petrol prices, etc.) is also crucial to forecast success.

Using long time series of aggregates of transport activity and their components allows one to better visualise how the long-term trends emerge.

Looking at past forecasting efforts alongside these trends allows a better understanding of what works and what doesn't work in the process of forecasting Australian transport.

CHAPTER 1

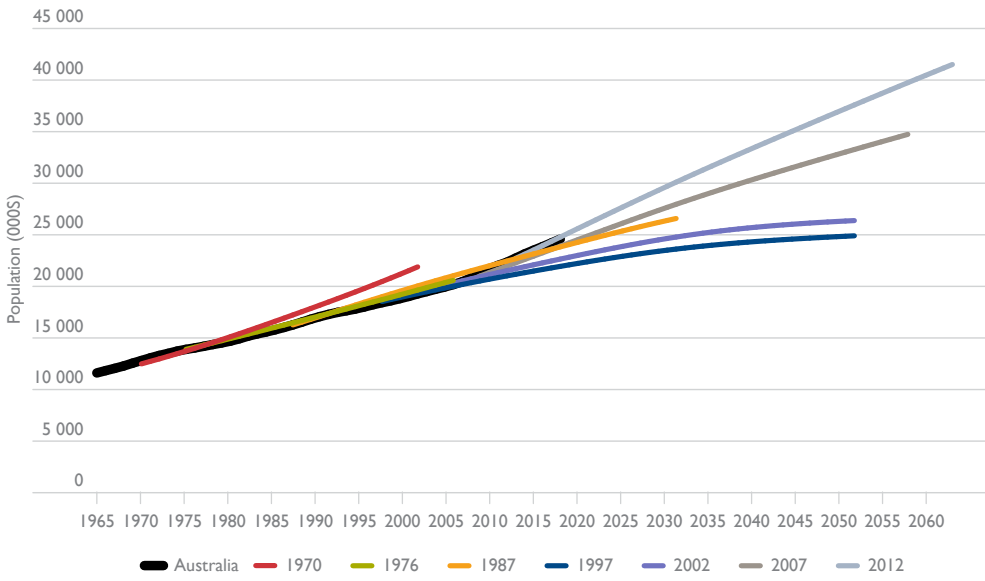
Assumptions behind the transport forecasts

Most transport model forecasts are dependent on assumptions about independent variables or projections of trends. However good the model of transport activity used might be, if the forecasts/projections of the determining variables are off, so will be the forecast of activity. Therefore, before examining how close Bureau forecasts of activity were to what actually transpired, it is perhaps wise to examine errors or successes in the forecasting/projection of the main independent variables used in Bureau modelling. The main independent variables covered will be population, GDP, overseas GDP, exchange rates, fuel prices, unemployment, road freight rates, fuel efficiency, and fares. These will be presented here and, as relevant, in the next chapter, which covers the activity forecasts themselves.

Population

The Australian Bureau of Statistics (ABS) has long been responsible for producing long-term projections of the Australian population. In almost all cases in the past, the Bureau has used these projections as input to its forecasting models. Figure 1.1 shows how some of these population projections have fared relative to what population levels actually transpired.

Figure 1.1 Actual Australian population versus projections



What can be seen is that population projections are generally based on the assumption that the basic parameters will not change. But change they do. And the changing parameter most likely to upset a projection is the level of immigration set by the government of the day. In the mid 1970s and the early 1990s, immigration was cut in response to economic downturns. As a result, projected population was above the actual.

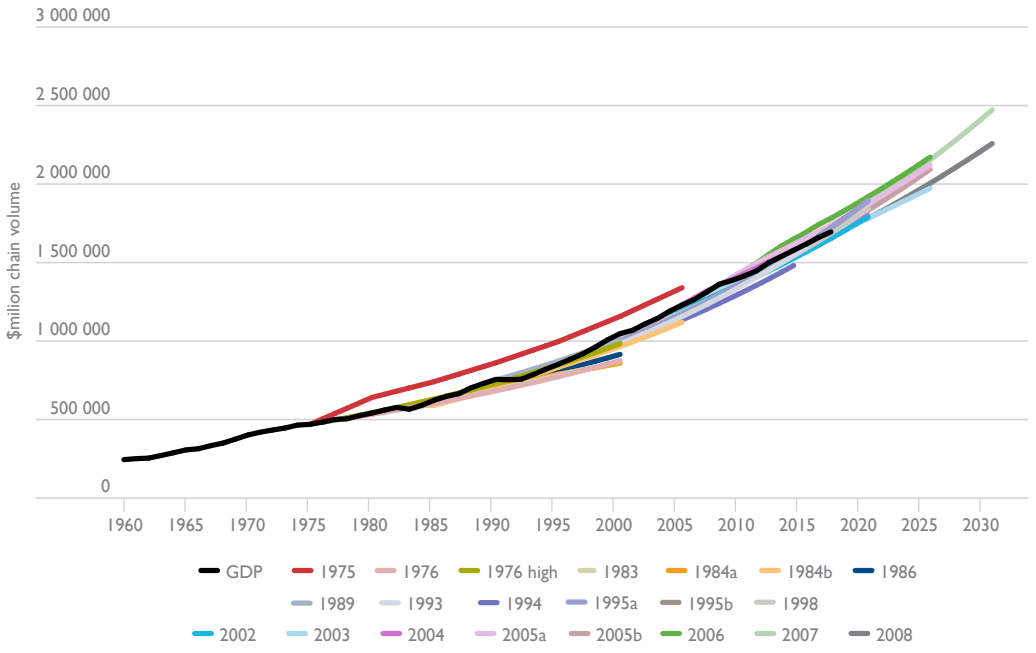
In contrast, from 2006 onwards, the levels of births and immigration both went up sharply, and projected populations were below the actual. Birth and immigration levels have remained elevated, and current ABS forecasts have these levels continuing. Should these levels fall, recent Bureau activity forecasts using these projections would be higher than future actual levels (and vice versa).

GDP

Gross Domestic Product (GDP) is used in numerous Bureau models. Projected GDP is partially dependent on the projected level of population, which is subject to all the difficulties described above. But the levels of GDP are also subject to 1) changes in long-term trend, and 2) short-term fluctuations in economic activity.

As can be seen in Figure 1.2, both of these factors are important in determining the accuracy of past GDP projections (by various agencies, public and private – see Table A1.2 for sources).

Figure 1.2 Actual Australian real GDP versus projections



Short-term fluctuations in economic activity are apparent in the mid 1970s, the early 1980s, early 1990s and early 2000s downturns/slow-downs. The effect of the Global Financial Crisis was not a downturn. But equally important, it seemed to be 1) a shift downward from the trend during the 2000s, and then 2) a shallower growth trend, in spite of the mining boom.

As the projections do not capture the short-term fluctuations in economic activity, it is the fit of their trend to the actual that is the measure of their success. The forecasts from the 1990s on generally were below the actuals during the early 2000s, but the Global Financial Crisis lowered the actuals toward them meaning a lucky long-term projection in the 2010s.

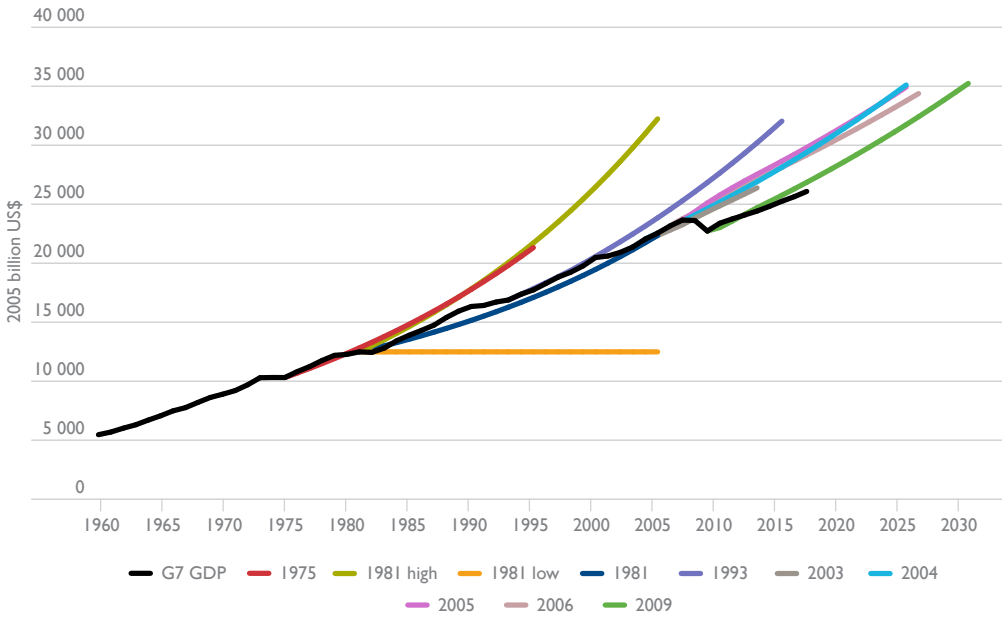
One of the interesting features of the graph is the scale change decade to decade, which correlates with the growth of many transport activities and the scale of expansion required in transport infrastructure. Current projections have real GDP growing by about 60 to 75 per cent over the two decades from 2010 to 2030, which represents about a 2.5 to 3.0 per cent growth rate per year. The 'rule of 72' says '72 divided by the growth rate equals the number of years to double'. Thus an average growth rate of 2.75 per cent per year implies doubling in a little over 25 years (72/2.75=26). Where transport activity is directly dependent on the level of GDP, the same flows through to those activities and to the need for supporting infrastructure.

Overseas GDP

Overseas GDP is used in many Bureau models that deal with the international aspects of transport to and from Australia – especially freight and air passengers.

The GDP of the G7 countries often is used in projections. Like domestic GDP, overseas GDP is also subject to 1) changes in long-term trend, and 2) short-term fluctuations in economic activity. As can be seen in Figure 1.3, both of these factors are important in determining the accuracy of past G7 GDP projections (by various agencies, public and private).

Figure 1.3 Actual real G7 GDP versus projections



As in Australia, short-term fluctuations in economic activity are apparent in the mid 1970s, the early 1980s, early 1990s and early 2000s downturns/slow-downs.

But unlike Australia, the effect of the Global Financial Crisis was definitely a downturn, leaving projections made before this time 'high and dry'.

This was followed by a shallower growth trend, which at about 2 per cent has G7 GDP doubling in a little over 35 years (72/2.0=36).

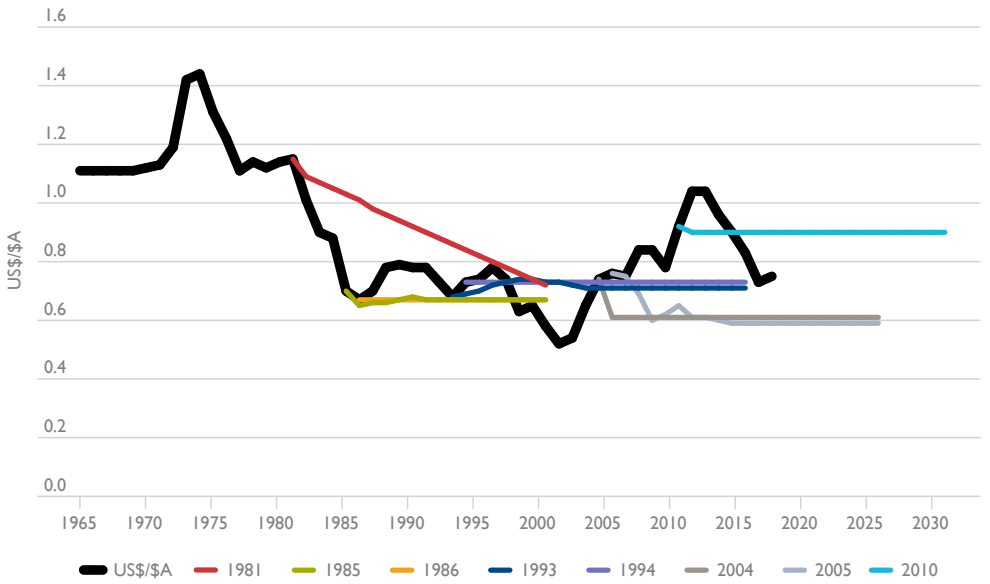
Exchange rates

Exchange rates are another factor that are input to the Bureau models that deal with the international aspects of transport to and from Australia – especially freight and air passengers.

Looking at Figure 1.4, which shows projections by various agencies, it can be seen that accurate projections are rare.

Thus, to the extent that exchange rates are central to transport activity forecasts, scenarios using high and low exchange rate projections are probably going to be as likely as the base-case projection.

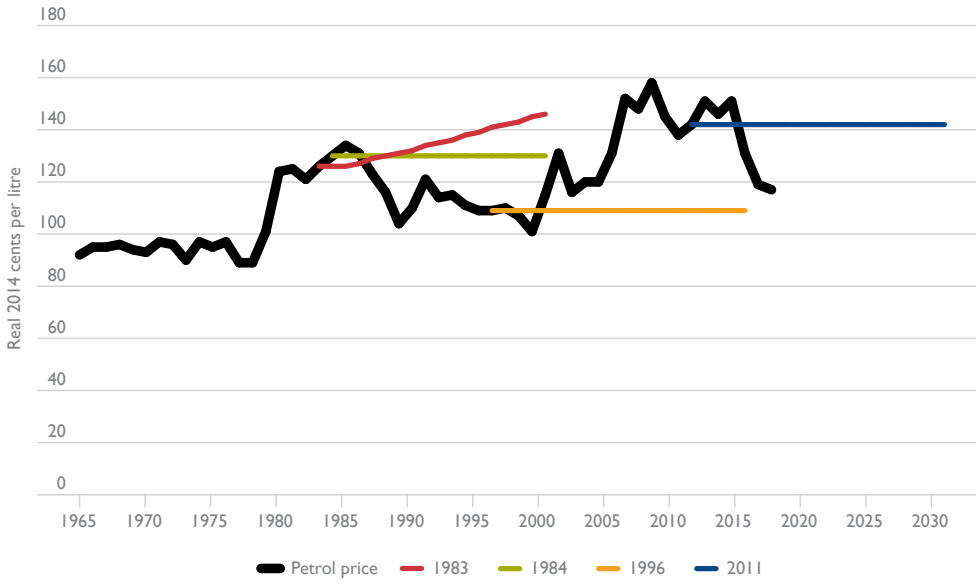
Figure 1.4 Actual Australian dollar exchange rate versus projections



Petrol prices

The same conclusion can be drawn about petrol price projections. As shown in Figure 1.5, the main method of projection has been a price unchanged from the current level. So again, to the extent that petrol prices are central to transport activity forecasts, scenarios using high and low petrol price projections are probably going to be as likely as the base-case projection.

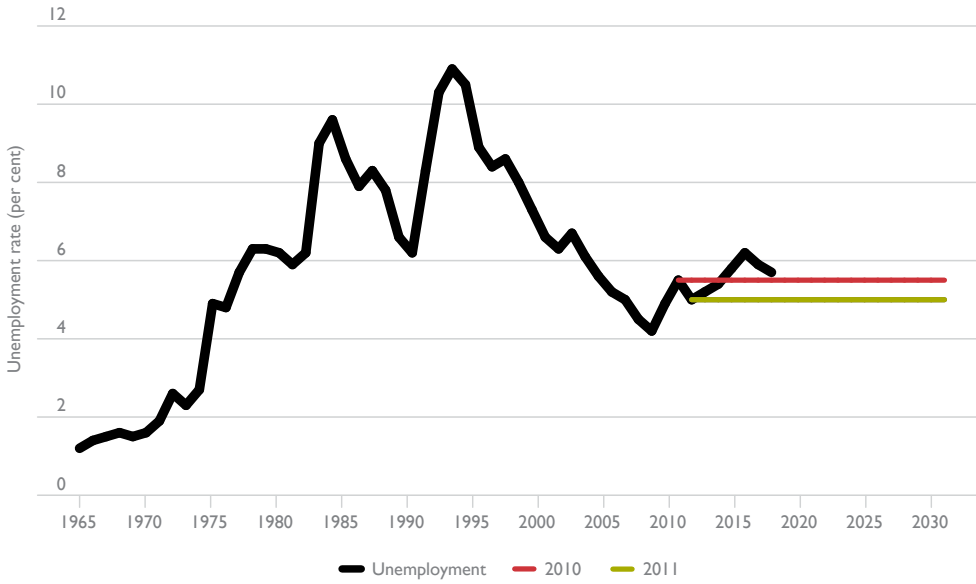
Figure 1.5 Actual Australian petrol price versus projections



Unemployment

And once again, the same conclusion can be drawn about unemployment projections. As shown in Figure 1.6, the main method of projection has been an unchanged level of unemployment. So again, to the extent that unemployment is central to transport activity forecasts, scenarios using high and low unemployment rate projections are probably going to be as likely as the base-case projection.

Figure 1.6 Actual Australian unemployment versus projections



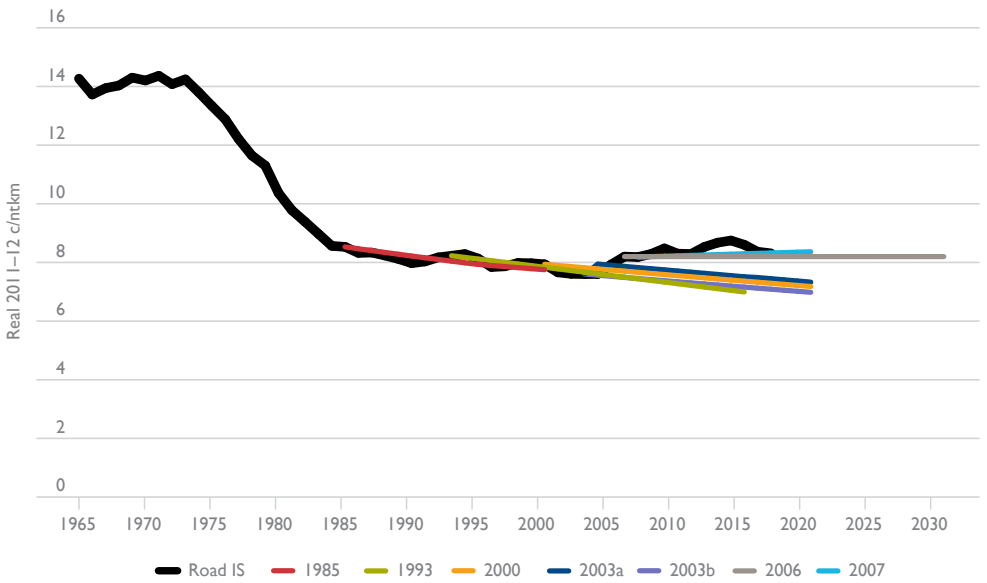
Interstate road freight rates

Projections of interstate road freight rates have been 'with the trend' rather than unchanged per se.

That being said, the trend since the mid 2000s has been unchanged, and so have the projections.

The conclusion is that if the trend remains unchanged for a decade or so, the transport forecasts using them will be getting the price signals right over that period.

Figure 1.7 Actual interstate road freight rates versus projections



Fares

Three types of fares are commonly used in Bureau passenger travel models – urban passenger fares, and domestic and international airfares.

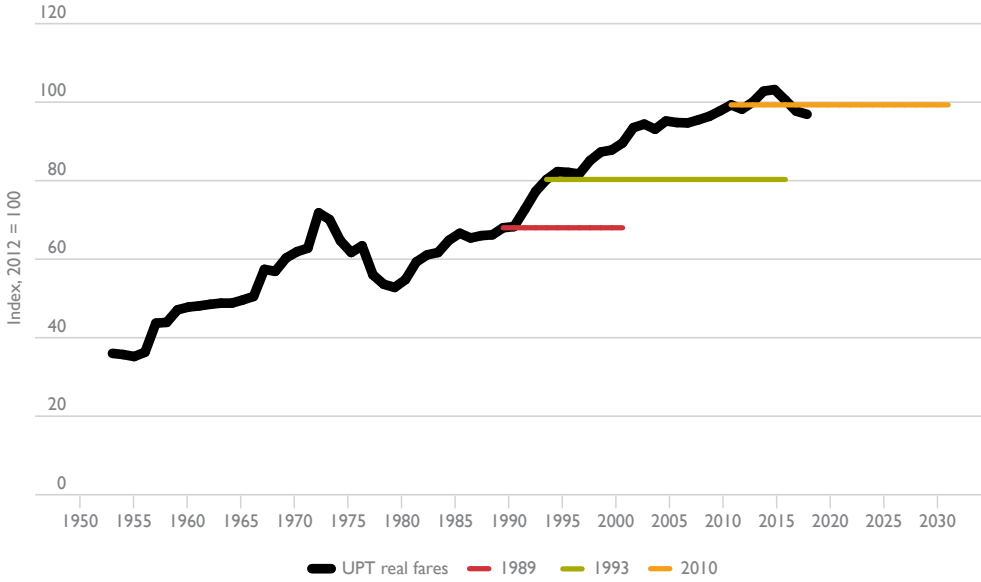
Fluctuations in all three are related to movements in fuel prices, while the trends are affected by the degree of technological change and trends in wages.

Urban passenger fares

As can be seen in Figure 1.8, the general trend has been for *rising real urban passenger fares,* except during the period 1973–74 to 1979–80, when real fares fell as nominal fare levels failed to keep up with higher inflation rates. The long-term trend toward rising real fare levels may perhaps be a function of several factors – e.g. rising real wage rates, minimal technology gains, increasing cost of infrastructure investment as city boundaries expand and property values rise, increasing congestion, attempts at greater cost recovery, etc. The rising trend has slowed somewhat since 2000–01.

The projections in past Bureau forecasts have been for unchanged fare levels, which means that, until recently, the negative effect of fare rises on passenger numbers will have been underestimated in Bureau forecasts.

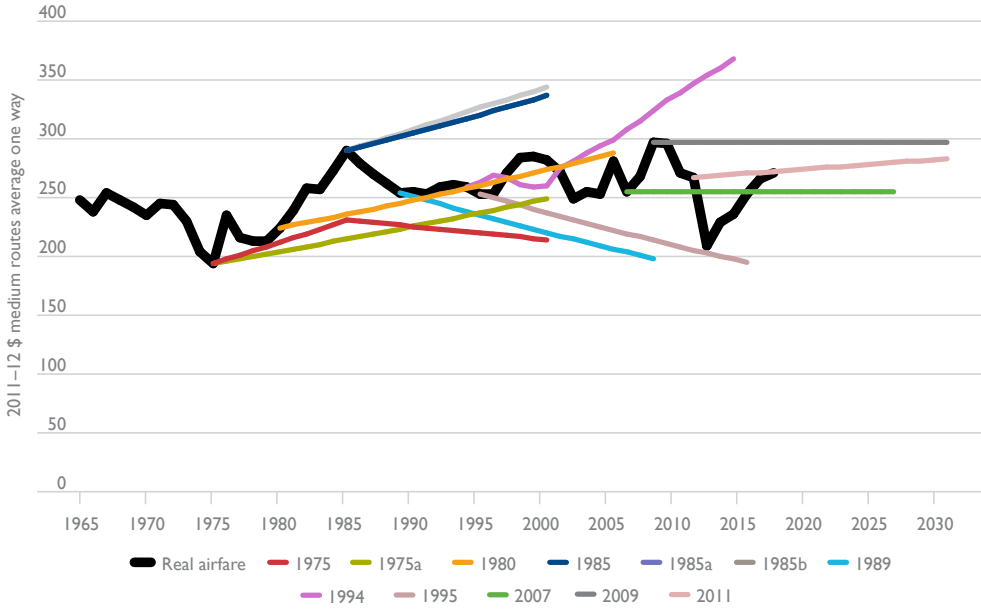
Figure 1.8 Actual urban passenger fares versus projections



Domestic air passenger fares

Figure 1.9 shows that the trend in the average real medium route one-way airfare (roughly equivalent to the current restricted economy fare) has been trendless, fluctuating around $250. Past projections, however, have often extrapolated short-term trends, meaning that they moved significantly away from the trend, and biased domestic aviation forecasts made using them.

Figure 1.9 Actual Australian domestic airfares versus projections

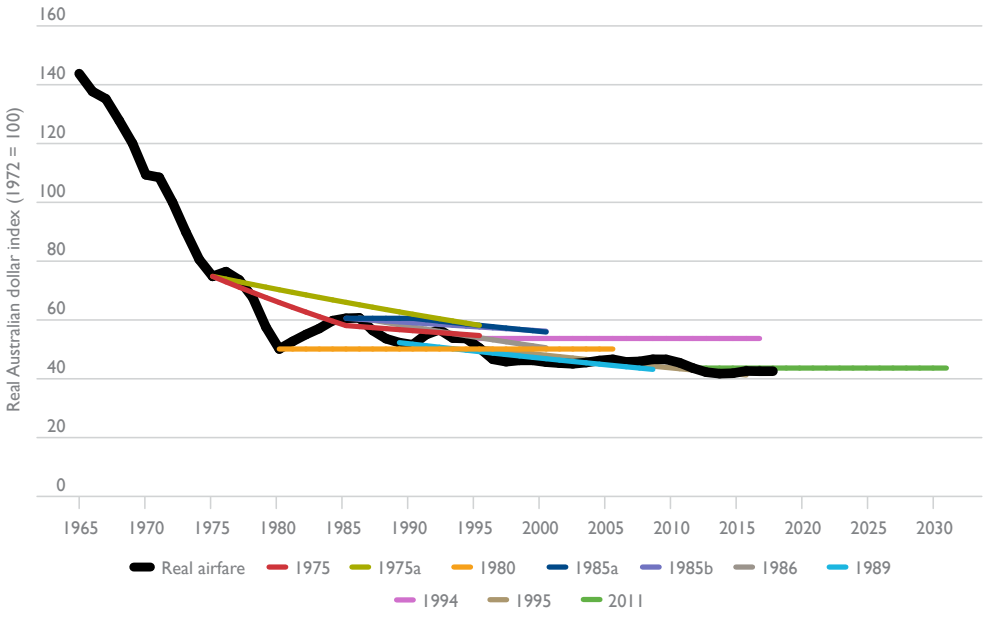


International air passenger fares

International airfares to and from Australia have, in real terms, been following a downward path. In the late 1960s and 1970s, the introduction of large jet aircraft led to sharp falls. From the 1980s on, the trend decline slowed, and was characterised by drops and then plateaus until the next drop.

