

# **Cycling to work in Sydney: analysis of journey-to-work Census data from 1996 and 2001**

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CENTRAL SYDNEY AREA  
HEALTH SERVICE

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## Executive Summary

Regular cycling, as with physical activity more generally, has many personal health benefits. In addition, cycling for transport has many environmental and social benefits. These include decreased air pollution and less traffic congestion.

The present analyses were conducted to examine whether there has been an increase in cycling in Sydney between the 1996 and 2001 Census. Data on the journey to work from both Censuses were purchased from the Australian Bureau of Statistics. Use of a bicycle on any part of the journey to work was coded as 'bicycle used'. Statistical Local Areas (SLAs) in the Newcastle, Sydney and Wollongong areas were coded as Inner Sydney if they were within 10 kilometres of Central Station in Sydney, Outer Sydney for the remaining Sydney SLAs and the rest as the Greater Metropolitan Region.

The total number of people cycling on their journey to work in the combined Sydney and Greater Metropolitan Region increased from 13,138 on the day of the 1996 Census to 15,526 on the day of the 2001 Census, representing an overall increase of 18 per cent. For people living in inner Sydney (within 10kms of Central Station) there was a 61 per cent increase in the number of people cycling on their journey to work *to a destination* in inner Sydney (a change from 3394 people in 1996 to 5463 people in 2001). There was a corresponding 53 per cent increase in the proportion of commuters *living in inner Sydney* who cycled on their journey to work from 1996 to 2001. In absolute terms this represents a change from 0.79 per cent of commuters living in inner Sydney in 1996 who cycled to work to 1.21 per cent of people travelling to work in 2001.

In 2001 in inner Sydney the proportion of people cycling on their journey to work was greatest in the Statistical Local Areas of South Sydney (2.5%), Marrickville (2.2%) and Leichhardt (2.0%). 5216 people living in inner Sydney cycled on their journey to work on Census day 2001. The biggest increases in the proportion of people cycling to work were in the Statistical Local Areas of North Sydney (119%), Waverley (87%), Lane Cove (87%), Marrickville (79%), Ashfield (74%) and Leichhardt (67%). There was a slight decrease in the proportion of people cycling on their journey to work in outer Sydney (-5%) and in adjacent areas such as the Newcastle and Wollongong areas (-12%).

Possible reasons for the increase in people cycling on the journey to work, particularly in the inner Sydney areas, could include increased levels of appreciation of the health and environmental benefits of cycling, a distance to work (up to 5 or 10 kms) that can be readily cycled, the existence of quiet back-street routes and off-road cycle-paths that make commuting a reasonable option, traffic congestion in the inner Sydney areas that contributes to making cycling as quick as driving, high levels of local advocacy by local Bicycle User Groups for better facilities and road treatments for bicycles, and a preference for an urban lifestyle that is conducive to walking and cycling.

## **Introduction**

Riding a bicycle is an effective, accessible and enjoyable form of physical activity, and, when used as transport, can lead to reduced motor vehicle usage.<sup>1-3</sup> Cycling improves cardiovascular fitness, uses all the major muscle groups, strengthens bones and helps prevent osteoporosis, improves circulation, relieves the effects of rheumatoid arthritis and, like all physical activity, helps people cope better with stress.<sup>4</sup> In addition to the health enhancing and protective effects of cycling, people riding a bicycle are exposed to 2-3 times less air pollution (volatile organic compounds) compared with people driving cars on the same road.<sup>5</sup>

Regular cycling can lead to a significant reduction in overall mortality and diabetes. In a large cohort study involving 30,000 people in Denmark followed over 14 years, bicycling to work decreased the risk of mortality by 40 per cent after taking into account leisure time physical activity.<sup>6</sup> In another study in Finland with 21,000 people followed over 12 years, people who spent more than 30 minutes a day cycling to and from work had close to a 40 percent lower risk of developing diabetes.<sup>7</sup>

The British Medical Association has concluded that after weighing up the benefits of physical activity from cycling and the risk of injury, the benefits outweighed the risks.<sup>8</sup> That is, the risks to human health associated with physical inactivity are greater than the risks of participation in physical activity such as riding a bicycle.

Reports indicate that building cycling into daily life, for example, by cycling to work or other destinations, is more likely to be sustainable in the long term than gym based exercise prescription schemes.<sup>9,10</sup> Promoting bicycle riding as a mode of transport is an effective way to increase participation in physical activity, improve and protect physical and mental health, reduce air and traffic pollution, and contribute to community development.<sup>11,12</sup>

Between 1991 and 2001, the total number of bicycles owned by Sydney (NSW, Australia) residents increased by 40% from around 800,000 to 1.2 million.<sup>13</sup> Almost half the households in NSW are reported to have at least one bicycle.<sup>13</sup> Anecdotal reports from Bicycle User Groups (BUGs) have suggested that more people are cycling in inner Sydney in recent years. We conducted a descriptive study to determine whether cycling to work among people living in inner Sydney had increased.

## **Method**

We analysed journey to work (JTW) data from the 1996 and 2001 *Australian Census of Health and Housing*. These data were purchased from the Australian Bureau of Statistics. The Census data comprised journey to work data from 1996 and 2001 for respondents whose journey to work origin or destination was a Statistical Local Area (SLA) in Sydney or the Greater Metropolitan Region and who answered the questions “*How did the person get to work on the [the day of the Census?]*”

(JTW Origin data) and “For the main job held last week, what was the person’s workplace address?” (JTW Destination data). Responders to the Census were able to tick more than one mode of travel to work, so that a journey to work using bicycle may or may not have also involved another mode of travel, such as train or ferry.

To explore the hypothesis of whether the proportion of people cycling on the journey to work had increased in inner Sydney, we arranged SLAs into three groups; inner Sydney, outer Sydney and the Greater Metropolitan Region (Table 1). We defined an inner Sydney SLA as an SLA that is mostly within a 10km radius of Sydney Central Station. An outer Sydney SLA was defined as a Sydney metropolitan SLA that is more than 10km from Sydney Central Station. The third SLA grouping comprised of SLAs in the Greater Metropolitan Region and the Blue Mountains SLA was included in this group. To identify inner Sydney SLAs, we used a suburban Sydney Gregory’s map<sup>14</sup> and a compass to plot and demarcate all suburbs that were in and outside a 10km radius of Sydney Central Station. This mode of measurement was checked using a Sydney and Blue Mountains street directory<sup>15</sup> to confer whether or not the inner Sydney suburbs identified using the Gregory’s map were also identified using the Sydney UBD. In all cases the results of the two methods were consistent.

**Table 1. Statistical Local Areas (SLAs) of inner Sydney, outer Sydney and the Greater Metropolitan Region**

Inner Sydney SLAs*	Outer Sydney SLAs**	Greater Metropolitan Region SLAs
Ashfield	Auburn	Blue Mountains
Botany Bay	Bankstown	Cessnock
Burwood	Baulkham Hills	Gosford
Canterbury	Blacktown	Hawkesbury
Drummoyne	Camden	Kiama
Hunter’s Hill	Campbelltown	Lake Macquarie
Lane Cove	Concord	Maitland
Leichhardt	Fairfield	Newcastle
Marrickville	Holroyd	Port Stephens
Mosman	Hornsby	Shellharbour
North Sydney	Hurstville	Shoalhaven
Randwick	Kogarah	Wollongong
Rockdale	Kuringgai	Wyang
South Sydney♣	Liverpool	
Sydney Inner¶	Manly	
Sydney remainderΦ	Parramatta	
Waverley	Penrith	
Willoughby	Pittwater	
Woollahra	Ryde	
	Strathfield	
	Sutherland	
	Warringah	
	Wingecarri	
	Wollondilly	

\* Inner Sydney SLA defined as a SLA that is mostly within a 10km radius of Sydney Central Station.

