



**Transport Policy at the Crossroads:
Travel to work in Australian capital cities
1976-2011**

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Cover photo:

Murdoch Station on the Mandurah line in Perth. Murdoch, which opened in December 2007, is the busiest suburban station in Perth. Although the station is served by a large park-and-ride lot, around two-thirds of passengers arrive by connecting bus, transferring at a purpose-built interchange that forms part of the station. Murdoch and the two neighbouring stations cost a combined total of \$46 million to construct, a fraction of the price of recent, less effective stations built in east coast cities.

Photo: P. Mees

SUMMARY

This report analyses the way residents of Australia's seven capital cities (the six state capitals plus Canberra) have travelled to work over the last 35 years. It uses data from the census, which has included a question on the mode of transport used to travel to work since 1976.

Key findings

- The number of cars driven to work each day in Australia's capital cities has nearly doubled since 1976, from 2,027,990 to 3,942,167. Just under two-thirds of the increase is due to growth in the workforce; the remaining third is due to a shift away from more sustainable transport modes: public transport, walking and car-pooling.
- After two decades of rapid decline, public transport usage rates commenced a revival in 1996. The revival began slowly, but the five years to 2011 saw the biggest increase in public transport mode share seen since 1976. There has been a corresponding fall in the share of workers travelling by car, although the fall in the car driving rate has been dampened by continuing declines in car-pooling. Adelaide, Canberra and Hobart have missed out on this public transport revival.
- The revival of public transport has occurred mainly on rail systems, which have recovered the ground lost during the two decades of decline to 1996. The share of workers travelling by train is now higher than at any time since 1976, and in Perth is three times as high as 35 years ago. Buses and (in Melbourne and Adelaide) trams have been less successful, with current usage rates still less than half those of 1976.
- Walking is the most sustainable of all travel modes, and makes a significant contribution to work travel in Hobart, Canberra and Sydney. Walking receives little support from policy makers, but despite this, walking rates increased in the decade leading up to the 2006 census. However, walking rates have declined since 2006 in all cities except Canberra and Perth, suggesting that a renewed policy effort is required to improve conditions for pedestrians.
- Cycling is of negligible importance as a travel mode for work trips in all cities except Canberra. It is not clear that increases in cycling have come at the expense of the car, since higher cycling rates are usually accompanied by lower walking rates. Cycling receives much more attention from policy makers than walking, even though it plays a much smaller role in the journey to work: one possible reason is that cycling is by far the most male-dominated transport mode, reflecting the gender composition of the transport planning profession.
- Despite the publicity devoted to its transport problems in recent years, Sydney is Australia's sustainable transport capital, with by far the lowest mode share for car driving, the highest share for public transport and above-average rates of walking. More cars are driven to work each day in Melbourne than Sydney, despite the latter's larger workforce. Public transport grew rapidly in the five years to 2011, reversing a decline over the previous five years. Despite this, the state's infrastructure advisory body is recommending that funding be redirected from rail to road, based on projections that the census data has shown to be erroneous.
- Melbourne has the second-highest public transport mode share, but the lowest rate of car pooling and below average rates of walking: as a result, car driving is higher than in Brisbane. Melbourne has experienced the fastest growth in public transport mode share of all seven capitals since 1996, but had the most rapid decline in the two decades before then: because the earlier decline was much greater than the recent increase, Melbourne had the biggest decline in public transport usage, and the biggest rise in car driving, over the 35 years since

1976, except for Hobart. Given the recent revival in public transport, it is strange that the Victorian government's top transport priority is an as-yet-unfunded east-west road tunnel estimated to cost between \$12 and \$15 billion. No serious analysis has been presented to justify this project, which if it proceeds would likely put a stop to the revival of public transport.

- Census figures also cast doubt on recent rail patronage figures from Sydney and Melbourne. Travel to work by rail in Sydney grew faster between 2006 and 2011 than published patronage data, while travel to work in Melbourne grew more slowly. This suggests that patronage estimation methodologies may have underestimated rail patronage growth in Sydney and overestimated it in Melbourne.
- Brisbane has the second-lowest rate of car driving among the seven capitals, and has also experienced a revival of public transport over the last three censuses. However, the growth in public transport over the last five years has been slower than in Sydney, Melbourne and Perth: indeed, rail usage rates are now higher in Perth than in Brisbane. Public transport growth has been held back by the City of Brisbane's large program of tunnel, bridge and motorway building.
- Adelaide is Australia's 'car capital', with the highest rate of car driving among the seven capital cities. This is the result of low public transport usage and low rates of active transport (walking and cycling). In the five years to 2011, Adelaide missed out on the public transport revival that occurred in other larger capital cities: public transport mode share stagnated, while both walking and cycling rates declined. These trends are the result of the abandonment over the last 30 years of the Dunstan government's pro-public transport policies.
- Perth has had the most impressive turnaround in public transport of any capital city during the period covered by this study: it is the only city where public transport mode share is higher than in 1981. A concerted community campaign, backed by skilled planning and budgeting, has revived the city's rail system, which now carries more passengers than Brisbane's. This success suggests that Perth can be a model for other Australian cities, particularly Adelaide.
- Canberra has experienced a sustained decline in public transport, and a steady rise in car driving, for the last two decades (apart from a temporary reversal during 2001-06). The current car driving rate is the highest ever recorded, something that has not occurred in any other capital city except Hobart. Public transport mode share actually declined slightly in the five years to 2011: Canberra was the only one of the seven cities where this occurred. The problems are the result of poor transport policies, which have focussed on road construction, while reversing the successful public transport approach employed in Canberra until the late 1980s.
- Hobart has relatively high rates of walking, but public transport has been declining, and car use growing, since the Tasman Bridge reopened in 1977. The current rate of car driving is the highest on record. No serious attempt has been made to improve the attractiveness of public transport, while facilities for pedestrians also require attention.

Policy implications

These findings show that the time has come for a radical reorientation of transport policy in Australian cities. In the past, policy makers who favoured roads could claim to be following public preferences, expressed in mode share trends, but now that public transport is gaining ground at the expense of the car, policy makers are still stubbornly clinging to road-based solutions. The recent revival of public transport has, except in Perth, been achieved with relatively little policy support, suggesting that serious pro-transit policies could create

significant change. These policies are much more likely to address problems like congestion, greenhouse gases and oil security than continued road-building, which will only add to the rising car volumes choking our cities.

The census figures suggest that Australian cities, while lacking the urban density of European cities, can achieve European-level mode shares by providing European-quality public transport, along with substantially improved conditions for pedestrians. State and territory governments need to change their transport policies, which remain dominated by road-building. They also need to create effective capacity for transport governance, management, planning and research to ensure that investment in sustainable transport delivers value for money. The Federal Government's Infrastructure Australia agency proposes a national debate about public transport: we agree, but argue that this debate must include public transport's role in reducing the need for major investment in urban roads.

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INTRODUCTION

Transport problems are a significant cause of discontent in most of Australia's major cities. There is increasing community pressure for improved and extended public transport; growing traffic volumes are contributing to traffic congestion, local air pollution and greenhouse gas emissions, while increasing dependence on insecure oil supplies. The main response to these problems, historically and currently, has been to propose massive investment in new infrastructure, particularly roads (e.g. Infrastructure NSW, 2012). The infrastructure-first approach does not appear to be working, since transport problems continue to worsen despite these large investments.

This report seeks to contribute to a reconsideration of urban transport policy by presenting and analysing data on travel patterns in Australia's seven capital cities (Canberra plus the six state capitals) over time. It is anticipated that analysis of this kind can contribute to the development of more effective policies, by revealing some of the factors behind rising traffic volumes that may not have been fully considered by proponents of the infrastructure-first approach.

The report relies on census data about the mode of transport used for travel to work, since a question on this topic has been included in every Australian census since 1976. The journey to work is not, of course, the only kind of travel in cities, but it is the largest single contributor to traffic volumes, especially in peak period. Equally importantly, it is the only kind of travel for which a multi-city, multi-year comparison is possible, since general travel surveys are conducted in different years, and using different methodologies, across Australia's major cities. This report updates an earlier analysis (Mees et al 2007, 2008) by including data from the 2011 census, released on October 30, 2012. The methodology used to produce the data, and the resulting limitations, are explained in the Appendix.

Considering the length of time for which census data on mode shares for travel to work have been available, it is surprising that there has been so little analysis of this data. Manning (1978) and O'Connor et al (2001, plus earlier publications) examined the spatial distribution of work travel, but did not report on mode shares. More recent work has begun to consider the travel modes, as well as the distribution, of work trips. BITRE (2010, 2011, 2012a) analyses mode shares and the spatial distribution of work trips in 2001 and 2006 in Perth, Melbourne and Sydney, with a report on Brisbane forthcoming (the BITRE figures differ slightly from those reported in this document, because of definitional differences: for example, BITRE includes taxi among 'public transport', while we assign it to 'other'; BITRE includes 'work from home' in its calculations, while we only consider those who left home to travel to work). Pucher et al (2011) present a detailed comparison of cycling in Sydney and Melbourne, using census data and other sources to explain the difference in cycling rates between the two cities. ABS (2008) analysed changes in public transport mode share for work and study trips in Australia's capital cities between 1996 and 2006, but relied on results from household surveys, not the census. Because of relatively small sample sizes, the survey results are not very reliable, especially for smaller cities: for example, they improbably suggest that public transport's trip share in Hobart declined from 12.8 per cent to 5.2 per cent in the four years after 1996, then doubled again over the following six years (p. 2).

So this report remains, along with its 2007 predecessor, the only analysis to present trends over the full period from 1976 to 2011, utilising the more reliable census data. The results are presented in the following tables and graphs.

