



**Travel to work in Australian capital cities,
1976-2006:
an analysis of census data**

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Cover photo:

A typical example of the service standards underlying the dramatic decline in use of buses for travel to work in Melbourne.

This bus stop is in the heart of a 'major activity centre' in inner Melbourne at a significant intermodal transfer point. Construction works in an adjacent business now obstruct the footpath at the bus stop. These works are scheduled to take almost a year. The alternative of moving the bus stop a few metres was not taken, apparently because it would require the re-location of a rubbish bin and other 'street furniture'.

Summary

Since 1976, the Australian census has asked people how they travel to work. This report uses the answers to this question from 1976 to 2006 to identify the major trends in travel to work in Australia's capital cities (the six state capitals plus Canberra) over three decades.

Main findings

- There has been a dramatic increase in the number of cars driven to work each day in Australia's capital cities, with a total increase of 1,439,024 cars, or 70.1%, between 1976 and 2006.

- The most important cause of the increase in car use is a shift away from more sustainable transport modes – public transport, walking and car-pooling.

In Sydney, Melbourne, Adelaide and Hobart, mode shift accounted for the majority of the growth in car use, ahead of increases in the size of the workforce. In the other capitals, rapid population growth was the biggest factor in increased car travel, but mode shift still accounted for nearly half of the growth in car use.

- Car-pooling has performed particularly poorly over the last three decades: the share of workers travelling as passengers has fallen continuously in all capitals. The biggest decline was in Melbourne, which now has the lowest rate of car pooling. There seems to be little prospect of reversing this trend.
- Public transport's share of work travel has declined in all cities over the three decades, but at different rates. The biggest decline was in Melbourne; the smallest decline in Sydney and in Canberra (where public transport use was already low in 1976). However, public transport's mode share has begun a modest revival in the last 5 to 10 years, except in Sydney and Hobart.
- Walking is the most sustainable of all travel modes and has a significant share of the travel market in some cities, notably Hobart, Sydney and Canberra. Walking receives almost no support from transport policy-makers, but its share of work trips is increasing in all capitals.
- Cycling receives much more attention from policy-makers than walking, but is much less significant. Cycling is of negligible importance everywhere except Canberra. Increases in cycling appear to come at the expense of walking and public transport, rather than car use.
- Melbourne is the worst performing city over the three decades. It has the biggest increase in car driving and the biggest declines in public transport, car pooling and walking. More cars are driven to work each day in Melbourne than in Sydney, despite Sydney's much bigger workforce. The share of workers who drive is now higher in Melbourne than in Sydney, Brisbane, Hobart and even Canberra. This appears to be a result of Melbourne having constructed more urban freeways and tollways over the last 30 years than any other capital.

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- Adelaide is the next-worst performer. It has had a smaller increase in car driving than Melbourne, but this is only because it started with a higher rate. Adelaide now has the highest share of workers driving cars of any Australian capital. This poor trend is a result of the reversal of the 1970s Dunstan Government's transport policies, which favoured public transport and restrained urban road building.
- Sydney has by far the lowest rate of car driving, and the highest public transport usage, despite recent problems with its train system. However, this performance is largely the historical legacy of past urban planning decisions, and of the upgrading of the rail system under the Wran Government.
- Perth and Brisbane show the most positive trends, with significant improvements in public transport's share of travel, but both cities still have a long way to go. Brisbane now has the second-lowest rate of car driving to work after Sydney, but this is mainly a reflection of how poorly Melbourne has performed. Perth used to be the worst performer for car driving. As a consequence of the upgrading and extension of the rail system, Perth's car-use has now dropped below Adelaide's.
- Transport patterns and policies in Canberra remain dominated by the car, as they were in 1976. Hobart performs quite well in walking and car-pooling, but needs to do something about the state of its public transport.

Policy recommendations

These findings demonstrate the need for significant changes to federal and state transport policies; especially if Australia is to meet its obligations to combat global warming. Transport is the second-largest source of greenhouse emissions after electricity generation, and the level of transport emissions is growing rapidly.

The census data show that treating traffic problems by building more roads is an ineffective response. The main result has been to shift travellers out of environmentally friendly modes and into cars. By contrast, the performance of public transport and walking can be improved more cheaply and would produce superior environmental outcomes.

The former federal government's *Auslink* funding program has exacerbated the problems identified in this report, because it is biased in favour of roads and against public transport. It needs to be replaced by a new 'mode-neutral' funding model which is tied to environmental outcomes, especially the reduction of greenhouse emissions.

State governments also need to change their transport policies, which remain dominated by motorway-building. In addition, they need to reform the governance and management of public transport, especially in Sydney and Melbourne, both of which lack competent, dynamic regional public transport agencies.

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Travel to work in Australian capital cities, 1976-2006

Introduction

Growing traffic levels are a problem in all large Australian cities. They produce congestion and frustration, as well as adding to smog and other local air pollution. Rising oil and petrol prices raise questions about the increasing social impacts of continued car dependence.

Traffic growth is also a major factor behind Australia's increasing emissions of the greenhouse gases that contribute to global warming. Transport is the second-largest source of greenhouse emissions after power generation, and is growing rapidly. If Australia is to meet its international obligations to combat climate change, this trend cannot continue.

Governments across Australia claim that they are tackling urban transport problems, but they continue to worsen. Perhaps governments have been treating the symptoms instead of the causes. This report seeks to identify some of those causes, through a detailed examination of trends in work travel in Australian capital cities over the last three decades. It focuses on the journey to work, for two reasons. First, work journeys are longer than other trips, and are more concentrated in time, so they are the major factor behind peak-hour traffic volumes. Second, there is much better data available for this kind of trip than for others, because the Australian census has incorporated a question about the mode of travel used for the journey to work since 1976.

This report examines the census data on the mode of travel for the journey to work over the three decades since 1976. It compares the performance of the different modes of travel in Australia's seven major cities (the state capitals plus Canberra), in order to assess the effectiveness of the transport policies employed over this period.

The data comes from seven censuses, the most recent being that of 2006, the journey-to-work data from which was released in late October 2007. The methodology used to compile the data, and the limitations arising from it, are explained in the Appendix.

Overall findings: huge growth in car travel

In all Australian cities, there has been a dramatic growth in the number of cars driven to work [Tables 1.1-1.8]. The rapid growth in car driving has two causes. There has been an overall increase in the size of the workforce, and this has been accompanied by a shift away from more environmentally friendly modes, namely car-pooling (shown in the 'car passenger' numbers), public transport and walking. Changes in the rates of cycling to work are discussed separately below.

In Sydney, Melbourne, Adelaide and Hobart, the shift away from environmentally friendly modes has contributed more to the increase in car numbers than has growth in the workforce.

In Sydney in 1976, 662,405 people drove cars to work on census day. Over the three decades to 2006, the workforce grew by 25%. If modal splits had remained constant, this growth would have increased the number of car drivers by 167,125 (25% of 662,405). Instead, the number of car drivers increased by 356,712 or more than twice the predicted amount. Around 53% of the increase in traffic in Sydney between 1976 and 2006 came from mode shift; only 47% came from growth in the workforce.

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The situation is worse in Melbourne, because the shift away from environmentally friendly modes of travel has been greater. Melbourne has had the biggest increase in the share of workers driving to work of any of the seven capital cities, from 56.1% in 1976 to 72.6% in 2006. In fact, in 2006 Melburnians used 8,032 *more* cars to drive to work than residents of Sydney, even though 193,194 *fewer* people travelled to work on census day in Melbourne than in Sydney [Figure 1]. The number of car drivers in Melbourne increased by 409,701, or 66.4%, between 1976 and 2006, but only 43% of this increase was due to growth in the workforce [Figure 1 & Table 1.2]. The other 57% was the result of a shift away from environmentally friendly modes.

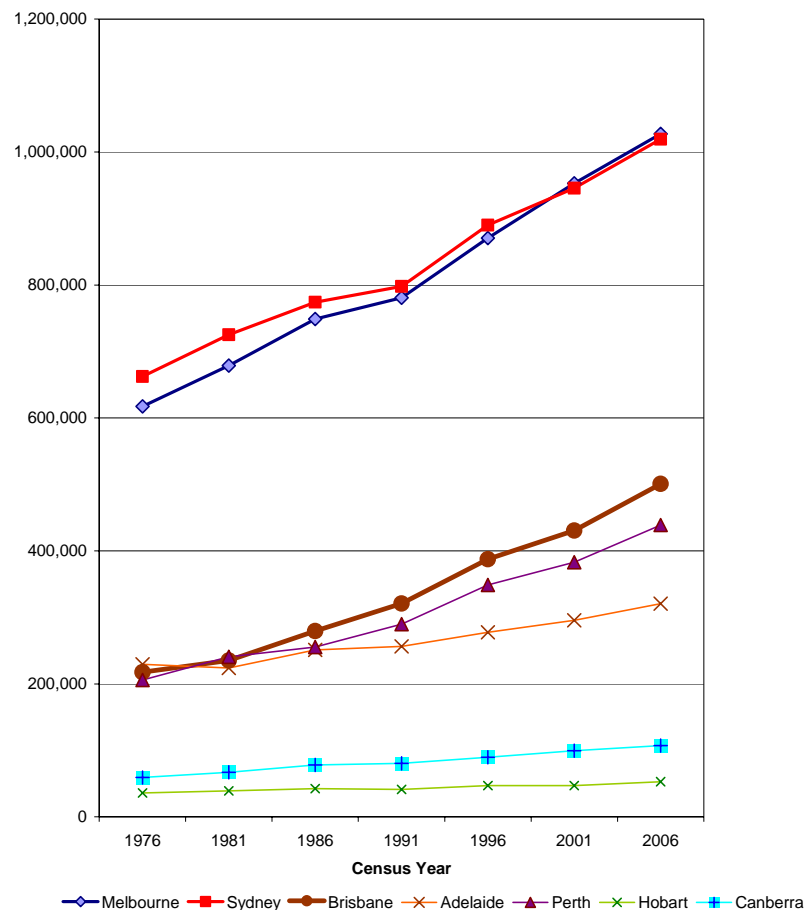


Figure 1: Numbers of cars on the road for work trips

In Adelaide, the number of cars driven to work increased by 91,217, or 40%, between 1976 and 2006, but the total number of workers travelling on census day only grew by 15%. Adelaide has had the second-biggest rise in the share of workers driving after Melbourne, but because it started with a higher rate in 1976, Adelaide now has the highest mode share for car driving of any capital city, at 75.4%. Since 1976, 63% of the growth in car numbers in Adelaide was due to mode shift.

In Hobart, comparisons with 1976 are complicated by the fact that the Tasman Bridge was closed as a result of the 1975 shipping accident, leading to abnormally high use of public transport, especially ferries. But even taking 1981 as the starting point, the majority of the growth in car use to 2006 was due to mode shift.

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In Brisbane and Perth, rapid growth in the workforce contributed more to the increase in car numbers than did mode shift, but even in these cities, mode shift was an important factor. Canberra is the only city in which mode shift was not a major factor, but this is because the share of travel by car drivers was already very high in 1976.