\*\* Outer Sydney SLA defined as SLA for Sydney metropolitan area that is more than 10km from Sydney Central Station.

♣ South Sydney SLA comprises suburbs and localities of Alexandria, Beaconsfield, Blackfriars, Broadway, Chippendale, Darlinghurst, Darlington, Elizabeth Bay, Erskineville, Erskineville South, Everleigh, Golden Grove, King George V Hospital, Kings Cross, Macdonaldtown, Missenden Road, Moore Park, Potts Point, Redfern, Rosebery, Rushcutters Bay, Sheas Creek, Strawberry Hills, Surry Hills, Sydney East, Sydney South, Sydney showground, Sydney University, Taylor Square, University of New South Wales, Victoria Barracks, Waterloo, Woolloomooloo, Zetland.

¶ Sydney Inner SLA comprises suburbs and localities of Australia Square, Chinatown, Church Hill, Circular Quay, Dawes Point, Garden Island, Millers Point, Parliament House, St James, Sydney City, The Rocks, Sydney Cove, Walsh Bay.

Φ Sydney remainder SLA comprises suburbs and localities of Brickfield Hill, Darling Harbour, Darling Island, Goats Island, Haymarket, Pyrmont, Railway Square, Ultimo.

Excel software was used for the analysis. The data was sorted by the SLA groupings previously described. The proportion of people cycling on the journey to work in each SLA was calculated by dividing the number of journeys to work involving a bicycle by the total number of journeys to work, for 1996 and 2001 JTW Origin and Destination data. For the SLA groups of inner Sydney, outer Sydney and the Greater Metropolitan Region, the average proportion of people cycling on the journey to work was also calculated. Results for 1996 and 2001, and for the three SLA groups were compared. Data for the SLAs of the Central Sydney Area Health Service (CSAHS) were also examined. The number of people cycling on the journey to work to each SLA was compared for 1996 and 2001.

## **Results**

The number of people cycling on their journey to work in the combined Sydney and Greater Metropolitan Region increased from 13,138 on the day of the 1996 Census to 15,526 on the day of the 2001 Census, an overall increase of 18 per cent. Between 1996 and 2001 there was an overall increase in the proportion of people cycling on the journey to work in the combined Sydney and Greater Metropolitan Region from 0.78 per cent to 0.83 per cent of people traveling to work. These changes were largely due to increases that occurred in inner Sydney SLAs. All data provided by the Australian Bureau of Statistics appear in Appendices 1-4. Appendices 5-7 show these same data grouped by region.

At the 2001 Census, the proportion of people cycling on their journey to work was greater for the SLAs of inner Sydney (1.21%) compared with those of outer Sydney (0.55%) and the Greater Metropolitan Region (1.12%). While the proportion of people from inner Sydney cycling on their journey to work increased between 1996 and 2001, a reverse trend was noted in outer Sydney and Greater Metropolitan Region SLAs.

### *Origin of cycling trips*

For people from inner Sydney, the proportion cycling on their journey to work increased by 53 per cent, from 0.79 per cent to 1.21 per cent, between the 1996 and 2001 Censuses (Table 2). The largest increases were in the inner Sydney SLAs of North Sydney (119%), Waverley (87%), Lane Cove (87%), Marrickville (79%), Ashfield (74%), Leichhardt (67%), Woollahra (62%), South Sydney (53%) and Sydney remainder (53%). A slight decrease was observed for Rockdale SLA. In 2001, the proportion of people from inner Sydney cycling on their journey to work was greatest for people from SLAs of South Sydney (2.49%), Marrickville (2.18%), Leichhardt (1.99%) and Waverley (1.63%). On the day of the 2001 Census (Tuesday, 7 August), 5216 people from inner Sydney reported cycling on their journey to work.

**Table 2. Journey to work by bicycle by residents of inner Sydney SLA's, 1996 and 2001**

Inner Sydney SLAs*	Bicycle used on journey to work 1996	Bicycle Mode share (%) 1996	Bicycle used on journey to work 2001	Bicycle Mode share (%) 2001	Relative change in bicycle mode share, 1996 and 2001 (%)
Ashfield	85	0.53	148	0.92	74%
Botany Bay	168	1.27	182	1.30	2%
Burwood	47	0.45	56	0.51	13%
Canterbury	174	0.39	174	0.39	0%
Drummoyne	61	0.45	99	0.66	47%
Hunter's Hill	19	0.44	23	0.51	16%
Lane Cove	62	0.46	117	0.86	87%
Leichhardt	324	1.18	605	1.99	69%
Marrickville	376	1.22	704	2.18	79%
Mosman	59	0.51	85	0.75	47%
North Sydney	119	0.42	275	0.92	119%
Randwick	521	1.07	690	1.38	29%
Rockdale	140	0.43	134	0.40	-7%
South Sydney♣	536	1.63	977	2.49	53%
Sydney Inner¶	10	0.71	29	1.00	41%
Sydney remainderΦ	31	0.74	101	1.13	53%
Waverley	235	0.87	435	1.63	87%
Willoughby	103	0.45	171	0.68	51%
Woollahra	135	0.60	211	0.97	62%
<b>TOTAL</b>	<b>3205</b>	<b>0.79</b>	<b>5216</b>	<b>1.21</b>	<b>53%</b>

\* Inner Sydney SLA defined as a SLA that is mostly within a 10km radius of Sydney Central Station.

♣ South Sydney SLA comprises suburbs and localities of Alexandria, Beaconsfield, Blackfriars, Broadway, Chippendale, Darlinghurst, Darlington, Elizabeth Bay, Erskineville, Erskineville South, Everleigh, Golden Grove, King George V Hospital, Kings Cross, Macdonaldtown, Missenden Road, Moore Park, Potts Point, Redfern, Rosebery, Rushcutters Bay, Sheas Creek, Strawberry Hills, Surry Hills, Sydney East, Sydney South, Sydney showground, Sydney University, Taylor Square, University of New South Wales, Victoria Barracks, Waterloo, Woolloomooloo, Zetland.

¶ Sydney Inner SLA comprises suburbs and localities of Australia Square, Chinatown, Church Hill, Circular Quay, Dawes Point, Garden Island, Millers Point, Parliament House, St James, Sydney City, The Rocks, Sydney Cove, Walsh Bay.

Φ Sydney remainder SLA comprises suburbs and localities of Brickfield Hill, Darling Harbour, Darling Island, Goats Island, Haymarket, Pyrmont, Railway Square, Ultimo.

The proportion of people from outer Sydney cycling on their journey to work decreased slightly from 0.58 per cent to 0.55 per cent between the 1996 and 2001 Censuses, however, in some outer Sydney SLAs there was an increase (Table 3). For instance, the proportion of people cycling on their journey to work increased in the SLAs of Kuringgai (45%) and Manly (31%), but decreased notably in the SLAs of Strathfield (-39%), Wollondilly (-39%), Camden (-28%), Liverpool (-27%) and Holroyd (-26%). Of the outer Sydney SLAs, Manly had the highest proportion of people cycling on their journey to work (1.32%), while Wollondilly (0.25%), Baulkham Hills (0.29%) and Strathfield (0.31%) had the lowest. On the day of the 2001 Census, 5461 people from outer Sydney reported that they cycled on their journey to work.