Census data: method of travel to work, 1976-2011

	1976	%	1981	%	1986	%	1991	%	1996	%	2001	%	2006	%	2011	%
Total Workforce	1,425,324		1,553,110		1,555,226		1,621,868		1,675,461		1,816,225		1,903,527		2,063,271	
Went to Work	1,284,581		1,338,142		1,339,533		1,374,511		1,415,512		1,533,253		1,608,683		1,772,780	
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%	411,165	23.2%
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%	283,760	16.0%
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%	7,622	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%	119,783	6.8%
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%	1,200,502	67.7%
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%	1,106,965	62.4%
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%	93,537	5.3%
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%	15,624	0.9%
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%	84,553	4.8%
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%	60,936	3.4%
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%	12,645	0.7%
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%	5,984	0.3%
Other	---	---	---	---	---	---	17,656	1.3%	18,620	1.3%	6,826	0.4%	8,573	0.5%	9,473	0.5%
Other Two Methods	---	---	---	---	---	---	---	---	8,829	0.6%	12,817	0.8%	7,525	0.5%	10,181	0.6%
Other Three Methods	---	---	---	---	---	---	---	---	372	0.0%	690	0.0%	516	0.0%	676	0.0%
Truck	---	---	---	---	---	---	---	---	---	---	29,910	2.0%	25,643	1.6%	21,977	1.2%
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%	1,772,780	100%

Table 1.1: ABS Census – method of travel to work, 1976-2011, Sydney

	1976	%	1981	%	1986	%	1991	%	1996	%	2001	%	2006	%	2011	%
Total Workforce	1,217,005		1,272,411		1,319,888		1,351,871		1,391,637		1,544,301		1,685,963		1,927,929	
Went to Work	1,100,297		1,101,534		1,136,322		1,134,822		1,175,694		1,290,537		1,415,489		1,642,078	
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%	263,772	16.1%
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%	191,761	11.7%
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%	42,820	2.6%
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%	29,191	1.8%
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%	1,249,345	76.1%
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%	1,165,536	71.0%
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%	83,809	5.1%
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%	25,704	1.6%
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%	56,412	3.4%
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%	46,845	2.9%
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%	7,929	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%	3,953	0.2%
Other	---	---	---	---	---	---	12,253	1.1%	12,881	1.1%	5,439	0.4%	6,540	0.5%	8,321	0.5%
Other Two Methods	---	---	---	---	---	---	---	---	9,144	0.8%	6,750	0.5%	8,937	0.6%	11,614	0.7%
Other Three Methods	---	---	---	---	---	---	---	---	430	0.0%	528	0.0%	614	0.0%	740	0.0%
Truck	---	---	---	---	---	---	---	---	---	---	17,437	1.4%	15,531	1.1%	14,288	0.9%
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%	1,642,078	100%

Table 1.2: ABS Census – method of travel to work, 1976-2011, Melbourne

	1976	%	1981	%	1986	%	1991	%	1996	%	2001	%	2006	%	2011	%
Total Workforce	415,073		450,855		496,555		575,781		664,139		739,836		862,354		1,010,615	
Went to Work	373,358		374,632		423,047		480,880		550,334		613,374		720,572		854,445	
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%	127,783	15.0%
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%	64,593	7.6%
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%	2,508	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%	60,682	7.1%
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%	649,144	76.0%
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%	592,708	69.4%
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%	56,436	6.6%
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%	10,425	1.2%
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%	31,319	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%	35,774	4.2%
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%	9,723	1.1%
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%	2,201	0.3%
Other	---	---	---	---	---	---	7,216	1.5%	8,853	1.6%	2,768	0.5%	3,658	0.5%	5,076	0.6%
Other Two Methods	---	---	---	---	---	---	---	---	4,574	0.8%	5,337	0.9%	5,013	0.7%	6,678	0.8%
Other Three Methods	---	---	---	---	---	---	---	---	231	0.0%	328	0.1%	360	0.0%	498	0.1%
Truck	---	---	---	---	---	---	---	---	---	---	12,870	2.1%	12,471	1.7%	11,598	1.4%
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%	854,445	100%

Table 1.3: ABS Census – method of travel to work, 1976-2011, Brisbane

	2006	%	2011	%
Total Workforce	1,204,876		1,383,377	
Went to Work	999,321		1,160,686	
Public Transport	109,027	10.9%	139,985	12.1%
Train	56,095	5.6%	70,253	6.1%
Ferry/Tram	2,562	0.3%	2,604	0.2%
Bus	50,370	5.0%	67,128	5.8%
Car Total	797,054	79.8%	916,219	78.9%
Car driver	722,485	72.3%	839,089	72.3%
Car passenger	74,569	7.5%	77,130	6.6%
Bicycle	11,117	1.1%	13,575	1.2%
Walked Only	36,669	3.7%	42,344	3.6%
Total of Other Modes:	45,454	4.5%	48,563	4.2%
Motorbike/scooter	12,065	1.2%	12,572	1.1%
Taxi	2,829	0.3%	2,678	0.2%
Other	5,519	0.6%	7,740	0.7%
Other Two Methods	6,739	0.7%	8,946	0.8%
Other Three Methods	460	0.0%	657	0.1%
Truck	17,842	1.8%	15,970	1.4%
Transport Mode to Work TOTALS	999,321	100%	1,160,686	100%

Table 1.3A: ABS Census – method of travel to work, 2006-2011, South East Queensland

	1976	%	1981	%	1986	%	1991	%	1996	%	2001	%	2006	%	2011	%
Total Workforce	400,888		401,708		423,639		438,791		436,888		466,829		509,267		576,820	
Went to Work	370,227		348,360		364,400		362,743		363,622		386,024		425,129		484,728	
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%	47,951	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%	11,914	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%	2,195	0.5%
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	7.1%	33,842	7.0%
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%	399,489	82.4%
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%	369,250	76.2%
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%	30,239	6.2%
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%	6,493	1.3%
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%	14,289	2.9%
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%	16,506	3.4%
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%	3,261	0.7%
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%	1,298	0.3%
Other	---		---		---		4,189	1.2%	4,203	1.2%	2,202	0.6%	2,741	0.6%	3,640	0.8%
Other Two Methods	---		---		---		---		2,533	0.7%	3,958	1.0%	2,316	0.5%	4,016	0.8%
Other Three Methods	---		---		---		---		100	0.0%	192	0.0%	169	0.0%	227	0.0%
Truck	---		---		---		---		---		4,558	1.2%	4,197	1.0%	4,064	0.8%
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%	484,728	100%

Table 1.4: ABS Census – method of travel to work, 1976-2011, Adelaide

	1976	%	1981	%	1986	%	1991	%	1996	%	2001	%	2006	%	2011	%
Total Workforce	346,776		393,348		432,936		474,690		553,387		606,401		704,117		857,631	
Went to Work	307,545		338,469		351,008		390,066		454,630		499,220		585,536		722,761	
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%	90,792	12.6%
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%	55,882	7.7%
Ferry/Tram	369	0.1%	308	0.1%	441	0.1%	201	0.1%	171	0.0%	207	0.0%	266	0.0%	359	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%	34,551	4.8%
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%	573,528	79.4%
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%	527,160	72.9%
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%	46,368	6.4%
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%	9,312	1.3%
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%	19,907	2.8%
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%	29,222	4.0%
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%	4,943	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%	1,699	0.2%
Other	---	---	---	---	---	---	5,174	1.3%	6,398	1.4%	3,137	0.6%	6,054	1.0%	9,652	1.3%
Other Two Methods	---	---	---	---	---	---	---	---	2,957	0.7%	4,941	1.0%	3,138	0.5%	5,101	0.7%
Other Three Methods	---	---	---	---	---	---	---	---	93	0.0%	209	0.0%	181	0.0%	286	0.0%
Truck	---	---	---	---	---	---	---	---	---	---	7,260	1.5%	7,540	1.3%	7,541	1.0%
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%	722,761	100%

Table 1.5: ABS Census – method of travel to work, 1976-2011, Perth

	1976	%	1981	%	1986	%	1991	%	1996	%	2001	%	2006	%	2011	%
Total Workforce	73,388		70,048		72,695		71,811		78,515		79,502		89,665		96,870	
Went to Work	67,327		60,601		62,225		59,138		64,676		64,860		73,556		79,951	
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%	5,206	6.5%
Train	37	0.1%	28	0.0%	34	0.1%	9	0.0%	37	0.1%	32	0.0%	41	0.1%	56	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%	50	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%	5,100	6.4%
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%	65,884	82.4%
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%	58,577	73.3%
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%	7,307	9.1%
Bicycle	196	0.3%	364	0.6%	432	0.7%	385	0.7%	467	0.7%	626	1.0%	834	1.1%	880	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%	5,264	6.6%
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%	2,717	3.4%
Motorbike/scooter	478	0.7%	457	0.8%	476	0.8%	352	0.6%	324	0.5%	345	0.5%	465	0.6%	485	0.6%
Taxi	581	0.9%	355	0.6%	467	0.8%	387	0.7%	302	0.5%	250	0.4%	273	0.4%	302	0.4%
Other	---		---		---		727	1.2%	1,048	1.6%	347	0.5%	422	0.6%	514	0.6%
Other Two Methods	---		---		---		---		532	0.8%	780	1.2%	488	0.7%	627	0.8%
Other Three Methods	---		---		---		---		24	0.0%	35	0.1%	38	0.1%	42	0.1%
Truck	---		---		---		---		---		897	1.4%	868	1.2%	747	0.9%
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%	79,951	100%

Table 1.6: ABS Census – method of travel to work, 1976-2011, Hobart

	1976	%	1981	%	1986	%	1991	%	1996	%	2001	%	2006	%	2011	%
Total Workforce	92,229		110,848		125,456		136,254		149,250		160,652		175,805		195,619	
Went to Work	84,635		96,701		109,058		115,142		124,563		136,027		148,511		167,312	
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%	13,078	7.8%
Train	84	0.1%	101	0.1%	110	0.1%	42	0.0%	109	0.1%	149	0.1%	110	0.1%	190	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%	44	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%	12,844	7.7%
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%	135,575	81.0%
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%	121,971	72.9%
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%	13,604	8.1%
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%	4,667	2.8%
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%	8,135	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%	5,857	3.5%
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%	1,799	1.1%
Taxi	459	0.5%	577	0.6%	696	0.6%	485	0.4%	540	0.4%	561	0.4%	412	0.3%	463	0.3%
Other	---	---	---	---	---	---	1,101	1.0%	1,171	0.9%	605	0.4%	696	0.5%	853	0.5%
Other Two Methods	---	---	---	---	---	---	---	---	1,093	0.9%	1,737	1.3%	936	0.6%	1,339	0.8%
Other Three Methods	---	---	---	---	---	---	---	---	67	0.1%	139	0.1%	81	0.1%	120	0.1%
Truck	---	---	---	---	---	---	---	---	---	---	1,692	1.2%	1,469	1.0%	1,283	0.8%
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%	167,312	100%

Table 1.7: ABS Census – method of travel to work, 1976-2011, Canberra

	1976	%	1981	%	1986	%	1991	%	1996	%	2001	%	2006	%	2011	%
Total Workforce	3,970,683		4,252,328		4,426,395		4,671,066		4,949,277		5,413,746		5,930,698		6,728,755	
Went to Work	3,587,970		3,658,439		3,785,593		3,917,302		4,149,031		4,523,295		4,977,476		5,724,055	
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%	959,747	16.8%
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%	608,156	10.6%
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%	55,598	1.0%
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%	295,993	5.2%
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%	4,273,467	74.7%
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%	3,942,167	68.9%
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%	331,300	5.8%
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%	73,105	1.3%
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%	219,879	3.8%
Total of Other Modes:	65,524	1.8%	74,165	2.0%	66,369	1.8%	99,070	1.3%	127,677	3.1%	174,830	3.9%	177,426	3.6%	197,857	3.5%
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%	40,785	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%	15,900	0.3%
Other	---	---	---	---	---	---	---	---	53,174	1.3%	21,324	0.5%	28,684	0.6%	37,529	0.7%
Other Two Methods	---	---	---	---	---	---	---	---	29,662	0.7%	36,320	0.8%	28,353	0.6%	39,556	0.7%
Other Three Methods	---	---	---	---	---	---	---	---	1,317	0.0%	2,121	0.0%	1,959	0.0%	2,589	0.0%
Truck	---	---	---	---	---	---	---	---	---	---	74,624	1.6%	67,719	1.4%	61,498	1.1%
Transport Mode to Work TOTALS	3,587,970	100%	3,658,439	100%	3,785,593	100%	3,917,302	99%	4,149,031	100%	4,523,295	100%	4,977,476	100%	5,724,055	100%

Table 1.8: ABS Census – method of travel to work, 1976-2011, All Cities

OVERALL FINDINGS

Massive growth in car driving continues

Over the 35 years from 1976 to 2011, there was a dramatic increase in the number of cars driven to work on census day in Australia's seven capital cities [Tables 1.1-1.8; Figure 1]. The overall number of cars across the seven cities has almost doubled, from 2,027,990 to 3,942,167 [Table 1.8]. This growth in traffic has overwhelmed the increases in road space provided over the same period, leading to increased congestion and longer travel times.