Past projections of international airfares have varied between slow downward and constant, but have generally been close to the trend. So generally, past Bureau forecasts will not have been adversely affected.

Figure 1.10 Actual international airfares versus projections



CHAPTER 2
The transport forecasts

The Bureau and its predecessors has been forecasting various transport activities since the mid 1960s. This chapter will present an overview of these forecasts in eight areas: road traffic, light vehicle numbers, passenger travel, freight, airports, ports, congestion and emissions.

Road traffic

The main categories of road traffic forecast in the past have been: 1) Total Australian road traffic (vehicle-kilometres travelled or vkt), and 2) Total Metropolitan (capital cities) road traffic

Total Australian Road Traffic

A motor vehicle travelling one kilometre accounts for one vehicle-kilometre travelled (one vkt). To examine past forecasts, it is instructive to look at two components and then the total aggregate vkt, i.e.:

Vkt/person * population = total vkt

The data for the components and for total vehicle kilometres (all motor vehicles) for the last 50 years in Australia are shown in Figures 2.1 to 2.3, together with forecasts with start dates ranging from 1966 to 2011. The first thing to notice is that the pattern of growth in total vkt (Figure 2.3) in the last 50 years has been such that the absolute change has been consistently slowing. This means that the percentage growth has been slowing even faster. Looking at the forecasts, it can be seen that they fall into two groups:

a) those that assumed increasing absolute change (the four high forecasts out to 2000), and

b) those that correctly projected a linear or decreasing rate of absolute increase.

The difference between the two is a function of the models used. The first (incorrect) group of forecasts were based on aggregate models. The second (roughly correct) group split the aggregate into vkt per person (assumed to be constantly slowing in growth – saturating) and population (exponential) growth. The first forecast made was done in 1966 and was almost spot on in its forecast of the next 25 years of traffic growth. However, it was a case of the right answer for the wrong reasons. As shown in Figures 2.1 and 2.2, yes, the vkt per person was assumed to saturate, but at too low a level. However, this error was almost exactly cancelled out by too high a population growth forecast. Of the five forecasts of the 70s and 80s, four were mistaken exponentially growing aggregate forecasts. The fifth, in 1982 had a low per person forecast and a correct population forecast, resulting in a low aggregate forecast.

The forecasts of the 1990s were correctly disaggregated, and with compensating errors in the two components, did well until the Global Financial Crisis – which no government modeller would have forecast. The 2011 forecast is (so far) doing very well. The 2015 forecast predicts a recovery in vkt per person, and thus an upturn in total vkt.

Figure 2.1 Australian vehicle kilometres travelled per person

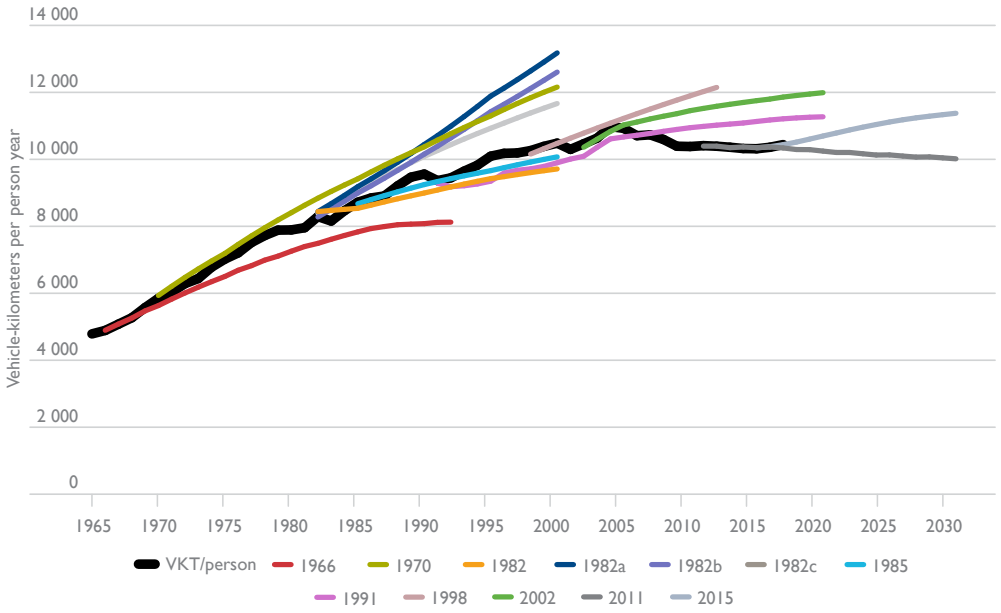


Figure 2.2 Australian population

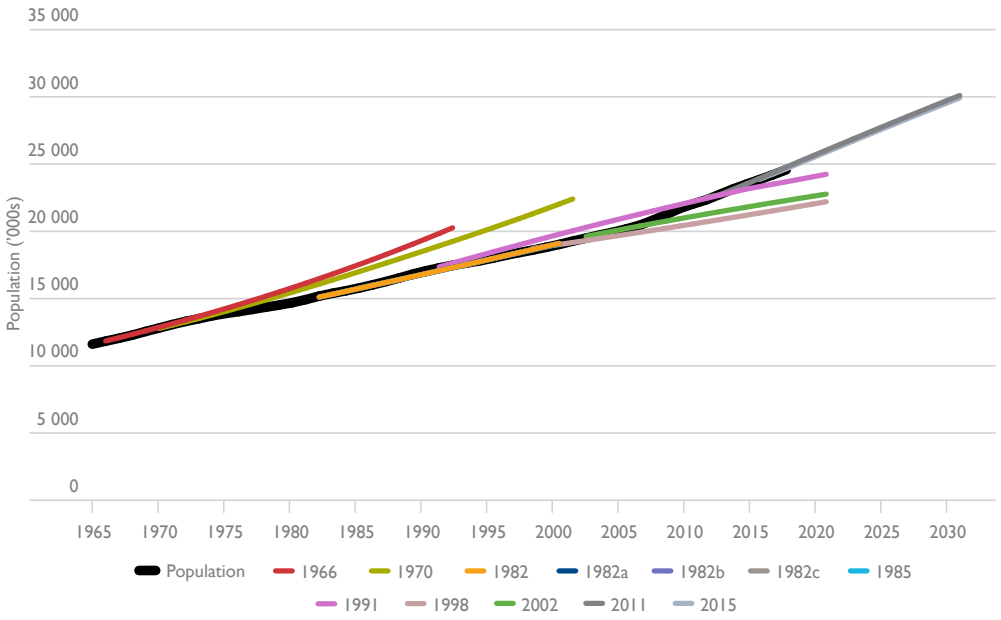
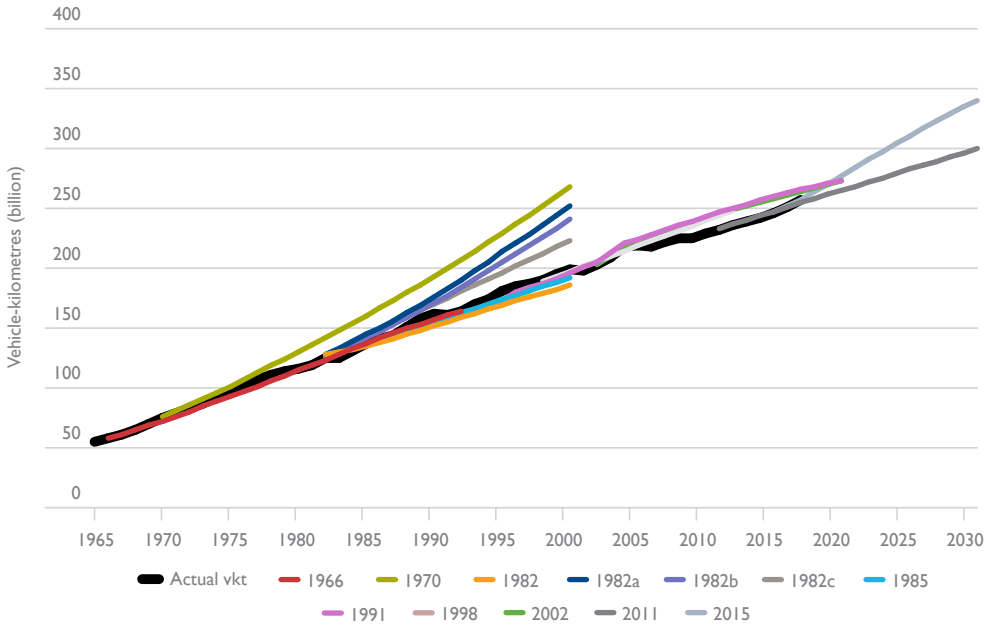


Figure 2.3 Australian vehicle kilometres travelled



The messages for forecasters from this analysis of road traffic forecasts are as follows:

1. Modelling some transport features requires splitting them into components and modelling those.
2. Population forecasts for Australia can be off when immigration levels suddenly change in response to changes in the economy or in policy.
3. Black swans happen (Global Financial Crisis, immigration changes).
4. Sometimes you get lucky (compensating errors).

Metropolitan Road Traffic

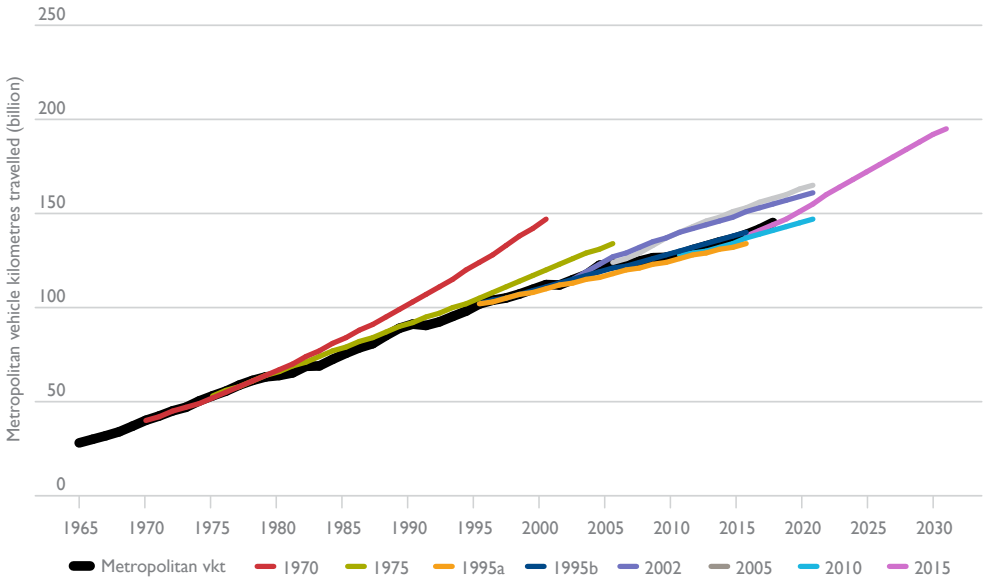
The same mechanisms driving Australian vkt seem to affect metropolitan vkt.

Vehicle kilometres travelled per person have saturated and even declined after the Global Financial Crisis.

But a faster growth in population (much of it going into the cities) has balanced that forecasting error to some extent.

The result is that the forecasts for metropolitan vkt shown in Figure 2.4 are similar to those shown for Australia as a whole in Figure 2.3.

Figure 2.4 Metropolitan vehicle kilometres travelled



Light vehicle numbers

The only vehicle categories that have been frequently forecast by the Bureau are cars (including sport utility vehicles – SUVs) and light commercial vehicles (LCVs, comprising utes, panel vans, etc.) Together cars and LCVs make up a category called Light Vehicles (LVs).

The models for vehicle numbers are comprised disaggregated models of the form:

Light Vehicles per person * population = Light Vehicle numbers.

Figures 2.5 to 2.8 show the 50 year history of these components, together with Bureau forecasts and population projections of the time. From Figure 2.6 it can be seen that the forecasts in the 1970s and 80s of the number of light vehicles per person were close to the actual trend if not level. The 1970 population projection was high, but combined with a low 1970 Bureau forecast of LVs per person, it gave an accurate forecast of vehicle numbers out to the late 1980s. The 1981 and 1985 forecasts were roughly on track, and didn't suffer too much from inaccurate population projections.

When we come to the forecasts from 1995 on, however, there are compounding errors. First, the population projections of the day did not pick the sudden rise and increase in rate of growth of population that occurred in the mid 2000s. Secondly, Bureau forecasts assumed a saturating trend in light vehicles per person matching the saturating trend in vkt per person that we have already seen in the previous section. The formula behind this assumption takes the form:

LV vkt per person / LV vkt per vehicle = Light Vehicles per person

The assumption was that the middle term – LV vkt per vehicle – would remain constant, and thus if LV kilometres per person started to saturate, so would the number of light vehicles. But

as Figure 2.5 shows, from 1995 the middle term – LV vkt per vehicle – started on a downward trend that continues to the present. And so, as Figure 2.5 shows, people have indeed roughly held their travel in light vehicles constant since 1995. But they are also buying more vehicles, and thus using each of them less. Bureau forecasts from 1995 up to 2003 assumed vkt per vehicle to remain roughly constant at about 16000 kilometres per year, whereas that figure is now closer to 13000.

Figure 2.5 Components explaining light vehicles per person

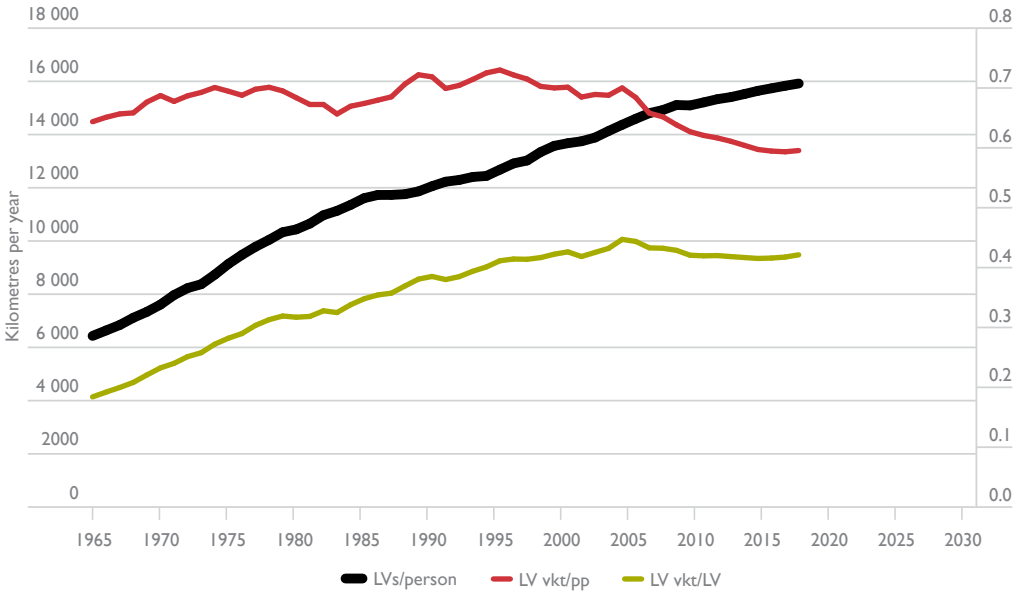


Figure 2.6 Light vehicles per person and forecasts

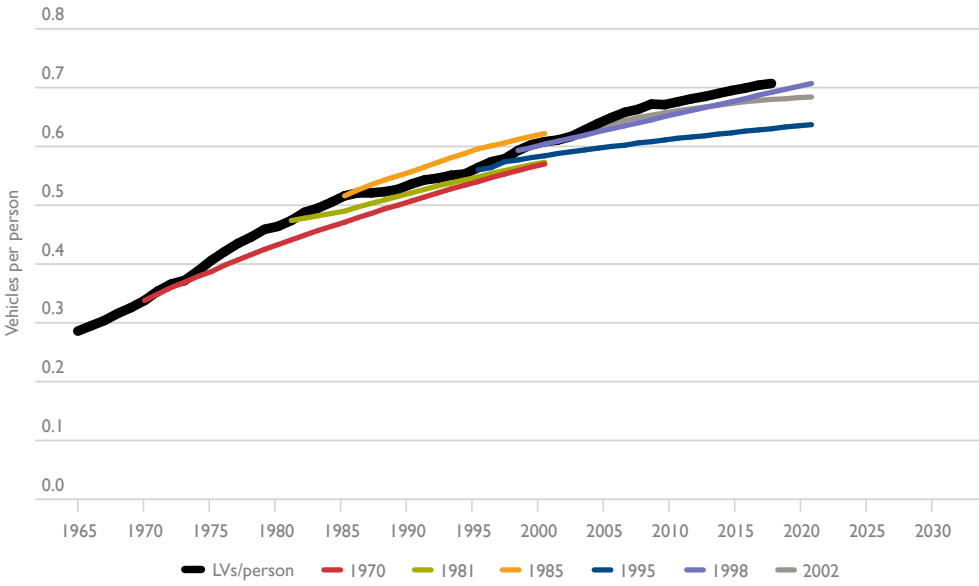


Figure 2.7 Population and projections

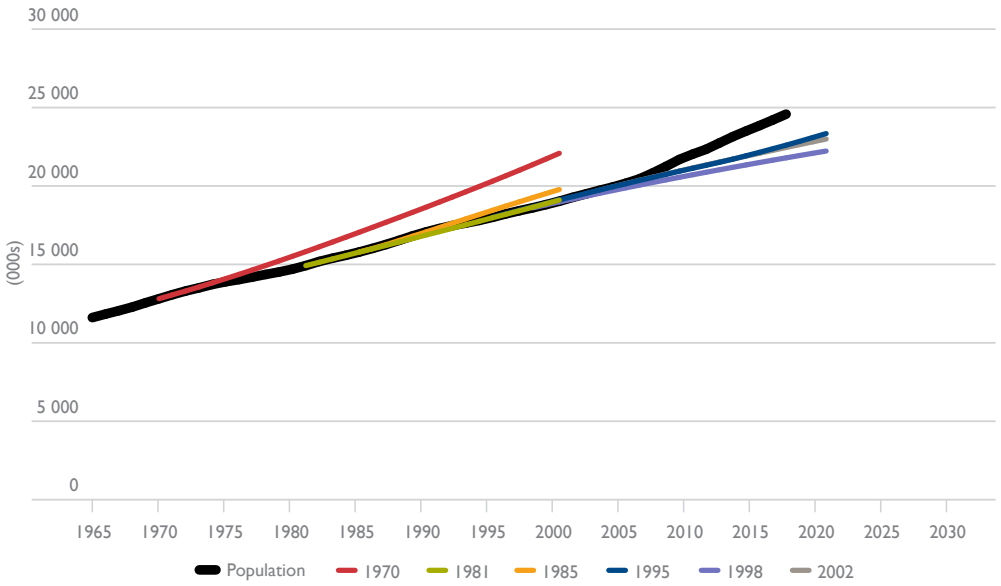
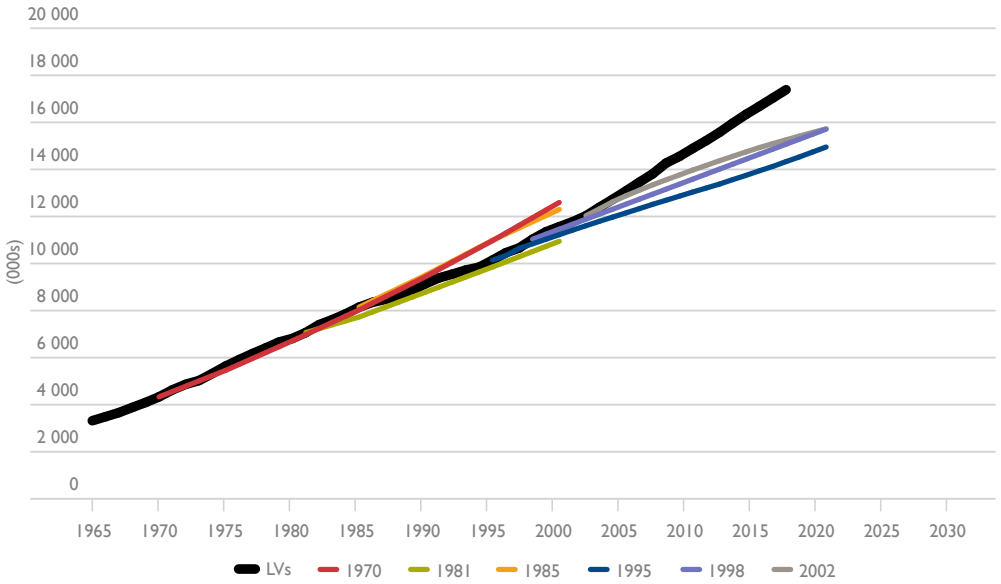


Figure 2.8 Light vehicle numbers and forecasts



The forecasts from 1995 on were hit with a double whammy:

1) A decline in average distance vehicles were driven, meaning *more vehicles per person* were required to do an unchanged distance per person, and
2) Low population projections compared to the actual result with higher than expected immigration – i.e. more people.

The result, as shown in Figure 2.8, is a large under-prediction of vehicle numbers.

Passenger travel

Passenger travel forecasts have been concentrated in three areas: 1) Australia-level all modes passenger travel, 2) Metropolitan passenger travel (including UPT travel), and 3) metropolitan UPT travel on its own.

Australian (All Modes) Passenger Kilometres

Australia-level passenger travel forecasts include all passenger modes – light vehicles, motorcycles, buses, other road vehicles, rail, air and sea.

The earliest of the forecasts (1975) assumed no saturation in per person road travel (i.e. unabated exponential growth – see Figure 2.9)

The later forecast (1993) was spot on. But this was due to a slight underestimate for road growth coupled with a slightly too high growth rate for air travel (see Figure 2.10). As we've found before, sometimes you get lucky (compensating errors).

Figure 2.9 All modes Australian passenger kilometres

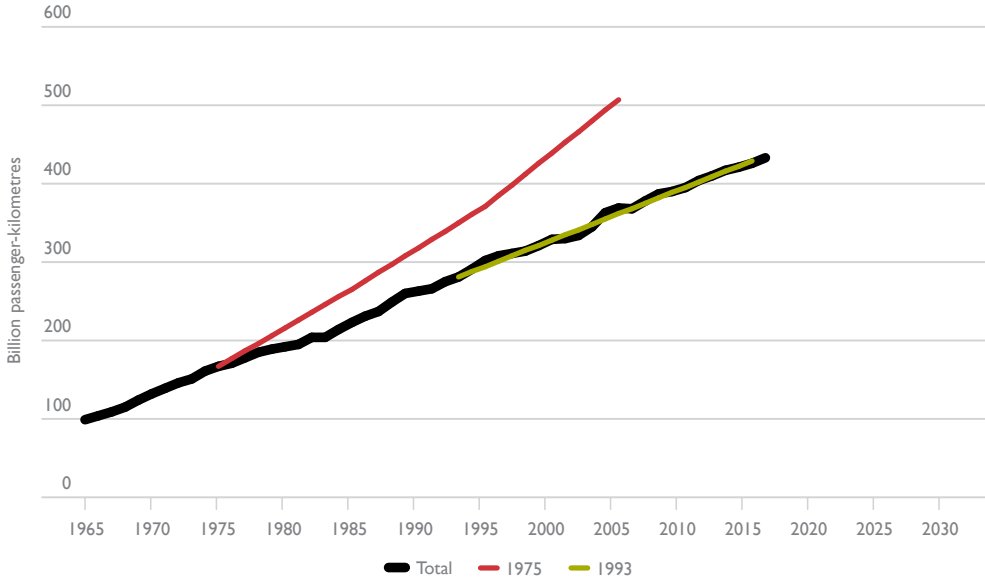
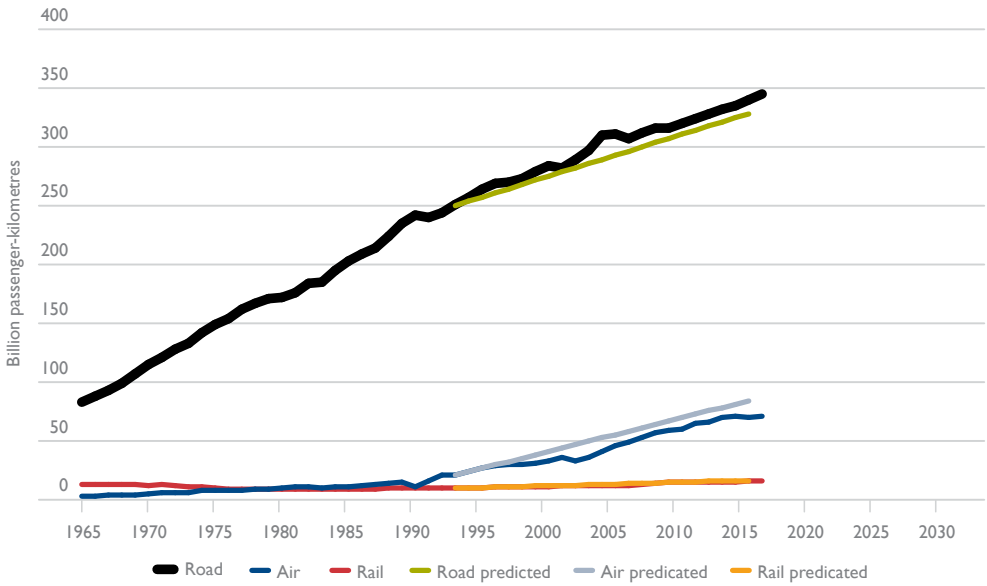


Figure 2.10 All modes forecasts from 1993



Metropolitan (Road Plus Urban Public Transport) Passenger Kilometres

Forecasts of metropolitan passenger travel can also be broken down into forecasts of passenger kilometres per person and population. Past forecasts of these three are shown in Figure 2.11, 2.12 and 2.13.

It can be seen that the 1977 forecast did not catch the saturation that transpired in passenger kilometres per person. So in spite of having a near perfect population forecast (a rarity), the prediction for metropolitan passenger travel was far too high.

The 1995 forecast did not catch the post-2005 downturn in passenger kilometres per person, but its population forecast did not catch the increase in immigration that occurred about the same time, with the result that the forecast metropolitan passenger-kilometres was luckily accurate.