**Table 3. Journey to work by bicycle by residents of outer Sydney SLA's, 1996 and 2001**

Outer Sydney SLAs**	Bicycle used on journey to work 1996	Bicycle Mode share (%) 1996	Bicycle used on journey to work 2001	Bicycle Mode share (%) 2001	Relative change in bicycle mode share, 1996 and 2001 (%)
Auburn	90	0.58	87	0.51	- 12%
Bankstown	338	0.62	301	0.53	- 15%
Baulkham Hills	150	0.28	178	0.29	4%
Blacktown $\psi$	402	0.47	453	0.47	0%
Camden	69	0.54	71	0.39	- 28%
Campbelltown	260	0.51	288	0.54	6%
Concord	73	0.76	91	0.79	4%
Fairfield	241	0.42	221	0.38	- 10%
Holroyd	180	0.58	142	0.43	- 26%
Hornsby	251	0.45	282	0.47	4%
Hurstville	111	0.44	144	0.52	18%
Kogarah	78	0.42	64	0.32	- 24%
Kuringgai	123	0.33	176	0.48	45%
Liverpool	372	0.86	354	0.63	- 27%
Manly	157	1.01	205	1.32	31%
Parramatta	259	0.50	291	0.55	10%
Penrith	461	0.73	465	0.67	- 8%
Pittwater	173	0.80	173	0.79	- 1%
Ryde	204	0.53	239	0.60	13%
Strathfield	48	0.51	32	0.31	- 39%
Sutherland $\beta$	575	0.69	565	0.63	- 9%
Warringah	472	0.86	505	0.90	5%
Wingecarri	100	0.88	99	0.77	- 13%
Wollondilly	50	0.41	35	0.25	- 39%
<b>TOTAL</b>	<b>5237</b>	<b>0.58</b>	<b>5461</b>	<b>0.55</b>	<b>- 5%</b>

\*\* Outer Sydney SLA defined as SLA for Sydney metropolitan area that is more than 10km from Sydney Central Station.

$\psi$  Blacktown: split into three SLAs for 2001 Census; Blacktown– North, Blacktown– South-East and Blacktown– South-West. For purpose of analysis data for Blacktown– North, Blacktown – South-East and Blacktown – South-West, for 2001, were combined into a summary measure.

$\beta$  Sutherland: split into two SLA's for 2001 Census; Sutherland Shire- East and Sutherland Shire– West. For purpose of analysis data for Sutherland Shire - East and Sutherland Shire – West, for 2001, were combined into a summary measure.

Between 1996 and 2001, the proportion of people in the Greater Metropolitan Region (including the Blue Mountains) cycling on their journey to work decreased by 12.5 per cent, from 1.28 per cent to 1.12 per cent, though the pattern varied between areas (Table 4). The proportion of people cycling on their journey to work increased from 1996 to 2001 in the Blue Mountains (43%), Kiama (42%), and Newcastle Inner (27%). The largest decreases occurred in the Hawkesbury (-32%), Cessnock (-30%) and Port Stephens (-26%) and Wyong (-25%). In 2001, Newcastle Inner and Remainder had the largest proportion of people cycling on the journey to work (3.58% and 2.55% respectively) followed by Shoalhaven (1.43%), Port Stephens (1.40) and Wollongong (1.34%). On the day of the 2001 Census 4432 people from outer Sydney reported that they cycled on their journey to work.

**Table 4. Journey to work by bicycle by residents of Greater Metropolitan Region SLAs, 1996 and 2001**

Newcastle, Blue Mountains and Wollongong SLAs	Bicycle used on journey to work 1996	Bicycle Mode share (%) 1996	Bicycle used on journey to work 2001	Bicycle Mode share (%) 2001	Relative change in bicycle mode share, 1996 and 2001 (%)
Blue Mountains	161	0.65	250	0.93	43%
Cessnock	115	1.02	82	0.71	- 30%
Gosford	392	0.84	387	0.76	- 10%
Hawkesbury	317	1.41	231	0.96	- 32%
Kiama	27	0.48	42	0.68	42%
Lake Macquarie	488	0.89	392	0.68	- 24%
Maitland	145	0.92	126	0.74	- 20%
Newcastle Inner	44	2.82	61	3.58	27%
Newcastle	1132	2.69	1102	2.55	- 5%
Remainder					
Port Stephens	278	1.88	232	1.4	- 26%
Shellharbour	151	0.89	140	0.74	- 17%
Shoalhaven $\Omega$	343	1.82	307	1.43	- 21%
Wollongong	815	1.38	823	1.34	- 3%
Wyong	288	0.89	257	0.67	- 25%
<b>TOTAL</b>	<b>4696</b>	<b>1.28</b>	<b>4432</b>	<b>1.12</b>	<b>- 12.5%</b>

$\Omega$  Shoalhaven: split into 2 SLAs for 2001 Census: Shoalhaven– Part A and Shoalhaven– Part B. For purpose of analysis data for Shoalhaven– Part A and Shoalhaven – Part B, for 2001, were combined into summary measure.

#### *Destination of trips*

The number of people cycling to a work destination in inner Sydney increased from 3394 to 5463 (61%), with the largest increases observed for the SLAs of Sydney inner (127% increase), North Sydney (119% increase), Sydney remainder (114% increase), Willoughby (84% increase), Lane Cove (73% increase) and South Sydney (62% increase) (Table 5). Of inner Sydney SLAs, the most common destinations for people cycling to work were Sydney inner (1167), South Sydney (1100), Sydney remainder (522), North Sydney (397), Randwick (394), Willoughby (294), Botany Bay (273), Leichhardt (238) and Marrickville (221).

On the day of the 1996 and 2001 Census, the number of people cycling to a work destination in outer Sydney increased marginally from 4681 to 4794 (2%) (Table 6). The largest increases in the number of people cycling to a work destination in outer Sydney were observed for the SLAs of Ryde (30% increase), while the largest decreases were observed for workers journeying to Strathfield (-29%) and Wollondilly (-27%). Of the outer Sydney SLAs, the most common destinations for people cycling to work were Sutherland (434), Warringah (400), Blacktown (382), Penrith (380), Parramatta (365), Liverpool (332), Bankstown (331) and Ryde (300).

**Table 5. Inner Sydney destinations of people cycling to work in 1996 and 2001**

Journey to work destinations in Inner Sydney SLAs*	Number of bicycles used 1996	Number of bicycles used 2001	% Change since 1996
Ashfield	44	66	50%
Botany Bay	271	273	0.7%
Burwood	54	42	- 22%
Canterbury	110	105	- 5%
Drummoyne	49	43	- 12%
Hunter's Hill	23	26	13%
Lane Cove	60	104	73%
Leichhardt	161	238	48%
Marrickville	163	221	36%
Mosman	61	66	8%
North Sydney	181	397	119%
Randwick	321	394	23%
Rockdale	94	104	11%
South Sydney▲	679	1100	62%
Sydney Inner¶	515	1167	127%
Sydney remainder Φ	244	522	114%
Waverley	101	153	51%
Willoughby	160	294	84%
Woollahra	103	148	44%
<b>TOTAL</b>	<b>3394</b>	<b>5463</b>	<b>61%</b>

\* Inner Sydney SLA defined as a SLA that is mostly within a 10km radius of Sydney Central Station.

▲ South Sydney SLA comprises suburbs and localities of Alexandria, Beaconsfield, Blackfriars, Broadway, Chippendale, Darlinghurst, Darlington, Elizabeth Bay, Erskineville, Erskineville South, Everleigh, Golden Grove, King George V Hospital, Kings Cross, Macdonaldtown, Missenden Road, Moore Park, Potts Point, Redfern, Rosebery, Rushcutters Bay, Sheas Creek, Strawberry Hills, Surry Hills, Sydney East, Sydney South, Sydney showground, Sydney University, Taylor Square, University of New South Wales, Victoria Barracks, Waterloo, Woolloomooloo, Zetland.