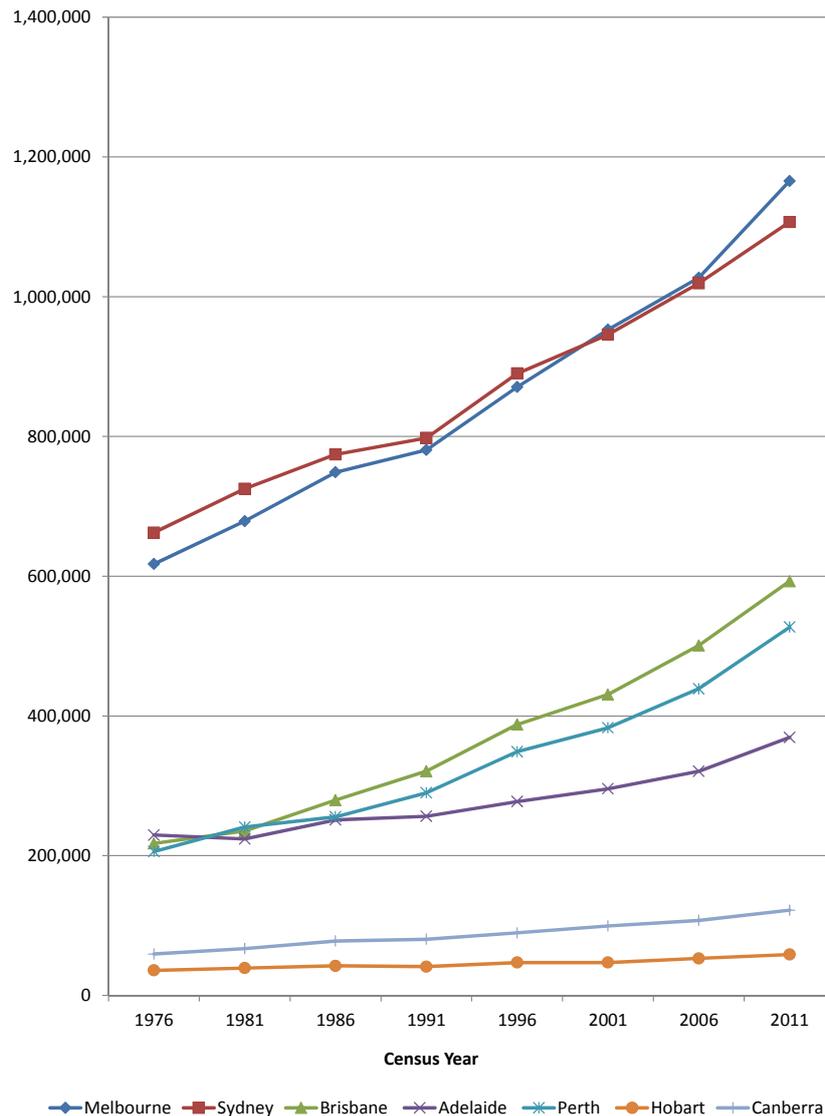


Figure 1: Numbers of cars on the road for work trips

The large growth in car use is driven by two factors: employment growth and mode shift. The total number of workers travelling on census day increased by 60 per cent between 1976 and 2011, but the number of car drivers increased much more rapidly – by 94 per cent – as the share of workers using more environmentally friendly modes (car pooling, public transport, walking and cycling) declined. If mode share had remained constant over the 35 years, there would be 697,383 fewer cars being driven to work in 2011 than was actually the case. Until 15 years ago, mode shift accounted for the majority of the growth in car use, but more recent

censuses have seen a shift back to public transport (see discussion below); rapid growth in the workforce is now the main factor behind rising traffic volumes.

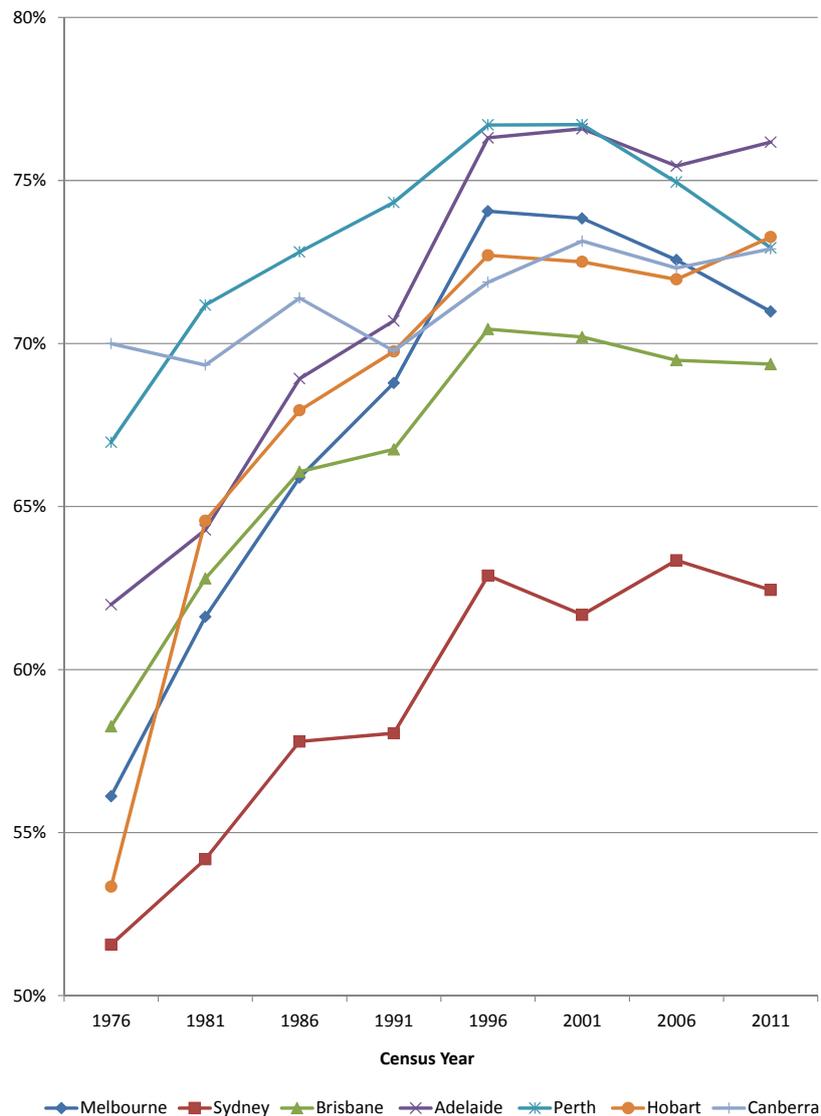


Figure 2: Mode share for car drivers

The largest increase in the share of work trips made by car drivers has been in Hobart. However, car driving was artificially suppressed in 1976, because the Tasman Bridge was closed following the previous year's shipping disaster; hence the high rate of ferry use in 1976 in Table 1.6. Leaving aside the special case of Hobart, the largest increase in the mode share for car drivers, from 56.1 per cent in 1976 to 71.0 per cent in 2011, has occurred in Melbourne, where the decline in the shares of sustainable travel modes has been greatest (see below). There are now more cars driven to work in Melbourne on census day than in Sydney, despite the latter's larger workforce. The next-largest increase in the mode share for car driving has been in Adelaide, which has overtaken Perth to have the highest rate of car driving of all seven cities. The smallest rate of increase has been in Canberra, where car use was already very high in 1976 [Figure 2].

The last 15 years have seen a stabilisation, even a small decline, in the share of work trips made by car drivers, following an all-time high of 78 per cent in 1996 [Table 1.8]. The decline in car driver mode share is due to increases in the shares of public transport, walking and to a small extent, cycling, although some of these gains have been offset by further falls

in car pooling (see below). The pattern has not been entirely uniform or consistent, however. Car driving's mode share increased in Sydney between 2001 and 2006 due to problems with the rail system, but fell again by 2011; car driving has been rising, and public transport use declining, in Canberra for two decades, except for a temporary reversal between 2001 and 2006.

The last five years (2006 to 2011) have seen the largest fall in the share of work trips made by car drivers, and the largest increase in public transport, recorded since 1976. Despite the recent trends, car driving rates remain much higher, and sustainable transport shares much lower, than in 1976, indicating substantial scope for improving on the turnaround of recent years.

Car pooling in decline

The attraction of car pooling to policy makers is obvious: filling empty seats in cars that are already on the road can offer reductions in congestion and pollution, at low cost. Unfortunately, car pooling has been much less attractive to Australian workers than to policy makers: the share of workers travelling as car passengers registered the largest decline since 1976 of any form of travel [Figure 3].