The 2005 forecast did catch some of the effect of higher immigration, and so wasn't so lucky, coming in with too high a forecast for metropolitan travel.

The jury is still out on the 2010 and 2013 forecasts.

Figure 2.11 Metropolitan passenger kilometres per person and forecasts

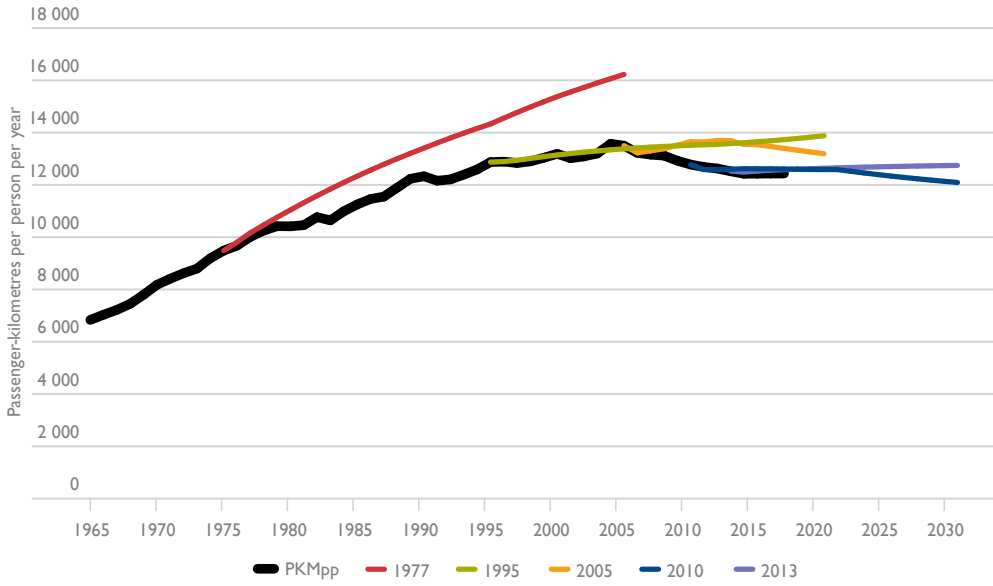


Figure 2.12 Metropolitan population and forecasts

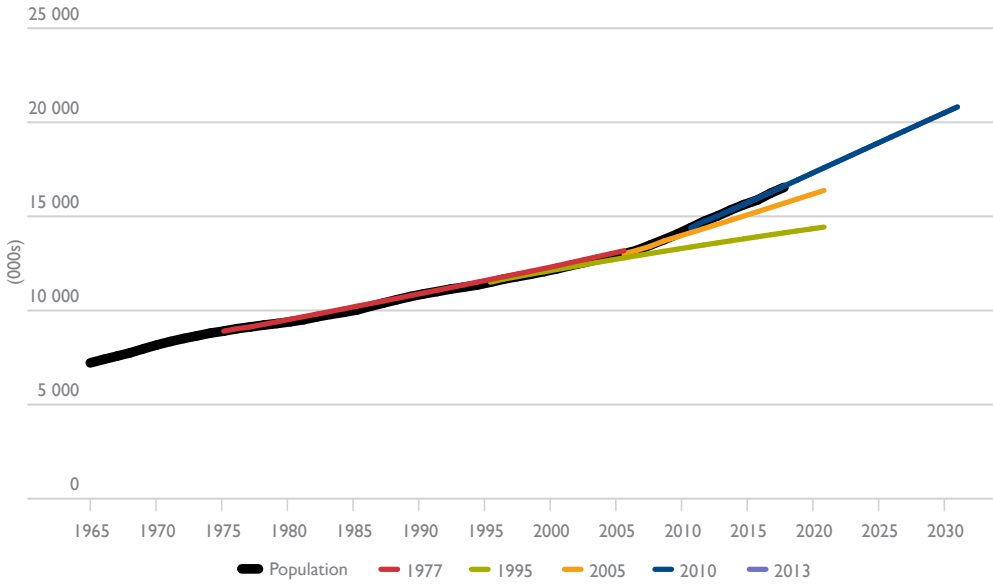
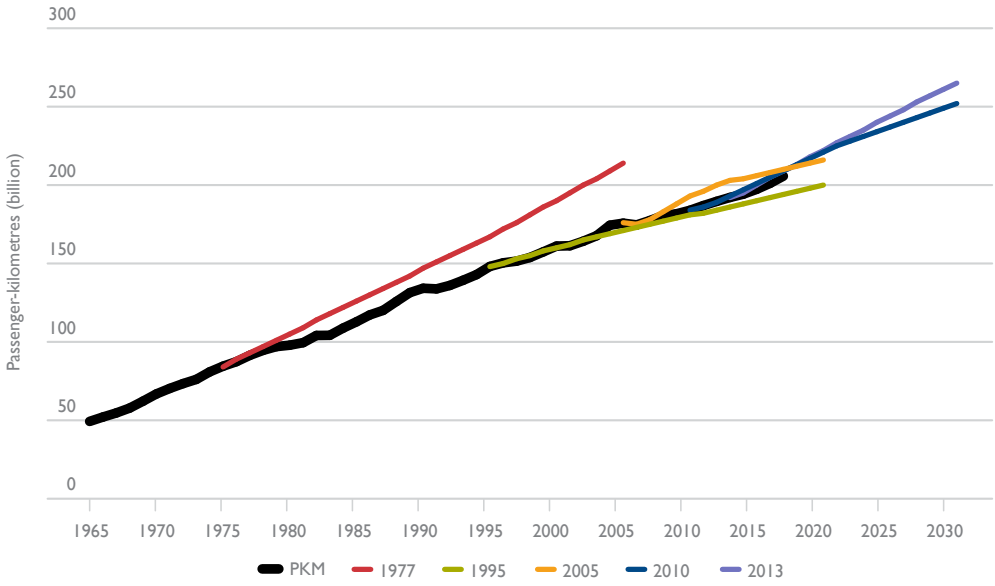


Figure 2.13 Metropolitan passenger kilometres and forecasts



Metropolitan Urban Public Transport Passenger Kilometres

A passenger travelling one kilometre accounts for one passenger-kilometre (one pkm). 'Metropolitan' in Australia's case refers to the sum of the eight capital cities.

Interest in past forecasts revolved around three facets:

- Total metropolitan passenger-kilometres
- The share of UPT, and thus
- UPT passenger-kilometres.

The data for all three components for the last 50 years in metropolitan Australia are shown in Figures 2.14 to 2.16, together with forecasts with start dates ranging from 1977 to 2010.

Total metropolitan passenger-kilometres in Figure 2.14 similar to Australian vehicle-kilometres travelled as shown in Figure 2.1. That is, they are slowly turning downwards from a straight line.

Early forecasts were of the "exponential growth of aggregate" type, and erred on the upside. Later forecasts have the trend right, if not always the level.

UPT share forecasts are shown in Figure 2.15.

Forecasts in the 1970s and 1980s erred towards assuming a recovery.

In fact the UPT share of metropolitan pkm declined sharply from 1965 to 1980 and then started a period of slow decline. Forecasts from the mid-1990s captured this.

Then, from 2005 to 2009, a sharp increase in cost-of living pressures saw a return to the cheaper UPT options for commuters (a move enabled by supply increases), and UPT share moved sharply upward.

As pressures eased, the UPT share again levelled out, and has been well predicted by the 2010 forecast.

When, after 1980, the decline in UPT share eased off, the absolute level of UPT passenger kilometres began to increase.

From 2005 to 2009, the level shifted upwards, and then resumed its previous trend (set by a constant share of a growing metropolitan passenger kilometre total).

The messages for forecasters from this analysis are as follows:

1. Modelling some transport features requires splitting them into components and modelling those.
2. A model of UPT has to include forecasts of cost pressures as a trigger for UPT demand surges. This is not to say these will be got right, but it is certain that when the current era of record low housing interest rates and low petrol prices ends, there will be a surge in demand for UPT.
3. Black swans happen (Global Financial Crisis, sharp cost of living changes).
4. Sometimes you get lucky (compensating errors).

Figure 2.14 Metropolitan passenger kilometres

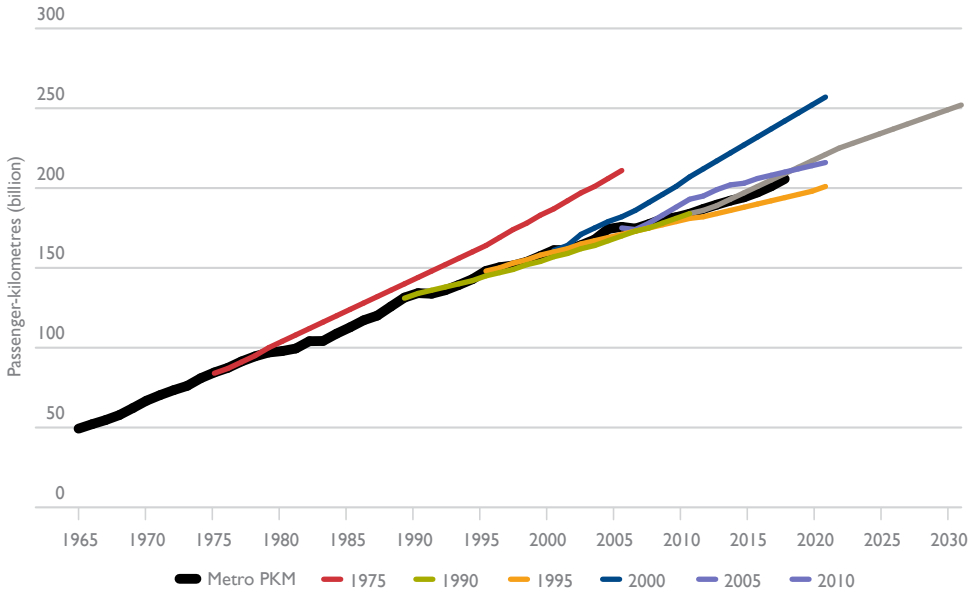


Figure 2.15 Urban Public Transport mode share

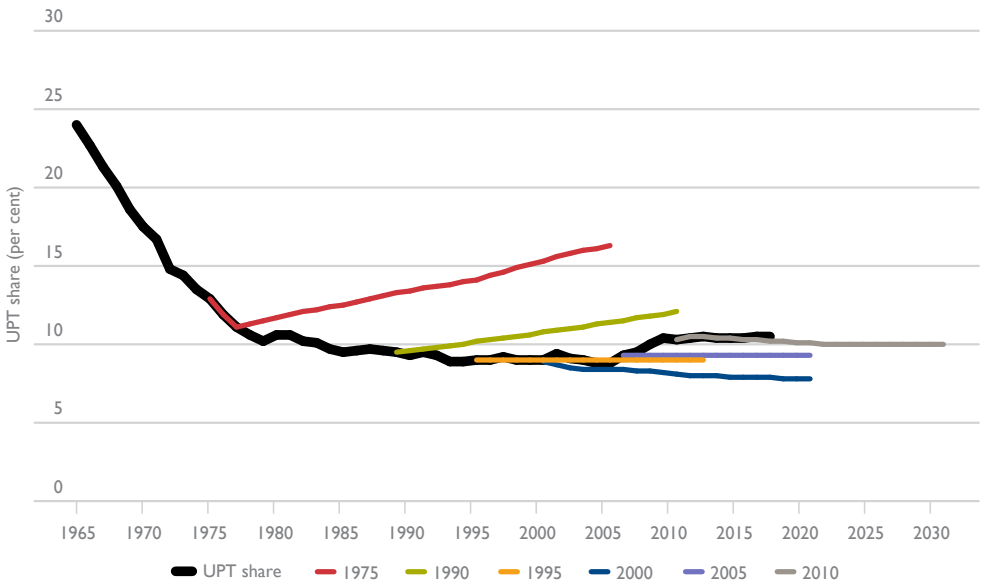
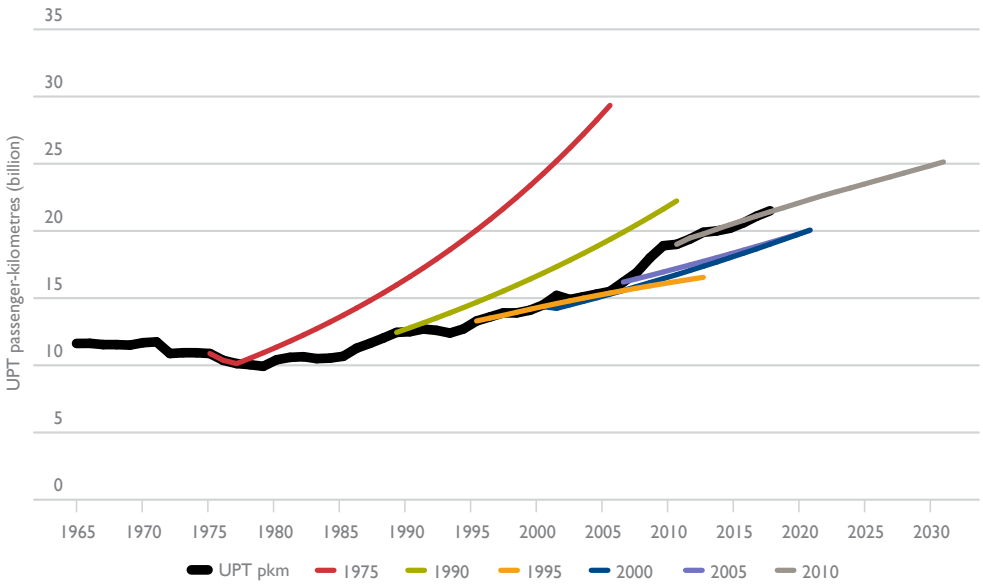


Figure 2.16 Urban Public Transport passenger kilometres



Freight

Past forecasts of freight can be separated into four categories:

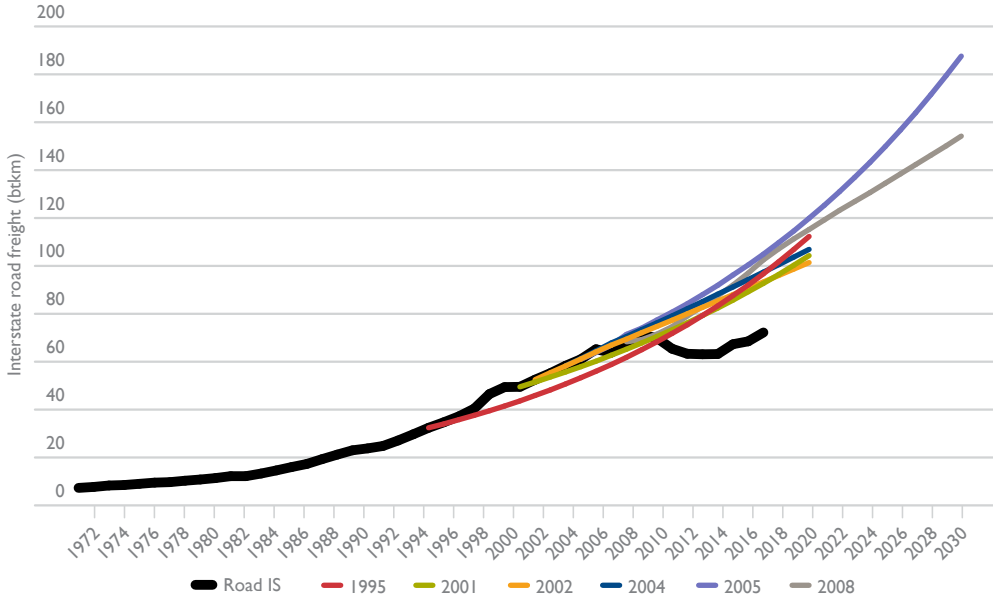
1. Interstate freight (road and rail)
2. Road freight
3. Rail freight
4. Air freight

Interstate Freight

Looking at the actual paths of interstate road and rail freight (the black lines in Figure 2.17 and 2.18, it can be seen that there are three prominent stages: 1) roughly exponential growth to 2008, 2) a sharp decline from 2009 to 2014, and 3) a resumption of growth from 2015. The decline from 2009 to 2014 was due to 1) the effects of the Global Financial Crisis, and 2) the fall-off in Australian manufacturing, with imports to each capital city replacing Australian-made goods moved by road and rail between cities.

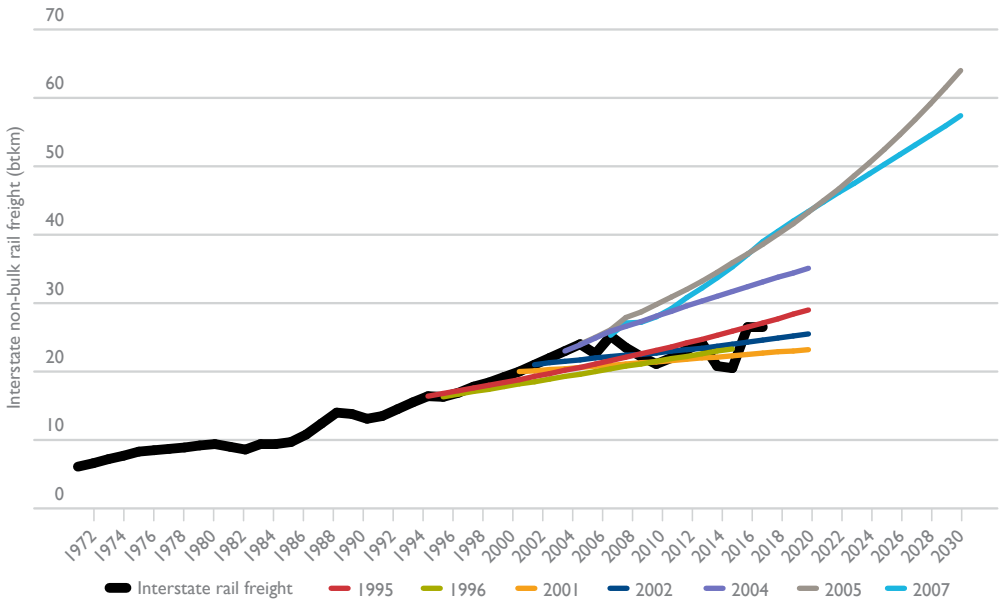
It can be seen that the forecasts of road freight (all made before stage two), were reasonably accurate up to 2008, and their trend matches the trend during the resumption of growth from 2015 on. What was not forecast was the structural change during the second stage from 2009 to 2014. Lesson: Black swans happen.

Figure 2.17 Interstate road freight



Early rail freight forecasts were correct by the early 2010s, thanks to an underestimate of the trend growth combined with no allowance for the Global Financial Crisis/manufacturing decline effect (sometimes you get lucky). The 2004, 2005 and 2007 forecasts had no such luck.

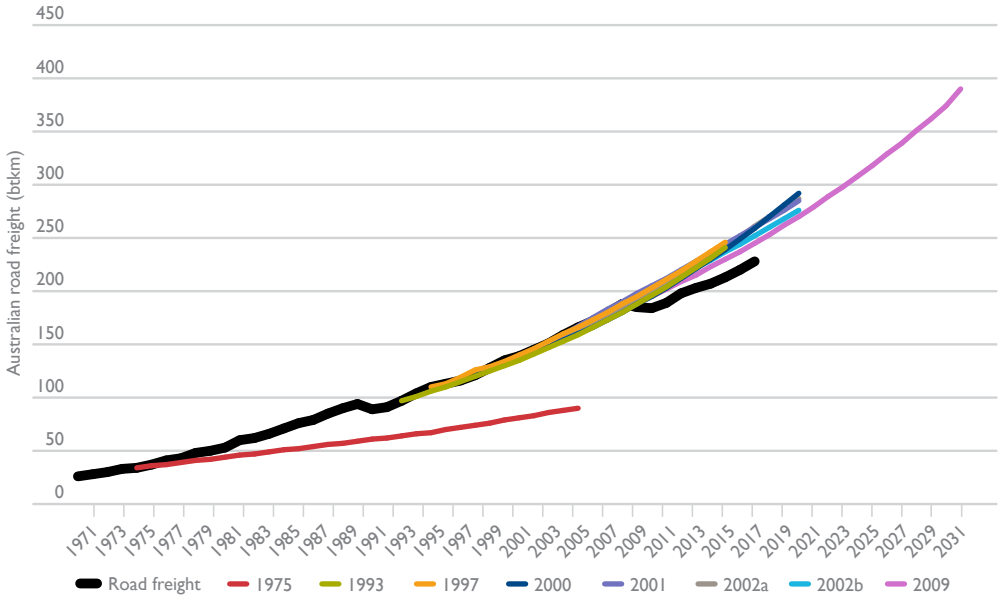
Figure 2.18 Interstate rail freight



Road Freight

Total Australian road freight followed a similar pattern to interstate road freight, except that the effect of the recession of the early 1990s is more prominent.

Figure 2.19 Total Australian road freight



The earliest forecast of Australian road freight in 1975 seems to have been influenced by the early 1970s recession towards a very low growth rate. Subsequent forecasts have been progressively better until the Global Financial Crisis and manufacturing decline saw them overshoot (black swans again).

Rail Freight

There are two major categories of rail freight – bulk and non-bulk.

Bulk rail freight is linked to commodity production in Australia, and the growth in commodity production, and thus in bulk rail freight, seems to have been systematically underestimated since the 1990s.

Figure 2.20 Bulk rail freight

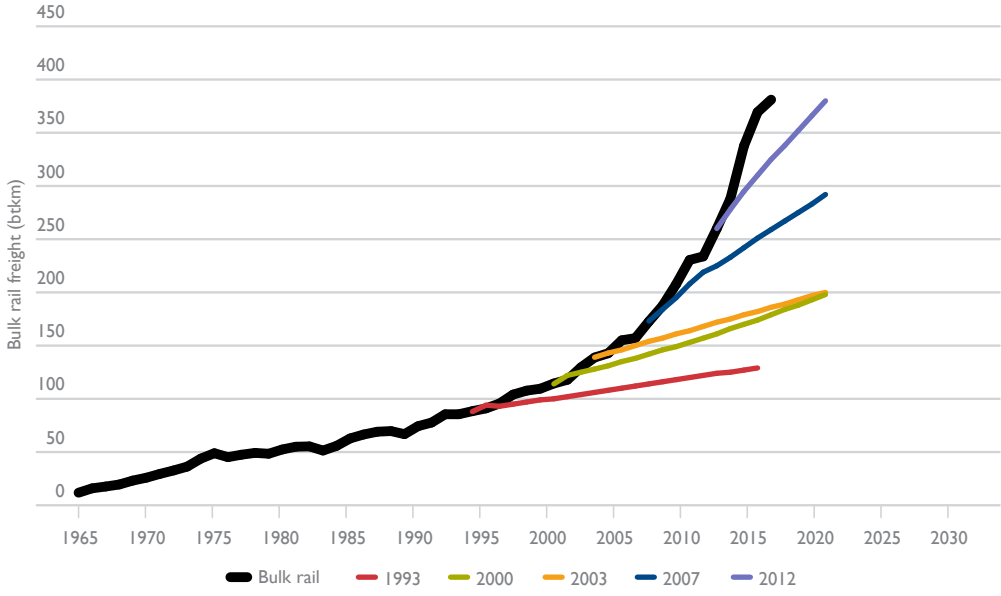
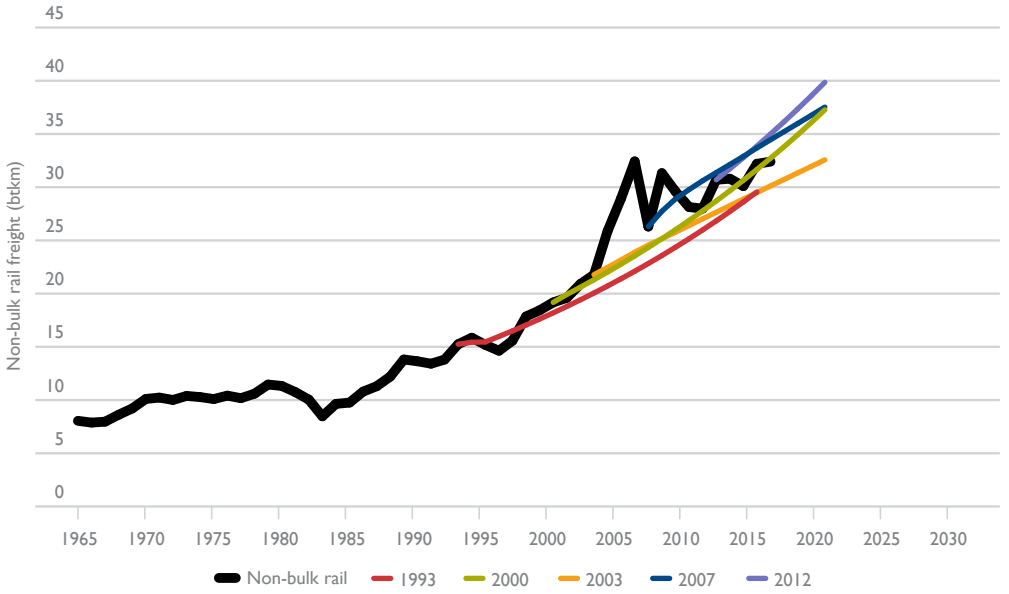


Figure 2.21 Non-bulk rail freight

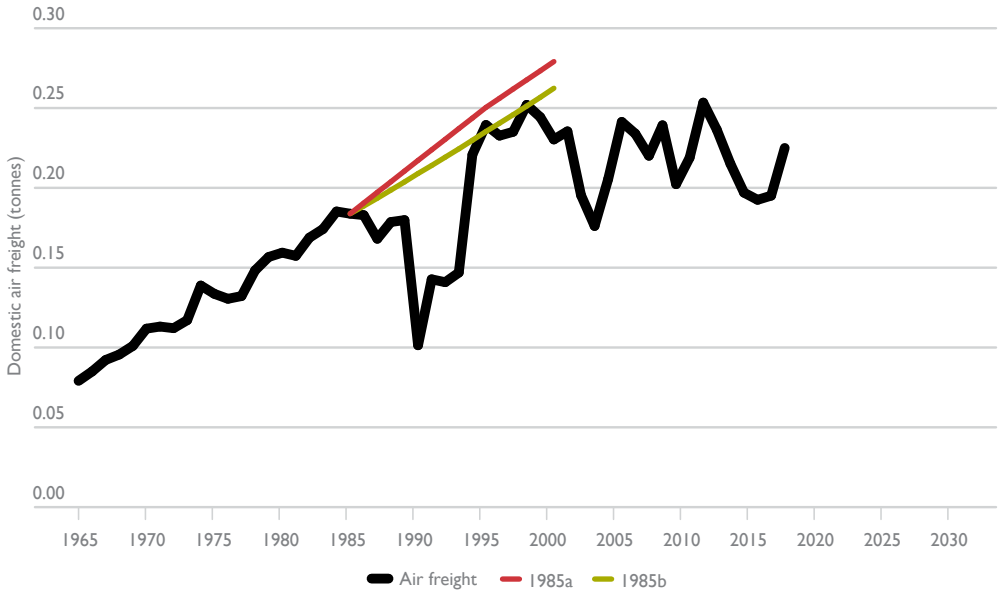


Non-bulk rail freight in the whole of Australia has a pattern similar to interstate rail freight. Up to 2006, growth had been accelerating. But post-Global Financial Crisis there has been a substantial drop below previous trend. Early forecasts (notably the 2000 forecast) that were below the actual came closer to it after the Global Financial Crisis (just lucky, not good forecasting).