There has, however, been a small improvement in the mode share situation in most Australian cities in the last 5 to 10 years. In Melbourne, Brisbane, Perth and Hobart, the 'car driver' share peaked in 1996, and has declined modestly since then [Tables 1.1-1.8; Figure 2]. In Canberra and Adelaide, 2006 car driver numbers were lower than those of 2001. These changes are the result of modest increases in the mode shares for public transport and walking. Sydney is the only city in which public transport's share of travel declined and car driving rose between 2001 and 2006. Even so, Sydney still had the highest rate of public transport use and the lowest rate of car driving in 2006.

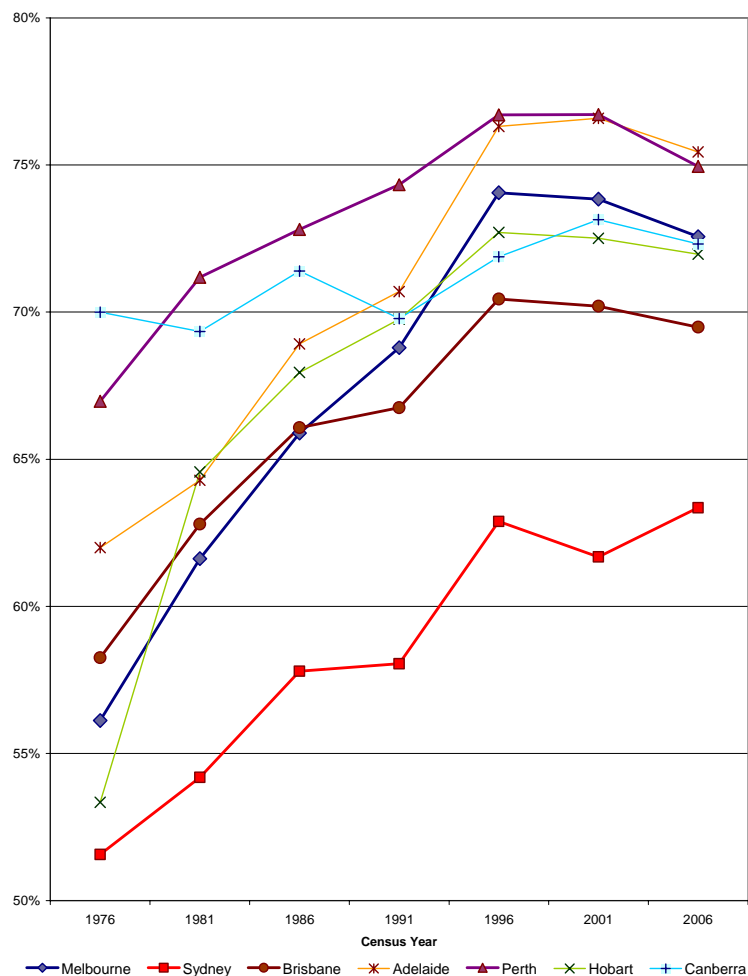


Figure 2: Mode share for car drivers

Travel to work in Australian capital cities, 1976-2006

Census data: method of travel to work, 1976-2006

SYDNEY

| | 1976 | % | 1981 | % | 1986 | % | 1991 | % | 1996 | % | 2001 | % | 2006 | % |
|--------------------------------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|
| Total Workforce | 1,425,324 | | 1,553,110 | | 1,555,226 | | 1,621,868 | | 1,675,461 | | 1,816,225 | | 1,903,527 | |
| Travelled to Work | 1,284,581 | | 1,338,142 | | 1,339,533 | | 1,374,511 | | 1,415,512 | | 1,533,253 | | 1,608,683 | |
| Public Transport | 385,289 | 30.0% | 383,023 | 28.6% | 350,738 | 26.2% | 341,460 | 24.8% | 305,363 | 21.6% | 343,692 | 22.4% | 341,076 | 21.2% |
| Train | 192,595 | 15.0% | 214,245 | 16.0% | 203,111 | 15.2% | 202,574 | 14.7% | 213,070 | 15.1% | 241,792 | 15.8% | 232,525 | 14.5% |
| Ferry/Tram | 11,313 | 0.9% | 10,482 | 0.8% | 9,933 | 0.7% | 7,591 | 0.6% | 4,825 | 0.3% | 6,211 | 0.4% | 6,709 | 0.4% |
| Bus | 181,381 | 14.1% | 158,296 | 11.8% | 137,694 | 10.3% | 131,295 | 9.6% | 87,468 | 6.2% | 95,689 | 6.2% | 101,842 | 6.3% |
| Car Total | 794,386 | 61.8% | 854,453 | 63.9% | 895,176 | 66.8% | 922,461 | 67.1% | 996,182 | 70.4% | 1,047,230 | 68.3% | 1,119,307 | 69.6% |
| Car driver | 662,405 | 51.6% | 725,094 | 54.2% | 774,178 | 57.8% | 797,878 | 58.0% | 890,138 | 62.9% | 945,671 | 61.7% | 1,019,117 | 63.4% |
| Car passenger | 131,981 | 10.3% | 129,359 | 9.7% | 120,998 | 9.0% | 124,583 | 9.1% | 106,044 | 7.5% | 101,559 | 6.6% | 100,190 | 6.2% |
| Bicycle | 4,646 | 0.4% | 8,008 | 0.6% | 9,262 | 0.7% | 8,934 | 0.6% | 8,193 | 0.6% | 9,223 | 0.6% | 10,886 | 0.7% |
| Walked Only | 75,257 | 5.9% | 64,701 | 4.8% | 59,503 | 4.4% | 65,702 | 4.8% | 62,815 | 4.4% | 69,098 | 4.5% | 79,570 | 4.9% |
| Total of Other Modes: | 25,003 | 1.9% | 27,957 | 2.1% | 24,854 | 1.9% | 35,954 | 2.6% | 42,959 | 3.0% | 64,010 | 4.2% | 57,844 | 3.6% |
| Motorbike/scooter | 12,996 | 1.0% | 16,117 | 1.2% | 12,990 | 1.0% | 8,029 | 0.6% | 7,590 | 0.5% | 7,129 | 0.5% | 9,062 | 0.6% |
| Taxi | 12,007 | 0.9% | 11,840 | 0.9% | 11,864 | 0.9% | 10,269 | 0.7% | 7,548 | 0.5% | 6,638 | 0.4% | 6,525 | 0.4% |
| Other | --- | --- | --- | --- | --- | --- | 17,656 | 1.3% | 18,620 | 1.3% | 6,826 | 0.4% | 8,573 | 0.5% |
| Other Two Methods | --- | --- | --- | --- | --- | --- | --- | --- | 8,829 | 0.6% | 12,817 | 0.8% | 7,525 | 0.5% |
| Other Three Methods | --- | --- | --- | --- | --- | --- | --- | --- | 372 | 0.0% | 690 | 0.0% | 516 | 0.0% |
| Truck | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 29,910 | 2.0% | 25,643 | 1.6% |
| Transport Mode to Work TOTALS | 1,284,581 | 100% | 1,338,142 | 100% | 1,339,533 | 100% | 1,338,557 | 100% | 1,415,512 | 100% | 1,533,253 | 100% | 1,608,683 | 100% |

Table 1.1: ABS Census – method of travel to work, 1976-2006, Sydney

MELBOURNE

| | 1976 | % | 1981 | % | 1986 | % | 1991 | % | 1996 | % | 2001 | % | 2006 | % |
|--------------------------------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|
| Total Workforce | 1,217,005 | | 1,272,411 | | 1,319,888 | | 1,351,871 | | 1,391,637 | | 1,544,301 | | 1,685,963 | |
| Travelled to Work | 1,100,297 | | 1,101,534 | | 1,136,322 | | 1,134,822 | | 1,175,694 | | 1,290,537 | | 1,415,489 | |
| Public Transport | 265,001 | 24.1% | 220,291 | 20.0% | 210,287 | 18.5% | 179,090 | 15.8% | 143,223 | 12.2% | 168,905 | 13.1% | 196,721 | 13.9% |
| Train | 130,483 | 11.9% | 111,704 | 10.1% | 113,322 | 10.0% | 103,237 | 9.1% | 100,360 | 8.5% | 118,547 | 9.2% | 142,359 | 10.1% |
| Ferry/Tram | 65,425 | 5.9% | 56,817 | 5.2% | 50,823 | 4.5% | 38,218 | 3.4% | 22,232 | 1.9% | 30,704 | 2.4% | 33,462 | 2.4% |
| Bus | 69,093 | 6.3% | 51,770 | 4.7% | 46,142 | 4.1% | 37,635 | 3.3% | 20,631 | 1.8% | 19,654 | 1.5% | 20,900 | 1.5% |
| Car Total | 744,648 | 67.7% | 801,882 | 72.8% | 857,059 | 75.4% | 880,792 | 77.6% | 954,560 | 81.2% | 1,031,977 | 80.0% | 1,106,172 | 78.1% |
| Car driver | 617,448 | 56.1% | 678,743 | 61.6% | 748,705 | 65.9% | 780,650 | 68.8% | 870,711 | 74.1% | 952,885 | 73.8% | 1,027,149 | 72.6% |
| Car passenger | 127,200 | 11.6% | 123,139 | 11.2% | 108,354 | 9.5% | 100,142 | 8.8% | 83,849 | 7.1% | 79,092 | 6.1% | 79,023 | 5.6% |
| Bicycle | 10,816 | 1.0% | 13,768 | 1.2% | 13,062 | 1.1% | 12,068 | 1.1% | 10,602 | 0.9% | 12,837 | 1.0% | 18,909 | 1.3% |
| Walked Only | 66,100 | 6.0% | 50,052 | 4.5% | 42,838 | 3.8% | 40,405 | 3.6% | 35,610 | 3.0% | 37,486 | 2.9% | 50,894 | 3.6% |
| Total of Other Modes: | 13,732 | 1.2% | 15,541 | 1.4% | 13,076 | 1.2% | 22,467 | 2.0% | 31,699 | 2.7% | 39,332 | 3.0% | 42,793 | 3.0% |
| Motorbike/scooter | 6,322 | 0.6% | 8,509 | 0.8% | 6,824 | 0.6% | 5,359 | 0.5% | 5,139 | 0.4% | 5,407 | 0.4% | 7,525 | 0.5% |
| Taxi | 7,410 | 0.7% | 7,032 | 0.6% | 6,252 | 0.6% | 4,855 | 0.4% | 4,105 | 0.3% | 3,771 | 0.3% | 3,646 | 0.3% |
| Other | --- | --- | --- | --- | --- | --- | 12,253 | 1.1% | 12,881 | 1.1% | 5,439 | 0.4% | 6,540 | 0.5% |
| Other Two Methods | --- | --- | --- | --- | --- | --- | --- | --- | 9,144 | 0.8% | 6,750 | 0.5% | 8,937 | 0.6% |
| Other Three Methods | --- | --- | --- | --- | --- | --- | --- | --- | 430 | 0.0% | 528 | 0.0% | 614 | 0.0% |
| Truck | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 17,437 | 1.4% | 15,531 | 1.1% |
| Transport Mode to Work TOTALS | 1,100,297 | 100% | 1,101,534 | 100% | 1,136,322 | 100% | 1,134,822 | 100% | 1,175,694 | 100% | 1,290,537 | 100% | 1,415,489 | 100% |