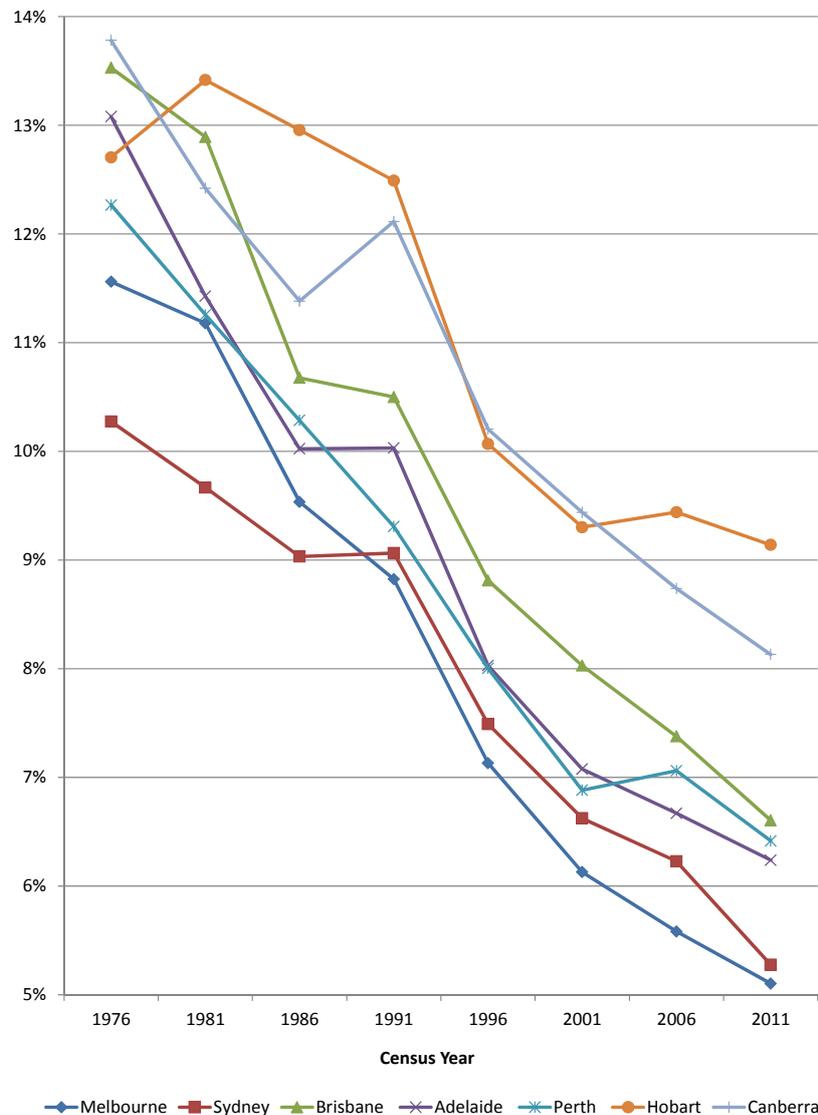


Figure 3: Mode share for car passengers

The average occupancy of cars, already a low 1.21 workers in 1976, has fallen to 1.08 in 2011. The greatest decline has been in Brisbane; the second-biggest fall is in Melbourne, which now has the lowest mode share for car pooling. The smallest decline has been in Canberra, which along with Hobart has the highest share of workers travelling as car passengers.

The actual fall in car pooling rates may be even higher than the ‘car passenger’ figures suggest, since the ABS figures do not distinguish between workers who rode as passengers in a car already being used to transport someone to work, and workers ‘chauffeured’ to work, for example by another family member.

The basic problem is that car pooling is an extremely inflexible transport mode: ‘For practical purposes, car-pooling is a [public transport] system with one round trip per day’ (Schaeffer & Sclar, 1975, p. 107). The prospects for significant improvements to this situation seem remote.

Public transport recovering after long decline

Public transport usage rates fell rapidly from 1976, reaching a low of 14.6 per cent of work trips in 1996 [Table 1.8; Figure 4]. Since then, public transport has recovered, initially slowly, with mode share rising to 15.2 per cent by 2006.

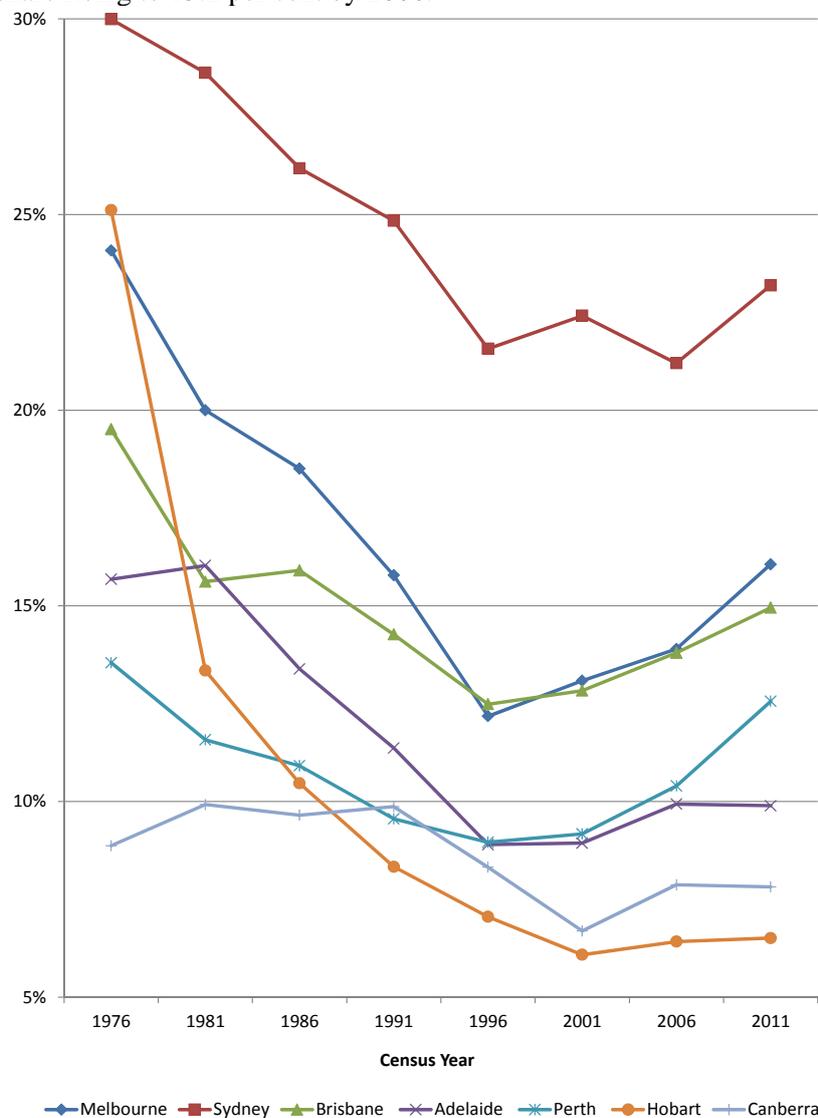


Figure 4: Mode share for public transport (all types)

The last five years have seen a larger increase in public transport mode share, lifting the total across the seven capital cities to 16.8 per cent of work trips. This is by far the biggest increase in public transport mode share seen since 1976. The largest increases in mode share over the 2006-2011 period were in Perth (from 10.4 to 12.6 per cent, a rise of 2.2 percentage points), Melbourne (also 2.2 per cent) and Sydney (2.1 per cent). Public transport's share of work trips rose by 1.2 percentage points in Brisbane, but it stagnated in Adelaide and Hobart, with Canberra registering a small decline.

The rise in public transport's share of work trips in Perth can be explained by the substantial expansion of public transport, particularly the rail system, since the 2006 census. Critical to this expansion is the new southern railway to Mandurah, which opened in late 2007. Sydney and Melbourne did not see such dramatic expansion of public transport infrastructure over the same period, although Sydney's Epping to Chatswood railway, which opened in 2009, contributed to the increase in patronage. The main factor in Sydney and Melbourne appears to have been strong central city employment growth (central cities are the destinations with the highest mode shares: in both cities, public transport caters for the majority of workers employed in the Central Business District).

Most of the increase in public transport usage has occurred on train systems, which have fared much better than buses, trams and ferries [Figures 5 and 6], except in Adelaide, the only city with a rail system that has not been electrified (Hobart's suburban rail service closed in 1974, while Canberra has never had trains). In Perth, the share of work trips made by train is now three times as high as in 1976, while the absolute number of rail passengers has increased seven-fold (and more than eight-fold since the all-time low of 1981). The mode share for trains in Perth has now overtaken the figure for Brisbane (7.7 versus 7.6 per cent), despite being less than a third the Brisbane figure in 1976. In Sydney, the share of workers travelling by train was actually higher (16 per cent) in 2011 than in 1976 (15 per cent), while in Melbourne the current figure is almost as high as the 1976 rate (11.7 versus 11.9 per cent).

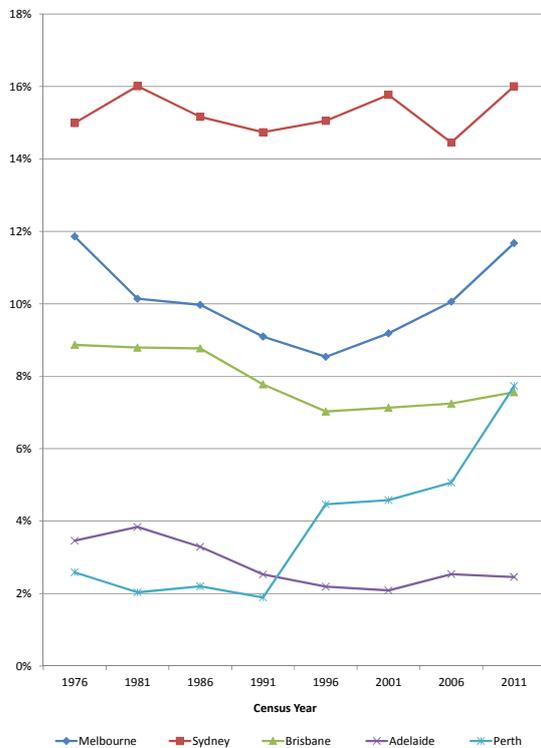


Figure 5: Mode share for trains

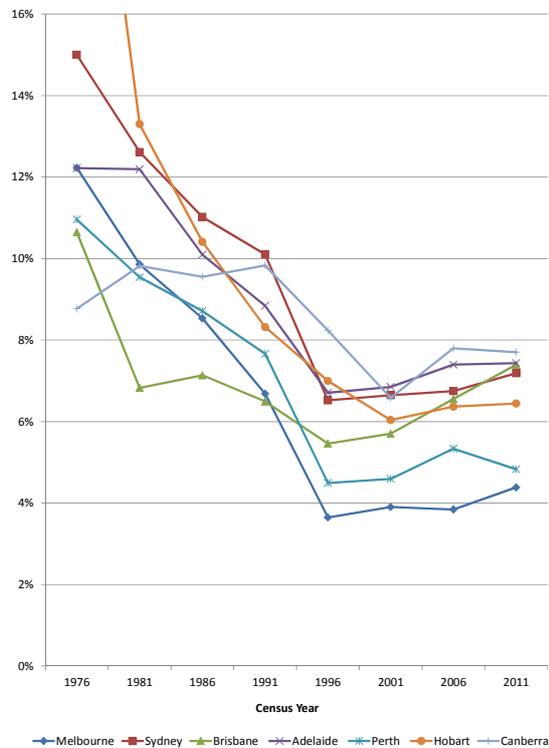


Figure 6: Mode share for bus, ferry and tram

By contrast, the share of work trips made by bus, tram and ferry is much lower than in 1976 in all seven cities. The bus share has fallen by more than half across the seven cities [Table 1.8], as has the tram share in Melbourne and Adelaide, the only cities with trams throughout the period since 1976. The greatest fall in bus travel was in Melbourne, where the 2011 bus share was only a quarter of the 1976 figure; mode share for trams also fell by more than half. Brisbane has seen the smallest decline in bus usage rates (apart from Canberra, where bus usage was already low in 1976), due largely to the very substantial investment in busways that has occurred in recent years. However, this bus focus has come partly at the expense of rail's market share, which as indicated above has now fallen below Perth.