Air Freight

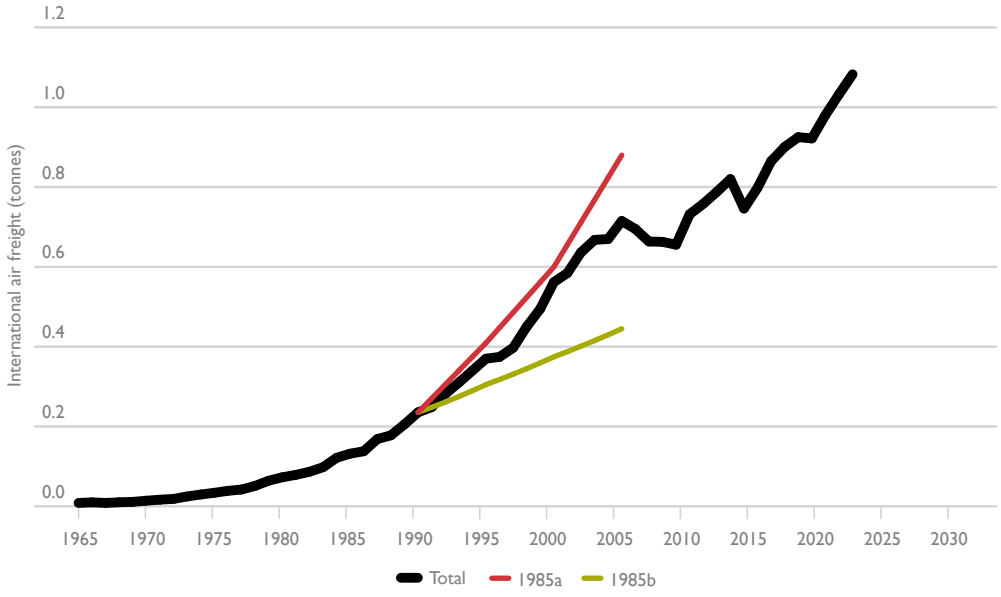
Domestic air freight saw a linear trend to the early 1990s, a sudden drop and then recovery after the demise of Ansett, and then a flat trend thereafter. The two 1985 forecasts didn't pick the drop, but came close when freight volumes recovered in the late 1990s. Since then the trend has been flat.

Figure 2.22 Domestic air freight



International air freight showed a slowing exponential growth to the early 1990s, an upward shift similar to that for domestic air freight to 1995, and then a resumption of slowing growth. The 1985a forecast did all right to 1995, but only because it didn't slow the exponential growth, and so mimicked the effect of the upward shift. The 1985b forecast had exponential growth turning into linear growth – prematurely as it turned out.

Figure 2.23 International air freight



Airports

Forecasts of airport capacity demand rely on activity forecasts of passenger and aircraft movements through airports.

As such the activity forecasts are of great importance to the planning of infrastructure expansions, such as the Sydney second airport.

Passenger Movements through Capital City Airports

The eight capital city airports are major hubs of the domestic air travel network.

The pattern of growth of airport passenger numbers has been one of a semi-exponential growth, split into sections (see Figure 2.24).

The sections were initiated by one-off events, followed by new industry players entering.

The first stage of growth was from 1965 to 1980, and ended when domestic airfares rose sharply from 1980 to 1983 (see Figure 2.25) and international airfares ceased their dramatic decline in the period 1965 to 1980 (see Figure 2.26).

The next stage ran to the pilots' strike in 1990.

Then during the 1990s growth resumed, only to be interrupted in 2001–02 by the collapse of Ansett Airlines.

Thereafter, the advent of cut-price airlines has progressively reduced real best discount airfares, resulting in high growth rates for airport passenger numbers.

Finally, the Global Financial Crisis again interrupted growth in 2009, after which growth has resumed.

The forecasts made in the past have generally been successful only as long as the stage in which they were made lasted.

In general, they were satisfactory within the stage, above the down-turn and below the next stage.

Recent forecasts have missed a downturn related to the collapse of the mining boom.

The messages for forecasters from this analysis are as follows:

1. Predicting domestic airfares is difficult, international airfares less so. Probably the best forecast is no change for the longer term.
2. There have been, and are likely to continue to be, stages of semi-exponential growth corresponding to changes in industry structure.
3. Black swans happen (pilots' strike, Ansett, Global Financial Crisis, mining booms/busts).

Figure 2.24 Air passenger movements through capital city airports

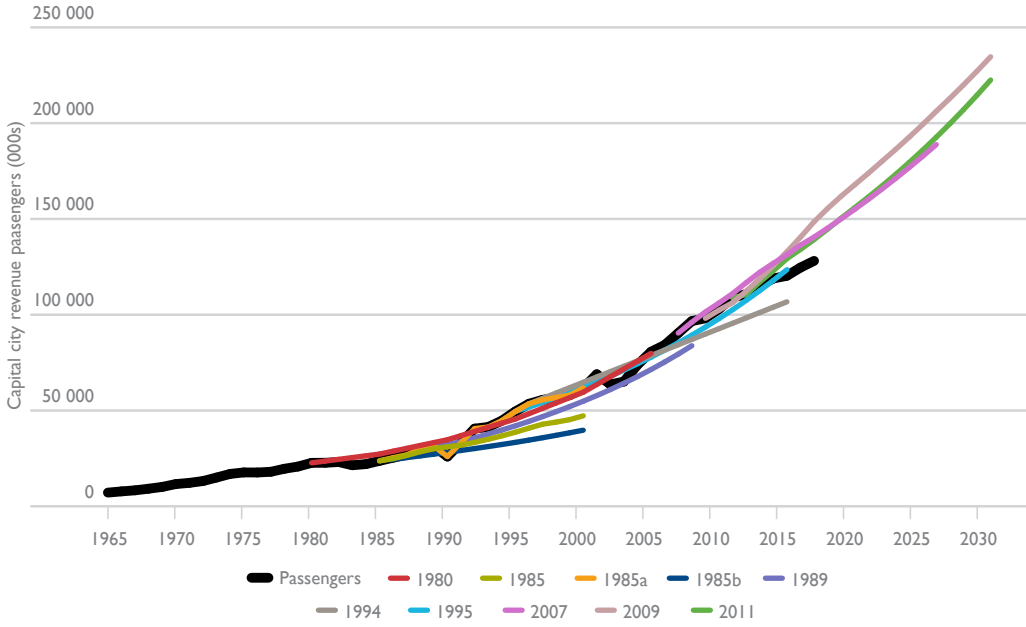


Figure 2.25 Real medium-distance airfares (average of economy and best discount)

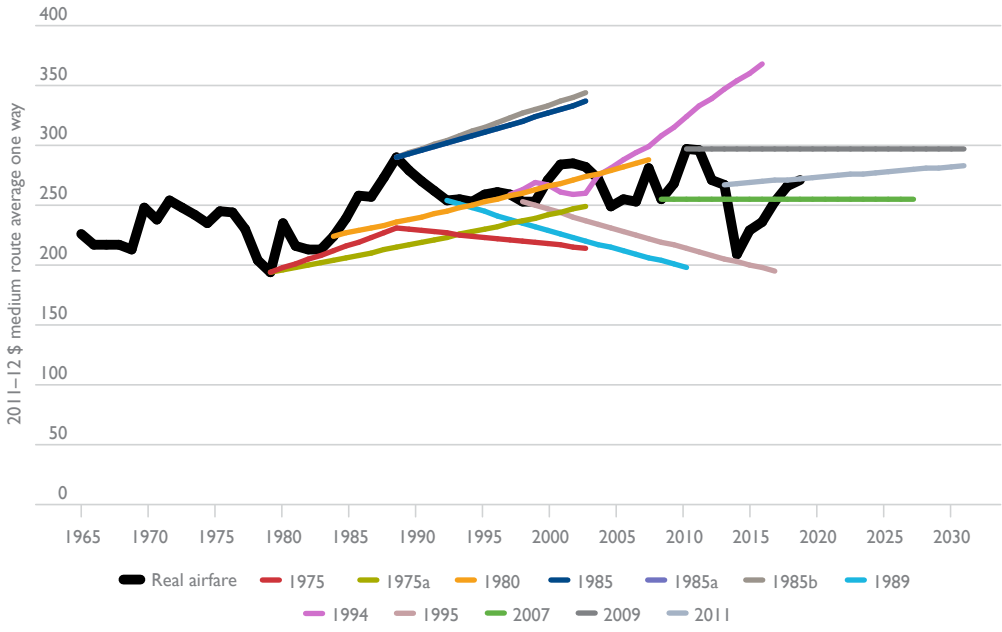
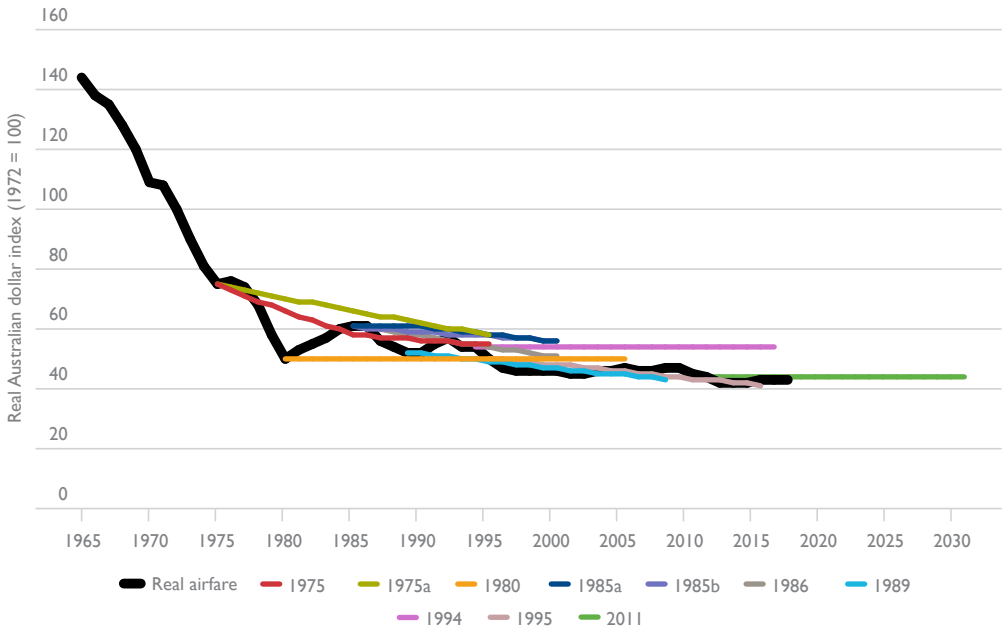


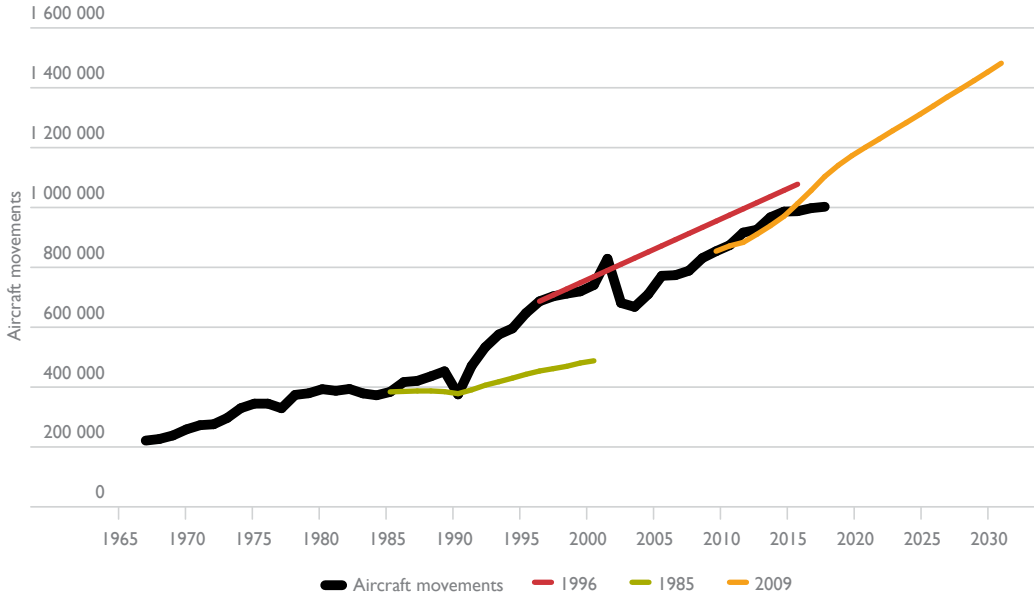
Figure 2.26 Real international airfares



Aircraft Movements through Capital City Airports

The earliest forecast for all capital city airports combined was made in 1985. It continued the trend from the early 1980s. It was increasingly below the actual as time went by, especially when the surge in activity in the early 1990s (that we saw also in air freight) took place. The second forecast made in 1996 again got the trend right for a few years, before the collapse of Ansett Airlines in 2001–02 shifted the level of flights downward. The recent drop-off in movements is basically in Sydney, related to capacity constraints developing prior to the new second airport opening.

Figure 2.27 Aircraft movements through capital city airports



Ports

The movement of containers through ports is important to forecast, due to its rapid growth and to the location of many ports in the heart of capital cities.

Figure 2.28 shows the number of full container imports passing through capital city ports.

The first forecast in 1995 was far too low, bearing no relationship to past growth rates.

The next two forecasts in 2001 and 2003 were also low, but much less so.

The latest set of forecasts were accurate to 2008, after which the effects of the Global Financial Crisis meant they erred on the high side. It seems that expectations of continued rapid growth in imports are not coming to pass.

Forecasts of container export movements have been similar in accuracy to those for imports, except that the effect of the Global Financial Crisis has been added to by the decline in Australian manufacturing exports. This meant that forecasts in the mid-2000s have turned out to be much higher than the actual levels. The latest forecast has built this lowering into predicted future export levels.

Figure 2.28 Container import movements through capital city ports

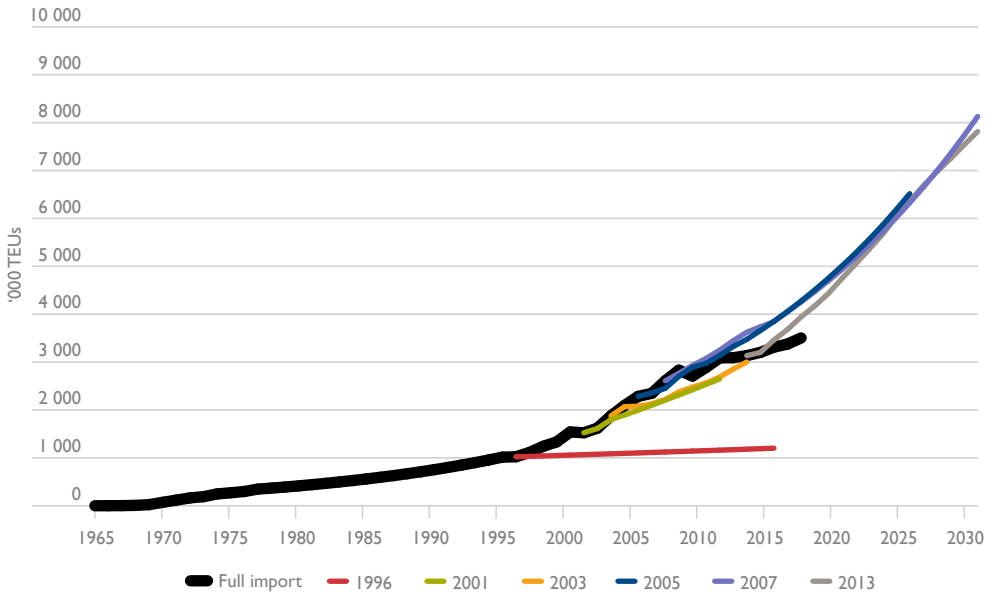
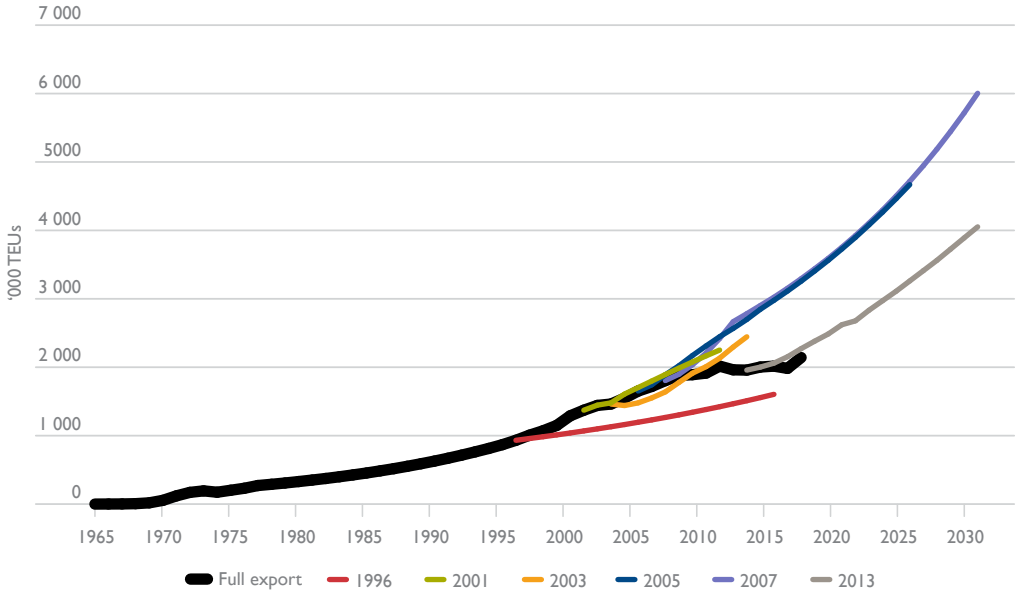


Figure 2.29 Container export movements through capital city ports



Congestion

There have been three forecasts made of congestion costs in Australia's capital cities (see Figure 2.30).

The first was made in 1995 and turned out to be on the low side.

The cause wasn't errors in the forecast growth in metropolitan traffic.

As Figure 2.4 showed, the 1995 forecast of that was almost spot on (luck involved).

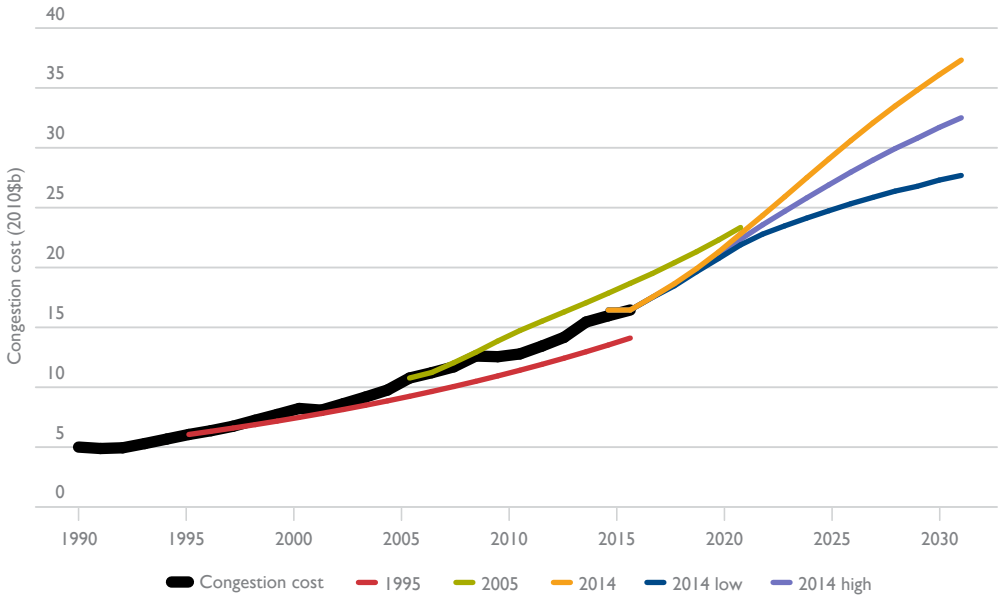
Rather, it was a significant underestimate of the congestion cost per vkt in Sydney that was responsible.

The second forecast was tracking the actual cost well, until the Global Financial Crisis caused a step drop in metropolitan traffic (again see Figure 2.4).

The actual congestion cost then resumed tracking the forecast at a lower level.

The most recent forecast is for a steeper rise in congestion costs corresponding to a forecast higher growth in metropolitan traffic (again see Figure 2.4).

Figure 2.30 Congestion cost in Australia's capital cities



Greenhouse gas emissions

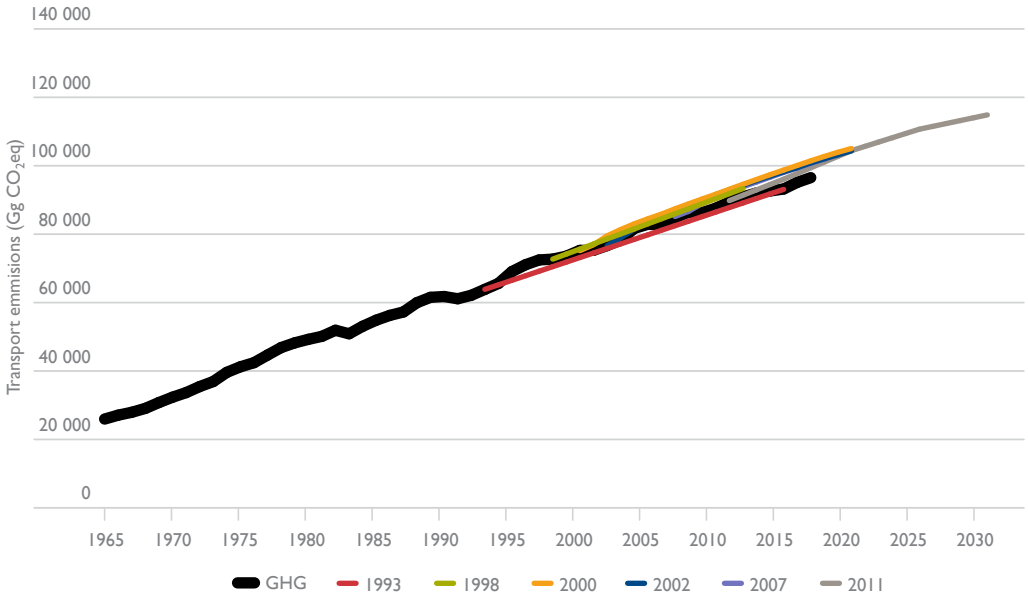
Greenhouse gas (GHG) emissions from Australian transport to 2008 exhibited very little noise around a very stable trend. However, after the global Financial Crisis, the trend fell in level and has remained below the previous trend.

The earliest forecast, made in the early 1990s, came out low.

Later forecasts followed the trend nicely until the Global Financial Crisis, after which they came out high. Even so, the importance of the trend is apparent.

In the future, there will be many possible disruptive technologies (electric vehicles, autonomous vehicles, bio-fuel technologies, etc.) that will change the trend.

Figure 2.31 Greenhouse gas emissions from Australian transport



CHAPTER 3
Conclusions

Sources of error

Several sources of error in past forecasts by the Bureau have been illustrated in this Report, as well as areas of success.

Errors in Structural Frameworks

In the three forecast areas reviewed, proper structural equations (usually 1990 on) gave reasonable forecasts if the dependent variables had reasonable values.

However, past Bureau models of the number of motor vehicles illustrate the effect of missing a crucial element in a structural model. No account was taken of the trend of consumers buying more cars and then using each of them less. The result was that consumers' total travel agreed with the structural models (given the right independent variable readings, especially population), but the number of vehicles per person did not stay constant as the structural models assumed. The result was under-prediction of motor vehicle number growth, especially as ABS population projections did not allow for the increased level of immigration that eventuated.

Missing crucial structural components can result in forecasts going wrong.

Errors in Independent Variables

Where independent variables radically changed trend – for example population growth with radical changes in immigration affecting traffic forecasts, or surges in the cost of living increasing the demand for UPT – even proper structural model forecasts were in error.

However, given that Government Departments' projections of GDP, population, exchange rates, etc. are politically sensitive, the "unchanged trend" or "accepted Government projection" is the required base for Government forecasts of independent variables.

Errors due to Structural Change

When the structure of an industry changes, It often marks the end of one stage of exponential growth and the beginning of a new one. This was quite apparent in the growth patterns of passenger movements through capital city airports.

Forecasters need to try to imagine the next such future industry structure, rather than rely entirely on estimated equations.

Errors due to Radical Change

Other errors in forecasts were after periods of disturbance, such as the Global Financial Crisis, the collapse of Ansett, etc., or due to changes in industry structure, for example the introduction of cut-price airlines.

These changes in structure are "black swan" events – events that couldn't be predicted. Such changes can only be dealt with in advance, using scenarios that consider unlikely scenarios.

Errors due to Accepting Short-term Growth Trends

Some Bureau forecasts, especially the earlier non-structural ones, were overly influenced by the short-term past trend. The 1975 total Australian road freight forecast is a case in point, projecting a short-term trend set during the early-1970s recession.