Table 1.2: ABS Census – method of travel to work, 1976-2006, Melbourne

Travel to work in Australian capital cities, 1976-2006

BRISBANE

| | 1976 | % | 1981 | % | 1986 | % | 1991 | % | 1996 | % | 2001 | % | 2006 | % |
|--------------------------------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|
| Total Workforce | 415,073 | | 450,855 | | 496,555 | | 575,781 | | 664,139 | | 739,836 | | 862,354 | |
| Travelled to Work | 373,358 | | 374,632 | | 423,047 | | 480,880 | | 550,334 | | 613,374 | | 720,572 | |
| Public Transport | 72,858 | 19.5% | 58,515 | 15.6% | 67,297 | 15.9% | 68,630 | 14.3% | 68,720 | 12.5% | 78,721 | 12.8% | 99,444 | 13.8% |
| Train | 33,107 | 8.9% | 32,942 | 8.8% | 37,106 | 8.8% | 37,400 | 7.8% | 38,677 | 7.0% | 43,750 | 7.1% | 52,212 | 7.2% |
| Ferry/Tram | 1,876 | 0.5% | 1,506 | 0.4% | 1,473 | 0.3% | 1,368 | 0.3% | 802 | 0.1% | 1,671 | 0.3% | 2,452 | 0.3% |
| Bus | 37,875 | 10.1% | 24,067 | 6.4% | 28,718 | 6.8% | 29,862 | 6.2% | 29,241 | 5.3% | 33,300 | 5.4% | 44,780 | 6.2% |
| Car Total | 268,008 | 71.8% | 283,560 | 75.7% | 324,681 | 76.7% | 371,501 | 77.3% | 436,162 | 79.3% | 479,833 | 78.2% | 553,888 | 76.9% |
| Car driver | 217,497 | 58.3% | 235,257 | 62.8% | 279,514 | 66.1% | 321,007 | 66.8% | 387,664 | 70.4% | 430,587 | 70.2% | 500,723 | 69.5% |
| Car passenger | 50,511 | 13.5% | 48,303 | 12.9% | 45,167 | 10.7% | 50,494 | 10.5% | 48,498 | 8.8% | 49,246 | 8.0% | 53,165 | 7.4% |
| Bicycle | 2,595 | 0.7% | 4,086 | 1.1% | 5,063 | 1.2% | 6,742 | 1.4% | 5,719 | 1.0% | 6,788 | 1.1% | 7,951 | 1.1% |
| Walked Only | 19,187 | 5.1% | 15,830 | 4.2% | 15,113 | 3.6% | 17,451 | 3.6% | 17,423 | 3.2% | 18,434 | 3.0% | 26,339 | 3.7% |
| Total of Other Modes: | 10,710 | 2.9% | 12,641 | 3.4% | 10,893 | 2.6% | 16,556 | 3.4% | 22,310 | 4.1% | 29,598 | 4.8% | 32,950 | 4.6% |
| Motorbike/scooter | 7,519 | 2.0% | 8,734 | 2.3% | 7,398 | 1.7% | 6,394 | 1.3% | 5,950 | 1.1% | 6,102 | 1.0% | 9,138 | 1.3% |
| Taxi | 3,191 | 0.9% | 3,907 | 1.0% | 3,495 | 0.8% | 2,946 | 0.6% | 2,702 | 0.5% | 2,193 | 0.4% | 2,310 | 0.3% |
| Other | --- | --- | --- | --- | --- | --- | 7,216 | 1.5% | 8,853 | 1.6% | 2,768 | 0.5% | 3,658 | 0.5% |
| Other Two Methods | --- | --- | --- | --- | --- | --- | --- | 4,574 | 0.8% | 5,337 | 0.9% | 5,013 | 0.7% | |
| Other Three Methods | --- | --- | --- | --- | --- | --- | --- | 231 | 0.0% | 328 | 0.1% | 360 | 0.0% | |
| Truck | --- | --- | --- | --- | --- | --- | --- | --- | --- | 12,870 | 2.1% | 12,471 | 1.7% | |
| Transport Mode to Work TOTALS | 373,358 | 100% | 374,632 | 100% | 423,047 | 100% | 464,324 | 100% | 550,334 | 100% | 613,374 | 100% | 720,572 | 100% |

Table 1.3: ABS Census – method of travel to work, 1976-2006, Brisbane

ADELAIDE

| | 1976 | % | 1981 | % | 1986 | % | 1991 | % | 1996 | % | 2001 | % | 2006 | % |
|--------------------------------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|
| Total Workforce | 400,888 | | 401,708 | | 423,639 | | 438,791 | | 436,888 | | 466,829 | | 509,267 | |
| Travelled to Work | 370,227 | | 348,360 | | 364,400 | | 362,743 | | 363,622 | | 386,024 | | 425,129 | |
| Public Transport | 58,053 | 15.7% | 55,845 | 16.0% | 48,780 | 13.4% | 41,244 | 11.4% | 32,359 | 8.9% | 34,500 | 8.9% | 42,238 | 9.9% |
| Train | 12,810 | 3.5% | 13,372 | 3.8% | 11,991 | 3.3% | 9,174 | 2.5% | 7,971 | 2.2% | 8,057 | 2.1% | 10,787 | 2.5% |
| Ferry/Tram | 1,949 | 0.5% | 1,821 | 0.5% | 1,590 | 0.4% | 1,205 | 0.3% | 734 | 0.2% | 973 | 0.3% | 1,289 | 0.3% |
| Bus | 43,294 | 11.7% | 40,652 | 11.7% | 35,199 | 9.7% | 30,865 | 8.5% | 23,654 | 6.5% | 25,470 | 6.6% | 30,162 | 7.4% |
| Car Total | 277,943 | 75.1% | 263,755 | 75.7% | 287,673 | 78.9% | 292,830 | 80.7% | 306,671 | 84.3% | 322,949 | 83.7% | 349,092 | 82.1% |
| Car driver | 229,518 | 62.0% | 223,946 | 64.3% | 251,145 | 68.9% | 256,444 | 70.7% | 277,477 | 76.3% | 295,634 | 76.6% | 320,735 | 75.4% |
| Car passenger | 48,425 | 13.1% | 39,809 | 11.4% | 36,528 | 10.0% | 36,386 | 10.0% | 29,194 | 8.0% | 27,315 | 7.1% | 28,357 | 6.7% |
| Bicycle | 8,263 | 2.2% | 8,401 | 2.4% | 8,061 | 2.2% | 7,186 | 2.0% | 4,494 | 1.2% | 4,572 | 1.2% | 6,476 | 1.5% |
| Walked Only | 18,138 | 4.9% | 11,941 | 3.4% | 12,084 | 3.3% | 11,989 | 3.3% | 9,440 | 2.6% | 10,096 | 2.6% | 13,508 | 3.2% |
| Total of Other Modes: | 7,830 | 2.1% | 8,418 | 2.4% | 7,802 | 2.1% | 9,494 | 2.6% | 10,658 | 2.9% | 13,907 | 3.6% | 13,815 | 3.2% |
| Motorbike/scooter | 6,075 | 1.6% | 6,710 | 1.9% | 5,870 | 1.6% | 3,706 | 1.0% | 2,308 | 0.6% | 1,780 | 0.5% | 3,191 | 0.8% |
| Taxi | 1,755 | 0.5% | 1,708 | 0.5% | 1,932 | 0.5% | 1,599 | 0.4% | 1,514 | 0.4% | 1,217 | 0.3% | 1,201 | 0.3% |
| Other | --- | --- | --- | --- | --- | --- | 4,189 | 1.2% | 4,203 | 1.2% | 2,202 | 0.6% | 2,741 | 0.6% |
| Other Two Methods | --- | --- | --- | --- | --- | --- | --- | 2,533 | 0.7% | 3,958 | 1.0% | 2,316 | 0.5% | |
| Other Three Methods | --- | --- | --- | --- | --- | --- | --- | 100 | 0.0% | 192 | 0.0% | 169 | 0.0% | |
| Truck | --- | --- | --- | --- | --- | --- | --- | --- | --- | 4,558 | 1.2% | 4,197 | 1.0% | |
| Transport Mode to Work TOTALS | 370,227 | 100% | 348,360 | 100% | 364,400 | 100% | 362,743 | 100% | 363,622 | 100% | 386,024 | 100% | 425,129 | 100% |

Table 1.4: ABS Census – method of travel to work, 1976-2006, Adelaide

PERTH

| | 1976 | % | 1981 | % | 1986 | % | 1991 | % | 1996 | % | 2001 | % | 2006 | % |
|--------------------------------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|
| Total Workforce | 346,776 | | 393,348 | | 432,936 | | 474,690 | | 553,387 | | 606,401 | | 704,117 | |
| Travelled to Work | 307,545 | | 338,469 | | 351,008 | | 390,066 | | 454,630 | | 499,220 | | 585,536 | |
| Public Transport | 41,663 | 13.5% | 39,187 | 11.6% | 38,306 | 10.9% | 37,274 | 9.6% | 40,734 | 9.0% | 45,791 | 9.2% | 60,884 | 10.4% |
| Train | 7,961 | 2.6% | 6,889 | 2.0% | 7,724 | 2.2% | 7,383 | 1.9% | 20,305 | 4.5% | 22,860 | 4.6% | 29,650 | 5.1% |
| Ferry/Tram | 369 | 0.1% | 308 | 0.1% | 441 | 0.1% | 201 | 0.1% | 171 | 0.0% | 207 | 0.0% | 266 | 0.0% |
| Bus | 33,333 | 10.8% | 31,990 | 9.5% | 30,141 | 8.6% | 29,690 | 7.6% | 20,258 | 4.5% | 22,724 | 4.6% | 30,968 | 5.3% |
| Car Total | 243,691 | 79.2% | 279,028 | 82.4% | 291,675 | 83.1% | 326,243 | 83.6% | 385,100 | 84.7% | 417,331 | 83.6% | 480,216 | 82.0% |
| Car driver | 205,966 | 67.0% | 240,930 | 71.2% | 255,573 | 72.8% | 289,934 | 74.3% | 348,719 | 76.7% | 382,974 | 76.7% | 438,867 | 75.0% |
| Car passenger | 37,725 | 12.3% | 38,098 | 11.3% | 36,102 | 10.3% | 36,309 | 9.3% | 36,381 | 8.0% | 34,357 | 6.9% | 41,349 | 7.1% |
| Bicycle | 2,959 | 1.0% | 3,971 | 1.2% | 5,066 | 1.4% | 6,126 | 1.6% | 4,690 | 1.0% | 5,580 | 1.1% | 6,790 | 1.2% |
| Walked Only | 13,608 | 4.4% | 9,614 | 2.8% | 9,209 | 2.6% | 9,861 | 2.5% | 10,142 | 2.2% | 10,992 | 2.2% | 15,530 | 2.7% |
| Total of Other Modes: | 5,624 | 1.8% | 6,669 | 2.0% | 6,752 | 1.9% | 10,562 | 2.7% | 13,964 | 3.1% | 19,526 | 3.9% | 22,116 | 3.8% |
| Motorbike/scooter | 3,972 | 1.3% | 4,886 | 1.4% | 4,856 | 1.4% | 4,205 | 1.1% | 3,176 | 0.7% | 2,892 | 0.6% | 3,831 | 0.7% |
| Taxi | 1,652 | 0.5% | 1,783 | 0.5% | 1,896 | 0.5% | 1,183 | 0.3% | 1,340 | 0.3% | 1,087 | 0.2% | 1,372 | 0.2% |
| Other | --- | --- | --- | --- | --- | --- | 5,174 | 1.3% | 6,398 | 1.4% | 3,137 | 0.6% | 6,054 | 1.0% |
| Other Two Methods | --- | --- | --- | --- | --- | --- | --- | 2,957 | 0.7% | 4,941 | 1.0% | 3,138 | 0.5% | |
| Other Three Methods | --- | --- | --- | --- | --- | --- | --- | 93 | 0.0% | 209 | 0.0% | 181 | 0.0% | |
| Truck | --- | --- | --- | --- | --- | --- | --- | --- | --- | 7,260 | 1.5% | 7,540 | 1.3% | |
| Transport Mode to Work TOTALS | 307,545 | 100% | 338,469 | 100% | 351,008 | 100% | 390,066 | 100% | 454,630 | 100% | 499,220 | 100% | 585,536 | 100% |