¶ Sydney Inner SLA comprises suburbs and localities of Australia Square, Chinatown, Church Hill, Circular Quay, Dawes Point, Garden Island, Millers Point, Parliament House, St James, Sydney City, The Rocks, Sydney Cove, Walsh Bay.

Φ Sydney remainder SLA comprises suburbs and localities of Brickfield Hill, Darling Harbour, Darling Island, Goats Island, Haymarket, Pyrmont, Railway Square, Ultimo.

**Table 6. Outer Sydney destinations of people cycling to work in 1996 and 2001**

Journey to work destinations in Outer Sydney SLAs**	Number of people cycling to work in week before 1996 Census	Number of people cycling to work in week before 2001 Census	% Change since 1996
Auburn	158	171	8%
Bankstown	377	331	- 12%
Baulkham Hills	104	124	19%
Blacktown ψ	337	382	13%
Camden	47	56	19%
Campbelltown	188	203	8%
Concord	49	60	22%
Fairfield	184	192	4%
Holroyd	177	162	- 8%
Hornsby	148	146	- 1%
Hurstville	113	121	7%
Kogarah	77	71	- 8%
Kuringgai	97	96	- 1%
Liverpool	359	332	- 8%
Manly	124	132	6%
Parramatta	350	365	4%
Penrith	378	380	0.5%
Pittwater	145	157	8%
Ryde	223	300	35%
Strathfield	76	54	- 29%
Sutherland β	444	434	- 2%
Warringah	388	400	3%
Wingecarri	90	90	0%
Wollondilly	48	35	- 27%
<b>TOTAL</b>	<b>4681</b>	<b>4794</b>	<b>2%</b>

\*\* Outer Sydney SLA defined as SLA for Sydney metropolitan area that is more than 10km from Sydney Central Station.

ψ Blacktown: split into three SLAs for 2001 Census; Blacktown–North, Blacktown–South-East and Blacktown–South-West. For purpose of analysis data for Blacktown– North, Blacktown–South-East and Blacktown–South-West, for 2001, were combined into a summary measure.

β Sutherland: split into two SLA's for 2001 Census; Sutherland Shire- East and Sutherland Shire– West. For purpose of analysis data for Sutherland Shire - East and Sutherland Shire– West, for 2001, were combined into a summary measure.

On the day of the 1996 and 2001 Census, the number of people cycling to a work destination in the Greater Metropolitan Region decreased from 4270 to 3939 (8%), with the largest decrease observed among people cycling to work to the SLAs of Hawkesbury (-25%) and Cessnock (-22%) (Table 7). Increases were observed in some SLAs, notably in people cycling to work to the Blue Mountains (46% increase), Kiama (77%, though numbers small), and Newcastle Inner (16%). Of the Greater Metropolitan Region SLAs, the most common destinations for people cycling to work were Newcastle remainder (865), Wollongong (774), Lake Macquarie (310), Shoalhaven (304), Newcastle inner (290) and Gosford (278).

**Table 7. Greater Metropolitan Region destinations of people cycling to work in 1996 and 2001**

Journey to work destinations in the Greater Metropolitan Region SLAs	Number of people cycling to work in week before 1996 Census	Number of people cycling to work in week before 2001 Census	% Change since 1996
Blue Mountains	94	137	46%
Cessnock	105	82	- 22%
Gosford	314	278	- 11%
Hawkesbury	306	230	- 25%
Kiama	13	23	77%
Lake Macquarie	358	310	- 13%
Maitland	107	96	- 10%
Newcastle Inner	251	290	16%
Newcastle Remainder	1007	865	- 14%
Port Stephens	263	239	- 9%
Shellharbour	93	92	- 1%
Shoalhaven Ω	327	304	- 7%
Wollongong	784	774	- 1%
Wyong	248	219	- 12%
<b>TOTAL</b>	<b>4270</b>	<b>3939</b>	<b>- 8%</b>

Ω Shoalhaven: split into 2 SLAs for 2001 Census: Shoalhaven– Part A and Shoalhaven– Part B. For purpose of analysis data for Shoalhaven– Part A and Shoalhaven– Part B, for 2001, were combined into summary measure.

### Central Sydney Area Health Service

For people resident in SLAs of the Central Sydney Area Health Service, the proportion cycling on their journey to work increased by 55 per cent, from 0.88 per cent to 1.36 per cent, between the 1996 and 2001 Censuses (Table 8).

**Table 8. Journey to work by bicycle by residents of Central Sydney Area Health Service SLA's, 1996 and 2001**

SLAs in the Central Sydney Area Health Service	Bicycle used on journey to work 1996	Bicycle Mode share (%) 1996	Bicycle used on journey to work 2001	Bicycle Mode share (%) 2001	Relative change in bicycle mode share, 1996 and 2001 (%)
Ashfield	85	0.53	148	0.92	74%
Burwood	47	0.45	56	0.51	13%
Canterbury	174	0.39	174	0.39	0%
Concord	73	0.76	91	0.79	4%
Drummoyne	61	0.45	99	0.66	47%
Leichhardt	324	1.18	605	1.99	69%
Marrickville	376	1.22	704	2.18	79%
South Sydney♣	536	1.63	977	2.49	53%
Strathfield	48	0.51	32	0.31	- 39%
Sydney Inner ¶	10	0.71	29	1.00	41%
Sydney remainder Φ	31	0.74	101	1.13	53%
<b>TOTAL</b>	<b>1765</b>	<b>0.88</b>	<b>3016</b>	<b>1.36</b>	<b>55%</b>

The number of people cycling on their journey to a work destination in a SLA of the Central Sydney Area Health Service increased from 2144 to 3618 (69%) (Table 9).

**Table 9. Central Sydney Area Health Service destinations of people cycling to work in 1996 and 2001**

Journey to work destinations in SLAs of the Central Sydney Area Health Service	Number of bicycles used 1996	Number of bicycles used 2001	% Change since 1996
Ashfield	44	66	50%
Burwood	54	42	- 22%
Canterbury	110	105	- 5%
Concord	49	60	22%
Drummoyne	49	43	- 12%
Leichhardt	161	238	48%
Marrickville	163	221	36%
South Sydney▲	679	1100	62%
Strathfield	76	54	- 29%
Sydney Inner ¶	515	1167	127%
Sydney remainder Φ	244	522	114%
<b>TOTAL</b>	<b>2144</b>	<b>3618</b>	<b>69%</b>

## Discussion

This study indicates that between the 1996 and 2001 Census, in Sydney and Greater Metropolitan Region SLA's combined, there has been an increase in both the proportion of people cycling on the journey to work and in the number of people cycling to work. These increases appear to be mostly due to the increases in the inner Sydney SLAs. In outer Sydney and in particular Greater Metropolitan Region SLAs, there was a decrease in the proportion of people cycling on the journey to work between the 1996 and 2001 Census.

That a greater number of people are cycling to work destinations in inner Sydney may indicate there is an increasing need for end-of-cycling-trip facilities in inner Sydney, such as secure bicycle storage, shower, change room and ironing facilities in work places. Increased levels of cycling to places such as Manly, which are major transport interchanges, may be influenced by the availability of bicycle lockers.