No Error, Due to Compensating Errors

Good luck – it has to happen sometime! A prime example is the 1995 metropolitan passenger travel forecast, which has been almost perfect during the 20 years to 2015. It owes its accuracy to the fact that its over-estimation of per person travel since the Global Financial Crisis in 2008 almost perfectly balances its underestimation of population growth (due to increases in immigration) during the same time period.

So a forecast can be good for the wrong reasons.

Improving future forecasts

The current analysis of past Bureau forecasting suggests several ways of improving on the process.

In spite of progress over the decades in the technology and techniques of forecasting, it remains the case that accurate long-term forecasting relies principally on assembling long-term standardised datasets for the structural components of the phenomenon of interest, and then modelling how the components fit together. The importance of understanding the dynamics of the independent variables that drive the structural components is also crucial to forecast success.

Using long time series of aggregates of transport activities and their components allows one to better visualise how the long-term trends emerge. Looking at past forecasting efforts alongside these trends allows a better understanding of what works and what doesn't work in the process of forecasting Australian transport.

However, even with proper structural models, transport activity forecasts are only as good as the projections of their determining factors, e.g. population growth, GDP, fares, etc. Given the uncertainties in these determining factors, the use of sensitivity tests is crucial to at least giving an idea to users of how the forecasts might change under different conditions.

APPENDIX A
Data tables

Note: The numbers heading each column of the forecasts refer to the "Numbered Bureau References" section following Appendix A

Table A1.1 Actual Australian population (000s) versus ABS projections

	Australia	1970	1976	1987	1997	2002	2007	2012
1965	11609							
1966	11834							
1967	12050							
1968	12281							
1969	12554							
1970	12810	12486						
1971	13068	12728						
1972	13304	12966						
1973	13505	13216						
1974	13723	13472						
1975	13893	13734	13893					
1976	14033	14001	14099					
1977	14193	14274	14308					
1978	14360	14553	14519					
1979	14516	14835	14734					
1980	14696	15123	14952					
1981	14923	15414	15163					
1982	15184	15709	15377					
1983	15393	16008	15594					
1984	15579	16310	15814					
1985	15788	16615	16037					
1986	16018	16922	16251					
1987	16264	17232	16469	16264				
1988	16532	17541	16690	16533				
1989	16814	17855	16914	16806				
1990	17065	18169	17140	17076				
1991	17284	18488	17360	17355				
1992	17478	18809	17582	17636				
1993	17635	19133	17807	17914				
1994	17803	19460	18035	18189				
1995	18002	19791	18266	18462				
1996	18222	20128	18488	18733				
1997	18421	20468	18714	18999	18529			
1998	18605	20815	18942	19266	18729			
1999	18810	21167	19173	19527	18920			
2000	19027	21525	19407	19787	19108			
2001	19272	21889	19642	20043	19294			
2002	19493		19876	20296	19477	19660		
2003	19719		20111	20545	19658	19888		
2004	19931		20345	20790	19837	20110		
2005	20175		20580	21033	20013	20324		
2006	20449			21274	20186	20531	20449	
2007	20825			21512	20357	20734	20610	
2008	21247			21749	20524	20935	21006	
2009	21689			21984	20690	21133	21325	
2010	22029			22218	20853	21329	21644	
2011	22337			22451	21014	21522	21964	
2012	22740			22683	21173	21712	22284	22719
2013	23143			22913	21329	21901	22605	23116
2014	23502			23144	21484	22089	22927	23521

Actual Australian population (000s) versus ABS projections (continued)

	Australia	1970	1976	1987	1997	2002	2007	2012
2015	23848			23372	21637	22276	23249	23937
2016	24207			23601	21789	22461	23571	24357
2017	24578			23829	21938	22646	23894	24778
2018				24053	22086	22829	24216	25198
2019				24281	22232	23010	24537	25617
2020				24504	22375	23189	24857	26034
2021				24723	22515	23365	25177	26449
2022				24943	22653	23540	25495	26863
2023				25162	22787	23710	25812	27276
2024				25374	22918	23877	26127	27687
2025				25584	23046	24040	26440	28096
2026				25792	23169	24199	26750	28503
2027				25996	23288	24353	27057	28906
2028				26194	23402	24501	27361	29308
2029				26389	23512	24644	27661	29707
2030				26581	23616	24781	27958	30104
2031					23717	24912	28250	30498
2032					23812	25037	28539	30889
2033					23902	25156	28824	31276
2034					23988	25269	29104	31661
2035					24069	25375	29382	32043
2036					24145	25475	29656	32423
2037					24218	25568	29927	32800
2038					24287	25657	30195	33175
2039					24352	25739	30461	33549
2040					24413	25817	30724	33921
2041					24472	25889	30985	34291
2042					24528	25957	31245	34661
2043					24581	26021	31503	35030
2044					24632	26081	31759	35398
2045					24680	26138	32014	35765
2046					24727	26191	32267	36132
2047					24773	26242	32519	36498
2048					24816	26289	32770	36863
2049					24859	26335	33019	37227
2050					24901	26378	33268	37590
2051							33515	37953
2052							33761	38314
2053							34006	38674
2054							34250	39033
2055							34494	39391
2056							34737	39747
2057								40102
2058								40456
2059								40809
2060								41160
2061								41510

Table A1.2 Actual Australian real GDP versus projections

No. bureau ref.		32	12	12	61	14	24	16	34	51	1	6	38	58	35	9	29	8,44	10	11	30c	59
GDP	$billion chain volume		2.50%	3.00%		NIEIR		2.50%	3.00%		3.00%	3.25%		3.00%	2.70%	Treasury	Treasury	Access	2.70%	Access	Treasury	
Financial year	GDP	1975	1976	1976 high	1983	1984a	1984b	1986	1989	1993	1994	1995a	1995b	1998	2002	2003	2004	2005a	2005b	2006	2007	2008
1960	245																					
1961	251																					
1962	255																					
1963	271																					
1964	289																					
1965	307																					
1966	315																					
1967	334																					
1968	351																					
1969	376																					
1970	402																					
1971	420																					
1972	434																					
1973	447																					
1974	465																					
1975	470	470																				
1976	484	504	484	484																		
1977	500	538	496	498																		
1978	505	573	508	513																		
1979	525	607	521	529																		
1980	541	641	534	544																		
1981	560	661	547	561																		
1982	578	681	561	578																		
1983	566	701	575	595	566																	
1984	591	721	589	613	585	591	591															
1985	623	741	604	631	604	616	591															
1986	648	765	619	650	620	633	611	648														
1987	665	790	635	670	637	650	633	664														

Actual Australian real GDP versus projections (continued)

No. bureau ref.		32	12	12	61	14	24	16	34	51	1	6	38	58	35	9	29	8,44	10	11	30c	59
GDP	$billion chain volume		2.50%	3.00%		NIEIR		2.50%	3.00%		3.00%	3.25%		3.00%	2.70%	Treasury	Treasury	Access	2.70%	Access	Treasury	
Financial year	GDP	1975	1976	1976 high	1983	1984a	1984b	1986	1989	1993	1994	1995a	1995b	1998	2002	2003	2004	2005a	2005b	2006	2007	2008
1988	703	814	651	690	655	668	655	681														
1989	731	838	667	710	673	686	678	698	731													
1990	756	862	684	732	691	705	701	715	752													
1991	754	889	701	754	709	721	726	733	775													
1992	757	916	718	776	726	737	751	751	798													
1993	787	943	736	800	744	754	778	770	822	787												
1994	820	969	754	824	763	771	805	789	847	812	820											
1995	852	996	773	848	782	788	833	809	872	838	845	852	852									
1996	885	1028	793	874	800	802	858	829	899	865	870	879	879									
1997	919	1061	813	900	818	816	884	850	925	893	896	908	908									
1998	962	1093	833	927	836	830	910	871	953	921	923	938	938	962								
1999	1009	1125	854	955	855	845	938	893	982	952	951	968	968	991								
2000	1048	1157	875	983	874	860	966	915	1011	983	979	999	999	1020								
2001	1069	1193					995			1016	1009	1032	1032	1051								
2002	1109	1230					1025			1049	1039	1066	1066	1083	1109							
2003	1144	1267					1055			1084	1070	1100	1100	1115	1139	1144						
2004	1190	1303					1087			1120	1102	1136	1136	1148	1170	1184	1190					
2005	1229	1340					1120			1157	1135	1173	1173	1183	1201	1224	1232	1229	1229			
2006	1265									1195	1169	1211	1211	1218	1234	1267	1275	1266	1262	1265		
2007	1313									1234	1204	1250	1250	1255	1267	1305	1320	1305	1296	1294	1313	
2008	1362									1275	1240	1291	1291	1293	1301	1341	1356	1354	1331	1351	1349	1362
2009	1386									1317	1278	1333	1333	1331	1336	1377	1393	1405	1367	1403	1387	1394
2010	1414									1360	1316	1376	1376	1371	1372	1414	1429	1451	1404	1449	1426	1407
2011	1448									1405	1355	1421	1421	1412	1409	1451	1467	1495	1442	1497	1465	1449
2012	1500									1452	1396	1467	1467	1455	1447	1487	1504	1537	1481	1552	1506	1478
2013	1539									1500	1438	1515	1515	1498	1486	1524	1542	1577	1521	1605	1548	1512
2014	1579									1549	1481	1564	1564	1543	1527	1561	1579	1616	1562	1650	1591	1564
2015	1617									1600		1615	1615	1590	1568	1598	1616	1657	1604	1693	1636	1600

Actual Australian real GDP versus projections (continued)

No. bureau ref.		32	12	12	61	14	24	16	34	51	1	6	38	58	35	9	29	8,44	10	11	30c	59
GDP	$billion chain volume		2.50%	3.00%		NIEIR		2.50%	3.00%		3.00%	3.25%		3.00%	2.70%	Treasury	Treasury	Access	2.70%	Access	Treasury	
Financial year	GDP	1975	1976	1976 high	1983	1984a	1984b	1986	1989	1993	1994	1995a	1995b	1998	2002	2003	2004	2005a	2005b	2006	2007	2008
2016	1660											1667	1667	1637	1610	1635	1653	1698	1648	1742	1681	1621
2017	1695											1722	1722	1687	1654	1671	1690	1740	1692	1782	1728	1654
2018												1777	1777	1737	1698	1708	1727	1784	1738	1827	1777	1708
2019												1835	1835	1789	1744	1745	1764	1829	1785	1872	1826	1753
2020												1895	1895	1843	1791	1782	1801	1874	1833	1919	1877	1781
2021																1820		1921	1883	1967	1930	1824
2022																1858		1969	1933	2016	1983	1868
2023																1896		2018	1986	2067	2039	1912
2024																1934		2069	2039	2118	2096	1958
2025																1973		2121	2094	2171	2154	2005
2026																					2214	2053
2027																					2276	2103
2028																					2339	2153
2029																					2405	2205
2030																					2472	2258

Table A1.3 Actual real G7 GDP versus projections

No. bureau ref.		33	49			51	42	44	8	11	59
US$billion	2005 basis		High	Low	Average						
Financial year	G7 GDP	1975	1981	1981	1981	1993	2003	2004	2005	2006	2009
1960	5467										
1961	5692										
1962	6020										
1963	6307										
1964	6703										
1965	7069										
1966	7487										
1967	7760										
1968	8202										
1969	8622										
1970	8901										
1971	9205										
1972	9693										
1973	10296										
1974	10315										
1975	10310	10310									
1976	10816	10692									
1977	11244	11088									
1978	11762	11498									
1979	12194	11923									
1980	12276	12364									
1981	12489	12822	12489	12489	12489						
1982	12445	13296	12992	12489	12741						
1983	12807	13788	13516	12489	13002						
1984	13429	14298	14061	12489	13275						
1985	13895	14827	14627	12489	13558						
1986	14309	15376	15217	12489	13853						
1987	14752	15945	15830	12489	14159						
1988	15402	16535	16468	12489	14478						
1989	15947	17147	17132	12489	14810						
1990	16335	17781	17822	12489	15155						
1991	16419	18439	18540	12489	15515						
1992	16710	19121	19287	12489	15888						
1993	16887	19829	20065	12489	16277	16887					
1994	17372	20562	20873	12489	16681	17360					
1995	17738	21323	21715	12489	17102	17846					
1996	18278		22590	12489	17539	18346					
1997	18825		23500	12489	17994	18859					
1998	19236		24447	12489	18468	19387					
1999	19773		25432	12489	18961	19969					
2000	20481		26457	12489	19473	20568					
2001	20612		27523	12489	20006	21185					
2002	20924		28633	12489	20561	21821					
2003	21376		29787	12489	21138	22475	21376				
2004	22047		30987	12489	21738	23149	21821	22047			
2005	22551		32236	12489	22362	23844	22344	22541	22551		
2006	23157					24559	22809	23046	23092	23157	
2007	23659					25296	23265	23562	23665	23769	

Actual real G7 GDP versus projections (continued)

No. bureau ref.		33	49			51	42	44	8	11	59
US$billion	2005 basis		High	Low	Average						
Financial year	G7 GDP	1975	1981	1981	1981	1993	2003	2004	2005	2006	2009
2008	23622					26055	23824	24090	24365	24263	
2009	22729					26837	24357	24629	25106	24768	22729
2010	23390					27642	24864	25181	25769	25342	23021
2011	23754					28471	25361	25745	26387	25930	23574
2012	24087					29325	25868	26322	26978	26511	24142
2013	24420					30205	26386	26911	27539	27062	24702
2014	24819					31111		27514	28090	27604	25224
2015	25252					32044		28130	28652	28134	25757
2016	25641							28760	29225	28651	26301
2017	26088							29405	29809	29179	26856
2018								30063	30406	29715	27423
2019								30737	31014	30262	28003
2020								31425	31634	30819	28594
2021								32129	32267	31386	29198
2022								32849	32912	31964	29815
2023								33585	33570	32552	30444
2024								34337	34242	33151	31087
2025								35106	34926	33761	31744
2026										34382	32414
2027											33099
2028											33798
2029											34512
2030											35241

Table A1.4 Actual Australian dollar exchange rate versus projections

No. bureau ref.		24	17	16,49	52	3,4	44	8	47a
Financial year	US$/$A	1981	1985	1986	1993	1994	2004	2005	2010
1965	1.11								
1966	1.11								
1967	1.11								
1968	1.11								
1969	1.11								
1970	1.12								
1971	1.13								
1972	1.19								
1973	1.42								
1974	1.44								
1975	1.31								
1976	1.22								
1977	1.11								
1978	1.14								
1979	1.12								
1980	1.14								
1981	1.15	1.15							
1982	1.01	1.09							
1983	0.90	1.07							
1984	0.88	1.05							
1985	0.70	1.03	0.70						
1986	0.67	1.01	0.65	0.67					
1987	0.70	0.98	0.66	0.67					
1988	0.78	0.96	0.66	0.67					
1989	0.79	0.94	0.67	0.67					
1990	0.78	0.92	0.68	0.67					
1991	0.78	0.90	0.67	0.67					
1992	0.73	0.88	0.67	0.67					
1993	0.68	0.86	0.67	0.67	0.68				
1994	0.73	0.84	0.67	0.67	0.69	0.73			
1995	0.74	0.82	0.67	0.67	0.70	0.73			
1996	0.78	0.80	0.67	0.67	0.72	0.73			
1997	0.74	0.78	0.67	0.67	0.73	0.73			
1998	0.63	0.76	0.67	0.67	0.74	0.73			
1999	0.65	0.74	0.67	0.67	0.74	0.73			
2000	0.58	0.72	0.67	0.67	0.73	0.73			
2001	0.52				0.73	0.73			
2002	0.54				0.72	0.73			
2003	0.65				0.71	0.73			
2004	0.74				0.71	0.73	0.74		
2005	0.76				0.71	0.73	0.61	0.76	
2006	0.75				0.71	0.73	0.61	0.75	
2007	0.84				0.71	0.73	0.61	0.69	
2008	0.84				0.71	0.73	0.61	0.60	
2009	0.78				0.71	0.73	0.61	0.62	
2010	0.92				0.71	0.73	0.61	0.65	0.92
2011	1.04				0.71	0.73	0.61	0.61	0.90
2012	1.04				0.71	0.73	0.61	0.61	0.90
2013	0.96				0.71	0.73	0.61	0.60	0.90

Actual Australian dollar exchange rate versus projections (continued)

No. bureau ref.		24	17	16,49	52	3,4	44	8	47a
Financial year	US$/$A	1981	1985	1986	1993	1994	2004	2005	2010
2014	0.90				0.71	0.73	0.61	0.59	0.90
2015	0.83				0.71	0.73	0.61	0.59	0.90
2016	0.73						0.61	0.59	0.90
2017	0.75						0.61	0.59	0.90
2018							0.61	0.59	0.90
2019							0.61	0.59	0.90
2020							0.61	0.59	0.90
2021							0.61	0.59	0.90
2022							0.61	0.59	0.90
2023							0.61	0.59	0.90
2024							0.61	0.59	0.90
2025							0.61	0.59	0.90
2026									0.90
2027									0.90
2028									0.90
2029									0.90
2030									0.90

Table A1.5 Actual Australian petrol price versus projections

No. bureau ref.	Real 2014	61	23	3,4	30b
Financial year	Petrol price	1983	1984	1996	2011
1965	92				
1966	95				
1967	95				
1968	96				
1969	94				
1970	93				
1971	97				
1972	96				
1973	90				
1974	97				
1975	95				
1976	97				
1977	89				
1978	89				
1979	101				
1980	124				
1981	125				
1982	121				
1983	126	126			
1984	130	126	130		
1985	134	126	130		
1986	131	127	130		
1987	123	129	130		
1988	116	130	130		
1989	104	131	130		
1990	110	132	130		
1991	121	134	130		
1992	114	135	130		
1993	115	136	130		
1994	111	138	130		
1995	109	139	130		
1996	109	141	130	109	
1997	110	142	130	109	
1998	107	143	130	109	
1999	101	145	130	109	
2000	115	146	130	109	
2001	131			109	
2002	116			109	
2003	120			109	
2004	120			109	
2005	131			109	
2006	152			109	
2007	148			109	
2008	158			109	
2009	145			109	
2010	138			109	
2011	142			109	142
2012	151			109	142
2013	146			109	142

Actual Australian petrol price versus projections (continued)

No. bureau ref.	Real 2014	61	23	3,4	30b
Financial year	Petrol price	1983	1984	1996	2011
2014	151			109	142
2015	131			109	142
2016	119				142
2017	117				142
2018					142
2019					142
2020					142
2021					142
2022					142
2023					142
2024					142
2025					142
2026					142
2027					142
2028					142
2029					142
2030					142

Table A1.6 Actual Australian unemployment rate versus projections (per cent)

No. bureau ref.		30B	30A
Financial year	Unemployment	2010	2011
1950	1.8		
1951	1.1		
1952	1.4		
1953	2.9		
1954	2		
1955	1.4		
1956	1.5		
1957	2		
1958	2.6		
1959	2		
1960	2.4		
1961	2.3		
1962	3.2		
1963	2.2		
1964	1.7		
1965	1.2		
1966	1.4		
1967	1.5		
1968	1.6		
1969	1.5		
1970	1.6		
1971	1.9		
1972	2.6		
1973	2.3		
1974	2.7		
1975	4.9		
1976	4.8		
1977	5.7		
1978	6.3		
1979	6.3		
1980	6.2		
1981	5.9		
1982	6.2		
1983	9.0		
1984	9.6		
1985	8.6		
1986	7.9		
1987	8.3		
1988	7.8		
1989	6.6		
1990	6.2		
1991	8.3		
1992	10.3		
1993	10.9		
1994	10.5		
1995	8.9		
1996	8.4		
1997	8.6		
1998	8.0		

Actual Australian unemployment rate versus projections (per cent) (continued)

No. bureau ref.		30B	30A
Financial year	Unemployment	2010	2011
1999	7.3		
2000	6.6		
2001	6.3		
2002	6.7		
2003	6.1		
2004	5.6		
2005	5.2		
2006	5.0		
2007	4.5		
2008	4.2		
2009	4.9		
2010	5.5	5.5	
2011	5.0	5.5	5.0
2012	5.2	5.5	5.0
2013	5.4	5.5	5.0
2014	5.8	5.5	5.0
2015	6.2	5.5	5.0
2016	5.9	5.5	5.0
2017	5.7	5.5	5.0
2018		5.5	5.0
2019		5.5	5.0
2020		5.5	5.0
2021		5.5	5.0
2022		5.5	5.0
2023		5.5	5.0
2024		5.5	5.0
2025		5.5	5.0
2026		5.5	5.0
2027		5.5	5.0
2028		5.5	5.0
2029		5.5	5.0
2030		5.5	5.0

Table A1.7 Actual interstate freight rates versus projections (real c/ntkm 2011–12)

No. bureau ref.		49	52	28	29,40	43	47	11a
Financial year	Real road IS	1985	1993	2000	2003a	2003b	2006	2007
1965	14.3							
1966	13.7							
1967	13.9							
1968	14.0							
1969	14.3							
1970	14.2							
1971	14.4							
1972	14.1							
1973	14.2							
1974	13.8							
1975	13.3							
1976	12.9							
1977	12.2							
1978	11.6							
1979	11.3							
1980	10.4							
1981	9.8							
1982	9.4							
1983	9.0							
1984	8.6							
1985	8.5	8.5						
1986	8.3	8.5						
1987	8.3	8.4						
1988	8.2	8.3						
1989	8.1	8.3						
1990	8.0	8.2						
1991	8.0	8.2						
1992	8.2	8.1						
1993	8.2	8.0	8.2					
1994	8.3	8.0	8.2					
1995	8.1	7.9	8.1					
1996	7.8	7.9	8.1					
1997	7.9	7.9	8.0					
1998	8.0	7.8	7.9					
1999	8.0	7.8	7.9					
2000	7.9	7.8	7.8	7.9				
2001	7.7		7.8	7.9				
2002	7.6		7.7	7.9				
2003	7.6		7.7	7.8	7.6	7.6		
2004	7.6		7.6	7.8	7.9	7.6		
2005	7.9		7.6	7.7	7.9	7.5		
2006	8.2		7.5	7.7	7.9	7.5	8.2	
2007	8.2		7.4	7.7	7.8	7.5	8.2	8.2
2008	8.3		7.4	7.6	7.8	7.4	8.2	8.2
2009	8.5		7.3	7.6	7.7	7.4	8.2	8.2
2010	8.3		7.3	7.5	7.7	7.3	8.2	8.2
2011	8.3		7.2	7.5	7.7	7.3	8.2	8.2
2012	8.5		7.2	7.5	7.6	7.3	8.2	8.3
2013	8.7		7.1	7.4	7.6	7.2	8.2	8.3

Actual interstate freight rates versus projections (real c/ntkm 2011–12) (continued)

No. bureau ref.		49	52	28	29,40	43	47	11a
Financial year	Real road IS	1985	1993	2000	2003a	2003b	2006	2007
2014	8.7		7.1	7.4	7.6	7.2	8.2	8.3
2015	8.6		7.0	7.4	7.5	7.2	8.2	8.3
2016	8.4			7.3	7.5	7.1	8.2	8.3
2017	8.3			7.3	7.4	7.1	8.2	8.3
2018				7.3	7.4	7.1	8.2	8.3
2019				7.2	7.4	7.0	8.2	8.4
2020				7.2	7.3	7.0	8.2	8.4
2021							8.2	
2022							8.2	
2023							8.2	
2024							8.2	
2025							8.2	
2026							8.2	
2027							8.2	
2028							8.2	
2029							8.2	
2030							8.2	

Table A1.8 Actual Urban Public Transport passenger fares versus projections

No. bureau ref.			(34)	(52)	(30B)
Financial year	2012=100	UPT real fares	1989	1993	2010
1948					
1949					
1950					
1951					
1952					
1953		36.0			
1954		35.7			
1955		35.2			
1956		36.3			
1957		43.7			
1958		43.9			
1959		47.1			
1960		47.8			
1961		48.1			
1962		48.5			
1963		48.8			
1964		48.8			
1965		49.6			
1966		50.5			
1967		57.4			
1968		56.9			
1969		60.3			
1970		61.9			
1971		62.8			
1972		71.8			
1973		70.1			
1974		64.7			
1975		61.7			
1976		63.4			
1977		56.0			
1978		53.6			
1979		52.8			
1980		54.8			
1981		59.3			
1982		61.1			
1983		61.7			
1984		64.8			
1985		66.6			
1986		65.4			
1987		66.0			
1988		66.2			
1989		68.0	68.0		
1990		68.3	68.0		
1991		72.7	68.0		
1992		77.3	68.0		
1993		80.3	68.0	80.3	
1994		82.3	68.0	80.3	
1995		82.1	68.0	80.3	
1996		81.7	68.0	80.3	

Actual Urban Public Transport passenger fares versus projections (continued)

No. bureau ref.		2012=100	(34)	(52)	(30B)
Financial year	2012=100	UPT real fares	1989	1993	2010
1997		85.1	68.0	80.3	
1998		87.3	68.0	80.3	
1999		87.8	68.0	80.3	
2000		89.6	68.0	80.3	
2001		93.5		80.3	
2002		94.4		80.3	
2003		93.1		80.3	
2004		95.2		80.3	
2005		94.8		80.3	
2006		94.7		80.3	
2007		95.5		80.3	
2008		96.4		80.3	
2009		97.8		80.3	
2010		99.3		80.3	99.3
2011		98.2		80.3	99.3
2012		100.0		80.3	99.3
2013		102.8		80.3	99.3
2014		103.2		80.3	99.3
2015		100.5		80.3	99.3
2016		97.7			99.3
2017		96.9			99.3
2018					99.3
2019					99.3
2020					99.3
2021					99.3
2022					99.3
2023					99.3
2024					99.3
2025					99.3
2026					99.3
2027					99.3
2028					99.3
2029					99.3
2030					99.3