Table 1.5: ABS Census – method of travel to work, 1976-2006, Perth

Travel to work in Australian capital cities, 1976-2006

HOBART

| | 1976 | % | 1981 | % | 1986 | % | 1991 | % | 1996 | % | 2001 | % | 2006 | % |
|--------------------------------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|
| Total Workforce | 73,388 | | 70,048 | | 72,695 | | 71,811 | | 78,515 | | 79,502 | | 89,665 | |
| Travelled to Work | 67,327 | | 60,601 | | 62,225 | | 59,138 | | 64,676 | | 64,860 | | 73,556 | |
| Public Transport | 16,910 | 25.1% | 8,087 | 13.3% | 6,512 | 10.5% | 4,928 | 8.3% | 4,563 | 7.1% | 3,947 | 6.1% | 4,723 | 6.4% |
| Train | 37 | 0.1% | 28 | 0.0% | 34 | 0.1% | 9 | 0.0% | 37 | 0.1% | 32 | 0.0% | 41 | 0.1% |
| Ferry/Tram | 6,818 | 10.1% | 80 | 0.1% | 141 | 0.2% | 83 | 0.1% | 22 | 0.0% | 35 | 0.1% | 39 | 0.1% |
| Bus | 10,055 | 14.9% | 7,979 | 13.2% | 6,337 | 10.2% | 4,836 | 8.2% | 4,504 | 7.0% | 3,880 | 6.0% | 4,643 | 6.3% |
| Car Total | 44,468 | 66.0% | 47,260 | 78.0% | 50,344 | 80.9% | 48,640 | 82.2% | 53,537 | 82.8% | 53,060 | 81.8% | 59,880 | 81.4% |
| Car driver | 35,914 | 53.3% | 39,129 | 64.6% | 42,282 | 68.0% | 41,253 | 69.8% | 47,025 | 72.7% | 47,027 | 72.5% | 52,936 | 72.0% |
| Car passenger | 8,554 | 12.7% | 8,131 | 13.4% | 8,062 | 13.0% | 7,387 | 12.5% | 6,512 | 10.1% | 6,033 | 9.3% | 6,944 | 9.4% |
| Bicycle | 196 | 0.3% | 364 | 0.6% | 432 | 0.7% | 385 | 0.7% | 467 | 0.7% | 626 | 1.0% | 834 | 1.1% |
| Walked Only | 4,694 | 7.0% | 4,078 | 6.7% | 3,994 | 6.4% | 3,719 | 6.3% | 3,879 | 6.0% | 4,573 | 7.1% | 5,565 | 7.6% |
| Total of Other Modes: | 1,059 | 1.6% | 812 | 1.3% | 943 | 1.5% | 1,466 | 2.5% | 2,230 | 3.4% | 2,654 | 4.1% | 2,554 | 3.5% |
| Motorbike/scooter | 478 | 0.7% | 457 | 0.8% | 476 | 0.8% | 352 | 0.6% | 324 | 0.5% | 345 | 0.5% | 465 | 0.6% |
| Taxi | 581 | 0.9% | 355 | 0.6% | 467 | 0.8% | 387 | 0.7% | 302 | 0.5% | 250 | 0.4% | 273 | 0.4% |
| Other | --- | --- | --- | --- | --- | --- | 727 | 1.2% | 1,048 | 1.6% | 347 | 0.5% | 422 | 0.6% |
| Other Two Methods | --- | --- | --- | --- | --- | --- | --- | --- | 532 | 0.8% | 780 | 1.2% | 488 | 0.7% |
| Other Three Methods | --- | --- | --- | --- | --- | --- | --- | --- | 24 | 0.0% | 35 | 0.1% | 38 | 0.1% |
| Truck | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 897 | 1.4% | 868 | 1.2% |
| Transport Mode to Work TOTALS | 67,327 | 100% | 60,601 | 100% | 62,225 | 100% | 59,138 | 100% | 64,676 | 100% | 64,860 | 100% | 73,556 | 100% |

Table 1.6: ABS Census – method of travel to work, 1976-2006, Hobart

CANBERRA

| | 1976 | % | 1981 | % | 1986 | % | 1991 | % | 1996 | % | 2001 | % | 2006 | % |
|--------------------------------------|---------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|
| Total Workforce | 92,229 | | 110,848 | | 125,456 | | 136,254 | | 149,250 | | 160,652 | | 175,805 | |
| Travelled to Work | 84,635 | | 96,701 | | 109,058 | | 115,142 | | 124,563 | | 136,027 | | 148,511 | |
| Public Transport | 7,506 | 8.9% | 9,595 | 9.9% | 10,527 | 9.7% | 11,362 | 9.9% | 10,366 | 8.3% | 9,101 | 6.7% | 11,690 | 7.9% |
| Train | 84 | 0.1% | 101 | 0.1% | 110 | 0.1% | 42 | 0.0% | 109 | 0.1% | 149 | 0.1% | 110 | 0.1% |
| Ferry/Tram | 84 | 0.1% | 53 | 0.1% | 72 | 0.1% | 18 | 0.0% | 29 | 0.0% | 42 | 0.0% | 55 | 0.0% |
| Bus | 7,338 | 8.7% | 9,441 | 9.8% | 10,345 | 9.5% | 11,302 | 9.8% | 10,228 | 8.2% | 8,910 | 6.6% | 11,525 | 7.8% |
| Car Total | 70,906 | 83.8% | 79,065 | 81.8% | 90,277 | 82.8% | 94,290 | 81.9% | 102,246 | 82.1% | 112,332 | 82.6% | 120,375 | 81.1% |
| Car driver | 59,242 | 70.0% | 67,054 | 69.3% | 77,863 | 71.4% | 80,341 | 69.8% | 89,535 | 71.9% | 99,493 | 73.1% | 107,397 | 72.3% |
| Car passenger | 11,664 | 13.8% | 12,011 | 12.4% | 12,414 | 11.4% | 13,949 | 12.1% | 12,711 | 10.2% | 12,839 | 9.4% | 12,978 | 8.7% |
| Bicycle | 784 | 0.9% | 2,046 | 2.1% | 2,272 | 2.1% | 2,318 | 2.0% | 2,759 | 2.2% | 3,112 | 2.3% | 3,753 | 2.5% |
| Walked Only | 3,873 | 4.6% | 3,868 | 4.0% | 3,933 | 3.6% | 4,601 | 4.0% | 5,335 | 4.3% | 5,679 | 4.2% | 7,339 | 4.9% |
| Total of Other Modes: | 1,566 | 1.9% | 2,127 | 2.2% | 2,049 | 1.9% | 2,571 | 2.2% | 3,857 | 3.1% | 5,803 | 4.3% | 5,354 | 3.6% |
| Motorbike/scooter | 1,107 | 1.3% | 1,550 | 1.6% | 1,353 | 1.2% | 985 | 0.9% | 986 | 0.8% | 1,069 | 0.8% | 1,760 | 1.2% |
| Taxi | 459 | 0.5% | 577 | 0.6% | 696 | 0.6% | 485 | 0.4% | 540 | 0.4% | 561 | 0.4% | 412 | 0.3% |
| Other | --- | --- | --- | --- | --- | --- | 1,101 | 1.0% | 1,171 | 0.9% | 605 | 0.4% | 696 | 0.5% |
| Other Two Methods | --- | --- | --- | --- | --- | --- | --- | --- | 1,093 | 0.9% | 1,737 | 1.3% | 936 | 0.6% |
| Other Three Methods | --- | --- | --- | --- | --- | --- | --- | --- | 67 | 0.1% | 139 | 0.1% | 81 | 0.1% |
| Truck | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 1,692 | 1.2% | 1,469 | 1.0% |
| Transport Mode to Work TOTALS | 84,635 | 100% | 96,701 | 100% | 109,058 | 100% | 115,142 | 100% | 124,563 | 100% | 136,027 | 100% | 148,511 | 100% |