It should be noted that the tables in this report provide public transport mode shares on a 'main mode' basis (for details, see the Appendix). So, for example, a worker who takes a bus to the station and then a train is counted as 'train', not 'bus'. This means the figures reported here underestimate the important role buses, in particular, play as feeders to rail, especially in Perth, where integration between the two modes is most developed. The figures also understate the importance of ferries in Sydney, because bus-ferry trips are counted as 'bus' under the ABS classifications, and a significant share of ferry trips begin on feeder buses.

The much stronger performance of rail compared with buses casts doubt on the current preference for bus transport expressed by numerous commentators and in plans such as Infrastructure New South Wales' (2012) State Infrastructure Strategy. Similarly, the poor performance of trams in Melbourne and Adelaide, and the negligible role of light rail in Sydney, sit uneasily with the current enthusiasm for light rail in cities like Canberra. We are not arguing that buses, or light rail, have no role to play, but rather that they are no substitute for an effective multi-modal public transport system, which in larger cities at least, seems to require a heavy rail backbone. The strong performance of Perth, a city with few natural advantages for public transport, supports this view (see also BITRE 2012b).

Active transport: has progress stalled?

Walking and cycling are the only truly sustainable transport modes, producing no pollution and even improving people's health. Of the two 'active' transport modes, walking is by far the more important, catering for around three times as many work trips as cycling across the seven capital cities [Figures 7 and 8], as well as requiring less in the way of infrastructure and no parking facilities. Despite these benefits, walking receives little attention from policy-makers and commentators, for whom 'sustainable transport' often seems to mean cycling only. A recent example is a report from the Department of Infrastructure and Transport (DIT, 2012), which notes that walking accounts for many more trips than cycling, but then devotes the majority of the discussion of possible policy measures to cycling.

At the 2006 census, it seemed that active transport, in particular walking, was a modest 'success story' for transport planning, with less decline since 1976 than for public transport or carpooling, and a modest reversal of that decline beginning in 1996/2001. The 2006 active transport mode share of 5.5 per cent across the seven cities studied was noticeably higher than the 1996 and 2001 figure of 4.4 per cent, and the same as the figure in 1981. In the smaller capitals, Canberra and Hobart, where a higher proportion of destinations are within walking and cycling distance of the average resident, active transport played a significant role in overall travel: the 2006 active transport mode shares of 8.7 per cent in Hobart and 7.4 per cent in Canberra were the highest recorded over the entire period since 1976. Among the larger cities, Sydney had the highest active transport mode share of 5.6 per cent; Melbourne's higher cycling rate was more than cancelled out by lower rates of walking.

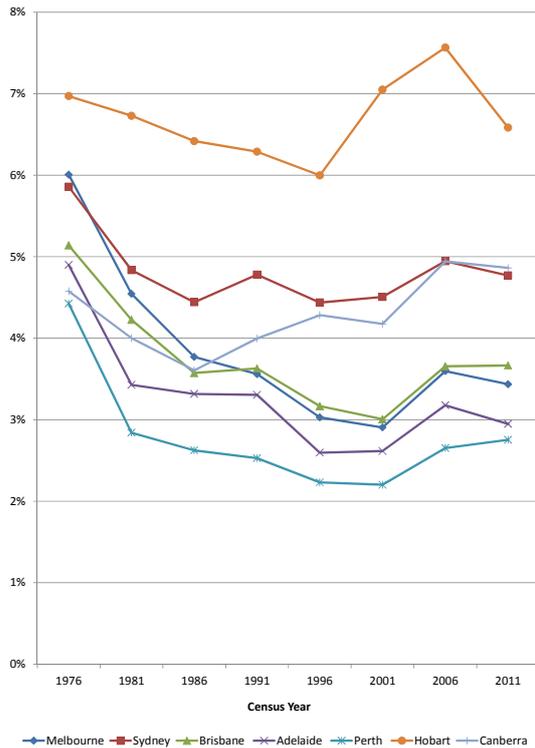


Figure 7: Mode share for walking

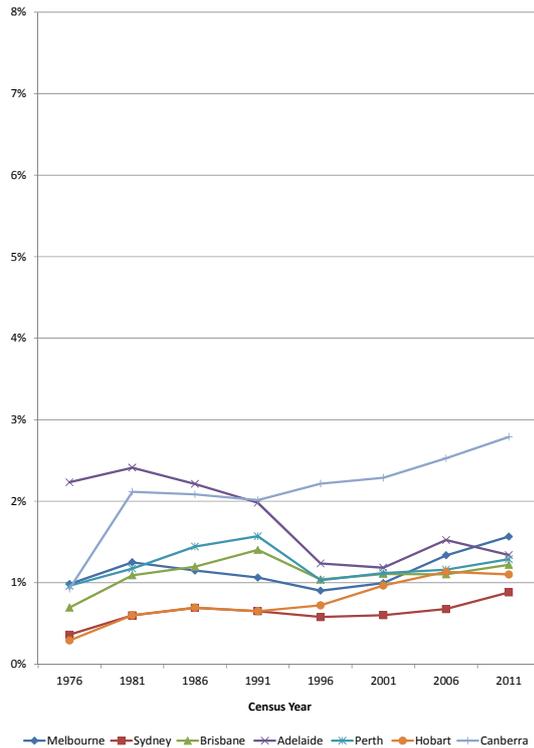


Figure 8: Mode share for cycling

The growth in active transport to 2006 is unlikely to be the result of explicit transport policies, because most of the growth occurred in walking, which as indicated above, receives little encouragement from policy makers. The most likely explanation is increased inner city populations due to urban redevelopment, which together with rising CBD employment have significantly increased the number of workers for whom active transport is a viable option.

These positive trends did not continue to the 2011 census, which saw walking rates decline by 0.2 percentage points, cancelling out a similar rise in cycling rates, and leaving overall active transport mode share the same as in 2006. Walking's mode share declined in Sydney, Melbourne, Adelaide and Hobart; it remained the same in Brisbane and Canberra, and increased by 0.1 per cent in Perth (where walking rates had been low to begin with). Cycling rates increased modestly in all cities except Adelaide, which saw a small decline, and Hobart, where cycling mode share remained at 1.1 per cent. Hobart suffered the largest decline in active transport, followed by Adelaide.

The decline in walking is of particular concern, as rising inner city populations between 2006 and 2011 should have led to an increase. As the decline occurred across most of the seven capital cities, it is unlikely to be a statistical aberration. One possible factor is that much recent inner-city residential development has taken place in precincts like Melbourne's Docklands and Southbank, which provide poor environments for pedestrians, with wide arterial roads and major barriers to movement on foot. Similar problems can be seen with the Canberra redevelopment site at New Acton, which is cut off from the core of the CBD by a series of high-speed arterial roads. The lack of attention given to pedestrians in transport and planning policies may finally be beginning to bear fruit.

One question that also needs to be asked is whether recent increases in cycling may be coming at the expense of walking. Most observers treat an increase in cycling rates as a sign of successful policy, as if the objective was simply to increase cycling regardless of whether the increase comes at the expense of the car. For example, Pucher et al (2011) treat the higher cycling rate in Melbourne, compared with Sydney, as an indicator of successful transport

policy, despite the fact that overall active transport usage rates are substantially lower in Melbourne than in Sydney. It is possible that recent improvements to bicycle facilities, through expanded cycle paths and lanes, combined with an absence of any equivalent measure favouring pedestrians, have induced some workers who would have walked to work to cycle instead. If this is the case, then there has been no overall gain for sustainable transport.

Higher rates of cycling are associated with lower rates of walking, except in Canberra. Hobart and Sydney, with the highest rates of walking and active transport overall (except Canberra), also have the lowest cycling rates; Melbourne, with the second-highest cycling rate after Canberra, has lower-than-average rates of walking. Adelaide and Perth, however, combine low rates for both active modes.

These facts and possibilities suggest the need for a reconsideration of policy and commentary around active transport. Despite welcome recent increases, cycling remains of negligible importance as a transport mode for work trips in all capital cities except Canberra. Recent increases in cycling's share have come from a very low base, and have made no measurable difference to overall transport outcomes. The number of cyclists across the seven capitals increased by 17,506 in the five years to 2011, but this was dwarfed by the 202,971 additional public transport commuters, let alone the extra 475,243 car drivers [Table 1.8]. Even walking, which lost mode share, increased by 21,134.

Transport planning and policy needs to give walking a much higher priority than at present. There is also a need for a shift in cycling policy, based on a realistic assessment of the very narrow market currently served by cycling policies – predominantly male, middle-class and inner city – and the need to cater for a much broader segment of the urban population while complementing, rather than competing with, policies to promote walking. Given the positive trends up to 2006, the scope for improved usage rates for active transport should be considerable.

Transport modes and gender

One possible reason for the attention paid to cycling is that cycling is by far the most male-dominated transport mode [Table 2], reflecting the gender (and probably also socio-economic) makeup of transport planners and policy makers. While 55 per cent of those travelling to work on census day across the seven capital cities were male (reflecting men's higher workforce participation and greater propensity to work full-time), 77 per cent of cyclists were male. The next most 'male' mode was car driving, where men accounted for 57 per cent of travellers. By contrast, women are over-represented (relative to their share of overall travellers) among car passengers, walkers and users of all modes of public transport, particularly buses. Perhaps this helps explain why the 'male' modes of car driving and cycling receive more policy and media attention than the female-dominated modes of walking and public transport (although this probably does not apply to car pooling).