That a lesser proportion of trips to work are by bicycle in outer Sydney and the Greater Metropolitan Region may be due to increases in average distances traveled to work by residents of these regions, or perhaps a perception of a hostile road environment. In addition, there may be relatively less end-of-cycle-trip facilities available for people commuting to work in outer Sydney and the Greater Metropolitan Region, compared to what is available to inner Sydney workers. The extent to which planning for or expenditure on cycling infrastructure, by both local governments and the NSW Roads and Traffic Authority (RTA) differs between inner Sydney, outer Sydney and the Greater Metropolitan Region SLAs is unknown, and is worthy of exploration. The relative activity level of cycling-related agencies such as Bicycle User Groups, Health Promotion Units and Public Health Units in different SLAs is unknown.

Reasons explaining the increase in cycling in the inner Sydney areas are speculative without additional data. However, possible reasons include:

- an increased awareness among the inner Sydney population of the personal health benefits of cycling and a desire to improve or maintain fitness
- a distance to work (up to 5 or 10 kms) that can be readily cycled
- the existence of quiet back-streets routes<sup>16</sup> and off-road cycle-paths that make commuting a reasonable option
- traffic congestion in the inner Sydney areas that contributes to making cycling as quick as driving
- high levels of local advocacy by local Bicycle User Groups for better facilities and road treatments for bicycles
- better end of trip facilities
- preference for an urban lifestyle that is conducive to walking and cycling.

It is also possible that the demographic profile of the inner Sydney area has changed, with an increase of younger people. However, examination of the demographic profile of the Central Sydney Area Health Service using 1996<sup>17</sup> and 2001 Census data<sup>18</sup> does not support this hypothesis.

There are a number of limitations to this study. The 1996 and 2001 data are simply descriptive statistics derived from the Census and have not been adjusted for the effects of potential confounders such as distance traveled to work (the average length of journey to work for residents of inner Sydney is likely to be shorter than that of residents of outer Sydney and the Greater Metropolitan Region and therefore more conducive to cycling to work), socio-economic status of SLAs and peoples' ability to purchase bicycles, workplaces with end-of-trip facilities and shifts in places of employment.

Because of the many health, social and environmental benefits of cycling, we recommend that further research be undertaken to conduct an ecological and sociological analysis of these journey to work data to better explain cycling predictors in Sydney and the Greater Metropolitan region. In our view, cycling in general needs to be encouraged by state and local governments, with the provision of more off-road and on-road cycle paths, provision of better 'end of cycle trip' facilities at common work destinations including secure bicycle storage and showering, change room and ironing facilities in work places. In addition we would recommend that the Departments of Infrastructure, Planning and Resources, and Transport and the RTA prioritise walking and cycling, and that driver education aims to increase awareness of cyclists' rights and safe driving practice in relation to cyclists.

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**Appendix 1 - Employed Persons living in Sydney/Newcastle/Wollongong and their Journey to Work by Whether Bicycle Used**  
**Australian Bureau of Statistics, 1996 Census of Population and Housing**

Statistical Local Area ORIGIN	Bicycle used	Bicycle not used	Total Trips	No trip to work	Total Employment	Bicycle Mode Share (%)
Ashfield	85	15939	16024	2026	18050	0.53
Auburn	90	15472	15562	1693	17255	0.58
Bankstown	338	54571	54909	7032	61941	0.62
Baulkham Hills	150	52599	52749	9873	62622	0.28
Blacktown	402	84367	84769	11363	96132	0.47
Blue Mountains	161	24464	24625	5937	30562	0.65
Botany	168	13039	13207	1463	14670	1.27
Burwood	47	10340	10387	1407	11794	0.45
Camden	69	12649	12718	2387	15105	0.54
Campbelltown	260	50788	51048	7625	58673	0.51
Canterbury	174	44400	44574	5065	49639	0.39
Cessnock	115	11136	11251	2477	13728	1.02
Concord	73	9505	9578	1378	10956	0.76
Drummoyne	61	13569	13630	1785	15415	0.45
Fairfield	241	56630	56871	6494	63365	0.42
Gosford	392	46222	46614	10252	56866	0.84
Hawkesbury	317	22204	22521	4345	26866	1.41
Holroyd	180	30591	30771	3940	34711	0.58
Hornsby	251	55561	55812	10719	66531	0.45
Hunter's Hill	19	4297	4316	834	5150	0.44
Hurstville	111	25378	25489	3602	29091	0.44
Kiama	27	5643	5670	1334	7004	0.48
Kogarah	78	18609	18687	2889	21576	0.42
Ku-ring-gai	123	36762	36885	8566	45451	0.33
Lake Macquarie	488	54581	55069	11053	66122	0.89
Lane Cove	62	13284	13346	2236	15582	0.46
Leichhardt	324	27135	27459	4155	31614	1.18
Liverpool	372	42931	43303	5733	49036	0.86
Maitland	145	15542	15687	3111	18798	0.92
Manly	157	15435	15592	2689	18281	1.01
Marrickville	376	30405	30781	3995	34776	1.22
Mosman	59	11487	11546	2048	13594	0.51
Newcastle - Inner	44	1515	1559	346	1905	2.82
Newcastle - Remainder	1132	40883	42015	8296	50311	2.69
North Sydney	119	28218	28337	3574	31911	0.42
Parramatta	259	51038	51297	7063	58360	0.50

Penrith	461	62564	63025	10437	73462	0.73
Pittwater	173	21585	21758	4503	26261	0.80
Port Stephens	278	14546	14824	3491	18315	1.88
Randwick	521	48354	48875	7007	55882	1.07
Rockdale	140	32054	32194	3913	36107	0.43
Ryde	204	38178	38382	5572	43954	0.53
Shellharbour	151	16831	16982	2897	19879	0.89
Shoalhaven	343	18521	18864	4817	23681	1.82
South Sydney	536	32426	32962	5251	38213	1.63
Strathfield	48	9299	9347	1340	10687	0.51
Sutherland Shire	575	82781	83356	14492	97848	0.69
Sydney - Inner	10	1391	1401	225	1626	0.71
Sydney - Remainder	31	4138	4169	579	4748	0.74
Warringah	472	54542	55014	9120	64134	0.86
Waverley	235	26788	27023	3950	30973	0.87
Willoughby	103	22612	22715	3820	26535	0.45
Wingecarribee	100	11278	11378	2925	14303	0.88
Wollondilly	50	12020	12070	2411	14481	0.41
Wollongong	815	58280	59095	9847	68942	1.38
Woollahra	135	22330	22465	3816	26281	0.60
Wyong	288	32022	32310	6948	39258	0.89
Total	13138	1669729	1682867	276146	1959013	0.78

*Cells in this table have been randomly adjusted to avoid the release of confidential data.*

**Appendix 2 - Employed Persons travelling to destinations in Sydney/Newcastle/Wollongong and their Journey to Work by Whether Bicycle Used**