Table 1.7: ABS Census – method of travel to work, 1976-2006, Canberra

ALL CITIES

| | 1976 | % | 1981 | % | 1986 | % | 1991 | % | 1996 | % | 2001 | % | 2006 | % |
|--------------------------------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|------------------|--------------|
| Total Workforce | 3,970,683 | | 4,252,328 | | 4,426,395 | | 4,671,066 | | 4,949,277 | | 5,413,746 | | 5,930,698 | |
| Travelled to Work | 3,587,970 | | 3,658,439 | | 3,785,593 | | 3,917,302 | | 4,149,031 | | 4,523,295 | | 4,977,476 | |
| Public Transport | 847,280 | 23.6% | 774,543 | 21.2% | 732,447 | 19.3% | 683,988 | 17.5% | 605,328 | 14.6% | 684,657 | 15.1% | 756,776 | 15.2% |
| Train | 377,077 | 10.5% | 379,281 | 10.4% | 373,398 | 9.9% | 359,819 | 9.2% | 380,529 | 9.2% | 435,187 | 9.6% | 467,684 | 9.4% |
| Ferry/Tram | 87,834 | 2.4% | 71,067 | 1.9% | 64,473 | 1.7% | 48,684 | 1.2% | 28,815 | 0.7% | 39,843 | 0.9% | 44,272 | 0.9% |
| Bus | 382,369 | 10.7% | 324,195 | 8.9% | 294,576 | 7.8% | 275,485 | 7.0% | 195,984 | 4.7% | 209,627 | 4.6% | 244,820 | 4.9% |
| Car Total | 2,444,050 | 68.1% | 2,609,003 | 71.3% | 2,796,885 | 73.9% | 2,936,757 | 75.0% | 3,234,458 | 78.0% | 3,464,712 | 76.6% | 3,788,930 | 76.1% |
| Car driver | 2,027,990 | 56.5% | 2,210,153 | 60.4% | 2,429,260 | 64.2% | 2,567,507 | 65.5% | 2,911,269 | 70.2% | 3,154,271 | 69.7% | 3,466,924 | 69.7% |
| Car passenger | 416,060 | 11.6% | 398,850 | 10.9% | 367,625 | 9.7% | 369,250 | 9.4% | 323,189 | 7.8% | 310,441 | 6.9% | 322,006 | 6.5% |
| Bicycle | 30,259 | 0.8% | 40,644 | 1.1% | 43,218 | 1.1% | 43,759 | 1.1% | 36,924 | 0.9% | 42,738 | 0.9% | 55,599 | 1.1% |
| Walked Only | 200,857 | 5.6% | 160,084 | 4.4% | 146,674 | 3.9% | 153,728 | 3.9% | 144,644 | 3.5% | 156,358 | 3.5% | 198,745 | 4.0% |
| Total of Other Modes: | 65,524 | 1.8% | 74,165 | 2.0% | 66,369 | 1.8% | 99,070 | 2.5% | 127,677 | 3.1% | 174,830 | 3.9% | 177,426 | 3.6% |
| Motorbike/scooter | 38,469 | 1.1% | 46,963 | 1.3% | 39,767 | 1.1% | 29,030 | 0.7% | 25,473 | 0.6% | 24,724 | 0.5% | 34,972 | 0.7% |
| Taxi | 27,055 | 0.8% | 27,202 | 0.7% | 26,602 | 0.7% | 21,724 | 0.6% | 18,051 | 0.4% | 15,717 | 0.3% | 15,739 | 0.3% |
| Other | --- | --- | --- | --- | --- | --- | --- | --- | 53,174 | 1.3% | 21,324 | 0.5% | 28,684 | 0.6% |
| Other Two Methods | --- | --- | --- | --- | --- | --- | --- | --- | 29,662 | 0.7% | 36,320 | 0.8% | 28,353 | 0.6% |
| Other Three Methods | --- | --- | --- | --- | --- | --- | --- | --- | 1,317 | 0.0% | 2,121 | 0.0% | 1,959 | 0.0% |
| Truck | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 74,624 | 1.6% | 67,719 | 1.4% |
| Transport Mode to Work TOTALS | 3,587,970 | 100% | 3,658,439 | 100% | 3,785,593 | 100% | 3,864,792 | 100% | 4,149,031 | 100% | 4,523,295 | 100% | 4,977,476 | 100% |

Table 1.8: ABS Census – method of travel to work, 1976-2006, All Cities

The decline in car-pooling

Car-pooling should be the easiest form of sustainable travel to arrange, because it simply involves filling empty seats in cars that are already travelling. Unfortunately, the census data shows that car-pooling has fared worst of the more sustainable forms of travel. The recent modest improvements in mode share for public transport and walking have not been matched in car-pooling. The ‘car passenger’ share has fallen continuously in every city since 1976 [Figure 3], the only exception being very small rises in Perth and Hobart between 2001 and 2006. As a result, the average occupancy of cars, which was already low in 1976, has declined still further. In Melbourne, for example, the average car transported 1.21 workers in 1976, but only 1.08 in 2006.

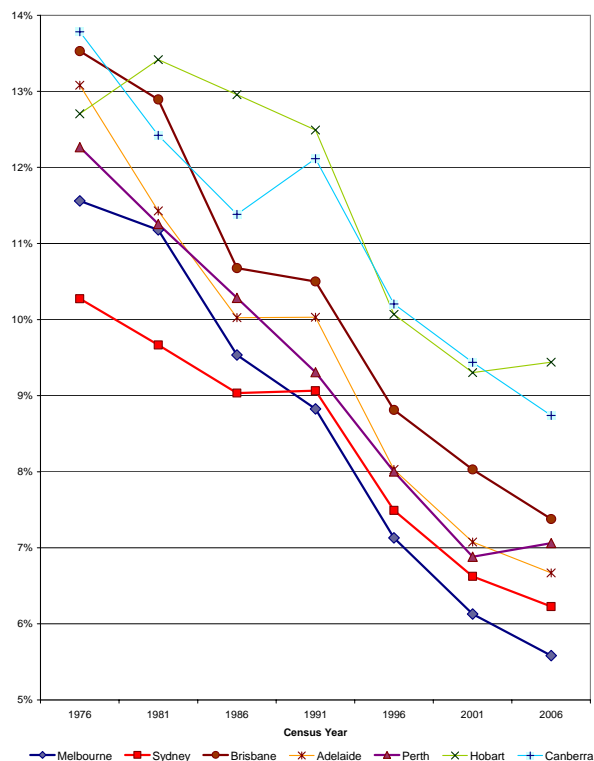


Figure 3: Mode share for car passengers

These trends mirror those found in overseas cities, where car occupancy rates for the journey to work are also falling. The main problem seems to be that car-pooling is an extremely inflexible transport mode. As two US transport researchers said more than 30 years ago: ‘For practical purposes, car-pooling is a [public transport] system with one round trip a day.’¹ However, car-pooling has not declined at the same rate in all Australian cities. The worst performer is Melbourne, where the mode share for car passengers has more than halved since 1976 to only 5.6%, the lowest figure of any city. The highest rates of car-pooling are in Hobart and Canberra: the cities with the shortest driving distances and the lowest usage of public transport.

¹ K. Schaeffer & E. Sclar, *Access for All*, Penguin, UK, 1975, p. 107.

Public transport: good and bad news

The overall pattern since 1976 has been for a large decline in public transport's share of travel [Figure 4], but this decline has not been universal or uniform. All cities except Sydney have seen modest improvements in public transport mode share in the last 5 or 10 years, although this has not been enough to make up for the declines in earlier decades.

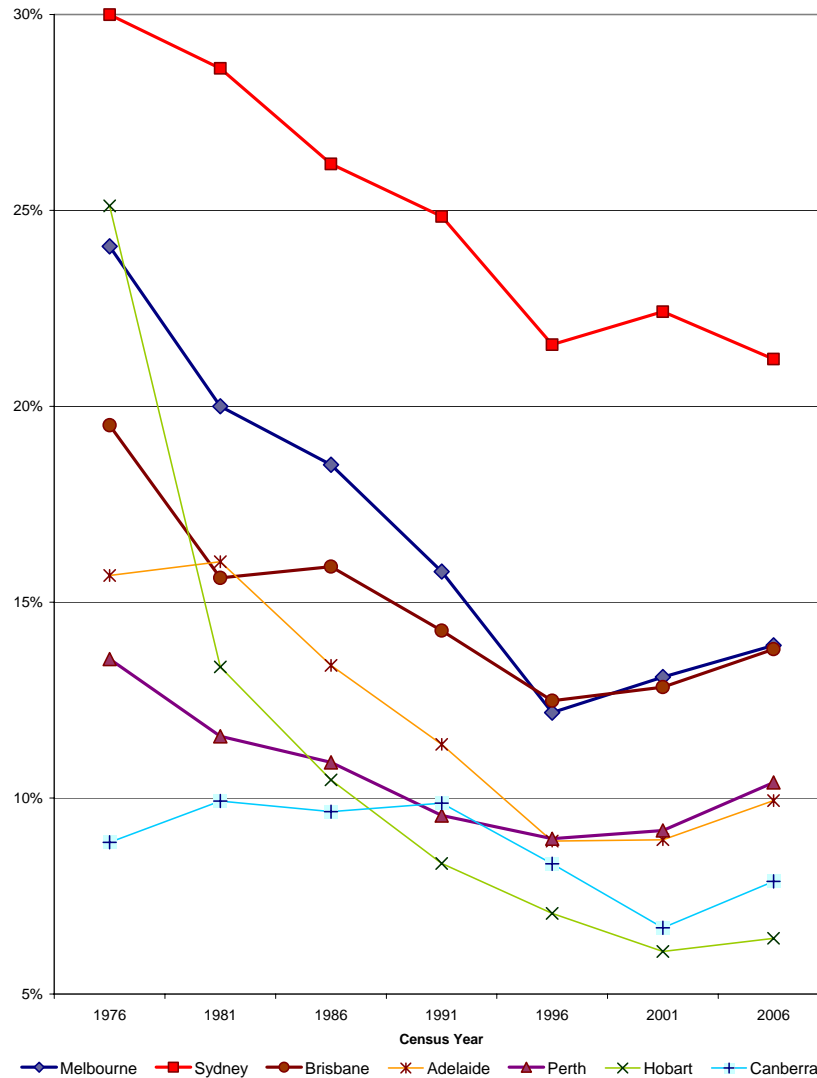


Figure 4: Mode share for public transport (all types)

The main reasons for this recent improvement in performance are increased employment in the Central Business Districts of Australian cities (CBDs are the destinations with the highest public transport mode shares), and modest improvements – in Perth, major improvements – in public transport services by most state and territory governments, following service cuts in the 1990s.

Travel to work in Australian capital cities, 1976-2006

Train travel has fared much better than bus and tram travel (as shown in Figures 5 and 6) except in Adelaide – the only city with an extant rail system that has not been electrified. In Sydney, despite the recent problems with the city's rail service, the share of trips to work made by train was only marginally lower in 2006 than 1976, and the 2001 number was actually higher. In Brisbane and Melbourne, the train share is lower than three decades ago, but the decline is much less marked than is the case for other public transport modes. In Perth, which has dramatically upgraded a rail system that was threatened with closure in the 1970s, the share of work trips made by train has doubled, with a further increase expected following the opening of the new Mandurah line later this year.

By contrast, in all cities, the share of work trips made by bus was much lower in 2006 than 1976. The bus share fell by half or more in all cities except Brisbane, Adelaide and Canberra, but still fell in those cities. The greatest fall in bus travel was in Melbourne, where mode share in 2006 was less than a quarter of the 1976 figure. And Melbourne provided little comfort for those travellers looking to trams as an alternative to bus travel, since the share of journeys to work by tram also fell by more than half over the three decades to 2006. Trams remain crowded in peak period, but this is mainly because peak service frequencies have also been cut by more than half over the same period.

It should be remembered that the ABS provides data only on the 'main mode' used for the small proportion of trips for which multiple modes are reported (see Appendix for a full explanation). This means that they underestimate the role of buses, in particular, as feeders to rail services. This role is not very important in most Australian cities, because few rail passengers access stations using buses, except in Perth, which has stronger integration of rail and bus services. The 'main mode' data also slightly overstate the importance of buses at the expense of trams, since the ABS codes 'bus-tram' trips as 'bus' trips; however, there are relatively few bus-tram trips in Melbourne or Adelaide. The ABS also understates the importance of ferries in Sydney, because 'bus-ferry' trips are also counted as 'bus' trips on a main-mode basis. This understatement is more significant because a high proportion of ferry passengers use buses as feeders.