	MELBOURNE		SYDNEY		BRISBANE		ADELAIDE		PERTH		HOBART		CANBERRA		ALL CITIES	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Travelled to Work	56%	44%	56%	44%	55%	45%	55%	45%	56%	44%	53%	47%	53%	47%	55%	45%
Public Transport	50%	50%	50%	50%	46%	54%	44%	56%	52%	48%	43%	57%	48%	52%	49%	51%
Train	52%	48%	52%	48%	49%	51%	47%	53%	51%	49%	71%	29%	58%	42%	51%	49%
Ferry/Tram	45%	55%	59%	41%	52%	48%	44%	56%	66%	34%					48%	52%
Bus	45%	55%	46%	54%	43%	57%	43%	57%	53%	47%	43%	57%	48%	52%	46%	54%
Car Total	56%	44%	56%	44%	55%	45%	55%	45%	55%	45%	53%	47%	52%	48%	55%	45%
Driver	57%	43%	57%	43%	56%	44%	56%	44%	56%	44%	55%	45%	54%	46%	57%	43%
Passenger	43%	57%	41%	59%	43%	57%	42%	58%	49%	51%	39%	61%	36%	64%	37%	63%
Bicycle	72%	28%	80%	20%	82%	18%	79%	21%	80%	20%	79%	21%	72%	28%	77%	23%
Walked	49%	51%	49%	51%	50%	50%	51%	49%	52%	48%	49%	51%	54%	46%	50%	50%

Table 2: Break down of mode choice by gender in 2011

Some commentators in Australia and the United States have argued that the flexibility of the car makes it an ideal travel mode for women, whose travel patterns are often more diverse, in space and time, than men's. By contrast, public transport, especially the fixed-rail variety, is said to be inflexible and thus unsuited to women's needs (e.g. Rosenbloom, 1993). The Victorian Women's Planning Network even went so far as to claim that: 'Traditional bus systems with inter regional routing or feeder bus systems which feed train lines are unlikely to suit the identified women's transport needs. For the same reason, fixed rail systems are also unlikely to match women's travel needs.' Therefore: 'The raft of policies which discriminate against car usage may run counter to the transport needs of women' (WPN, 1995, p. 48). Census results cast serious doubt on these claims, since they show women use all forms of public transport at higher rates than men, including fixed rail, while men are more likely to be car drivers than women.

TRANSPORT TRENDS IN EACH CITY

Sydney: Australia's 'sustainable transport' capital

Given the publicity devoted to Sydney's transport problems in recent years, it may come as a surprise that Australia's largest city is also the most sustainable, in terms of travel to work. The share of workers travelling as car drivers was 62.4 per cent in 2011, by far the lowest figure in the nation (the second-lowest figure is 69.4 per cent in Brisbane). While Sydney's larger workforce meant that on the day of the 2011 census, 130,702 more workers travelled to work than in Melbourne, they required 58,971 fewer cars to do so [Tables 1.1 and 1.2].

Sydney's relatively low rate of car driving is mainly due to much higher public transport usage rates, with a 2011 mode share of 23.2 per cent, well ahead of the second-best performer, Melbourne, with 16.1 per cent. This is mainly due to high rates of train travel, but it is also noteworthy that the mode share for buses is above the national average, and much higher than the combined rate for buses and trams in Melbourne. However, only 1164 Sydney workers, or 0.07 per cent of the workforce, went to work on Sydney's single light rail line. Sydney also has higher rates of car pooling and active transport than Melbourne, with active transport mode share above the national average. While a decline in public transport's mode share between 2001 and 2006, due mainly to problems on the rail system, saw car driving increase, a recovery in public transport in the five years to 2011 more than cancelled out this trend.

The number of workers travelling to work by train in Sydney increased by 22 per cent in the five years to 2011 [Table 1.1], but reported CityRail patronage only increased by 13 per cent over the same period, from 265 million to 299 million (BTS, 2012). Unless there was a substantial decline in use of the rail system for non-work travel, it seems likely that the current method of counting patronage has underestimated recent growth rates. By contrast, as discussed below, current estimation methods in Melbourne appear to have overestimated rail patronage growth rates. The result of these discrepancies has been to make patronage growth in Melbourne appear higher, relative to Sydney, than is actually the case.

The comparatively strong performance of public transport in Sydney is partly due to traffic congestion and parking shortages, especially in the Sydney CBD and key employment centres like North Sydney. However, it can also be attributed to the strong pro-rail policies of the Wran state government in the late 1970s and early 1980s, which saw substantial upgrading and extension of the suburban rail system. The spatial distribution of Sydney residents who travel to work by bus confirms that an additional factor is the strong performance of Sydney's public bus operator, Sydney Buses, particularly in serving travel to centralised locations: mode shares are much lower in areas served by private operators.

The relative success of public transport, and arguably walking, in Sydney in recent decades has occurred despite, rather than because, of government policies. Public transport plans have been announced and cancelled in a seemingly endless succession, while the motorway network has been steadily expanded. Sydney is now the only Australian capital city without a multi-modal public fare system allowing free transfers between different transport modes, although there is now a limited range of multi-modal periodical tickets. It was expected that the establishment, in 2011, of Infrastructure New South Wales would resolve this problem, but the organisation's 2012 State Infrastructure Strategy (INSW, 2012) reflects the same policy biases that have dominated transport planning in Sydney for at least two decades. The strategy explicitly argues for a redirection of funding away from rail transport towards roads, despite the much faster growth in rail patronage revealed by the 2011 census results.

The focus on roads is justified primarily on projections that car travel is expected to grow more rapidly than in the past (INSW, 2012, Table 6.3, p. 81), with buses growing less rapidly.

The strategy's figures are based on the 2006 census, which as Table 1.1 shows, represented an uncharacteristically low rail usage rate, and on reported CityRail patronage, which as indicated above seems to underestimate actual growth rates. In fact, the 2011 census results show the opposite pattern to that assumed by INSW, with both bus and rail travel growing more rapidly than car travel. The strategy predicts a 37 per cent increase in rail patronage over the 20 years to 2031, but the 2011 census showed a 22 per cent increase in work trips by rail just in the five years to 2011 (Table 1.1).

The Infrastructure NSW report is littered with similar examples of poor basic research: for example, it states that Line A of the Paris RER has a maximum capacity of 25-26 trains per hour (p. 110), when the current timetable for the line, available on the RATP website (RATP, 2012), shows a train every two minutes through the central station, Chatelet-Les Halles, from 7:54 am to 9:02 am (heading east), or 30 trains per hour. Line A runs exclusively with double-deck trains and has one track in each direction through the city centre, but the report then argues (p. 111) that double-deck trains must be replaced by single-deck vehicles to lift capacity to 30 trains per hour – the same figure RER Line A is already achieving!

Infrastructure NSW also justifies the shift to roads on the basis that buses travel on roads, but the congested roads identified in the strategy, such as the M4, M5 and Eastern Distributor, parallel rail lines and do not carry significant numbers of buses.

So while travel patterns in Sydney suggest a real potential to create a substantially less car-dominated city, Infrastructure NSW is planning for increased, rather than reduced, car domination. The projections on which the Infrastructure NSW proposals are based have already been shown to be erroneous by the results of the 2011 census, suggesting that the organisation needs to urgently rethink its transport priorities.

Melbourne: The worst long-term performer, but recent progress

When the seven capital cities are compared across the 35 years from 1976 to 2011, Melbourne stands out as having the largest increase in car driving (a rise of 14.9 percentage points) – apart from Hobart, where car driving was artificially low in 1976 because of the Tasman Bridge closure – and the biggest falls in public transport (8.3 percentage points) and walking (2.6 per cent). Melbourne also had the second-biggest fall in car pooling, after Brisbane. Melbourne now has the lowest rate of car pooling and the lowest usage of public transport modes other than heavy rail (i.e. bus and tram) in the country.

Public transport mode share in Melbourne reached an all-time low of 12.2 per cent in 1996, barely half the 24.1 per cent recorded in 1976, and below Brisbane's 1996 share of 12.5 per cent. After this record-breaking decline, public transport mode share in Melbourne began a steady recovery, rising to 16.8 per cent by 2011, the second-highest figure nationally after Sydney, and the largest increase over the 1996-2011 period of any of the seven capital cities. So Melbourne had the biggest fall in mode share up to 1996 and the biggest improvement since; however, because the earlier fall was much greater than the recent rise, the long-term result is still a record rate of decline. The decline has occurred mainly in the use of trams and buses, since rail's mode share is almost as high as it was in 1976.

Why did mode share fall faster in Melbourne than other cities up to 1996? A key reason for the decline is that Melbourne has built more lane-kilometres of freeway and tollway since 1976 than any other Australian city, but has not constructed a new suburban rail line since the Glen Waverley line opened in 1930. Melbourne's bus services are notoriously infrequent and poorly coordinated (e.g. Currie & Loader, 2009), while tram service quality has deteriorated as a result of traffic congestion and substantial reductions in service levels, especially in peak period. The particularly rapid decline in mode share between 1991 and 1996 can be attributed

to service cuts by the Kirner and Kennett governments, which coincided with a fall in CBD employment (which reduced congestion on the roads and pressure on parking).

Why has mode share partially recovered since 1996? One likely reason is that the previous decline had been so severe that some correction was inevitable once cuts to service levels stopped. In 1976, public transport mode share in Sydney was 5.9 percentage points higher than in Melbourne; by 1996, the gap had widened to 9.4 per cent; in 2011 the gap had narrowed to 7.1 per cent. Another reason, common to most Australian cities, is rising CBD and inner city employment levels. However, employment has grown more rapidly in central Melbourne than in central Sydney in recent years, leading to more pressure on central city parking availability and thus more incentive for workers to use public transport (BITRE, 2012b, pp. 18, 33).

Some commentators, notably the free-market think-tank the Institute of Public Affairs, have attributed the recent rise in mode share to the 1999 privatisation of Melbourne's trains (trams were privatised the same year, but most bus services have always been privately run, with the small public network privatised in 1994). The IPA even argued that Melbourne's performance suggested that Perth's rail system should be privatised (see Allsop, 2007). However, as Tables 1.2 and 1.5 show, the increase in rail patronage has been much higher in Perth than in Melbourne: 175 per cent since 1996 versus 91 per cent. Patronage on Victoria's V/Line inter-urban rail services, which returned to public hands in 2004, has also increased more rapidly than on the privately-run suburban services. Conversely, mode share has not grown significantly on Melbourne's privately-operated trams and buses.

While the recent increases in work trips and mode share on Melbourne's rail system have been impressive, they are less so than the claims that have been made about overall patronage increases on Melbourne trains. For example, the Victorian Department of Transport reports patronage growth of 58 per cent over the six years from 2004-05 to 2010-11 (Auditor-General, 2012, p. 27). Measuring patronage rates in Melbourne over time is complicated by the adoption, in 2005-06, of a new methodology for estimating trip rates, which means that comparisons with previous years are not meaningful (BITRE, 2012b, p. 16).