Table A1.9 Actual Australian domestic airfares versus projections

Restricted Economy, medium-distance routes (2003–04$)													
No. bureau ref.		12	33	24	14	49	61	36a	4	51,52,30h	11	30e	30j
Financial year	Real airfare	1975	1975a	1980	1985	1985a	1985b	1989	1994	1995	2007	2009	2011
1960	226												
1961	217												
1962	217												
1963	217												
1964	213												
1965	248												
1966	238												
1967	254												
1968	248												
1969	242												
1970	235												
1971	245												
1972	244												
1973	230												
1974	204												
1975	194	194	194										
1976	235	198	196										
1977	216	201	198										
1978	213	205	200										
1979	213	208	202										
1980	224	212	204	224									
1981	239	216	206	227									
1982	258	219	208	229									
1983	257	223	210	231									
1984	273	227	213	233									
1985	290	231	215	236	290	290	290						
1986	279	230	217	238	293	293	294						
1987	270	229	219	240	296	296	297						
1988	262	228	221	243	299	299	301						
1989	254	227	223	245	302	302	304	254					
1990	255	225	226	248	305	305	308	251					
1991	253	224	228	250	308	308	312	248					
1992	259	223	230	253	311	311	315	245					
1993	261	222	232	255	314	314	319	241					
1994	259	221	235	258	317	317	323	238	259				
1995	253	220	237	260	320	320	327	235	263	253			
1996	253	219	239	263	324	324	330	232	269	250			
1997	271	218	242	266	327	327	333	229	267	247			
1998	284	217	244	268	330	330	337	226	261	244			
1999	285	215	247	271	333	333	340	223	259	240			
2000	282	214	249	274	337	337	344	220	260	237			
2001	272			276				217	275	234			
2002	249			279				215	281	231			
2003	255			282				212	288	228			
2004	253			285				209	294	225			
2005	281			288				206	299	222			
2006	255							204	308	219	255		

Actual Australian domestic airfares versus projections (continued)

Restricted Economy, medium-distance routes (2003–04$)													
No. bureau ref.		12	33	24	14	49	61	36a	4	51,52,30h	11	30e	30j
Financial year	Real airfare	1975	1975a	1980	1985	1985a	1985b	1989	1994	1995	2007	2009	2011
2007	268							201	315	217	255		
2008	297							198	324	214	255	297	
2009	296								333	211	255	297	
2010	271								339	208	255	297	
2011	267								347	205	255	297	267
2012	209								354	203	255	297	268
2013	229								360	200	255	297	269
2014	236								368	198	255	297	270
2015	253									195	255	297	271
2016	266										255	297	271
2017	271										255	297	272
2018											255	297	273
2019											255	297	274
2020											255	297	275
2021											255	297	276
2022											255	297	276
2023											255	297	277
2024											255	297	278
2025											255	297	279
2026											255	297	280
2027												297	281
2028												297	281
2029												297	282
2030												297	283

Table A1.10 Actual international airfares versus projections

		Real Australian dollar index (1972=100)									
No. bureau ref.		12	33	24	49	61	16	36a	4	51,52,30h	30j
Financial year	Real fare	1975	1975a	1980	1985a	1985b	1986	1989	1994	1995	2011
1965	144										
1966	138										
1967	135										
1968	128										
1969	120										
1970	109										
1971	108										
1972	100										
1973	90										
1974	81										
1975	75	75	75								
1976	76	73	74								
1977	74	71	73								
1978	68	69	72								
1979	58	68	71								
1980	50	66	70	50							
1981	53	64	69	50							
1982	55	63	69	50							
1983	57	61	68	50							
1984	60	60	67	50							
1985	61	58	66	50	61	61					
1986	61	58	65	50	61	60	61				
1987	56	57	64	50	61	60	60				
1988	54	57	64	50	61	60	59				
1989	52	57	63	50	61	59	58	52			
1990	52	56	62	50	61	59	58	52			
1991	55	56	61	50	60	59	57	51			
1992	57	56	60	50	60	58	56	51			
1993	54	55	60	50	59	58	55	50			
1994	54	55	59	50	59	58	55	50	54		
1995	50	55	58	50	58	58	54	49	54	50	
1996	47			50	58	57	53	49	54	50	
1997	46			50	57	57	53	48	54	49	
1998	46			50	57	57	52	48	54	49	
1999	46			50	56	56	51	47	54	48	
2000	46			50	56	56	51	47	54	48	
2001	45			50				46	54	48	
2002	45			50				46	54	47	
2003	46			50				45	54	47	
2004	46			50				45	54	46	
2005	47			50				45	54	46	
2006	46							44	54	45	
2007	46							44	54	45	
2008	47							43	54	44	
2009	47								54	44	
2010	45								54	43	
2011	44								54	43	44
2012	42								54	43	44

Actual international airfares versus projections (continued)

		Real Australian dollar index (1972=100)									
No. bureau ref.		12	33	24	49	61	16	36a	4	51,52,30h	30j
Financial year	Real fare	1975	1975a	1980	1985a	1985b	1986	1989	1994	1995	2011
2013	42								54	42	44
2014	42								54	42	44
2015	43								54	41	44
2016	43								54		44
2017	43										44
2018											44
2019											44
2020											44
2021											44
2022											44
2023											44
2024											44
2025											44
2026											44
2027											44
2028											44
2029											44
2030											44

Table A2.1 Australian vehicle kilometres travelled per person

No. bureau ref.		48	31	13	23	61	25	49	51	58	56	30a	BITRE
Financial year	Actual vkt/ person	1966	1970	1982	1982a	1982b	1982c	1985	1991	1998	2002	2011	2015
1965	4787												
1966	4890	4894											
1967	5079	5082											
1968	5269	5259											
1969	5573	5474											
1970	5848	5632	5934										
1971	6031	5826	6209										
1972	6288	6010	6475										
1973	6440	6183	6726										
1974	6779	6347	6964										
1975	7021	6502	7190										
1976	7206	6688	7459										
1977	7515	6824	7714										
1978	7724	6990	7956										
1979	7886	7109	8188										
1980	7892	7257	8407										
1981	7957	7396	8629										
1982	8290	7491	8840	8440	8440	8277	8392						
1983	8157	7613	9042	8475	8676	8509	8628						
1984	8468	7727	9234	8507	8924	8748	8855						
1985	8719	7834	9417	8537	9184	8993	9075	8674					
1986	8846	7933	9625	8632	9415	9209	9287	8798					
1987	8906	7993	9824	8729	9659	9437	9497	8916					
1988	9208	8047	10015	8822	9912	9671	9701	9031					
1989	9467	8065	10197	8910	10173	9910	9897	9140					
1990	9560	8079	10373	8995	10444	10156	10087	9246					
1991	9365	8118	10574	9084	10708	10392	10263	9337	9283				
1992	9447	8124	10767	9175	10989	10641	10438	9424	9183				
1993	9647		10952	9262	11278	10895	10608	9507	9211				
1994	9825		11129	9345	11578	11155	10771	9586	9264				
1995	10094		11297	9424	11889	11422	10929	9662	9347				
1996	10179		11487	9483	12127	11644	11082	9751	9590				
1997	10191		11668	9545	12379	11877	11236	9837	9674				
1998	10261		11840	9604	12639	12116	11385	9919	9715	10157			
1999	10387		12003	9660	12905	12359	11528	9998	9789	10319			
2000	10483		12158	9713	13179	12606	11667	10074	9898	10477			
2001	10297								10008	10632			
2002	10465								10092	10784	10362		
2003	10632								10357	10933	10598		
2004	10978								10610	11080	10833		
2005	10926								10668	11223	11028		
2006	10706								10719	11363	11114		
2007	10732								10775	11501	11207		
2008	10593								10837	11636	11288		
2009	10392								10893	11768	11363		
2010	10383								10945	11897	11453		
2011	10409								10984	12024	11521	10394	

Australian vehicle kilometres travelled per person (continued)

No. bureau ref.		48	31	13	23	61	25	49	51	58	56	30a	BITRE
Financial year	Actual vkt/ person	1966	1970	1982	1982a	1982b	1982c	1985	1991	1998	2002	2011	2015
2012	10392								11021	12148	11585	10394	
2013	10361								11053		11644	10348	
2014	10323								11085		11699	10368	
2015	10316								11131		11752	10349	10342
2016	10360								11175		11800	10369	10377
2017	10440								11210		11860	10340	10438
2018									11237		11907	10293	10515
2019									11258		11950	10289	10605
2020									11271		11991	10246	10697
2021												10205	10786
2022												10205	10877
2023												10166	10961
2024												10129	11040
2025												10132	11115
2026												10098	11181
2027												10067	11239
2028												10073	11288
2029												10044	11333
2030												10016	11376

Table A2.2 Australian population

Financial year	Population	1966	1970	1982	1982a	1982b	1982c	1985	1991	1998	2002	2011	2015
1965	11609												
1966	11834	11843											
1967	12050	12090											
1968	12281	12342											
1969	12554	12600											
1970	12810	12863	12779										
1971	13068	13131	13027										
1972	13304	13405	13271										
1973	13505	13685	13526										
1974	13723	13970	13788										
1975	13893	14262	14057										
1976	14033	14560	14330										
1977	14193	14863	14610										
1978	14360	15174	14895										
1979	14516	15490	15183										
1980	14696	15814	15478										
1981	14923	16144	15776										
1982	15184	16481	16078	15109	15109	15109	15109						
1983	15393	16824	16384	15322	15322	15322	15322						
1984	15579	17176	16694	15538	15538	15538	15538						
1985	15788	17534	17006	15757	15757	15757	15757	15788					
1986	16018	17900	17320	15980	15980	15980	15980	15993					
1987	16264	18274	17637	16194	16194	16194	16194	16201					
1988	16532	18655	17954	16411	16411	16411	16411	16412					
1989	16814	19044	18275	16631	16631	16631	16631	16625					
1990	17065	19442	18596	16854	16854	16854	16854	16841					
1991	17284	19847	18923	17079	17079	17079	17079	17060	17355				
1992	17478	20262	19251	17298	17298	17298	17298	17282	17636				
1993	17635		19583	17519	17519	17519	17519	17507	17914				
1994	17803		19918	17744	17744	17744	17744	17734	18189				
1995	18002		20256	17971	17971	17971	17971	17965	18462				
1996	18222		20601	18201	18201	18201	18201	18180	18733				
1997	18421		20949	18423	18423	18423	18423	18398	18999				
1998	18605		21305	18648	18648	18648	18648	18619	19266	18729			
1999	18810		21664	18875	18875	18875	18875	18843	19527	18875			
2000	19027		22031	19105	19105	19105	19105	19069	19787	19021			
2001	19272		22404						20043	19169			
2002	19493								20296	19317	19619		
2003	19719								20545	19467	19817		
2004	19931								20790	19618	20011		
2005	20175								21033	19770	20203		
2006	20449								21274	19924	20391		
2007	20825								21512	20078	20576		
2008	21247								21749	20234	20757		
2009	21689								21984	20391	20935		
2010	22029								22218	20549	21111		
2011	22337								22451	20709	21285	22536	
2012	22740								22683	20869	21458	22719	

Australian population (continued)

Financial year	Population	1966	1970	1982	1982a	1982b	1982c	1985	1991	1998	2002	2011	2015
2013	23143								22913	21031	21628	23116	
2014	23502								23144	21194	21797	23521	
2015	23848								23323	21359	21964	23937	23866
2016	24207								23504	21524	22129	24357	24258
2017	24578								23686	21691	22292	24778	24659
2018									23870	21860	22453	25198	25067
2019									24055	22029	22612	25617	25477
2020									24242	22200	22769	26034	25890
2021												26449	26301
2022												26863	26711
2023												27276	27120
2024												27687	27527
2025												28096	27932
2026												28503	28335
2027												28906	28735
2028												29308	29133
2029												29707	29528
2030												30104	29921

Table A2.3 Australian vehicle kilometres travelled (billion)

No. bureau ref.		48	31	13	23	61	25	49	51	58	56	30a	BITRE
Financial year	Actual vkt	1966	1970	1982	1982a	1982b	1982c	1985	1991	1998	2002	2011	2015
1965	55												
1966	58	58											
1967	61	61											
1968	65	65											
1969	70	69											
1970	75	72	76										
1971	79	76	81										
1972	83	80	86										
1973	87	85	91										
1974	93	89	96										
1975	97	93	101										
1976	101	97	107										
1977	107	101	113										
1978	111	106	119										
1979	114	110	124										
1980	116	115	130										
1981	119	119	136										
1982	125	123	142	128	128	125	127						
1983	125	128	148	130	133	130	132						
1984	131	133	154	132	139	136	138						
1985	137	137	160	135	145	142	143	137					
1986	141	142	167	138	150	147	148	141					
1987	144	146	173	141	156	153	154	144					
1988	151	150	180	145	163	159	159	148					
1989	158	153	186	148	169	165	165	152					
1990	162	157	193	152	176	171	170	156					
1991	161	161	200	155	183	177	175	159	161				
1992	164	164	207	159	190	184	181	163	162				
1993	170		214	162	198	191	186	166	165				
1994	174		222	166	205	198	191	170	169				
1995	181		229	169	214	205	196	174	173				
1996	185		237	173	221	212	202	177	180				
1997	187		244	176	228	219	207	181	184				
1998	190		252	179	236	226	212	185	187	189			
1999	195		260	182	244	233	218	188	191	193			
2000	199		268	186	252	241	223	192	196	197			
2001	198								201	202			
2002	203								205	206	203		
2003	209								213	210	210		
2004	218								221	214	217		
2005	219								224	219	223		
2006	218								228	223	227		
2007	222								232	227	231		
2008	225								236	231	234		
2009	225								239	235	238		
2010	229								243	240	242		
2011	232								247	244	245	233	
2012	236								250	248	249	237	

Australian vehicle kilometres travelled (billion) (continued)

No. bureau ref.		48	31	13	23	61	25	49	51	58	56	30a	BITRE
Financial year	Actual vkt	1966	1970	1982	1982a	1982b	1982c	1985	1991	1998	2002	2011	2015
2013	239								253		252	240	
2014	242								257		255	244	
2015	246								260		258	247	247
2016	251								263		261	251	252
2017	257								266		264	255	257
2018									268		267	258	264
2019									271		270	262	270
2020									273		273	265	277
2021												268	284
2022												272	291
2023												275	297
2024												279	304
2025												283	310
2026												286	317
2027												289	323
2028												293	329
2029												296	335
2030												300	340

Table A2.4 Metropolitan vehicle kilometres travelled (billion)

No. bureau ref.		31	32	18	5	35,41	10	30a	22b
Financial year	Metropolitan vkt	1970	1975	1995a	1995b	2002	2005	2010	2015
1965	28.1								
1966	30.0								
1967	31.9								
1968	34.0								
1969	37.0								
1970	40.1	40							
1971	42.4	42							
1972	45.1	45							
1973	47.0	47							
1974	50.4	49							
1975	53.1	52	53						
1976	55.6	55	56						
1977	58.8	58	58						
1978	61.3	61	61						
1979	63.2	64	64						
1980	63.9	67	66						
1981	65.3	70	69						
1982	68.8	74	71						
1983	69.0	77	74						
1984	72.5	81	77						
1985	75.7	84	79						
1986	78.6	88	82						
1987	80.8	91	84						
1988	85.1	95	87						
1989	89.0	99	90						
1990	91.2	103	92						
1991	90.5	107	95						
1992	92.4	111	97						
1993	95.3	115	100						
1994	98.1	120	102						
1995	101.9	124	105	102	102				
1996	103.9	128	108	103	104				
1997	105.1	133	111	105	105				
1998	107.2	138	114	107	107				
1999	109.7	142	117	108	109				
2000	112.2	147	120	110	111				
2001	112.0		123	112	113				
2002	114.8		126	113	115	115			
2003	117.5		129	115	117	119			
2004	122.5		131	116	119	123			
2005	123.5		134	118	121	127	124		
2006	122.7			120	122	129	126		
2007	124.7			121	124	132	129		
2008	126.5			123	126	135	133		
2009	126.7			124	128	137	137		
2010	128.5			126	130	140	140	128	
2011	130.8			128	132	142	143	129	
2012	132.8			129	134	144	146	130	

Metropolitan vehicle kilometres travelled (billion) (continued)

No. bureau ref.		31	32	18	5	35,41	10	30a	22b
Financial year	Metropolitan vkt	1970	1975	1995a	1995b	2002	2005	2010	2015
2013	134.9			131	136	146	148	132	
2014	136.6			132	138	148	151	134	
2015	138.9			134	140	151	153	137	138
2016	141.7					153	156	139	141
2017	145.2					155	158	141	144
2018						157	160	143	147
2019						159	163	145	151
2020						161	165	147	155
2021									160
2022									164
2023									168
2024									172
2025									176
2026									180
2027									184
2028									188
2029									192
2030									195

Table A2.5 Components explaining light vehicles per person

Financial year	Kms LV vkt/LV	Kms LV vkt/pp	Number LVs/person
1965	14482	4141	0.29
1966	14650	4321	0.29
1967	14776	4494	0.30
1968	14815	4684	0.32
1969	15222	4965	0.33
1970	15466	5231	0.34
1971	15245	5400	0.35
1972	15456	5653	0.37
1973	15584	5800	0.37
1974	15769	6122	0.39
1975	15628	6346	0.41
1976	15477	6521	0.42
1977	15705	6828	0.43
1978	15776	7043	0.45
1979	15641	7181	0.46
1980	15384	7135	0.46
1981	15130	7164	0.47
1982	15130	7376	0.49
1983	14773	7310	0.49
1984	15065	7603	0.50
1985	15169	7828	0.52
1986	15292	7972	0.52
1987	15416	8038	0.52
1988	15897	8308	0.52
1989	16247	8566	0.53
1990	16169	8667	0.54
1991	15732	8550	0.54
1992	15848	8659	0.55
1993	16073	8863	0.55
1994	16317	9025	0.55
1995	16425	9257	0.56
1996	16240	9322	0.57
1997	16086	9312	0.58
1998	15810	9377	0.59
1999	15751	9504	0.60
2000	15780	9592	0.61
2001	15410	9415	0.61
2002	15507	9571	0.62
2003	15476	9723	0.63
2004	15752	10060	0.64
2005	15392	9983	0.65
2006	14803	9741	0.66
2007	14666	9727	0.66
2008	14365	9648	0.67
2009	14107	9464	0.67
2010	13967	9442	0.68
2011	13873	9452	0.68
2012	13747	9414	0.68
2013	13594	9378	0.69

Components explaining light vehicles per person (continued)

Financial year	Kms LV vkt/LV	Kms LV vkt/pp	Number LVs/person
2014	13438	9343	0.70
2015	13379	9358	0.70
2016	13352	9395	0.70
2017	13400	9480	0.71

Table A2.6 Light vehicles per person and forecasts

No. bureau ref.		31	23	25	5	58	56
Financial year	No. of LVs/person	1970	1981	1985	1995	1998	2002
1965	0.29						
1966	0.29						
1967	0.30						
1968	0.32						
1969	0.33						
1970	0.34	0.34					
1971	0.35	0.35					
1972	0.37	0.36					
1973	0.37	0.37					
1974	0.39	0.38					
1975	0.41	0.39					
1976	0.42	0.40					
1977	0.43	0.41					
1978	0.45	0.42					
1979	0.46	0.42					
1980	0.46	0.43					
1981	0.47	0.44	0.47				
1982	0.49	0.45	0.48				
1983	0.49	0.46	0.48				
1984	0.50	0.46	0.49				
1985	0.52	0.47	0.49	0.52			
1986	0.52	0.48	0.50	0.53			
1987	0.52	0.49	0.50	0.53			
1988	0.52	0.49	0.51	0.54			
1989	0.53	0.50	0.52	0.55			
1990	0.54	0.51	0.52	0.56			
1991	0.54	0.51	0.53	0.57			
1992	0.55	0.52	0.53	0.57			
1993	0.55	0.53	0.54	0.58			
1994	0.55	0.53	0.54	0.59			
1995	0.56	0.54	0.55	0.60	0.56		
1996	0.57	0.55	0.55	0.60	0.56		
1997	0.58	0.55	0.56	0.61	0.57		
1998	0.59	0.56	0.56	0.61	0.58	0.59	
1999	0.60	0.57	0.57	0.62	0.58	0.60	
2000	0.61	0.57	0.57	0.62	0.58	0.60	
2001	0.61				0.59	0.61	
2002	0.62				0.59	0.61	0.62
2003	0.63				0.59	0.62	0.62
2004	0.64				0.60	0.62	0.63
2005	0.65				0.60	0.63	0.64
2006	0.66				0.60	0.64	0.64
2007	0.66				0.61	0.64	0.65
2008	0.67				0.61	0.65	0.65
2009	0.67				0.61	0.65	0.66
2010	0.68				0.61	0.66	0.66
2011	0.68				0.62	0.66	0.66
2012	0.68				0.62	0.67	0.67
2013	0.69				0.62	0.67	0.67

Light vehicles per person and forecasts (continued)

No. bureau ref.		31	23	25	5	58	56
Financial year	No. of LVs/person	1970	1981	1985	1995	1998	2002
2014	0.70				0.62	0.68	0.67
2015	0.70				0.63	0.68	0.68
2016	0.70				0.63	0.69	0.68
2017	0.71				0.63	0.69	0.68
2018					0.63	0.70	0.68
2019					0.63	0.70	0.68
2020					0.64	0.71	0.68
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							
2030							

Table A2.7 Population and projections

No. bureau ref.		31	23	25	5	58	56
Financial year	Population (000s)	1970	1981	1985	1995	1998	2002
1965	11609						
1966	11834						
1967	12050						
1968	12281						
1969	12554						
1970	12810	12810					
1971	13068	13059					
1972	13304	13303					
1973	13505	13559					
1974	13723	13822					
1975	13893	14092					
1976	14033	14365					
1977	14193	14645					
1978	14360	14932					
1979	14516	15220					
1980	14696	15516					
1981	14923	15815	14923				
1982	15184	16117	15133				
1983	15393	16424	15347				
1984	15579	16734	15563				
1985	15788	17047	15782	15788			
1986	16018	17362	15994	16011			
1987	16264	17680	16208	16253			
1988	16532	17997	16425	16522			
1989	16814	18319	16646	16795			
1990	17065	18642	16869	17064			
1991	17284	18969	17084	17343			
1992	17478	19298	17303	17625			
1993	17635	19631	17525	17903			
1994	17803	19966	17749	18177			
1995	18002	20306	17976	18450	18002		
1996	18222	20651	18195	18720	18231		
1997	18421	21000	18417	18987	18450		
1998	18605	21357	18642	19253	18669	18605	
1999	18810	21717	18870	19514	18888	18794	
2000	19027	22085	19100	19774	19108	18981	
2001	19272				19317	19166	
2002	19493				19526	19348	19493
2003	19719				19735	19528	19719
2004	19931				19944	19705	19939
2005	20175				20143	19880	20151
2006	20449				20352	20052	20356
2007	20825				20541	20222	20558
2008	21247				20740	20388	20758
2009	21689				20940	20553	20954
2010	22029				21129	20715	21148
2011	22337				21318	20874	21339
2012	22740				21507	21032	21527
2013	23143				21706	21188	21715

Population and projections (continued)

No. bureau ref.		31	23	25	5	58	56
Financial year	Population (000s)	1970	1981	1985	1995	1998	2002
2014	23502				21925	21342	21901
2015	23848				22144	21494	22087
2016	24207				22373	21644	22271
2017	24578				22602	21793	22454
2018					22841	21939	22635
2019					23090	22084	22814
2020					23339	22226	22992
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							
2030							

Table A2.8 Light vehicle numbers and forecasts

No. bureau ref.		31	23	25	5	58	56
Financial year	LVs (000s)	1970	1981	1985	1995	1998	2002
1965	3319						
1966	3491						
1967	3665						
1968	3883						
1969	4095						
1970	4333	4333					
1971	4629	4558					
1972	4866	4784					
1973	5027	5009					
1974	5327	5234					
1975	5642	5460					
1976	5913	5711					
1977	6171	5962					
1978	6411	6213					
1979	6664	6465					
1980	6815	6716					
1981	7066	6979	7066				
1982	7402	7242	7232				
1983	7617	7505	7398				
1984	7863	7768	7563				
1985	8147	8031	7729	8147			
1986	8351	8315	7941	8420			
1987	8480	8599	8153	8692			
1988	8640	8883	8366	8965			
1989	8865	9166	8578	9237			
1990	9147	9450	8790	9510			
1991	9393	9755	9003	9806			
1992	9550	10059	9216	10102			
1993	9724	10364	9429	10398			
1994	9846	10669	9641	10694			
1995	10146	10973	9854	10990	10146		
1996	10460	11298	10073	11252	10336		
1997	10663	11623	10291	11514	10647		
1998	11034	11947	10510	11776	10839	11034	
1999	11349	12272	10729	12038	11031	11247	
2000	11565	12597	10947	12300	11226	11460	
2001	11775				11421	11672	
2002	12031				11607	11885	12031
2003	12388				11794	12097	12319
2004	12728				11973	12310	12624
2005	13085				12152	12522	12881
2006	13456				12333	12735	13116
2007	13812				12516	12947	13343
2008	14269				12689	13160	13558
2009	14552				12863	13372	13764
2010	14892				13039	13585	13972
2011	15219				13207	13798	14168
2012	15572				13376	14010	14367
2013	15966				13566	14223	14558

Light vehicle numbers and forecasts (continued)

No. bureau ref.		31	23	25	5	58	56
Financial year	LVs (000s)	1970	1981	1985	1995	1998	2002
2014	16340				13748	14435	14745
2015	16682				13942	14648	14928
2016	17034				14127	14860	15095
2017	17388				14333	15073	15258
2018					14532	15285	15417
2019					14742	15498	15573
2020					14953	15710	15726
2021							
2022							
2023							
2024							
2025							
2026							
2027							
2028							
2029							
2030							

Table A2.9 All modes Australian passenger kilometres (billion pkm)