The much stronger performance of rail compared with bus sits uneasily with the current policies of most Australian governments. Since the termination of the Better Cities program in 1996, the Federal government has refused to fund urban rail, while generously funding urban roads.

In Melbourne, Canberra, Brisbane and Adelaide, state and territory governments (and in Brisbane, the city government) show a strong policy preference for motorways and buses in preference to new or extended rail systems.

The only city that has gone against this general trend is Perth where the successful revival of the Perth rail system has gone hand in hand with an increase in the share of work trips made by bus. The rail upgrades in Perth have been accomplished without any direct federal funding assistance.

Travel to work in Australian capital cities, 1976-2006

The census figures suggest that expanded and upgraded high-speed heavy rail systems (or perhaps light rail systems, since Perth's trains have some of the operating characteristics of a light rail system) are the most effective form of public transport, if the objective is mode shift away from car driving.

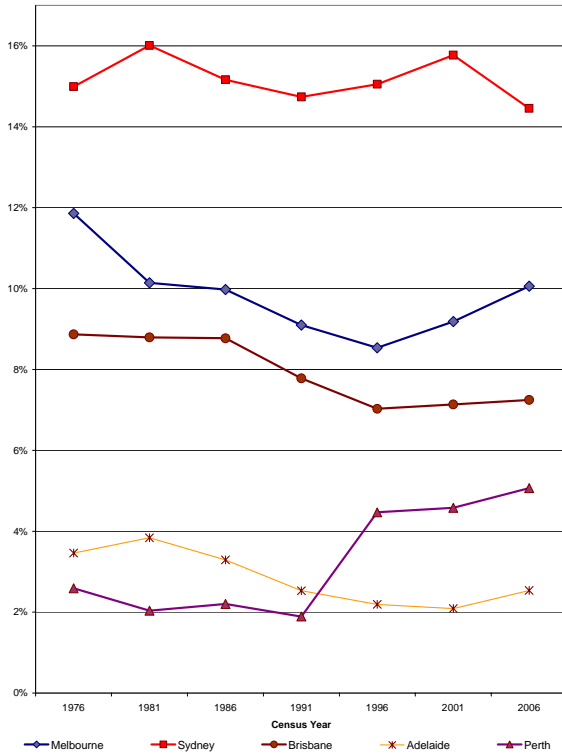


Figure 5: Mode share for trains

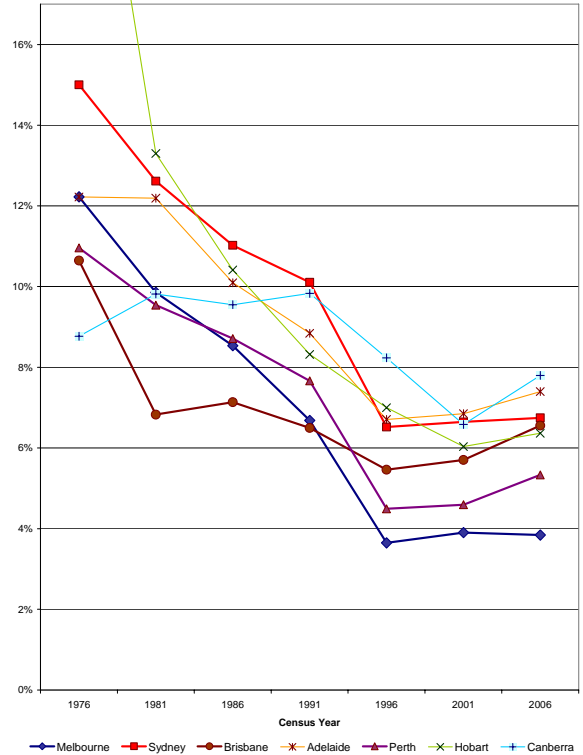


Figure 6: Mode share for bus, ferry and tram

Walking: moderate gains

Walking is the healthiest mode of transport and the best for the environment. It is also the cheapest to accommodate, requiring little investment in rights of way and no need for parking. Despite these advantages, walking receives virtually no attention from transport policy makers or the media, with the result that the pedestrian environment continues to deteriorate as preference is given to motor vehicles, and even cyclists, before pedestrians.

Despite the hostility of policy-makers, walking is a modest success story for environmentally friendly transport modes. Walking to work is growing in all cities [Figure 7]. Its share of travel to work is now higher than it was in 1981 in Sydney, Canberra and Hobart. Again, Melbourne has recorded the largest proportional decline over the three decades.

Walking is more important than cycling in all cities, with the ratio of walking to cycling ranging from seven to one in Sydney and Hobart, to two to one in Canberra, Perth and Adelaide.

Given that walking receives little positive encouragement, and much discouragement, from policy-makers, other explanations must be sought for this positive trend. We believe that the most important explanation is increased inner-city living, along with rising CBD employment, leading to substantial rises in walking trips in city centres. Given this positive demographic influence, the scope for policy change to build on the increases in walking should be considerable.

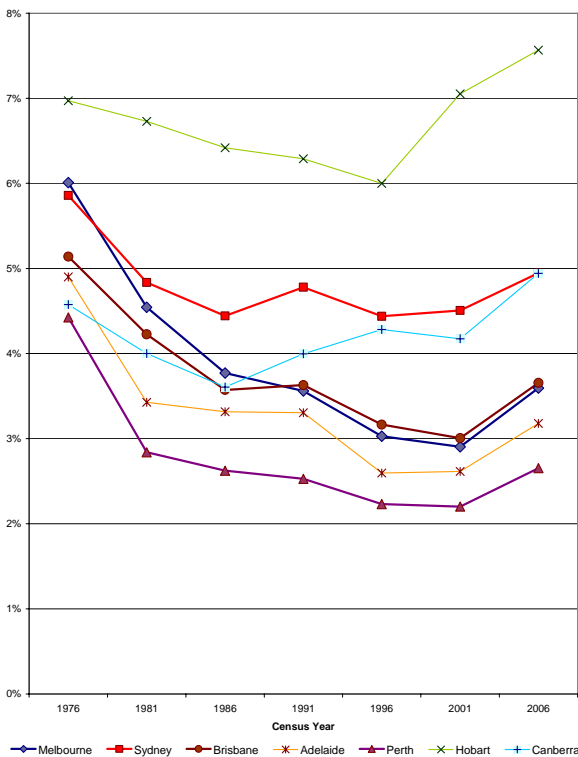


Figure 7: Mode share for walking

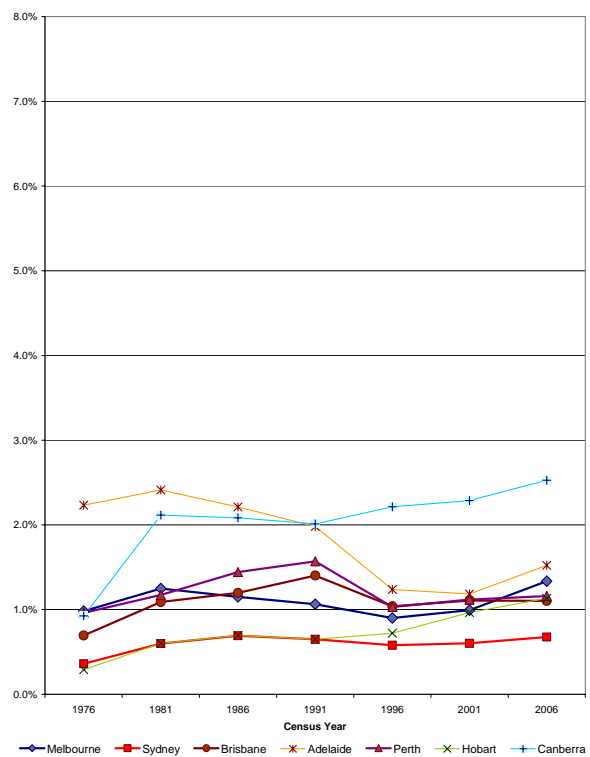


Figure 8: Mode share for cycling

Cycling: a reality check

For many transport planners, 'sustainable transport' means cycling, and this bias is reflected in the media. It is noteworthy that *The Age*, *The Sydney Morning Herald* and *The Australian* all led their coverage of the release of the 2006 census journey-to-work figures in October 2007 with the story that cycling had increased.

This enthusiasm is misplaced. Cycling is currently of negligible importance as a travel mode for the journey to work in all cities, accounting for around one per cent of trips everywhere except Canberra (where it is 2.5%). Although cycling rates are increasing [Figure 8], they are doing so from a very small base, with the result that the increases have made no appreciable difference to overall travel patterns. For example, the number of cyclists in Brisbane increased by 17% between 2001 and 2006 [Table 1.3], but the actual increase in numbers was only 1,163 – compared with an increase of 20,723 for public transport and 7,905 for walking.

Equally importantly, there is no evidence from the census results that increases in cycling come at the expense of car driving. Rather, they seem to be mainly at the expense of walking and public transport. The cities with the highest rates of walking in 2006 – Sydney and Hobart – also have the lowest rates of cycling. Along with Brisbane, which has the next-lowest cycling rate, Sydney and Hobart have the lowest mode share for car driving. Of course, these three cities have hilliest terrain, which is doubtless a significant factor behind their lower cycling rates.

Transport modes and gender

Another striking thing about cycling as a travel mode, much more than any other form of travel, is its strong domination by males, and by people who live in the inner city. While the percentage of 2006 workers who are female varies from 43 to 47% across the seven cities, the share of cyclists who are female ranges from only 17 to 26%, compared with 43 to 51% for walking and 50 to 56% for public transport [Table 2]. The gender and socio-economic composition of cyclists reflects that of transport planners and senior journalists. This may be one reason why cycling receives policy and media attention out of all proportion to its current significance as a sustainable transport mode.

After cycling, the mode most dominated by males is car driving. Women are disproportionately represented among car passengers, walkers and on all forms of public transport [Table 2]. So perhaps we should not be surprised that, with the partial exception of car-pooling, the male-dominated modes of car driving and cycling seem to receive more attention from (mainly male) transport policy-makers than the female-dominated modes.