**Australian Bureau of Statistics, 1996 Census of Population and Housing**

Destination Statistical Local Area	Bicycle used	Bicycle not used	Total Trips	No trip to work	Total Employment	Bicycle Mode Share (%)
Ashfield	44	8563	8607	1531	10138	0.51
Auburn	158	33151	33309	2766	36075	0.47
Bankstown	377	55671	56048	6527	62575	0.67
Baulkham Hills	104	27213	27317	6979	34296	0.38
Blacktown	337	51763	52100	8506	60606	0.65
Blue Mountains	94	10581	10675	3545	14220	0.88
Botany	271	34137	34408	5493	39901	0.79
Burwood	54	11329	11383	1800	13183	0.47
Camden	47	6063	6110	1645	7755	0.77
Campbelltown	188	25806	25994	5037	31031	0.72
Canterbury	110	22703	22813	3431	26244	0.48
Cessnock	105	7869	7974	1975	9949	1.32
Concord	49	10379	10428	1356	11784	0.47
Drummoyne	49	5967	6016	1124	7140	0.81
Fairfield	184	40415	40599	5289	45888	0.45
Gosford	314	32368	32682	8113	40795	0.96
Hawkesbury	306	13993	14299	3267	17566	2.14
Holroyd	177	26372	26549	3038	29587	0.67
Hornsby	148	29753	29901	7980	37881	0.49
Hunter's Hill	23	2410	2433	612	3045	0.95
Hurstville	113	16906	17019	2907	19926	0.66
Kiama	13	2535	2548	863	3411	0.51
Kogarah	77	11346	11423	2288	13711	0.67
Ku-ring-gai	97	19122	19219	6242	25461	0.50
Lake Macquarie	358	33548	33906	7884	41790	1.06
Lane Cove	60	14030	14090	2248	16338	0.43
Leichhardt	161	19525	19686	3513	23199	0.82
Liverpool	359	36342	36701	5414	42115	0.98
Maitland	107	10530	10637	2397	13034	1.01
Manly	124	8133	8257	2084	10341	1.50
Marrickville	163	22583	22746	2798	25544	0.72
Mosman	61	6229	6290	1701	7991	0.97
Newcastle - Inner	251	13245	13496	2091	15587	1.86
Newcastle - Remainder	1007	48985	49992	8881	58873	2.01
North Sydney	181	52406	52587	5761	58348	0.34

Parramatta	350	74434	74784	10218	85002	0.47
Penrith	378	35876	36254	7630	43884	1.04
Pittwater	145	10585	10730	3178	13908	1.35
Port Stephens	263	11042	11305	2641	13946	2.33
Randwick	321	26022	26343	4738	31081	1.22
Rockdale	94	17225	17319	2706	20025	0.54
Ryde	223	38882	39105	5874	44979	0.57
Shellharbour	93	6958	7051	1587	8638	1.32
Shoalhaven	327	16358	16685	4150	20835	1.96
South Sydney	679	79614	80293	8369	88662	0.85
Strathfield	76	14392	14468	1767	16235	0.53
Sutherland Shire	444	37694	38138	9173	47311	1.16
Sydney - Inner	515	148369	148884	13725	162609	0.35
Sydney - Remainder	244	49397	49641	5557	55198	0.49
Warringah	388	34675	35063	6757	41820	1.11
Waverley	101	12824	12925	2656	15581	0.78
Willoughby	160	42609	42769	6067	48836	0.37
Wingecarribee	90	8942	9032	2455	11487	1.00
Wollondilly	48	5921	5969	1401	7370	0.80
Wollongong	784	56490	57274	9348	66622	1.37
Woollahra	103	14298	14401	3311	17712	0.72
Wyong	248	21186	21434	5262	26696	1.16
Undefined Sydney	66	7587	7653	1151	8804	0.86
No Usual Address	215	50626	50841	7760	58601	0.42
Undefined New South Wales	140	16077	16217	2497	18714	0.86
Not stated	372	59675	60047	9082	69129	0.62
Total	13138	1669729	1682867	276146	1959013	0.78

*Cells in this table have been randomly adjusted to avoid the release of confidential data.*

**Appendix 3 - Employed Persons travelling to destinations in Sydney/Newcastle/Wollongong and their Journey to Work by Whether Bicycle Used**

Australian Bureau of Statistics, 2001 Census of Population and Housing

Destination Statistical Local Area	Bike used	Bike not used	Total Trips	No trip	Total Employment	Bike Mode share
Ashfield	66	7,907	7,973	1,575	9,548	0.83
Auburn	171	33,363	33,534	3,254	36,788	0.51
Bankstown	331	54,098	54,429	6,791	61,220	0.61
Baulkham Hills	124	35,219	35,343	9,561	44,904	0.35
Blacktown North	99	12,825	12,924	2,575	15,499	0.77
Blacktown SouthEast	195	34,222	34,417	4,367	38,784	0.57
Blacktown SouthWest	88	14,244	14,332	2,537	16,869	0.61
Blue Mountains	137	11,672	11,809	4,352	16,161	1.16
Botany Bay	273	35,668	35,941	6,747	42,688	0.76
Burwood	42	11,665	11,707	1,942	13,649	0.36
Camden	56	8,874	8,930	2,362	11,292	0.63
Campbelltown	203	29,899	30,102	5,757	35,859	0.67
Canterbury	105	22,266	22,371	3,490	25,861	0.47
Cessnock	82	9,307	9,389	2,586	11,975	0.87
Concord	60	9,996	10,056	1,497	11,553	0.60
Drummoyne	43	5,983	6,026	1,395	7,421	0.71
Fairfield	192	42,501	42,693	5,400	48,093	0.45
Gosford	278	35,948	36,226	9,846	46,072	0.77
Hawkesbury	230	15,917	16,147	4,092	20,239	1.42
Holroyd	162	26,450	26,612	3,292	29,904	0.61
Hornsby	146	31,466	31,612	8,704	40,316	0.46
Hunters Hill	26	2,573	2,599	799	3,398	1.00
Hurstville	121	16,935	17,056	3,043	20,099	0.71
Kiama	23	2,921	2,944	1,085	4,029	0.78
Kogarah	71	12,712	12,783	2,669	15,452	0.56
Kuringgai	96	20,008	20,104	7,357	27,461	0.48
Lake Macquarie	310	35,722	36,032	8,975	45,007	0.86
Lane Cove	104	15,680	15,784	2,725	18,509	0.66
Leichhardt	238	19,748	19,986	4,055	24,041	1.19
Liverpool	332	39,913	40,245	6,311	46,556	0.82
Maitland	96	12,233	12,329	2,990	15,319	0.78
Manly	132	8,366	8,498	2,455	10,953	1.55
Marrickville	221	20,479	20,700	3,034	23,734	1.07
Mosman	66	6,227	6,293	2,047	8,340	1.05

Newcastle Inner	290	14,073	14,363	2,366	16,729	2.02
Newcastle Remainder	865	46,442	47,307	9,351	56,658	1.83
North Sydney	397	55,146	55,543	6,745	62,288	0.71
Parramatta	365	76,004	76,369	10,184	86,553	0.48
Penrith	380	40,260	40,640	8,901	49,541	0.94
Pittwater	157	11,329	11,486	4,009	15,495	1.37
Port Stephens	239	14,012	14,251	3,553	17,804	1.68
Randwick	394	28,091	28,485	5,706	34,191	1.38
Rockdale	104	16,922	17,026	3,049	20,075	0.61
Ryde	300	45,010	45,310	6,902	52,212	0.66
Shellharbour	92	8,395	8,487	2,125	10,612	1.08
Shoalhaven Pt A	218	13,413	13,631	3,105	16,736	1.60
Shoalhaven Pt B	86	5,778	5,864	1,969	7,833	1.47
South Sydney	1,100	79,722	80,822	9,796	90,618	1.36
Strathfield	54	14,575	14,629	1,789	16,418	0.37
Sutherland Shire East	290	25,406	25,696	6,597	32,293	1.13
Sutherland Shire West	144	16,473	16,617	4,520	21,137	0.87
Sydney Inner	1,167	169,779	170,946	15,852	186,798	0.68
Sydney Remainder	522	58,388	58,910	6,853	65,763	0.89
Warringah	400	35,774	36,174	7,890	44,064	1.11
Waverley	153	12,772	12,925	3,119	16,044	1.18
Willoughby	294	45,010	45,304	6,888	52,192	0.65
Wingecarribee	90	10,186	10,276	3,082	13,358	0.88
Wollondilly	35	5,761	5,796	1,594	7,390	0.60
Wollongong	774	55,150	55,924	10,535	66,459	1.38
Woollahra	148	14,301	14,449	3,709	18,158	1.02
Wyong	219	24,437	24,656	6,341	30,997	0.89
No Fixed Address	393	97,204	97,597	12,829	110,426	0.40
NSW Undefined	152	12,110	12,262	1,695	13,957	1.24
Unknown	742	100,675	101,417	14,407	115,824	0.73
Sydney Undefined	43	4,734	4,777	495	5,272	0.90
<b>Total</b>	<b>15,526</b>	<b>1,860,339</b>	<b>1,875,865</b>	<b>325,623</b>	<b>2,201,488</b>	<b>0.83</b>