No. bureau ref.							32	51
Financial year	Passenger cars	Buses	Rail	Air	Other (4)	Total	1975	1993
1965	68.0	6.0	13.1	3.0	8.8	99		
1966	72.6	6.2	13.0	3.3	9.0	104		
1967	77.1	6.4	12.9	3.6	9.4	109		
1968	82.1	6.7	12.8	3.9	9.8	115		
1969	89.4	7.0	12.5	4.4	10.4	124		
1970	97.0	7.2	12.5	5.1	10.7	132		
1971	102.4	7.3	12.7	5.7	11.3	139		
1972	109.0	7.2	11.6	6.0	12.1	146		
1973	112.9	7.4	11.5	6.4	13.1	151		
1974	120.4	7.4	10.5	7.7	14.6	161		
1975	125.3	7.4	10.0	8.3	15.9	167	167	
1976	130.1	7.4	8.9	8.3	16.5	171	177	
1977	136.0	7.5	8.9	8.0	18.1	178	187	
1978	140.5	7.6	8.7	8.9	19.0	185	196	
1979	144.4	7.7	8.5	9.4	19.4	189	206	
1980	144.9	8.2	8.8	10.4	19.3	192	216	
1981	147.1	8.7	9.1	10.7	19.7	195	226	
1982	154.3	9.2	9.1	11.2	20.1	204	236	
1983	154.8	10.5	8.9	10.3	19.8	204	246	
1984	161.8	11.7	8.8	10.6	21.1	214	256	
1985	167.9	13.0	8.8	11.3	22.0	223	265	
1986	173.1	14.0	9.2	12.3	22.1	231	276	
1987	176.8	15.0	9.5	13.2	22.2	237	287	
1988	185.5	16.0	9.9	14.5	22.8	249	297	
1989	194.4	16.9	10.2	15.1	23.8	260	308	
1990	200.0	17.7	10.0	11.3	23.7	263	318	
1991	200.5	17.0	10.0	16.0	22.9	266	329	
1992	204.5	16.6	9.9	20.7	23.0	275	339	
1993	210.8	16.5	9.7	21.0	23.4	281	350	281
1994	216.1	16.3	9.9	24.4	24.1	291	361	288
1995	222.9	16.1	10.2	27.0	25.4	302	371	294
1996	226.0	16.6	10.6	29.0	25.9	308	385	301
1997	227.7	16.4	10.9	30.0	26.0	311	398	308
1998	229.9	16.6	10.8	30.4	26.7	314	412	315
1999	235.3	16.7	11.0	31.1	27.2	321	426	321
2000	239.8	17.0	11.4	32.8	27.6	329	439	328
2001	237.2	17.3	12.0	35.7	27.9	330	453	335
2002	243.2	17.4	11.8	33.0	28.9	334	466	341
2003	249.5	17.7	11.8	35.8	29.7	345	480	348
2004	261.4	17.8	11.9	41.1	30.6	363	494	355
2005	262.1	17.8	11.9	45.9	30.9	369	507	362
2006	257.3	18.3	12.4	48.7	31.6	368		368
2007	260.5	18.5	13.0	53.0	32.8	378		375
2008	262.1	18.8	14.0	57.2	34.7	387		382
2009	260.9	19.2	14.8	58.6	36.0	390		389
2010	262.5	19.5	14.7	60.2	38.3	395		395
2011	265.2	19.9	15.0	64.6	39.3	404		402
2012	267.6	20.4	15.3	66.4	40.4	410		409
2013	269.6	20.7	15.2	69.7	41.6	417		416

All modes Australian passenger kilometres (billion pkm) (continued)

No. bureau ref.							32	51
Financial year	Passenger cars	Buses	Rail	Air	Other (4)	Total	1975	1993
2014	271.6	21.1	15.2	70.9	42.6	421		422
2015	275.0	21.2	15.7	70.1	43.7	426		429
2016	279.0	21.5	16.1	71.4	44.9	433		

Table A2.10 All modes forecasts from 1993 (billion pkm)

No. bureau ref.				51	51	51
Financial year	Actual	Actual	Actual	1993	1993	1993
	Road	Air	Rail	Road	Air	Rail
1965	83	3	13			
1966	88	3	13			
1967	93	4	13			
1968	99	4	13			
1969	107	4	13			
1970	115	5	12			
1971	121	6	13			
1972	128	6	12			
1973	133	6	11			
1974	142	8	11			
1975	149	8	10			
1976	154	8	9			
1977	162	8	9			
1978	167	9	9			
1979	171	9	9			
1980	172	10	9			
1981	176	11	9			
1982	184	11	9			
1983	185	10	9			
1984	195	11	9			
1985	203	11	9			
1986	209	12	9			
1987	214	13	9			
1988	224	14	10			
1989	235	15	10			
1990	242	11	10			
1991	240	16	10			
1992	244	21	10			
1993	251	21	10	250	21	10
1994	257	24	10	254	24	10
1995	264	27	10	257	27	10
1996	269	29	11	261	30	11
1997	270	30	11	264	32	11
1998	273	30	11	268	35	11
1999	279	31	11	272	38	12
2000	284	33	11	275	41	12
2001	282	36	12	279	44	12
2002	289	33	12	282	47	12
2003	297	36	12	286	50	13
2004	310	41	12	289	53	13
2005	311	46	12	293	55	13
2006	307	49	12	296	58	14
2007	312	53	13	300	61	14
2008	316	57	14	304	64	14
2009	316	59	15	307	67	15
2010	320	60	15	311	70	15
2011	324	65	15	314	73	15
2012	328	66	15	318	76	16

All modes forecasts from 1993 (billion pkm) (continued)

No. bureau ref.				51	51	51
Financial year	Actual	Actual	Actual	1993	1993	1993
	Road	Air	Rail	Road	Air	Rail
2013	332	70	15	321	78	16
2014	335	71	15	325	81	16
2015	340	70	16	328	84	16
2016	345	71	16			

Table A2.11 Metropolitan passenger kilometres per person and forecasts

No. bureau ref.		32	5,18b	10,36	30b	22a
Financial year	pkm per person	1977	1995	2005	2010	2013
1965	6835					
1966	7035					
1967	7221					
1968	7454					
1969	7801					
1970	8179					
1971	8414					
1972	8622					
1973	8799					
1974	9195					
1975	9486	9486				
1976	9678	9810				
1977	10013	10167				
1978	10252	10469				
1979	10421	10760				
1980	10416	11040				
1981	10459	11318				
1982	10768	11586				
1983	10642	11844				
1984	10990	12093				
1985	11250	12332				
1986	11460	12563				
1987	11551	12786				
1988	11893	13000				
1989	12234	13207				
1990	12330	13406				
1991	12161	13605				
1992	12210	13798				
1993	12393	13983				
1994	12591	14161				
1995	12873	14333	12873			
1996	12890	14556	12892			
1997	12838	14773	12945			
1998	12901	14982	13013			
1999	13040	15183	13083			
2000	13188	15378	13144			
2001	13021	15556	13201			
2002	13089	15729	13253			
2003	13201	15899	13300			
2004	13574	16064	13342			
2005	13500	16225	13381	13500		
2006	13227		13415	13227		
2007	13158		13445	13303		
2008	13121		13472	13383		
2009	12925		13496	13521		
2010	12779		13517	13653	12779	
2011	12683		13536	13644	12589	
2012	12628		13552	13702	12584	
2013	12521		13582	13691	12603	12531

Metropolitan passenger kilometres per person and forecasts

No. bureau ref.		32	5,18b	10,36	30b	22a
Financial year	pkm per person	1977	1995	2005	2010	2013
2014	12426		13614	13551	12618	12494
2015	12430		13649	13541	12617	12530
2016	12435		13688	13469	12616	12564
2017	12435		13730	13398	12608	12584
2018			13776	13328	12599	12603
2019			13826	13260	12592	12620
2020			13881	13194	12588	12637
2021					12587	12652
2022					12521	12666
2023					12457	12679
2024					12397	12691
2025					12339	12702
2026					12285	12712
2027					12234	12721
2028					12185	12730
2029					12138	12738
2030					12094	12746

Table A2.12 Metropolitan population and forecasts

No. bureau ref.		32	5,18b	10,36	30b	22a
Financial year	Population (000s)	1977	1995	2005	2010	2013
1965	7215					
1966	7401					
1967	7575					
1968	7754					
1969	7967					
1970	8172					
1971	8351					
1972	8512					
1973	8652					
1974	8798					
1975	8903	8903				
1976	9033	9033				
1977	9127	9127				
1978	9224	9262				
1979	9308	9399				
1980	9400	9538				
1981	9512	9672				
1982	9663	9809				
1983	9790	9947				
1984	9902	10087				
1985	10030	10229				
1986	10224	10366				
1987	10399	10505				
1988	10575	10646				
1989	10742	10789				
1990	10884	10933				
1991	11005	11073				
1992	11137	11215				
1993	11241	11359				
1994	11352	11504				
1995	11501	11651	11501			
1996	11668	11793	11668			
1997	11797	11937	11796			
1998	11924	12083	11930			
1999	12068	12230	12055			
2000	12216	12380	12182			
2001	12387	12539	12307			
2002	12545	12697	12431			
2003	12703	12856	12554			
2004	12851	13015	12675			
2005	13013	13174	12795	13013		
2006	13201		12914	13201		
2007	13484		13030	13416		
2008	13763		13146	13696		
2009	14059		13259	13913		
2010	14394		13372	14133	14394	
2011	14737		13482	14353	14737	
2012	15015		13592	14575	15015	
2013	15340		13701	14798	15327	15327

Metropolitan population and forecasts (continued)

No. bureau ref.		32	5,18b	10,36	30b	22a
Financial year	Population (000s)	1977	1995	2005	2010	2013
2014	15626		13808	15021	15637	15637
2015	15869		13915	15246	15957	15957
2016	16235		14021	15472	16281	16281
2017	16541		14125	15698	16607	16607
2018			14229	15924	16932	16932
2019			14331	16151	17258	17258
2020			14432	16378	17583	17583
2021					17907	17907
2022					18232	18232
2023					18557	18557
2024					18882	18882
2025					19206	19206
2026					19529	19529
2027					19852	19852
2028					20174	20174
2029					20495	20495
2030					20815	20815

Table A2.13 Metropolitan passenger kilometres and forecasts

No. bureau ref.		32	5,18b	10,36	30b	22a
Financial year	Billion pkm	1977	1995	2005	2010	2013
1965	49.3					
1966	52.1					
1967	54.7					
1968	57.8					
1969	62.2					
1970	66.8					
1971	70.3					
1972	73.4					
1973	76.1					
1974	80.9					
1975	84.5	84				
1976	87.4	89				
1977	91.4	93				
1978	94.6	97				
1979	97.0	101				
1980	97.9	105				
1981	99.5	109				
1982	104.1	114				
1983	104.2	118				
1984	108.8	122				
1985	112.8	126				
1986	117.2	130				
1987	120.1	134				
1988	125.8	138				
1989	131.4	142				
1990	134.2	147				
1991	133.8	151				
1992	136.0	155				
1993	139.3	159				
1994	142.9	163				
1995	148.1	167	148			
1996	150.4	172	150			
1997	151.5	176	153			
1998	153.8	181	155			
1999	157.4	186	158			
2000	161.1	190	160			
2001	161.3	195	162			
2002	164.2	200	165			
2003	167.7	204	167			
2004	174.4	209	169			
2005	175.7	214	171	176		
2006	174.6		173	175		
2007	177.4		175	178		
2008	180.6		177	183		
2009	181.7		179	188		
2010	183.9		181	193	184	
2011	186.9		182	196	186	
2012	189.6		184	200	189	
2013	192.1		186	203	193	192

Metropolitan passenger kilometres and forecasts

No. bureau ref.		32	5,18b	10,36	30b	22a
Financial year	Billion pkm	1977	1995	2005	2010	2013
2014	194.2		188	204	197	195
2015	197.3		190	206	201	200
2016	201.1		192	208	205	205
2017	205.7		194	210	209	209
2018			196	212	213	213
2019			198	214	217	218
2020			200	216	221	222
2021					225	227
2022					228	231
2023					231	235
2024					234	240
2025					237	244
2026					240	248
2027					243	253
2028					246	257
2029					249	261
2030					252	265

Table A2.14 Metropolitan passenger kilometres

No. bureau ref.		32	5,18b	10,36	30b	22a
Financial year	Billion pkm	1977	1995	2005	2010	2013
1965	49.3					
1966	52.1					
1967	54.7					
1968	57.8					
1969	62.2					
1970	66.8					
1971	70.3					
1972	73.4					
1973	76.1					
1974	80.9					
1975	84.5	84				
1976	87.4	89				
1977	91.4	93				
1978	94.6	97				
1979	97.0	101				
1980	97.9	105				
1981	99.5	109				
1982	104.1	114				
1983	104.2	118				
1984	108.8	122				
1985	112.8	126				
1986	117.2	130				
1987	120.1	134				
1988	125.8	138				
1989	131.4	142				
1990	134.2	147				
1991	133.8	151				
1992	136.0	155				
1993	139.3	159				
1994	142.9	163				
1995	148.1	167	148			
1996	150.4	172	150			
1997	151.5	176	153			
1998	153.8	181	155			
1999	157.4	186	158			
2000	161.1	190	160			
2001	161.3	195	162			
2002	164.2	200	165			
2003	167.7	204	167			
2004	174.4	209	169			
2005	175.7	214	171	176		
2006	174.6		173	175		
2007	177.4		175	178		
2008	180.6		177	183		
2009	181.7		179	188		
2010	183.9		181	193	184	
2011	186.9		182	196	186	
2012	189.6		184	200	189	
2013	192.1		186	203	193	192

Metropolitan passenger kilometres (continued)

No. bureau ref.		32	5,18b	10,36	30b	22a
Financial year	Billion pkm	1977	1995	2005	2010	2013
2014	194.2		188	204	197	195
2015	197.3		190	206	201	200
2016	201.1		192	208	205	205
2017	205.7		194	210	209	209
2018			196	212	213	213
2019			198	214	217	218
2020			200	216	221	222
2021					225	227
2022					228	231
2023					231	235
2024					234	240
2025					237	244
2026					240	248
2027					243	253
2028					246	257
2029					249	261
2030					252	265

Table A2.15 Urban Public Transport mode share

No. bureau ref.		32	34	5,18b	28	10,36	30b
Financial year	UPT share (%)	1975	1990	1995	2000	2005	2010
1965	24.0						
1966	22.7						
1967	21.3						
1968	20.1						
1969	18.6						
1970	17.5						
1971	16.7						
1972	14.8						
1973	14.4						
1974	13.5						
1975	12.9	12.9					
1976	11.9	11.9					
1977	11.1	11.1					
1978	10.6	11.3					
1979	10.2	11.5					
1980	10.6	11.7					
1981	10.6	11.9					
1982	10.2	12.1					
1983	10.1	12.2					
1984	9.7	12.4					
1985	9.5	12.5					
1986	9.6	12.7					
1987	9.7	12.9					
1988	9.6	13.1					
1989	9.5	13.3	9.5				
1990	9.3	13.4	9.6				
1991	9.5	13.6	9.7				
1992	9.3	13.7	9.8				
1993	8.9	13.8	9.9				
1994	8.9	14.0	10.0				
1995	9.0	14.1	10.2	9.0			
1996	9.0	14.4	10.3	9.0			
1997	9.2	14.6	10.4	9.0			
1998	9.0	14.9	10.5	9.0			
1999	9.0	15.1	10.6	9.0			
2000	9.0	15.3	10.8	9.0	8.9		
2001	9.4	15.6	10.9	9.0	8.7		
2002	9.1	15.8	11.0	9.0	8.5		
2003	9.0	16.0	11.1	9.0	8.4		
2004	8.8	16.1	11.3	9.0	8.4		
2005	8.8	16.3	11.4	9.0	8.4		
2006	9.3		11.5	9.0	8.4	9.3	
2007	9.5		11.7	9.0	8.3	9.3	
2008	10.0		11.8	9.0	8.3	9.3	
2009	10.4		11.9	9.0	8.2	9.3	
2010	10.3		12.1	9.0	8.1	9.3	10.3
2011	10.4			9.0	8.0	9.3	10.5
2012	10.5			9.0	8.0	9.3	10.5
2013	10.4				8.0	9.3	10.4

Urban Public Transport mode share (continued)

No. bureau ref.		32	34	5,18b	28	10,36	30b
Financial year	UPT share (%)	1975	1990	1995	2000	2005	2010
2014	10.4				7.9	9.3	10.4
2015	10.4				7.9	9.3	10.3
2016	10.5				7.9	9.3	10.3
2017	10.5				7.9	9.3	10.2
2018					7.8	9.3	10.2
2019					7.8	9.3	10.1
2020					7.8	9.3	10.1
2021							10.0
2022							10.0
2023							10.0
2024							10.0
2025							10.0
2026							10.0
2027							10.0
2028							10.0
2029							10.0
2030							10.0

Table A2.16 Urban Public Transport passenger kilometres

No. bureau ref.		32	34	5,18b	28	10,36	30b
Financial year	UPT billion pkm	1975	1990	1995	2000	2005	2010
1965	11.6						
1966	11.6						
1967	11.5						
1968	11.5						
1969	11.5						
1970	11.7						
1971	11.7						
1972	10.9						
1973	10.9						
1974	10.9						
1975	10.9	11					
1976	10.4	10					
1977	10.1	10					
1978	10.0	11					
1979	9.9	11					
1980	10.4	11					
1981	10.6	12					
1982	10.6	12					
1983	10.5	13					
1984	10.5	13					
1985	10.7	14					
1986	11.3	14					
1987	11.6	15					
1988	12.0	15					
1989	12.4	16	12				
1990	12.5	17	13				
1991	12.7	17	13				
1992	12.6	18	14				
1993	12.4	19	14				
1994	12.7	19	14				
1995	13.3	20	15	13			
1996	13.6	21	15	14			
1997	13.9	22	16	14			
1998	13.9	22	16	14			
1999	14.1	23	16	14			
2000	14.5	24	17	14	14		
2001	15.2	25	17	15	14		
2002	14.9	26	18	15	14		
2003	15.1	27	18	15	15		
2004	15.3	28	19	15	15		
2005	15.5	29	19	15	15		
2006	16.2		20	16	16	16	
2007	16.9		20	16	16	16	
2008	18.0		21	16	16	17	
2009	18.9		22	16	16	17	
2010	19.0		22	16	17	17	19
2011	19.4			16	17	17	19
2012	19.9			17	17	18	20
2013	20.0				18	18	20

Urban Public Transport passenger kilometres (continued)

No. bureau ref.		32	34	5,18b	28	10,36	30b
Financial year	UPT billion pkm	1975	1990	1995	2000	2005	2010
2014	20.2				18	18	20
2015	20.6				18	19	21
2016	21.1				19	19	21
2017	21.5				19	19	21
2018					19	19	22
2019					20	20	22
2020					20	20	22
2021							23
2022							23
2023							23
2024							23
2025							24
2026							24
2027							24
2028							25
2029							25
2030							25

Table A2.17 Interstate road freight (billion tkm)

No. bureau ref.		6	9	21	29	46	30c
Financial year	Road IS	1995	2001	2002	2004	2005	2008
1972	7.3						
1973	7.7						
1974	8.3						
1975	8.5						
1976	9.0						
1977	9.5						
1978	9.7						
1979	10.3						
1980	10.8						
1981	11.4						
1982	12.2						
1983	12.2						
1984	13.3						
1985	14.6						
1986	16.0						
1987	17.3						
1988	19.3						
1989	21.2						
1990	23.0						
1991	23.8						
1992	24.8						
1993	27.1						
1994	29.7						
1995	32.4	32.4					
1996	34.7	34.0					
1997	37.2	35.8					
1998	40.4	37.6					
1999	46.5	39.5					
2000	49.4	41.5					
2001	49.5	43.6	49.5				
2002	52.5	45.9	51.5	52.5			
2003	55.2	48.2	53.6	55.4			
2004	58.3	50.7	55.7	58.2	58.3		
2005	61.0	53.3	57.9	61.1	61.3	61.0	
2006	65.2	56.0	60.2	64.1	64.5	63.8	
2007	63.8	58.8	62.7	66.9	67.8	66.9	
2008	68.3	61.8	65.2	69.4	70.5	71.4	68.3
2009	71.1	65.0	67.8	72.1	73.4	74.0	69.2
2010	69.9	68.3	70.5	74.7	76.2	77.4	71.5
2011	65.4	71.8	73.3	77.3	79.1	80.7	74.6
2012	63.3	75.4	76.2	80.0	82.1	84.2	79.1
2013	63.1	79.3	79.3	82.7	85.1	88.0	83.1
2014	63.2	83.3	82.4	85.3	88.2	91.9	87.5
2015	67.3	87.6	85.7	88.0	91.2	96.2	92.0
2016	68.5	92.0	89.2	90.7	94.3	100.4	97.0
2017	72.2	96.7	92.7	93.3	97.4	104.9	102.5
2018		101.7	96.4	96.0	100.5	109.7	107.1
2019		106.9	100.3	98.7	103.7	114.6	111.3
2020		112.3	104.3	101.4	106.9	119.9	115.2

Interstate road freight (billion tkm) (continued)

No. bureau ref.		6	9	21	29	46	30c
Financial year	Road IS	1995	2001	2002	2004	2005	2008
2021						125.3	119.2
2022						131.0	123.2
2023						137.0	126.9
2024						143.2	130.6
2025						149.8	134.5
2026						156.7	138.4
2027						163.9	142.3
2028						171.5	146.2
2029						179.4	150.1
2030						187.6	154.2

Table A2.18 Interstate rail freight (billion tkm)

No. bureau ref.		6	2	9	21	29	46	30c
Financial year	IS rail freight	1995	1996	2001	2002	2004	2005	2007
1972	6.1							
1973	6.6							
1974	7.2							
1975	7.7							
1976	8.3							
1977	8.5							
1978	8.7							
1979	8.9							
1980	9.2							
1981	9.4							
1982	9.0							
1983	8.6							
1984	9.4							
1985	9.4							
1986	9.7							
1987	10.8							
1988	12.4							
1989	14.0							
1990	13.8							
1991	13.1							
1992	13.5							
1993	14.5							
1994	15.5							
1995	16.4	16.4						
1996	16.3	16.8	16.3					
1997	16.9	17.2	16.7					
1998	17.8	17.6	17.1					
1999	18.4	18.0	17.4					
2000	19.2	18.4	17.8					
2001	20.0	18.8	18.2	20.0				
2002	21.0	19.3	18.5	20.1	21.0			
2003	22.0	19.7	18.9	20.3	21.3			
2004	23.0	20.2	19.3	20.4	21.5	23.0		
2005	24.0	20.6	19.6	20.6	21.7	23.9	24.0	
2006	22.6	21.1	20.0	20.8	22.0	24.9	25.0	
2007	25.2	21.6	20.4	20.9	22.2	25.9	26.1	25.3
2008	23.5	22.1	20.8	21.1	22.4	26.6	27.9	27.1
2009	22.2	22.6	21.1	21.3	22.5	27.3	28.7	27.2
2010	21.1	23.1	21.5	21.4	22.7	28.1	29.8	28.0
2011	22.0	23.6	21.9	21.6	23.0	28.8	30.9	29.2
2012	23.2	24.2	22.2	21.8	23.2	29.6	32.0	30.8
2013	24.2	24.7	22.6	22.0	23.4	30.3	33.2	32.2
2014	20.8	25.3	23.0	22.1	23.7	31.0	34.5	33.7
2015	20.5	25.9	23.3	22.3	24.0	31.7	35.9	35.3
2016	26.5	26.5		22.5	24.3	32.4	37.2	37.1
2017	26.5	27.1		22.7	24.6	33.1	38.6	39.0
2018		27.7		22.9	24.9	33.8	40.1	40.5
2019		28.4		23.0	25.2	34.4	41.6	42.0
2020		29.0		23.2	25.5	35.1	43.3	43.4

Interstate rail freight (billion tkm) (continued)

No. bureau ref.		6	2	9	21	29	46	30c
Financial year	IS rail freight	1995	1996	2001	2002	2004	2005	2007
2021							45.0	44.8
2022							46.7	46.2
2023							48.6	47.5
2024							50.5	48.9
2025							52.5	50.3
2026							54.6	51.7
2027							56.8	53.1
2028							59.1	54.5
2029							61.5	55.9
2030							64.0	57.4

Table A2.19 Total Australian road freight (billion tkm)

No. bureau ref.		32	51	53	28	29	56,60	40	47
Financial year	Road freight	1975	1993	1997	2000	2001	2002	2002	2009
1971	26								
1972	28								
1973	30								
1974	33								
1975	34	34							
1976	37	36							
1977	41	37							
1978	43	39							
1979	48	41							
1980	50	42							
1981	53	44							
1982	60	46							
1983	62	47							
1984	66	49							
1985	71	51							
1986	76	52							
1987	79	54							
1988	85	56							
1989	90	57							
1990	94	59							
1991	89	61							
1992	91	62							
1993	97	64	97						
1994	104	66	101						
1995	110	67	106	110					
1996	113	70	110	113					
1997	116	72	115	119					
1998	121	74	120	126	121				
1999	128	76	125	129	126				
2000	135	79	130	134	131				
2001	139	81	135	140	136				
2002	145	83	141	146	142		145	145	
2003	151	86	147	153	148	151	150	149	
2004	159	88	153	160	154	159	158	156	
2005	166	90	159	166	160	167	163	163	
2006	172		166	173	166	175	170	171	172
2007	180		173	180	173	183	178	179	177
2008	188		180	188	180	190	185	186	183
2009	185		188	195	188	198	192	193	189
2010	184		196	203	195	205	201	200	195
2011	189		204	211	203	212	209	207	202
2012	198		213	219	212	220	217	214	209
2013	203		222	228	221	228	225	222	215
2014	207		231	237	230	236	234	229	223
2015	213		241	246	239	244	243	237	230
2016	220				249	252	251	244	237
2017	228				259	260	261	252	245
2018					270	268	270	260	253
2019					281	276	279	268	262

Total Australian road freight (billion tkm) (continued)

No. bureau ref.		32	51	53	28	29	56,60	40	47
Financial year	Road freight	1975	1993	1997	2000	2001	2002	2002	2009
2020					292	285	287	276	270
2021									279
2022									289
2023									298
2024									308
2025									318
2026									329
2027									339
2028									351
2029									362
2030									374
2031									390

Table A2.20 Bulk rail freight (billion tkm)

No. bureau ref.		51	28	29	11a	BITRE
Financial year	Bulk rail	1993	2000	2003	2007	2012
1965	11.8					
1966	15.9					
1967	17.6					
1968	19.5					
1969	23.2					
1970	25.9					
1971	29.5					
1972	32.7					
1973	36.3					
1974	43.8					
1975	48.9					
1976	45.2					
1977	47.5					
1978	49.2					
1979	48.4					
1980	52.4					
1981	55.0					
1982	55.3					
1983	51.4					
1984	55.8					
1985	62.8					
1986	66.5					
1987	69.1					
1988	69.7					
1989	66.8					
1990	74.3					
1991	77.7					
1992	85.5					
1993	85.5					
1994	88.4	88				
1995	91.0	94				
1996	95.6	93				
1997	104.0	95				
1998	107.7	97				
1999	109.5	99				
2000	114.4	100	114			
2001	117.9	102	122			
2002	129.6	104	125			
2003	138.8	106	128	139		
2004	142.8	108	131	143		
2005	155.0	110	135	146		
2006	157.0	112	138	150		
2007	172.7	114	142	154	173	
2008	187.4	116	146	157	184	
2009	207.6	118	149	161	195	
2010	230.5	120	153	164	208	
2011	233.8	122	157	168	219	
2012	260.0	124	161	172	225	260
2013	288.1	125	166	175	233	278