Travel to work in Australian capital cities, 1976-2006

| | MELBOURNE | | SYDNEY | | BRISBANE | | ADELAIDE | | PERTH | | HOBART | | CANBERRA | |
|-------------------------|-----------|----------|--------|----------|----------|----------|----------|----------|--------|----------|--------|----------|----------|----------|
| | Male % | Female % | Male % | Female % | Male % | Female % | Male % | Female % | Male % | Female % | Male % | Female % | Male % | Female % |
| Total -all modes | 56.3 | 43.7 | 56.2 | 43.8 | 55.8 | 44.2 | 55.5 | 44.5 | 56.7 | 43.3 | 53.9 | 46.1 | 53.4 | 46.6 |
| | | | | | | | | | | | | | | |
| Public Transport | 49.8 | 50.2 | 49.4 | 50.6 | 45.5 | 54.5 | 43.7 | 56.3 | 49.2 | 50.8 | 43.8 | 56.2 | 48.2 | 51.8 |
| Train | 51.6 | 48.4 | 51.3 | 48.7 | 48.4 | 51.6 | 48.4 | 51.6 | 48.5 | 51.5 | - | - | - | - |
| Bus/Tram/Ferry | 45.1 | 54.9 | 45.4 | 54.6 | 42.3 | 57.7 | 42.0 | 58.0 | 49.9 | 50.1 | 43.6 | 56.4 | 48.1 | 51.9 |
| | | | | | | | | | | | | | | |
| Car driver | 57.5 | 42.5 | 58.5 | 41.5 | 56.9 | 43.1 | 56.7 | 43.3 | 56.6 | 43.4 | 55.4 | 44.6 | 53.7 | 46.3 |
| | | | | | | | | | | | | | | |
| Car passenger | 44.2 | 55.8 | 42.1 | 57.9 | 45.2 | 54.8 | 42.2 | 57.8 | 49.8 | 50.2 | 40.0 | 60.0 | 36.7 | 63.3 |
| | | | | | | | | | | | | | | |
| Bicycle | 75.2 | 24.8 | 82.7 | 17.3 | 83.1 | 16.9 | 82.0 | 18.0 | 82.2 | 17.8 | 81.7 | 18.3 | 73.9 | 26.1 |
| | | | | | | | | | | | | | | |
| Walked | 48.5 | 51.5 | 49.1 | 50.9 | 50.0 | 50.0 | 50.4 | 49.6 | 52.8 | 47.2 | 49.6 | 50.4 | 57.0 | 43.0 |

Table 2: Break down of mode choice by gender in 2006

Behind the data in each city

1. Melbourne: the worst-performing city

When the different cities are compared over the three decades, Melbourne stands out as the worst performer, with the largest increase in car driving, and the largest declines in car-pooling, public transport and walking [Figures 1 to 7]. As mentioned above, there are now more cars on the road transporting people to work in Melbourne than in Sydney despite the latter's much larger workforce. Melbourne now has the lowest rate of car-pooling of all seven cities, the lowest rate of usage of public transport modes other than heavy rail, and the third-highest rate of car driving (after Adelaide and Perth). Owing to lower rates of car-pooling and walking, the share of workers who drive is higher in Melbourne even than in Canberra and Hobart!

Why has Melbourne performed so badly?

We conclude that there are three main reasons:

- Melbourne has built more lane-kilometres of urban freeway and tollway since 1976 than any other Australian city.
- Melbourne has built no significant extensions to its suburban heavy rail system over this period: the last new line was the Glen Waverley line, which opened in 1930.
- Melbourne historically has had remarkably poor public transport management that has worked against coordinated operations of the different modes, a situation exacerbated by the privatisation of trains and trams in 1999.

Melbourne has even attracted international attention for its lack of integrated public transport planning. The European Community's HiTrans Best Practice Guide to public transport network planning, published in Norway, uses Melbourne as its case study of poorly planned and coordinated public transport!²

Current Victorian government policies propose no serious change to the pattern of the last three decades, and so a continuing decline in Melbourne's performance relative to other Australian capitals is likely.

Given that Melbourne's poor performance has been recognised as far away as Europe, it is surprising that Melbourne is being presented as a model for other Australian cities. In October 2007 the New South Wales Independent Pricing and Regulatory Tribunal (IPART) released a discussion paper canvassing the possibility of adopting the Victorian approach to regulating rail transport. IPART's issues paper made no reference to the fact that Melbourne is the worst-performing public transport system in Australia in terms of retaining mode share, or to the

² *HiTrans Best Practice Guide No. 2: Public transport – Planning the networks*, EC North Sea Region/ Rogaland County Council, Oslo, 2005, pp. 88, 133.

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Victorian Auditor-General's assessment that subsidies to Melbourne's public transport operators have doubled in real terms since privatisation in 1999.³

Part of the reason for recent positive reporting of Melbourne is the turnaround since 2001 in public transport's share of work travel, particularly on the rail system. But, as Table 1.2 shows, this improvement represents a rise in public transport's mode share of 0.8%, less than was achieved in the same period in Brisbane, Adelaide, Perth and even Canberra. And despite reports of record-breaking rail patronage, the absolute number of people taking the train to work in Melbourne in 2006 was only 9% higher than in 1976. In Sydney, despite the recent patronage decline, the 2006 figure was 21% higher than the 1976 figure. In Brisbane, the equivalent increase was 58%. In Perth, the number of rail commuters in 2006 was four times the 1976 total.

Another reason for Melbourne's popularity is the fact that the city has retained its trams. While we are strong supporters of Melbourne's tram system, the journey to work data does not support the contention that trams are a 'magic bullet' for public transport problems. The mode share for Melbourne's trams has declined by more than half over the last three decades, coming in behind buses in most other cities. The performance of Melbourne's buses has been even worse than its trams.

2. Sydney: still the most sustainable, but with serious problems

Sydney wins the prize as the 'least unsustainable' city in 2006, with the lowest share for travel to work by car drivers (63.4%), the highest mode share for public transport (21.2%) and the equal-second-highest share for walking (4.9%). However, Sydney's comparatively strong performance is a legacy of the transport policies of past decades, particularly the strong pro-rail stance of the Wran government in the late 1970s and early 1980s. The opening of the Eastern Suburbs line to Bondi, other extensions of electrified services and general modernisation works stemmed the decline in rail patronage and even lifted its mode share.

The last two decades have seen deterioration in rail services and a large program of motorway building. The improvements in mode share ceased, and substantial declines were only prevented by the city's historical strengths of an extensive rail system, high population densities and relatively high employment in suburban centres with rail access.

Progress in Sydney is now being hampered by two main problems.

The first problem in Sydney is the continued emphasis on motorway construction, which provides incentives for more passengers to abandon rail. The preference for motorways is driven partly by despair at the prospects for improving public transport, and by the biased nature of Federal transport funding.

³ IPART, *Review of the City Rail regulatory framework: Issues Paper*, Sydney, October 2007, p. 4 (Q. 3) and Appendix D; Melbourne subsidy figures from P. Kain, 'The Pitfalls in Competitive Tendering: addressing the risks revealed by experience in Australia and Britain', in European Conference of Ministers of Transport, *Competitive Tendering of Rail Services*, ECMT, Paris, 2007, pp. 43-125, at p. 91.

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The second problem is an entrenched culture of poor public transport management.

Rail managers have been able to deflect most attempts to improve efficiency, claiming that their system is supposedly so 'special' that it cannot learn from successful operations in Europe.

Public transport management in Sydney continues to take a fragmented and narrow approach to service planning, and the processes of regulation are labyrinthine. Four decades ago, the authors of the Sydney Region Outline Plan lamented:

In Sydney's inner suburbs ... there is virtually no bus-rail co-ordination. Many bus routes run parallel to rail routes direct to the City Centre, thereby competing directly with the rail system rather than feeding into it at strategically located interchange stations. Attractive and convenient facilities for transferring from buses to trains are almost non-existent. In many cases, to go from a bus stop to a railway station, passengers have to cross busy thoroughfares, or walk some distance without shelter... Much remains to be done in this area before Sydney can experience the benefits of a public transport system as good as Toronto in which bus and rail services are closely integrated, passenger transfer from one system to the other is made convenient by the existence of carefully designed interchange stations, and tickets for both systems are fully interchangeable...⁴

Unfortunately, little has changed since then. While some work is being done to reorganise rail operations in an attempt to increase capacity and improve punctuality, this is directed predominantly towards engineering projects rather than the 'software' of network design and timetabling. It is happening in isolation from bus and ferry operations which continue to operate as if the rail system, rather than the car, was the main competitor.

One clear illustration of this problem is the fact that Sydney is now the only Australian capital city without a multi-modal ticketing system. (The current failed 'smart-card' project is not a multi-modal ticketing system: rather, it is a technology enabling operators to continue charging separate fares for each stage of a multi-modal journey.)

Current public transport governance and management arrangements in Sydney appear to be drawn from academic theories about regulation, rather than from proven success in 'best practice' jurisdictions.

3. Brisbane: mixed performance

Brisbane now has the second-lowest share of workers travelling as car drivers. This is more a reflection of Melbourne's rapid decline in performance than Brisbane's inherent success. However, there have been improvements in mode share for public transport and walking in the last decade, and there are some signs of hope for continued positive trends.

⁴ *Sydney Region: Outline Plan 1970-2000 AD*, State Planning Authority of NSW, March 1968, Sydney, p. 43.

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Long-established management arrangements, under which buses were operated by the Brisbane City Council and private firms, while trains were the responsibility of Queensland Rail, have been an entrenched obstacle to public transport service improvements. In recent years, there have been changes to this structure, beginning in 2004 with the establishment of Translink, a coordinating body for public transport across South East Queensland. Translink's first major achievement was the introduction in 2005 of a fully multi-modal ticketing system (without smart-cards, a message that appears not to have registered in Sydney), which led to an immediate and substantial jump in patronage across all public transport modes, and is a major factor behind the one per cent rise in mode share between 2001 and 2006.

The Queensland Premier announced on 9 October 2007 that a new regional public transport agency will be established for South East Queensland in 2008, incorporating Translink's functions plus responsibility for rail and bus services across greater Brisbane. The new agency has the potential to create integrated services to match the integrated fare system, provided it is established with a dynamic, European-style management and planning culture, rather than simply being 'business as usual' under a different title.

Transport investment decisions in South East Queensland have worked against the recent improvements in public transport mode share. Rail extensions and service enhancements have been placed on the 'back-burner' despite rapid growth in patronage. One reason is substantial investment in a series of busways, which largely parallel the existing rail system. A more serious concern is the still larger diversion of investment funds to an extensive program of motorways, tunnels and bridges, which will directly compete with the rail and busway systems for customers.

4. Adelaide: Australia's most car-dominated capital city

Thirty years ago, the share of work trips made by car drivers in Adelaide was lower than in Canberra or Perth, (or in Hobart in 1981). Adelaide and Canberra were the only cities in which public transport's mode share increased between 1976 and 1981 (making Adelaide's mode share briefly higher than Brisbane's). Adelaide saw a small increase in cycling over this period as well.

This situation was a result of the progressive transport policies of the Dunstan Government, which froze freeway construction, extended suburban rail services, nationalised private bus operations and integrated fares and timetables across the public transport system.

Unfortunately, over the last 25 years the Dunstan policies have been abandoned. Public transport services have been cut and large-scale road construction has resumed. Adelaide is now the only Australian capital with a suburban rail system that has not been electrified. As a result, car driving has increased faster than in any other city apart from Melbourne, and is now the highest in the nation.

There has been a slight rally in bus use since 1996 and rail use since 2001, but the total public transport share of travel to work is still only 9.9%. These improvements are the result of a modest program of public transport improvement, which has recently seen the Glenelg tram extended into the heart of the city. However, transport policy in Adelaide remains dominated by road construction, with public transport and walking very much an afterthought.