*Cells in this table have been randomly adjusted to avoid the release of confidential data.*

**Appendix 4 - Employed Persons living in Sydney/Newcastle/Wollongong and their Journey to Work by Whether Bicycle Used**

**Australian Bureau of Statistics, 2001 Census of Population and Housing**

<b>Origin of Statistical Local Area</b>	<b>Bike used</b>	<b>Bike not used</b>	<b>Total Trips</b>	<b>No trip</b>	<b>Total Employment</b>	<b>Bike Share</b>
Ashfield	148	15,923	16,071	2,156	18,227	0.92
Auburn	87	17,087	17,174	1,737	18,911	0.51
Bankstown	301	56,900	57,201	6,901	64,102	0.53
Baulkham Hills	178	61,807	61,985	11,583	73,568	0.29
Blacktown North	151	31,682	31,833	4,566	36,399	0.47
Blacktown SouthEast	178	34,126	34,304	4,256	38,560	0.52
Blacktown SouthWest	124	29,464	29,588	3,537	33,125	0.42
Blue Mountains	250	26,700	26,950	6,553	33,503	0.93
Botany Bay	182	13,864	14,046	1,542	15,588	1.30
Burwood	56	10,945	11,001	1,541	12,542	0.51
Camden	71	18,006	18,077	3,286	21,363	0.39
Campbelltown	288	53,277	53,565	7,800	61,365	0.54
Canterbury	174	43,976	44,150	4,914	49,064	0.39
Cessnock	82	11,408	11,490	2,862	14,352	0.71
Concord	91	11,365	11,456	1,705	13,161	0.79
Drummoyne	99	14,847	14,946	2,062	17,008	0.66
Fairfield	221	58,033	58,254	6,103	64,357	0.38
Gosford	387	50,837	51,224	11,419	62,643	0.76
Hawkesbury	231	23,849	24,080	4,806	28,886	0.96
Holroyd	142	32,539	32,681	4,016	36,697	0.43
Hornsby	282	59,913	60,195	11,665	71,860	0.47
Hunters Hill	23	4,495	4,518	915	5,433	0.51
Hurstville	144	27,508	27,652	3,697	31,349	0.52
Kiama	42	6,178	6,220	1,542	7,762	0.68
Kogarah	64	19,901	19,965	2,979	22,944	0.32
Kuringgai	176	36,847	37,023	9,201	46,224	0.48
Lake Macquarie	392	56,863	57,255	11,787	69,042	0.68
Lane Cove	117	13,529	13,646	2,378	16,024	0.86
Leichhardt	605	29,760	30,365	4,749	35,114	1.99
Liverpool	354	56,093	56,447	7,226	63,673	0.63
Maitland	126	16,847	16,973	3,607	20,580	0.74
Manly	205	15,294	15,499	2,822	18,321	1.32
Marrickville	704	31,629	32,333	4,506	36,839	2.18
Mosman	85	11,186	11,271	2,191	13,462	0.75
Newcastle Inner	61	1,644	1,705	344	2,049	3.58

Newcastle Remainder	1,102	42,164	43,266	8,687	51,953	2.55
North Sydney	275	29,603	29,878	4,211	34,089	0.92
Parramatta	291	52,986	53,277	7,184	60,461	0.55
Penrith	465	68,870	69,335	11,133	80,468	0.67
Pittwater	173	21,853	22,026	4,949	26,975	0.79
Port Stephens	232	16,296	16,528	4,036	20,564	1.40
Randwick	690	49,250	49,940	7,591	57,531	1.38
Rockdale	134	33,405	33,539	4,130	37,669	0.40
Ryde	239	39,769	40,008	6,142	46,150	0.60
Shellharbour	140	18,906	19,046	3,500	22,546	0.74
Shoalhaven Pt A	173	8,635	8,808	1,810	10,618	1.96
Shoalhaven Pt B	134	12,593	12,727	3,513	16,240	1.05
South Sydney	977	38,320	39,297	6,043	45,340	2.49
Strathfield	32	10,264	10,296	1,489	11,785	0.31
Sutherland Shire East	344	40,241	40,585	7,289	47,874	0.85
Sutherland Shire West	221	48,315	48,536	8,669	57,205	0.46
Sydney Inner	29	2,861	2,890	369	3,259	1.00
Sydney Remainder	101	8,829	8,930	1,221	10,151	1.13
Warringah	505	55,805	56,310	9,926	66,236	0.90
Waverley	435	26,284	26,719	4,067	30,786	1.63
Willoughby	171	24,843	25,014	4,229	29,243	0.68
Wingecarribee	99	12,746	12,845	3,345	16,190	0.77
Wollondilly	35	13,787	13,822	2,780	16,602	0.25
Wollongong	823	60,514	61,337	11,080	72,417	1.34
Woollahra	211	21,562	21,773	3,953	25,726	0.97
Wyong	257	38,327	38,584	8,063	46,647	0.67
Other	417	58989	59406	23260	82666	0.70
<b>Total</b>	<b>15,526</b>	<b>1,860,339</b>	<b>1,875,865</b>	<b>325,623</b>	<b>2,201,488</b>	<b>0.83</b>

*Cells in this table have been randomly adjusted to avoid the release of confidential data.*

**APPENDIX 5: Journey to work by bicycle, total trips and bicycle mode in inner Sydney SLA's, 1996 and 2001**

Inner Sydney SLAs*	Bicycle used on journey to work 1996	Total trips to work of any mode 1996	Bicycle Mode share (%) 1996	Bicycle used on journey to work 2001	Total trips to work of any mode 2001	Bicycle Mode share (%) 2001	Relative change in bicycle mode share, 1996 and 2001 (%)
Ashfield	85	16024	0.53	148	16071	0.92	74%
Botany Bay	168	13207	1.27	182	14046	1.30	2%
Burwood	47	10387	0.45	56	11001	0.51	13%
Canterbury	174	44574	0.39	174	44150	0.39	0%
Drummoyne	61	13630	0.45	99	14946	0.66	47%
Hunter's Hill	19	4316	0.44	23	4518	0.51	16%
Lane Cove	62	13346	0.46	117	13646	0.86	87%
Leichhardt	324	27459	1.18	605	30365	1.99	69%
Marrickville	376	30781	1.22	704	32333	2.18	79%
Mosman	59	11546	0.51	85	11271	0.75	47%
North Sydney	119	28337	0.42	275	29878	0.92	119%
Randwick	521	48875	1.07	690	49940	1.38	29%
Rockdale	140	32194	0.43	134	33539	0.40	-7%
South Sydney	536	32962	1.63	977	39297	2.49	53%
Sydney Inner	10	1401	0.71	29	2890	1.00	41%
Sydney remainder	31	4169	0.74	101	8930	1.13	53%
Waverley	235	27023	0.87	435	26719	1.63	87%
Willoughby	103	22715	0.45	171	25014	0.68	51%
Woollahra	135	22465	0.60	211	21773	0.97	62%
<b>TOTALS</b>	<b>3205</b>	<b>405411</b>	<b>0.79</b>	<b>5216</b>	<b>430327</b>	<b>1.21</b>	<b>53%</b>

\* Inner Sydney SLA defined as a SLA that is mostly within a 10km radius of Sydney Central Station.