Figures produced using the new methodology show a 41 per cent increase in patronage between 2005-06 and 2010-11 (taken from Victorian budget papers). By contrast, Table 1.2 shows a lower increase over this period, of just under 35 per cent, suggesting either that growth in non-work rail trips in Melbourne was much faster than growth in work trips, or that the current methodology used to estimate patronage contains some inaccuracies. The Victorian Department of Transport has even claimed that public transport usage rates in Melbourne surpassed those in Sydney in 2006-07 (Victorian Government, 2009, pp. 10-11), but Tables 1.1 and 1.2 make it clear that public transport mode share in Sydney was dramatically higher than in Melbourne at both the 2006 and 2011 censuses – 21.2 to 13.9 per cent in 2006; 23.2 to 16.1 per cent in 2011. This provides further evidence that the claims of record-breaking patronage increases on Melbourne's trains are likely the result of a flawed estimation methodology that has exaggerated patronage growth.

Although recent rail patronage growth rates have probably been overstated, the fact remains that Melbourne has experienced a significant revival in public transport usage rates since 1996. The fact that mode share is still well below the 1976 figure suggests that there is ample scope for building on this revival. However, the Victorian government has not adopted this policy course. Inexplicably, its number one transport investment priority is a tunnel linking the Eastern Freeway with the Western Ring Road, with an estimated cost of \$12-15 billion. It is not possible to offer an analysis of the justification offered for the project, as has been done above in the case of Sydney, because no analytical work of any kind has been put forward in support of what would be the most expensive infrastructure project in the State's history. Instead, the Victorian Government (2011, pp. 41-42) simply asserts that the project 'will

support the long term sustainable growth and development of Melbourne, and have state-wide benefits', while also noting that the project has not yet undergone a business case development.

If the East-West freeway link does go ahead, it is likely to soak up all the funds available for investment in transport projects in Melbourne for a generation, and would probably halt or even reverse the recent revival in public transport.

Brisbane: good and bad news

Brisbane has for some time had the second-lowest mode share for car travel overall and car driving, after Sydney. Some of this is the result of higher use of trucks to travel to work than in other capitals, but the lower car driving rate is the result of more car pooling than in Melbourne, offsetting slightly lower public transport usage rates.

Public transport's share of work trips has been improving steadily since reaching an all-time low in 1996, but the rate of improvement has been slower than in Melbourne and Perth and, since 2006, Sydney. Train travel, in particular, has grown more slowly than in the other three cities, with Perth now having a slightly higher mode share for rail travel than Brisbane. Because rail is used more in Perth for off-peak and other non-work travel, Perth's trains carried 10 million more passengers in 2011-12 than Brisbane's – 63.0 million versus 52.8 million (PTA, 2012; Translink, 2012, p. 64) – despite serving a substantially smaller population.

Part of the explanation has been the relative neglect of rail in favour of substantial investment in busways, which have drawn some of their patronage from parallel rail services – as they were designed to do (Mees, 2010a, pp. 120-124). Brisbane has a higher rate of bus use for the journey to work than the other cities with electrified rail systems, and is the only such city in which bus transport is of comparable importance to rail. An important factor holding back public transport growth has been the Brisbane City Council's Transapex program to build a series of bridges and tunnels that compete with the rail and busway networks for both funds and patronage.

A major positive factor for sustainable transport has been the establishment of the Translink agency to coordinate public transport services across South East Queensland. Translink, which began operating in 2003 and became a separate agency in 2008, marks a change from the long-standing pattern of rivalry and non-coordination between the region's rail and bus operators. Translink's first major achievement was the introduction, in 2004, of a fully integrated, multi-modal fare system allowing free transfers between buses, trains and ferries. Progress on integrating different networks and timetables into a 'seamless' whole has been slower, but there have been some improvements in coordination.

The modest but steady improvements in public transport's mode share since 1996 suggest that Brisbane has the potential to become a less car-dominated city. Unfortunately, as in Sydney and Melbourne, current government policies are working in the opposite direction, emphasising new and expanded roads. A redirection of funding to more sustainable modes, combined with an aggressive plan to integrate and improve services across the different public transport modes, is required to get transport in Brisbane back on track.

The data in Table 1.3 are for the Brisbane Greater Capital City Statistical Area and its predecessor the Brisbane Statistical Division (see Appendix). These areas, which are defined by ABS, comprise the City of Brisbane and adjoining municipalities like Ipswich, Redcliffe and Logan. They exclude the Gold and Sunshine Coasts which, together with Brisbane make up the South East Queensland region. Public transport use, in particular, is much lower on the Gold and Sunshine Coasts than in Brisbane, so car use is correspondingly higher for the

broader SEQ region than it is for the Brisbane GCCSA. Indeed, Peter Spearritt (2009, p. 95) argues that the SEQ region is ‘unquestionably Australia’s most car-dominated city’. But, as Table 1.3A shows, even this broader region has higher rates of public transport use than Adelaide, Canberra and Hobart, and lower rates of car use than these three cities. Car driving, in particular, is significantly lower than in Adelaide, at 72.3 per cent, compared with 76.2 per cent.

Adelaide: Australia’s car capital

In 1976, car use in Adelaide was lower than in Canberra or Perth. Public transport use actually increased between 1976 and 1981 – Adelaide and Canberra were the only cities in which this occurred – and in 1981, Adelaide’s mode share was higher than Brisbane’s. These developments were the result of the pro-public transport policies of the Dunstan government, which froze freeway construction, extended suburban rail services, nationalised private bus services and introduced Australia’s first multi-modal fare system.

Over the last three decades, however, the Dunstan transport policies have been reversed. Continual cuts to public transport have been combined with renewed road investment. Adelaide is now the only Australian capital city with a non-electrified suburban rail system.

The results of the current transport policies have been dramatic: Adelaide has suffered the largest decline in public transport usage, and the largest increase in car use, apart from Melbourne, and without the mode share turnaround seen in Melbourne since 1996. As a result, Adelaide now has the highest mode share for car driving of any of the seven capital cities, the third-lowest rate of public transport use (after Canberra and Hobart) and the second-lowest rate of active transport use (after Perth). Between 2006 and 2011, when public transport usage grew substantially across the larger capital cities, mode share in Adelaide remained constant at a low 9.9 per cent, while both walking and cycling actually lost mode share, something that did not happen in any other city.

Adelaide’s performance stands in stark contrast to that of Perth, where public transport usage, starting from a very low base, has risen dramatically, and even active transport usage is on the rise. Given that Perth has a lower urban density and a less ‘transit-oriented’ urban form than Adelaide, the latter’s poor performance is inexcusable. There needs to be a dramatic rethinking of transport policies and priorities in Adelaide to build on the potential that undoubtedly exists for the city to become less car-dominated and more sustainable.

Perth: an impressive turnaround, but room for further progress

In 1976, Perth was a car-dominated city, and expected to remain so. The small, diesel-powered rail system was slated for closure, and in 1979 the Fremantle line was actually shut down. The revival of Perth’s public transport, which began with the 1983 reopening of the Fremantle line, centres around the electrification and extension of the city’s rail system, with the most recent major expansion, the Mandurah line, opening late in 2007. Importantly, the addition of new and improved infrastructure has been accompanied by a reform of organisational structures that enabled integration of rail and bus services to be taken further than anywhere else in Australia. At some stations on the Mandurah line, the majority of rail passengers arrive by feeder bus, something unheard of in other Australian cities.

The result has been the fastest growth in usage of public transport, particularly trains, for travel to work among the seven capital cities, with the number of workers travelling by train fully eight times as high as three decades ago (Table 1.5, 2011 vs. 1981). Perth has also been more successful than other Australian cities at attracting off-peak patronage to improve all-day usage of its rail system (BITRE, 2012, p. 15). As BITRE (2012b, pp. 56-57) suggests, Perth may well be a model for other Australian cities.

This remarkable turnaround was the result of a concerted political campaign by community groups over many years (Newman, 2011). However, the advocacy of community groups was able to produce effective projects on the ground because institutional reforms created the technical capacity for robust evaluation of alternative schemes, and then for project design, planning and budgeting (Mees, 2010b).

Perth still has a substantial way to go before its transport system can be considered sustainable, but there is considerable progress to build on. Current low rates of active transport use, while rising slowly, need to be improved, and there remains room for further progress in public transport. There is substantial scope for improving bus services, which are currently infrequent and circuitous, while opportunities for expanded and improved rail services also exist.

Currently, transport policy discussions in Perth are centred around proposals for light rail lines, with the State government announcing in September 2012 a light rail scheme called 'MAX', or Metropolitan Area Express, apparently in homage to the MAX light rail system in Portland, Oregon. The invocation of Portland by the government and other light rail advocates in Perth is puzzling, since public transport usage in Perth is already more than twice as high as the most recent figure for Portland (from the 2009 American Community Survey): 12.6 per cent of work trips compared with 6.1 per cent (Table 1.5; US Census Bureau, 2010, p. 5). Despite serving similar populations, MAX carried 41.2 million passengers in 2011 (TriMet, 2012), while Perth's trains carried 63.0 million in 2011-12 (PTA, 2012).

These figures, together with the relatively poor performance of tram/light rail services in Melbourne, Adelaide and Sydney, suggest that enthusiasm for light rail is no substitute for the rigorous analysis of alternative public transport strategies that has been so important in Perth's public transport revival to date. This is not an argument against light rail, merely an argument for comprehensive analysis of all the alternatives and a focus on integrated, multi-modal solutions.

Canberra: a spectacular transport policy failure

In 2004, the ACT government did something no other Australian government has done: it set targets for increasing the share of work trips by sustainable transport modes that could be checked against census results. The targets for 2011 were relatively modest, particularly for public transport: mode share was to rise from 6.7 per cent in 2001 (the lowest mode share ever recorded in Canberra) to 9 per cent, still below the 10 per cent recorded as recently as 1991 (ACT, 2004, p. 29; Table 1.7). By 2006, it looked as if Canberra was likely to meet this target, as public transport usage increased to 7.9 per cent of work trips; there were also small but significant rises in walking and cycling. However, the 2011 census results reveal that Canberra has failed to meet the targets for any of the sustainable transport modes.

Mode	2001 actual	2011 target	2006 actual	2011 actual
Walking	4.1%	6%	4.9%	4.9%
Cycling	2.3%	5%	2.5%	2.8%
Public transport	6.7%	9%	7.8%	7.7%

Table 3: Sustainable transport targets and performance in Canberra

Sources: ACT 2004; Table 1.7.

Public transport mode share actually declined slightly compared with 2006: Canberra was the only one of the seven capital cities to register a decline. Walking rates stayed at the 2006 level, while cycling increased only modestly. The result, set out in Table 3, is that Canberra is nowhere near meeting any of its sustainable transport targets: indeed, in public transport, the city is headed in the opposite direction to the target.