Comparisons between Adelaide and Perth are instructive. Three decades ago, Perth was the most car-dominated capital apart from Canberra. With a smaller rail system than Adelaide, a lower population density and less integration of urban development with public transport, Perth could have been expected to fall further behind Adelaide. While Perth remains a car-dominated city, as discussed below, it is now less so than Adelaide, and on current indications the difference in performance is expected to widen.

5. Perth: a surprising, if modest, turnaround

The revitalisation of Perth's public transport system began with the 1983 reopening of the Fremantle line, which had been closed four years earlier. It continued with the 1987 decision to electrify the three suburban rail lines, and accelerated with the construction of the new northern suburbs railway, which opened with a supporting feeder bus network in 1993. The process of rail expansion is still in progress with the imminent opening of the 72 km Mandurah line.

Organisational structures for public transport were reformed as part of this expansion program, with a strong focus on integration of rail and bus services, and on a 'seamless' experience for passengers. When the private sector became involved in bus operations in the 1990s, this followed the sub-contracting model, with TransPerth retaining control over branding, timetables and network planning. Service integration has been retained, with Perth presenting a stark contrast to the lack of multi-modal planning in Melbourne and Sydney. The result has been a steady improvement in public transport use from a low base with real expectations of continued future growth.

However, Perth remains a car-dominated city. Walking rates are the lowest in the country, although they have increased modestly since 1996. One reason for this is that substantial expansion of the major road system has taken place alongside expansion of rail, reducing the incentive for car drivers to shift to the new rail services. These road expansions have received generous Federal funding; by contrast, the expansion of the rail system has been paid for almost entirely from local sources.

6. Canberra: the car remains king

Canberra was planned for the convenience of car drivers, but its urban structure was also designed to permit a transition to public transport, should this become necessary. This was the reason for the adoption of the famous 'Y-Plan', which clusters major employment and retailing in town centres arranged in a linear pattern along the route of a possible inter-town public transport system. Unfortunately, the potential of this land-use arrangement has never been realised, because transport policies have remained car-dominated.

The Whitlam Government initiated a review of Canberra's transport plans which led to an attempt to create a more balanced transport pattern. Commencing in the late 1970s, there was substantial upgrading of bus routes, service levels and vehicles. The existence of a single public bus operator made these changes easier to implement.

Some attention was also paid to bicycle paths, and Canberra is the only Australian capital where cycling to work is approaching significant levels. The results of the new transport policy

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can be seen in the improved public transport mode share between 1976 and 1991, and the rise in cycling. Despite a decline in car-pooling, the share of workers driving cars to work was slightly lower in 1991 than 1976, a result not seen in any other Australian capital.

Following ACT self-government, operating subsidies for bus services were reduced and services cut sharply, leading to a large decline in public transport mode share to an all-time low of 6.7% in 2001. A partial recovery in public transport has occurred in the last five years, and walking has increased, but the car remains king in Canberra. Transport policy remains dominated by road building, with public transport treated mainly as a social service. Significant improvements to bus service levels in November 2007 may herald a new approach, but even after the improvements, service levels remain lower than in previous decades, and worse than in other Australian capital cities.

7. Hobart: time for some public transport

Car travel in Hobart was suppressed in 1976 by the closure of the Tasman Bridge, but had more than recovered by 1981 and has continued to grow ever since. The city's bus-based public transport has suffered since the 1990s from pressure to reduce costs, exacerbating the longstanding trend to declining mode share. Hobart does, however, have by far the highest mode share for walking to work of any Australian capital, with a jump from 6.0% in 1996 to 7.6% in 2006. This is partly a result of Hobart's compact, walkable inner city, together with increased CBD employment and rising inner city population levels.

While the high rate of inner city walking is welcome, the suburbs of Hobart will not see a reduction in car usage until effective public transport is provided. Following Metro's purchase of the privately owned Hobart Coaches, Hobart now has a single, public bus operator. This means that one ingredient is already in place. Significant change will not occur, however, until political decision-makers begin to treat public transport as a serious travel option, rather than a social service for people with no alternative.

Policy implications

The census findings point to the need for significant changes to urban transport policies at Federal and State levels. Current policies are creating rapid growth in car travel and the accompanying greenhouse emissions, despite aspirational statements to the contrary. Aspirational statements are not enough: the substantive policies driving the growth in car traffic must be addressed.

Treating the symptoms of traffic problems by building more roads is an ineffective response. Melbourne has built more urban freeways and tollways than any other city, and the main effect of these roads has been to increase traffic levels by reducing the mode share of public transport, car-pooling and walking.

State governments need to shift their transport investment priorities away from this ineffective policy response, but the most urgent need for change is at the Federal level. The 2007 ALP National Platform recognises the need for a new approach to urban transport.⁵ Despite the multi-modal rhetoric with which it was launched, the former Federal government's *Auslink* scheme is exacerbating urban transport problems, because it is biased in favour of new roads and against new urban rail infrastructure. Auslink needs to be replaced by an urban transport funding regime that focuses on the most effective solutions to urban transport problems, and which is tied to Australia's environmental obligations, particularly the imperative to reduce greenhouse emissions.

Investment needs to be redirected away from urban motorways towards more environmentally friendly modes, particularly public transport and walking. Within public transport, the most effective mode in reducing urban traffic levels is fast rail (heavy or light), although high-quality bus services are necessary as feeder and supplementary modes.

The other important mode of travel is walking, which requires little in the way of funding, but rather needs a reorientation of road space and road rules to give pedestrians priority over motor vehicles. There is good international evidence to suggest that walking and public transport complement one another, forming a 'virtuous circle'. Every public transport user is also a pedestrian, so improving pedestrian amenity encourages public transport use. And the provision of a high-quality public transport network tends to suppress car ownership and usage, leading to higher rates of walking.

Although it is important to provide safe and attractive facilities for cyclists as a road safety measure, cycling currently plays a very limited role in reducing car use. Some of the overblown rhetoric about the role of cycling needs to be given a rest, permitting more attention to be paid to walking and public transport – and, to a lesser extent, to changes to cycling policy to reach beyond the current male-dominated, inner-city niche.

Unfortunately, car-pooling is unlikely to make much of a contribution to reducing the demand for car travel in the foreseeable future.

Finally, transport governance and management remains a critical challenge for Australian cities. The recent announcement by the Queensland Premier of the establishment of a regional

⁵ see *Chapter 6: Nation Building*, especially the resolutions on pp. 96-8.

public transport agency to integrate trains, buses and ferries across South-East Queensland is welcome, but no equivalent bodies exist, or are even being discussed, in the nation's two largest cities. Sydney's public transport remains a labyrinth of single-mode fiefdoms and regulators, while Melbourne persists with the failed model of franchising and unaccountable, ineffective departmental regulation.

The success of multi-modal public transport planning in Perth provides local confirmation of the lessons learned in Europe, namely that in order to have European-style public transport, it is necessary to have a European-style regional transport agency with a dynamic, efficient, independent and accountable operating culture. The HiTrans Guide describes such a regional public transport agency as 'essential'.⁶ As the report goes to press, the Mayor of London has announced a plan for the regional agency Transport for London to take over commuter rail services in the South-East of England from private franchisees. Services will be upgraded to form the 'London Overground' and integrated with Underground and bus services into a multi-modal network.

⁶ p. 60.

Appendix: How the ABS figures were interpreted

The data used in this report is taken from the answers given to the census question on the 'Method of Travel to Work'. This question has been asked in all censuses since 1976, and is reported separately for each census year (the 2006 data is in table B45). As far as we are aware, this paper is the first to present data across the seven Australian capitals and across all relevant censuses.

Because ABS has reported the results of the travel to work question differently over the three decades, it has been necessary to adjust the data to present the results on a comparable basis. Most importantly, until 1991 ABS reported the 'main mode' used to travel to work (e.g. a person who drove a car to the station then caught a train is counted under 'train'), but subsequent censuses have reported multi-mode journeys separately. We have presented the results for all censuses on a 'main mode' basis for consistency.

We have analysed this data at the level of statistical divisions for each state capital and for Canberra. These statistical divisions approximate the growing urbanised area of each city.

Various 'journey to work' studies have been done by the ABS since 1961. In these studies, correlations were made between home locations and employment addresses to produce origin-destination matrices for small samples of the population in various geographical regions. These studies have many uses, but do not provide the same longitudinal data as the answers to the single 'travel to work' question.

The details of the 'method of travel to work' question have differed over the years in the optional answers provided in the census form, and in the way that the ABS has reported the answers have changed, so care is needed in assembling the data in a way that allows useful comparisons to be made.

In 1976, people over 15 years old and in employment were asked to describe their method of travel to work on the day before the census was taken. They were given ten options to choose from. These options were train, bus, ferry/tram, car – as driver, car as passenger, motorbike/motor scooter, bicycle, walked only, and, worked at home. Those who did not go to work were asked how they "usually" travelled. From 1981, the question asking those who did not go to work on census day about their 'usual' method of travel was removed and replaced with a new option of 'did not go to work'. This change means that the 1976 data, which is reported by the ABS in a way that does not distinguish between those who went to work on the reporting day and those who did not, slightly exaggerates the absolute numbers of travellers compared with subsequent years.

In subsequent years, several other options were added to the 'travel to work' question: 'other' was introduced in 1991, and 'truck' in 2001. Also in 2001, the 'ferry or tram' option was split in two.

In our analysis, a composite category has been created by bringing together the census 'other' option with the census options of motorcycle, taxi and truck. This allows the focus to remain on the trends in passenger car travel and in travel by the major public transport modes. The numbers of trips that fall within this composite category increased over time, as more options were made available, particularly with the inclusion of the 'truck' option, and with the changes in reporting of multiple-mode journeys described below. However, in no city or year do more than 5% of trips come within our definition of 'other', and most are less than 3%.

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For consistency, we have maintained the ferry/tram grouping, even after 2001, because for each city, the mode used is obvious. Melbourne and Adelaide, the only cities with trams over the whole study period, have no ferries. (Sydney's Metro light rail opened in 1997. Travel to work on this and the Darling Harbour monorail is shown in the census 'Sydney – tram' category to be low even compared with the small numbers of workers carried on the Sydney ferries.)

In all years, multiple answers were permitted. In analysing these multiple answers, the ABS assumes a set hierarchy of modes that allows multi-modal journeys to be classified by their 'main mode'. The five-step ABS 'main mode' hierarchy puts train at the top followed by bus, ferry/tram, car-driver and car-passenger.

In 1996 and 2001, the ABS explicitly reports the numbers of two- or three-mode journeys that include a train or a bus leg. Combinations of modes that do not include train or bus are reported as 'other'. In 2006, details are given of the second mode used in combination with train or bus in a two-mode trip.

Before 1996, the data was analysed using the hierarchy to determine the 'main mode' for two-mode trips. Each of the five possible 'main modes' was reported whenever it was used. No breakdowns were done for the very small number of three-mode trips.

Although the reporting methods differ, the results are comparable over different censuses, largely because multi-modal trips typically account for less than 5% of the total reported journeys even in the larger cities.