Bulk rail freight (billion tkm) (continued)

No. bureau ref.		51	28	29	11a	BITRE
Financial year	Bulk rail	1993	2000	2003	2007	2012
2014	337.6	127	170	179	242	295
2015	369.4	129	174	182	251	310
2016	381.1		179	186	259	325
2017			184	189	267	338
2018			188	193	275	352
2019			193	197	283	366
2020			198	200	292	380
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						

Table A2.21 Non-bulk rail freight (billion tkm)

No. bureau ref.		51	28	29	11a	BITRE
Financial year	Non-bulk rail	1993	2000	2003	2007	2012
1965	8.0					
1966	7.9					
1967	8.0					
1968	8.6					
1969	9.2					
1970	10.1					
1971	10.2					
1972	10.0					
1973	10.4					
1974	10.3					
1975	10.1					
1976	10.4					
1977	10.2					
1978	10.6					
1979	11.5					
1980	11.3					
1981	10.8					
1982	10.0					
1983	8.5					
1984	9.6					
1985	9.8					
1986	10.8					
1987	11.3					
1988	12.2					
1989	13.8					
1990	13.6					
1991	13.4					
1992	13.8					
1993	15.2	15				
1994	15.9	15				
1995	15.2	15				
1996	14.6	16				
1997	15.6	17				
1998	17.9	17				
1999	18.4	18				
2000	19.2	18	19			
2001	19.6	19	20			
2002	20.9	19	21			
2003	21.8	20	21	22		
2004	25.9	21	22	22		
2005	29.0	21	23	23		
2006	32.4	22	24	24		
2007	26.3	23	24	25	26	
2008	31.3	24	25	25	28	
2009	29.6	24	26	26	29	
2010	28.1	25	27	26	30	
2011	28.0	26	28	27	31	
2012	30.7	27	29	28	31	31
2013	30.8	28	30	28	32	32

Non-bulk rail freight (billion tkm) (continued)

No. bureau ref.		51	28	29	11a	BITRE
Financial year	Non-bulk rail	1993	2000	2003	2007	2012
2014	30.1	29	31	29	33	33
2015	32.2	30	32	29	34	34
2016	32.4		33	30	34	35
2017			34	31	35	36
2018			35	31	36	37
2019			36	32	37	39
2020			37	33	38	40
2021						
2022						
2023						
2024						
2025						
2026						
2027						
2028						
2029						
2030						

Table A2.22 Domestic air freight (million tonnes)

No. bureau ref.		49	61
Financial year	Air freight	1985a	1985b
1965	0.079		
1966	0.085		
1967	0.092		
1968	0.096		
1969	0.101		
1970	0.112		
1971	0.113		
1972	0.112		
1973	0.117		
1974	0.139		
1975	0.134		
1976	0.131		
1977	0.132		
1978	0.148		
1979	0.157		
1980	0.159		
1981	0.157		
1982	0.169		
1983	0.174		
1984	0.185		
1985	0.184	0.184	0.184
1986	0.183	0.191	0.189
1987	0.168	0.197	0.194
1988	0.179	0.204	0.199
1989	0.180	0.210	0.204
1990	0.101	0.217	0.209
1991	0.143	0.224	0.214
1992	0.141	0.230	0.219
1993	0.147	0.237	0.224
1994	0.221	0.244	0.230
1995	0.239	0.250	0.235
1996	0.233	0.256	0.241
1997	0.235	0.262	0.246
1998	0.252	0.268	0.251
1999	0.244	0.273	0.257
2000	0.230	0.279	0.262
2001	0.235		
2002	0.195		
2003	0.176		
2004	0.205		
2005	0.241		
2006	0.234		
2007	0.220		
2008	0.239		
2009	0.202		
2010	0.219		
2011	0.253		
2012	0.236		
2013	0.215		

Domestic air freight (million tonnes) (continued)

No. bureau ref.		49	61
Financial year	Air freight	1985a	1985b
2014	0.197		
2015	0.192		
2016	0.195		
2017	0.225		
2018			
2019			
2020			
2021			
2022			
2023			
2024			
2025			
2026			
2027			
2028			
2029			
2030			

Table A2.23 International air freight (million tonnes)

No. bureau ref.				49	61
Financial year	Inbound	Outbound	Total	1985a	1985b
1960	0.005	0.003	0.008		
1961	0.006	0.004	0.010		
1962	0.005	0.004	0.009		
1963	0.006	0.004	0.010		
1964	0.007	0.005	0.011		
1965	0.008	0.006	0.014		
1966	0.010	0.007	0.017		
1967	0.011	0.007	0.019		
1968	0.015	0.010	0.025		
1969	0.019	0.011	0.030		
1970	0.021	0.013	0.034		
1971	0.023	0.016	0.039		
1972	0.025	0.017	0.042		
1973	0.029	0.022	0.051		
1974	0.041	0.024	0.064		
1975	0.046	0.027	0.073		
1976	0.049	0.030	0.079		
1977	0.054	0.032	0.087		
1978	0.060	0.038	0.098		
1979	0.071	0.050	0.122		
1980	0.076	0.056	0.132		
1981	0.078	0.060	0.138		
1982	0.097	0.072	0.168		
1983	0.096	0.081	0.178		
1984	0.116	0.089	0.205		
1985	0.130	0.105	0.235	0.235	0.235
1986	0.119	0.130	0.248	0.270	0.248
1987	0.119	0.163	0.281	0.305	0.261
1988	0.138	0.172	0.310	0.340	0.275
1989	0.174	0.166	0.340	0.375	0.290
1990	0.185	0.184	0.370	0.409	0.305
1991	0.184	0.190	0.374	0.447	0.318
1992	0.189	0.208	0.397	0.485	0.331
1993	0.201	0.249	0.450	0.523	0.345
1994	0.222	0.273	0.495	0.562	0.359
1995	0.261	0.300	0.562	0.600	0.374
1996	0.264	0.320	0.585	0.656	0.388
1997	0.298	0.339	0.636	0.712	0.401
1998	0.321	0.347	0.668	0.768	0.415
1999	0.327	0.343	0.670	0.824	0.430
2000	0.355	0.360	0.715	0.880	0.445
2001	0.327	0.368	0.695		
2002	0.303	0.360	0.664		
2003	0.324	0.338	0.663		
2004	0.357	0.298	0.655		
2005	0.419	0.313	0.732		
2006	0.445	0.313	0.758		
2007	0.465	0.323	0.788		
2008	0.500	0.320	0.820		

International air freight (million tonnes) (continued)

No. bureau ref.				49	61
Financial year	Inbound	Outbound	Total	1985a	1985b
2009	0.422	0.324	0.746		
2010	0.480	0.319	0.798		
2011	0.541	0.324	0.865		
2012	0.566	0.334	0.900		
2013	0.567	0.358	0.925		
2014	0.550	0.372	0.922		
2015	0.547	0.433	0.980		
2016	0.516	0.516	1.032		
2017	0.559	0.524	1.083		
2018					
2019					
2020					
2021					
2022					
2023					
2024					
2025					
2026					
2027					
2028					
2029					
2030					

Table A2.24 Air passenger movements through capital city airports

No. bureau ref.		24	14	49	61	36a	4	51,52,30h	11	30e	30J
Financial year	Passengers (000s)	1980	1985	1985a	1985b	1989	1994	1995	2007	2009	2011
1965	7147										
1966	7781										
1967	8333										
1968	9185										
1969	10118										
1970	11605										
1971	12234										
1972	13178										
1973	15006										
1974	16899										
1975	17681										
1976	17646										
1977	18019										
1978	19597										
1979	20746										
1980	22677	22677									
1981	22716	23595									
1982	23119	24514									
1983	21420	25433									
1984	22036	26351									
1985	23725	27270	23725	23725	23725						
1986	25372	28764	24893	25372	24553						
1987	26830	30259	26518	26830	25411						
1988	29874	31754	28480	29874	26300						
1989	31435	33249	30035	31435	27221	31435					
1990	25951	34743	31048	25951	28175	32096					
1991	33132	36902	31900	33132	29143	33861					
1992	40549	39061	33361	40549	30144	35726					
1993	41370	41220	34957	41370	31181	37698					
1994	44672	43378	36751	44672	32253	39783	44672				
1995	49487	45537	38657	49487	33363	41988	49487	49487			
1996	53505	48334	40797	53505	34546	44319	53505	51764			
1997	55551	51132	42834	55551	35772	46785	56306	54149			
1998	56805	53929	43946	56805	37042	49394	59108	56648			
1999	57982	56726	45225	57982	38357	52042	61910	59268			
2000	61790	59523	47235	61790	39719	54840	64711	62013			
2001	68926	63586				57797	67513	64891			
2002	63594	67648				60922	70315	67908			
2003	65121	71710				64227	73117	71070			
2004	73885	75772				67721	75918	74386			
2005	80686	79835				71416	78720	77863			
2006	84200					75325	81522	81509			
2007	90432					79460	84324	85333	90432		
2008	96687					83836	87125	89344	96115		
2009	98128						89927	93551	101448	98128	
2010	102968						92729	97964	106131	102385	
2011	108888						95530	102594	111017	106276	108888
2012	110779						98332	107452	116706	112300	110509

Air passenger movements through capital city airports (continued)

No. bureau ref.		24	14	49	61	36a	4	51,52,30h	11	30e	30J
Financial year	Passengers (000s)	1980	1985	1985a	1985b	1989	1994	1995	2007	2009	2011
2013	115250						101134	112549	122165	118724	117005
2014	118913						103936	117898	126863	125611	122966
2015	120323						106737	123512	131255	132866	129242
2016	124619								136297	140460	134100
2017	128112								140531	148515	139235
2018									145214	155482	144702
2019									150053	161898	150416
2020									155055	167909	155921
2021									160227	173873	161452
2022									165573	180066	167211
2023									171100	186247	173198
2024									176812	192660	179433
2025									182716	199314	185915
2026									188821	206219	192665
2027										212955	199687
2028										219934	207002
2029										227161	214613
2030										234650	222521

Table A2.25 Real medium-distance airfares (average best discount/economy, 2002 on restricted economy in 2003–04 dollars)

No. bureau ref.		12	33	24	14	49	61	36a	4	51,52,30H	11	30e	30j
Financial year	Real airfare	1975	1975a	1980	1985	1985a	1985b	1989	1994	1995	2007	2009	2011
1960	226												
1961	217												
1962	217												
1963	217												
1964	213												
1965	248												
1966	238												
1967	254												
1968	248												
1969	242												
1970	235												
1971	245												
1972	244												
1973	230												
1974	204												
1975	194	194	194										
1976	235	198	196										
1977	216	201	198										
1978	213	205	200										
1979	213	208	202										
1980	224	212	204	224									
1981	239	216	206	227									
1982	258	219	208	229									
1983	257	223	210	231									
1984	273	227	213	233									
1985	290	231	215	236	290	290	290						
1986	279	230	217	238	293	293	294						
1987	270	229	219	240	296	296	297						
1988	262	228	221	243	299	299	301						
1989	254	227	223	245	302	302	304	254					
1990	255	225	226	248	305	305	308	251					
1991	253	224	228	250	308	308	312	248					
1992	259	223	230	253	311	311	315	245					
1993	261	222	232	255	314	314	319	241					
1994	259	221	235	258	317	317	323	238	259				
1995	253	220	237	260	320	320	327	235	263	253			
1996	253	219	239	263	324	324	330	232	269	250			
1997	271	218	242	266	327	327	333	229	267	247			
1998	284	217	244	268	330	330	337	226	261	244			
1999	285	215	247	271	333	333	340	223	259	240			
2000	282	214	249	274	337	337	344	220	260	237			
2001	272			276				217	275	234			
2002	249			279				215	281	231			
2003	255			282				212	288	228			
2004	253			285				209	294	225			
2005	281			288				206	299	222			

Real medium-distance airfares (average best discount/economy, 2002 on restricted economy in 2003–04 dollars) (continued)

No. bureau ref.	$2003–04	12	33	24	14	49	61	36a	4	51,52,30H	11	30e	30j
Financial year	Real airfare	1975	1975a	1980	1985	1985a	1985b	1989	1994	1995	2007	2009	2011
2006	255							204	308	219	255		
2007	268							201	315	217	255		
2008	297							198	324	214	255	297	
2009	296								333	211	255	297	
2010	271								339	208	255	297	
2011	267								347	205	255	297	267
2012	209								354	203	255	297	268
2013	229								360	200	255	297	269
2014	236								368	198	255	297	270
2015	253									195	255	297	271
2016	266										255	297	271
2017	271										255	297	272
2018											255	297	273
2019											255	297	274
2020											255	297	275
2021											255	297	276
2022											255	297	276
2023											255	297	277
2024											255	297	278
2025											255	297	279
2026											255	297	280
2027												297	281
2028												297	281
2029												297	282
2030												297	283

Table A2.26 Real international airfares

		Real Australian dollar index (1972=100)									
No. bureau ref.		12	33	24	49	61	16	36a	4	51,52,30h	30j
Financial year	Real airfare	1975	1975a	1980	1985a	1985b	1986	1989	1994	1995	2011
1965	144										
1966	138										
1967	135										
1968	128										
1969	120										
1970	109										
1971	108										
1972	100										
1973	90										
1974	81										
1975	75	75	75								
1976	76	73	74								
1977	74	71	73								
1978	68	69	72								
1979	58	68	71								
1980	50	66	70	50							
1981	53	64	69	50							
1982	55	63	69	50							
1983	57	61	68	50							
1984	60	60	67	50							
1985	61	58	66	50	61	61					
1986	61	58	65	50	61	60	61				
1987	56	57	64	50	61	60	60				
1988	54	57	64	50	61	60	59				
1989	52	57	63	50	61	59	58	52			
1990	52	56	62	50	61	59	58	52			
1991	55	56	61	50	60	59	57	51			
1992	57	56	60	50	60	58	56	51			
1993	54	55	60	50	59	58	55	50			
1994	54	55	59	50	59	58	55	50	54		
1995	50	55	58	50	58	58	54	49	54	50	
1996	47			50	58	57	53	49	54	50	
1997	46			50	57	57	53	48	54	49	
1998	46			50	57	57	52	48	54	49	
1999	46			50	56	56	51	47	54	48	
2000	46			50	56	56	51	47	54	48	
2001	45			50				46	54	48	
2002	45			50				46	54	47	
2003	46			50				45	54	47	
2004	46			50				45	54	46	
2005	47			50				45	54	46	
2006	46							44	54	45	
2007	46							44	54	45	
2008	47							43	54	44	
2009	47								54	44	
2010	45								54	43	
2011	44								54	43	44

Real international airfares (continued)

		Real Australian dollar index (1972=100)									
No. bureau ref.		12	33	24	49	61	16	36a	4	51,52,30h	30j
Financial year	Real airfare	1975	1975a	1980	1985a	1985b	1986	1989	1994	1995	2011
2012	42								54	43	44
2013	42								54	42	44
2014	42								54	42	44
2015	43								54	41	44
2016	43								54		44
2017	43										44
2018											44
2019											44
2020											44
2021											44
2022											44
2023											44
2024											44
2025											44
2026											44
2027											44
2028											44
2029											44
2030											44

Table A2.27 Aircraft movements through capital city airports

No. bureau ref.		4	17	30e
Financial year	Aircraft moves	1996	1985	2009
1965				
1966				
1967	221285			
1968	226563			
1969	238348			
1970	258741			
1971	272745			
1972	275812			
1973	296855			
1974	329579			
1975	344738			
1976	344709			
1977	329282			
1978	373909			
1979	379351			
1980	393023			
1981	387683			
1982	393714			
1983	378851			
1984	372607			
1985	383948		383948	
1986	416829		385570	
1987	420776		387041	
1988	436013		387131	
1989	452812		384769	
1990	375664		378039	
1991	470914		390727	
1992	533125		406309	
1993	575700		417797	
1994	595916		429902	
1995	647167		442745	
1996	686658	686 658	453705	
1997	703239	707 241	461459	
1998	712201	727 825	469375	
1999	719744	748 408	480509	
2000	741133	768 992	487818	
2001	828663	789 575		
2002	681082	810 158		
2003	667933	830 742		
2004	710201	851 325		
2005	771760	871 908		
2006	773877	892 492		
2007	788774	913 075		
2008	831244	933 659		
2009	853943	954 242		853943
2010	874084	974 825		871746
2011	916195	995 409		883384
2012	925566	1015 992		910220
2013	967281	1036 575		938911

Aircraft movements through capital city airports (continued)

No. bureau ref.		4	17	30e
Financial year	Aircraft moves	1996	1985	2009
2014	986381	1057 159		970601
2015	987581	1077 742		1013093
2016	997814			1056661
2017	1002411			1103406
2018				1140945.
2019				1173032
2020				1201251.
2021				1228384.
2022				1256406
2023				1283225
2024				1310927
2025				1339399.
2026				1368541
2027				1395832.
2028				1423898
2029				1452538.
2030				1482034

Table A2.28 Container import movements through capital city ports

No. bureau ref.		3	7	42	8	47b	30d
Financial year	000 TEUs Full imports	1996	2001	2003	2005	2007	2013
1965	0						
1966	1						
1967	3						
1968	8						
1969	24						
1970	72						
1971	118						
1972	164						
1973	190						
1974	247						
1975	271						
1976	298						
1977	348						
1978	369						
1979	391						
1980	415						
1981	441						
1982	468						
1983	497						
1984	527						
1985	560						
1986	594						
1987	630						
1988	669						
1989	710						
1990	754						
1991	800						
1992	849						
1993	901						
1994	956						
1995	1015						
1996	1023	1023					
1997	1113	1031					
1998	1241	1040					
1999	1333	1049					
2000	1541	1058					
2001	1524	1067	1524				
2002	1620	1076	1613				
2003	1878	1085	1799	1878			
2004	2094	1094	1894	2069			
2005	2284	1103	1995	2079	2284		
2006	2347	1113	2099	2129	2356		
2007	2608	1122	2205	2221	2452	2609	
2008	2832	1132	2313	2379	2702	2766	
2009	2708	1142	2422	2477	2890	2931	
2010	2888	1151	2534	2564	2974	3075	
2011	3088	1161	2647	2688	3136	3249	
2012	3091	1171		2854	3325	3445	
2013	3135	1181		3002	3474	3623	3135

Container import movements through capital city ports (continued)

No. bureau ref.		3	7	42	8	47b	30d
Financial year	000 TEUs Full imports	1996	2001	2003	2005	2007	2013
2014	3202	1192			3658	3736	3201
2015	3312	1202			3851	3846	3463
2016	3376				4057	4049	3681
2017	3504				4275	4254	3943
2018					4506	4468	4171
2019					4748	4694	4429
2020					5005	4931	4743
2021					5273	5184	5043
2022					5558	5445	5351
2023					5860	5724	5665
2024					6181	6015	6035
2025					6517	6325	6364
2026						6649	6682
2027						6990	6975
2028						7351	7246
2029						7730	7534
2030						8129	7815

Table A2.29 Container export movements through capital city ports

Financial year		3	7	42	8	47b	30d
	000 TEUs Full export	1996	2001	2003	2005	2007	2013
1965	0						
1966	1						
1967	2						
1968	6						
1969	18						
1970	54						
1971	120						
1972	171						
1973	193						
1974	173						
1975	202						
1976	231						
1977	271						
1978	289						
1979	308						
1980	329						
1981	351						
1982	374						
1983	399						
1984	426						
1985	454						
1986	485						
1987	517						
1988	552						
1989	589						
1990	628						
1991	670						
1992	715						
1993	763						
1994	813						
1995	868						
1996	932	932					
1997	1007	958					
1998	1071	984					
1999	1149	1011					
2000	1290	1039					
2001	1372	1069	1372				
2002	1442	1099	1446				
2003	1462	1130	1479	1462			
2004	1548	1162	1608	1440			
2005	1652	1196	1703	1479	1652		
2006	1719	1230	1798	1551	1742		
2007	1804	1266	1893	1639	1889	1805	
2008	1879	1303	1986	1777	2021	1897	
2009	1891	1342	2077	1913	2171	2036	
2010	1914	1382	2166	2008	2311	2206	
2011	2016	1423	2251	2132	2446	2419	
2012	1962	1466		2295	2567	2666	
2013	1958	1510		2445	2698	2782	1958

Container export movements through capital city ports (continued)

Financial year		3	7	42	8	47b	30d
	000 TEUs Full export	1996	2001	2003	2005	2007	2013
2014	2003	1556			2847	2902	2002
2015	2016	1604			2978	3023	2060
2016	1983				3114	3154	2153
2017	2142				3257	3293	2271
2018					3407	3439	2381
2019					3563	3591	2486
2020					3728	3753	2621
2021					3898	3924	2678
2022					4080	4106	2833
2023					4267	4297	2972
2024					4464	4502	3111
2025					4669	4717	3261
2026						4945	3411
2027						5187	3562
2028						5444	3725
2029						5715	3889
2030						6004	4052

Table A2.30 Congestion cost in Australia's capital cities

No. bureau ref.		18b	10	22b	22b	22b
Financiial year	2010$b Congestion cost	1995	2005	2014	2014 low	2014 high
1990	5					
1991	5					
1992	5					
1993	5					
1994	6					
1995	6	6				
1996	6	6				
1997	7	7				
1998	7	7				
1999	8	7				
2000	8	7				
2001	8	8				
2002	9	8				
2003	9	8				
2004	10	9				
2005	11	9	11			
2006	11	10	11			
2007	12	10	12			
2008	13	10	13			
2009	13	11	14			
2010	13	11	15			
2011	13	12	16			
2012	14	12	16			
2013	15	13	17			
2014	16	14	18	16	16	16
2015	16	14	19	16	16	16
2016			19	18	18	18
2017			20	19	18	19
2018			21	20	20	20
2019			22	21	21	21
2020			23	23	22	22
2021				24	23	24
2022				26	23	25
2023				28	24	26
2024				29	25	27
2025				31	25	28
2026				32	26	29
2027				33	26	30
2028				35	27	31
2029				36	27	32
2030				37	28	33

Table A2.31 Greenhouse gas emissions from Australian transport

No. bureau ref.		51	58	28	57	11a	BITRE
Financiial year	Gg CO_2eq GHG	1993	1998	2000	2002	2007	2011
1965	25955						
1966	27092						
1967	27934						
1968	29071						
1969	30785						
1970	32340						
1971	33679						
1972	35452						
1973	36919						
1974	39616						
1975	41231						
1976	42430						
1977	44668						
1978	46852						
1979	48230						
1980	49253						
1981	50129						
1982	51912						
1983	50878						
1984	53071						
1985	54854						
1986	56256						
1987	57249						
1988	59980						
1989	61541						
1990	61776						
1991	61121						
1992	62134						
1993	63862	63 862					
1994	65601	65 190					
1995	69080	66 519					
1996	71073	67 848					
1997	72467	69 177					
1998	72706	70 506	72706				
1999	73565	71 835	74178				
2000	75262	73 163	75649	75 184			
2001	75288	74 492	77121	76 924			
2002	76661	75 821	78593	79 510	76 603		
2003	78315	77 150	80065	81 355	78 920		
2004	81690	78 479	81537	83 019	81 433		
2005	82885	79 808	83009	84 485	83 647		
2006	82716	81 136	84481	85 848	85 224		
2007	84814	82 465	85953	87 409	86 899	85155	
2008	86419	83 794	87425	88 861	88 417	86672	
2009	86297	85 123	88897	90 287	89 891	88942	
2010	87576	86 452	90369	91 660	91 541	90826	
2011	89412	87 781	91841	93 131	92 961	92449	89805
2012	90892	89 109	93313	94 568	94 341	93852	91371
2013	92035	90 438		95 976	95 665	95236	92937

Greenhouse gas emissions from Australian transport (continued)

Financial year		51	58	28	57	11a	BITRE
	Gg CO_2eq GHG	1993	1998	2000	2002	2007	2011
2014	92623	91 767		97 380	96 971	96643	94504
2015	93199	93 096		98 740	98 237	98063	96070
2016	95142			100 091	99 450	99383	97741
2017	96525			101 430	100 859	100698	99412
2018				102 731	102 054	101971	101082
2019				103 942	103 208	103380	102753
2020				105 048	104 347	104683	104424
2021							105677
2022							106930
2023							108183
2024							109436
2025							110689
2026							111525
2027							112360
2028							113196
2029							114031
2030							114866

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Abbreviations and terms

ABS	Australian Bureau of Statistics
ATRF	Australian Transport Research Forum
b	billions
BITRE	Bureau of Infrastructure, Transport and Regional Economics
Black swan	unexpected, unpredictable events
BTCE	Bureau of Transport and Communications Economics
BTE	Bureau of Transport Economics
BTRE	Bureau of Transport and Regional Economics
CBR	Commonwealth Bureau of Roads
Chain-weighted	Adjusted for inflation
c/ntkm	cents per net tonne-kilometre
CO2eq	Carbon dioxide equivalents
GDP	Gross Domestic Product
G7 GDP	Gross Domestic Product of the G7 countries
Gg	Gigagrams
GHG	Greenhouse gases
IS	Interstate
LCVs	Light commercial vehicles
LVs	Light vehicles – equals cars (including SUVs) plus LCVs
m	millions
Metro(politan)	Sum of the eight capital cities
ntkm	net tonne kilometre – 1 tonne of freight (less container) moved 1 kilometre
OS	Other Studies
pkm	passenger kilometre – one passenger moved one kilometre
Real	Adjusted for inflation

SUVs	Sports Utility Vehicles
TEUs	Twentytonne equivalent unit container numbers
tkm	tonne kilometre – 1 tonne moved 1 kilometre
UPT	Urban Public Transport
vkt	vehicle kilometres travelled – 1 vehicle travelling 1 kilometre

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