These results constitute an unambiguous policy failure, particularly in public transport. The result of this policy failure is that the share of Canberrans driving cars to work is the highest recorded since census records began in 1976, at 72.9 per cent – at a time when car driving rates are in decline across the rest of Australia. Canberra and Hobart are the only two of the seven capitals where current car driving rates are the highest on record: even Adelaide has not done quite so badly.

A failure this dramatic should lead to a fundamental reassessment of the transport policies that are producing the opposite results to those intended. In particular, recent public transport policies, which have produced declining mode share and record public subsidy levels, need reconsideration.

The first reason Canberra's transport policies have failed is that the 2004 commitment to sustainable transport mode share increase was purely rhetorical, and was not backed by any substantive actions. Instead, the ACT government has done the opposite to its stated intentions, with a substantial program of road building and expansion, including building the Gungahlin Drive Extension as a freeway, widening Parkes Way along Lake Burley Griffin, and more recently starting work on another freeway, the Molonglo Parkway. This significant investment in roads, combined with little improvement in conditions for pedestrians and cyclists and a decline in public transport service levels following cuts in late 2006, have provided Canberrans with a strong incentive to drive more and use sustainable modes less.

Recent public transport policies have exacerbated these problems, and unless changed will further entrench car dominance. Since 2009, Canberra's public transport planners have formally abandoned the idea of competing with car travel across the great majority of the city. Most of Canberra is to be served by 'coverage' routes, generally running hourly or half-hourly and with poor connections to more frequent routes. These services are 'intended to provide basic access for people who need it rather than to compete with the car for patronage' (MRCagney, 2009, p. vii). A minority of Canberrans will be served by the 'frequent network', offering services every 15 minutes or better on weekdays, dropping to 30 minutes evenings and weekends (hardly a frequent service by any standards other than those in Canberra!), and designed to compete with the car.

This policy, which was reaffirmed in the 2012 *Transport for Canberra* strategy (ACT, 2012), guarantees that most Canberrans will be 'captive' to the car in perpetuity, with only a minority having the choice to use public transport. Even these fortunate people will find public transport unattractive should they wish to reach destinations on the 'coverage' network.

The strangest aspect of the current Canberra public transport policy is the way it reverses the successful approach adopted by the city from the mid-1970s to the late 1980s, when public transport attracted higher usage rates and a higher share of work trips than at present, while requiring lower subsidies (Mees, 2012). Under the old approach, similar levels of service (every 15 minutes or better in peak period) were provided across the entire city, with coordinated timetables easing connections across the system. This approach is in line with best practice in successful European systems (see Mees, 2010), in contrast with the current approach, which is based on experience in small US cities where public transport plays only a marginal role (Mees, 2012; Walker, 2008).

Current plans to replace one of the 'frequent' services with a light rail line do not change the fundamentally flawed nature of planning a public transport system that offers a real choice to only a minority of the population. Rather, it confirms that Canberra's light rail scheme runs the risk of replicating the poor performance of some US light rail systems and Sydney's single line. Canberra needs to replace its current transport policies with an approach based on the experience of cities where public transport has succeeded, not those where it has failed.

Hobart: car driving still on the rise

Car travel in Hobart was reduced in 1976 by the Tasman bridge closure (see the high rate of ferry use for 1976 in Table 1.6), but has increased steadily ever since the bridge reopened in 1977. Like Canberra, Hobart has not shared in the revival of public transport, and consequent decline in car driving, seen in the larger capital cities: car driving rates are now the highest on record, while public transport usage has stabilised at less than half the rate of 1981.

Hobart does have the highest rate of walking to work among the seven capital cities, with a significant increase in mode share from 6.0 per cent in 1996 to 7.6 per cent in 2006. Rising employment and population in Hobart's inner city are likely to be major factors behind this trend. However, walking rates fell significantly between 2006 and 2011, to 6.6 per cent of work trips. While walking rates fell nationally and in most cities (see above), the fall in Hobart was by far the largest nationally, and is a cause for particular concern. Hobart's hilly terrain probably limits the scope for large increased in cycling rates.

There appear to be no current plans to change this situation, despite the fact that the Greens Party has held the 'sustainable transport' portfolio since shortly after the 2010 election. After receiving a 2011 report providing a pessimistic assessment of the potential for light rail to Hobart's northern suburbs, the Tasmanian government seems to have simply given up on public transport. This again shows the danger of an exclusive focus on light rail as the sole solution to urban transport problems: even if it went ahead, the proposed rail line would only have served a fraction of Hobart's population; the remainder would remain dependent on the city's bus services, which have been in the doldrums for decades. Hobart needs to replace its current emphasis on road projects with a concerted program to upgrade public transport across the whole city and improve conditions for pedestrians.

CONCLUSIONS AND POLICY IMPLICATIONS

The census findings suggest that Australia's major cities are at a crossroads. Although car use has increased rapidly, there has been a revival of public transport – tentative to begin with, but strong in the five years to 2011. In past decades, governments which gave priority to road investments could claim to be acting in accordance with the wishes of the public, who were 'voting with their feet' for car travel. Now, public transport is gaining ground at the expense of the car, but most state and city governments remain wedded to road-based solutions.

The time has come for a radical reversal of transport priorities. If public transport can rebound with the modest levels of support received to date, serious pro-public transport policies have the potential to create very significant mode shifts, as the experience of Perth has shown. Public transport can be reconfigured to serve non-central and off-peak travel, as well as its traditional role catering for peak-period city centre work travel (Mees, 2010).

Australian cities should be planning for European-style public transport service quality and European-level mode shares. Achievement of these objectives would make virtually all planned major urban road investments redundant. Importantly, the success of public transport to date has already provided evidence that we do not need to wait until planning policies deliver European-level urban densities – something that is probably impossible, and would take many decades to achieve – before we can have European-style public transport (see also Mees, 2010).

Achieving European-style public transport in Australian cities will require more than just changes to funding priorities. The 72-kilometre Mandurah line in Perth, which included a tunnel under the CBD and two underground stations, cost \$1.2 billion in 2007 (the higher figure of \$1.6 billion sometimes cited is the cost of the entire New Metrorail project, of which the Mandurah line was only one element). Significantly smaller projects in east coast Australian cities have been costed at many times this figure (e.g. Mees, 2010b). Concerns have also been raised about the high operating costs of east-coast public transport systems: Infrastructure NSW (2012, p. 108) notes that City Rail operating subsidies are high by international standards and rising steadily, while the Victorian Auditor-General (2012, p. 29) points out that subsidies to Melbourne's private rail, tram and bus operators, which were already much higher than under public ownership, grew by 65 per cent in the five years to 2010-11. These issues underline the importance of effective governance, management, planning and research in public transport, areas where most Australian cities currently perform very poorly.

There is some evidence of a shift in thinking at the national level. Infrastructure Australia's 2011 report to the Council of Australian Governments notes that '[t]he international movement is to dramatically improve the provision and utilisation of public transport', and proposes the development of a national public transport strategy (IA, 2011, p. 32). However, IA's own record to date (see Mees, 2010b) suggests that the organisation has some way to go before it transcends the 'infrastructure first' approach that has proven so unsuccessful at dealing with the transport problems of Australian cities. Indeed, the very next section of the 2011 report discusses the high cost of major new urban roads without considering the prospect that the need for such roads can be reduced through a major shift to public transport, or that their construction would reduce the likelihood of such a shift occurring (see IA, 2011, p. 34). IA does, however, argue that there is a need for a national debate about public transport: we agree, and hope that this report can make some small contribution to that debate.

A renewed focus on public transport is essential, but will not be sufficient. Australian transport policy makers must also lift their game in the field of active transport, particularly walking. Walking requires little in the way of public funding: the most important measures

are reorienting the allocation of road space, and road rules, to give pedestrians priority over motor vehicles. Since every public transport user is also a pedestrian (Mees, 2010, chapter 11), walking and public transport can create a 'virtuous circle', in which improvements in one mode increase the usage of both modes. Improving pedestrian amenity encourages public transport use, while provision of high-quality public transport reduces car ownership and usage, increasing walking rates.

Cycling currently plays only a minor role in reducing car use in Australian cities. Although it is important to provide safe, convenient facilities for cyclists, some of the extravagant rhetoric currently circulating about cycling needs to be given a rest. Policy-makers need to pay attention to the extremely restricted constituency that currently dominates the cycling 'market' (mainly male, inner city professionals), and develop measures to make cycling a viable option for a wider section of the community, as is the case in the best European cities. This should mean an end to policies such as the recent trend to combine bike and bus lanes in such a way that buses must weave back and forth across cycle lanes to reach stops, which endangers cyclists, delays buses and adds to driver stress.

Unfortunately, car-pooling is unlikely to make a significant contribution to reducing the demand for car travel at any time in the foreseeable future.

Although Australian cities look very different from the European cities where public and active transport play major roles in reducing dependence on the car, the evidence from the census suggests that with the right transport policies in place, we can begin to match the Europeans' performance.

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APPENDIX: HOW THE ABS DATA WAS 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 year (the 2011 data is in table B45).

Because ABS has reported the results of the travel to work question differently in different censuses, it has been necessary to adjust the data to ensure that the results are reported 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 as 'train'), but subsequent censuses have reported multi-mode journeys separately. We have presented the results for all censuses on a 'main mode' basis to enable consistent comparisons across time.

The ABS has changed the geographical boundaries from 'Capital City Statistical Division' (SD) to 'Greater Capital City Statistical Areas' (GCCSA) between the 2006 and 2011 censuses. We have analysed the data at SD level from 1976-2006 and at GCCSA level for 2011 for each state capital and for Canberra. The intent of both boundaries is the same – to capture the extent of the metropolitan area and its satellite urban centres.

The adjusted boundaries have differing impacts on the capital cities. While Brisbane has the largest area expansion, it does not incorporate any additional major towns. Perth has been extended to the north and south, including the City of Mandurah. Adelaide has also expanded significantly to the east, taking in the Adelaide Hills. Sydney, Melbourne, Hobart and Canberra are the least changed capitals.

The influence of the new geography on this analysis is most likely to favour car mode share, as the included locations have little or no public transport (except in the case of Mandurah). The boundaries of the SDs have also been expanded since 1976 to take into account metropolitan growth. Using the new GCCSA boundaries for 2011 is therefore consistent with the overall time-series analysis presented here.

Table 1.3A, which reports figures for South east Queensland, is based on combining totals for the Brisbane GCCSA/SD with those for the Sunshine Coast and Gold Coast Statistical Areas (formerly SDs).

There has been a question in the census on the location of workplaces since 1961. This has enabled correlations to be made between home locations and employment addresses to produce origin-destination matrices for various geographical regions. This data has many uses, but until 1976 the census provided no information about the mode of travel used for the work journey.

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%.

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. So a worker who nominated car, bus and train modes will be counted as 'train'; a worker nominating bus and ferry or tram will be counted as 'bus'.

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 and 2011, 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.