**APPENDIX 6: Journey to work by bicycle, total trips and bicycle mode in outer Sydney SLA's, 1996 and 2001**

Outer Sydney SLAs**	Bicycle used on journey to work 1996	Total trips to work of any mode 1996	Bicycle Mode share (%) 1996	Bicycle used on journey to work 2001	Total trips to work of any mode 2001	Bicycle Mode share (%) 2001	Relative change in bicycle mode share, 1996 and 2001 (%)
Auburn	90	15562	0.58	87	17174	0.51	- 12%
Bankstown	338	54909	0.62	301	57201	0.53	- 15%
Baulkham Hills	150	52749	0.28	178	61985	0.29	4%
Blacktown	402	84769	0.47	453	95725	0.47	0%
Camden	69	12718	0.54	71	18077	0.39	- 28%
Campbelltown	260	51048	0.51	288	53565	0.54	6%
Concord	73	9578	0.76	91	11456	0.79	4%
Fairfield	241	56871	0.42	221	58254	0.38	- 10%
Holroyd	180	30771	0.58	142	32681	0.43	- 26%
Hornsby	251	55812	0.45	282	60195	0.47	4%
Hurstville	111	25489	0.44	144	27652	0.52	18%
Kogarah	78	18687	0.42	64	19965	0.32	- 24%
Kuringgai	123	36885	0.33	176	37023	0.48	45%
Liverpool	372	43303	0.86	354	56447	0.63	- 27%
Manly	157	15592	1.01	205	15499	1.32	31%
Parramatta	259	51297	0.50	291	53277	0.55	10%
Penrith	461	63025	0.73	465	69335	0.67	- 8%
Pittwater	173	21758	0.80	173	22026	0.79	- 1%
Ryde	204	38382	0.53	239	40008	0.60	13%
Strathfield	48	9347	0.51	32	10296	0.31	- 39%
Sutherland	575	83356	0.69	565	89121	0.63	- 9%
Warringah	472	55014	0.86	505	56310	0.90	5%
Wingecarri	100	11378	0.88	99	12845	0.77	- 13%
Wollondilly	50	12070	0.41	35	13822	0.25	- 39%
<b>TOTALS</b>	<b>5237</b>	<b>910370</b>	<b>0.58</b>	<b>5461</b>	<b>989939</b>	<b>0.55</b>	<b>- 5%</b>

\*\* Outer Sydney SLA defined as SLA for Sydney metropolitan area that is more than 10km from Sydney Central Station.

**APPENDIX 7: Journey to work by bicycle, total trips and bicycle mode in Blue Mountains, Newcastle and Wollongong SLAs, 1996 and 2001**

<b>Newcastle, Blue Mountains and Wollongong SLAs</b>	<b>Bicycle used on journey to work 1996</b>	<b>Total trips to work of any mode 1996</b>	<b>Bicycle Mode share (%) 1996</b>	<b>Bicycle used on journey to work 2001</b>	<b>Total trips to work of any mode 2001</b>	<b>Bicycle Mode share (%) 2001</b>	<b>Relative change in bicycle mode share, 1996 and 2001 (%)</b>
Blue Mountains	161	24625	0.65	250	26950	0.93	43%
Cessnock	115	11251	1.02	82	11490	0.71	- 30%
Gosford	392	46614	0.84	387	51224	0.76	- 10%
Hawkesbury	317	22521	1.41	231	24080	0.96	- 32%
Kiama	27	5670	0.48	42	6220	0.68	42%
Lake Macquarie	488	55069	0.89	392	57255	0.68	- 24%
Maitland	145	15687	0.92	126	16973	0.74	- 20%
Newcastle Inner	44	1559	2.82	61	1705	3.58	27%
Newcastle	1132	42015	2.69	1102	43266	2.55	- 5%
Remainder							
Port Stephens	278	14824	1.88	232	16528	1.4	- 26%
Shellharbour	151	16982	0.89	140	19046	0.74	- 17%
Shoalhaven Ω	343	18864	1.82	307	21535	1.43	- 21%
Wollongong	815	59095	1.38	823	61337	1.34	- 3%
Wyong	288	32310	0.89	257	38584	0.67	- 25%
<b>TOTALS</b>	<b>4696</b>	<b>367086</b>	<b>1.28</b>	<b>4432</b>	<b>396193</b>	<b>1.12</b>	<b>- 13%</b>

Ω Shoalhaven : split into 2 SLAs for 2001 Census: Shoalhaven – Part A and Shoalhaven – Part B. For purpose of analysis data for Shoalhaven – Part A and Shoalhaven – Part B, for 2001, were combined into summary measure.

**APPENDIX 8: Journey to work by bicycle, total trips and bicycle mode in Greater Metropolitan Region SLAs, 1996 and 2001**

Newcastle, Blue Mountains and Wollongong SLAs	Bicycle used on journey to work 1996	Total trips to work of any mode 1996	Bicycle Mode share (%) 1996	Bicycle used on journey to work 2001	Total trips to work of any mode 2001	Bicycle Mode share (%) 2001	Relative change in bicycle mode share, 1996 and 2001 (%)
Blue Mountains	161	24625	0.65	250	26950	0.93	43%
Cessnock	115	11251	1.02	82	11490	0.71	- 30%
Gosford	392	46614	0.84	387	51224	0.76	- 10%
Hawkesbury	317	22521	1.41	231	24080	0.96	- 32%
Kiama	27	5670	0.48	42	6220	0.68	42%
Lake Macquarie	488	55069	0.89	392	57255	0.68	24%
Maitland	145	15687	0.92	126	16973	0.74	- 20%
Newcastle Inner	44	1559	2.82	61	1705	3.58	27%
Newcastle	1132	42015	2.69	1102	43266	2.55	- 5%
Remainder							
Port Stephens	278	14824	1.88	232	16528	1.4	- 26%
Shellharbour	151	16982	0.89	140	19046	0.74	- 17%
Shoalhaven Ω	343	18864	1.82	307	21535	1.43	- 21%
Wollongong	815	59095	1.38	823	61337	1.34	- 3%
Wyong	288	32310	0.89	257	38584	0.67	- 25%
<b>TOTALS</b>	<b>4696</b>	<b>367086</b>	<b>1.28</b>	<b>4432</b>	<b>396193</b>	<b>1.12</b>	<b>- 13%</b>

Ω Shoalhaven: split into 2 SLAs for 2001 Census: Shoalhaven – Part A and Shoalhaven – Part B. For purpose of analysis data for Shoalhaven – Part A and Shoalhaven – Part B, for 2001, were combined into summary measure.

## APPENDIX 9. Inner Sydney SLA destinations of people cycling to work reported on Census day in 1996 and 2001

Journey to work destinations in Inner Sydney SLAs*	Number of people cycling to inner Sydney work destinations 1996	Total trips to inner Sydney work destinations 1996	1996 Bicycle mode share %	Number of people cycling to inner Sydney work destinations 2001	Total trips to inner Sydney work destinations 2001	2001 Bicycle mode share %	% Change in number of people cycling to inner Sydney work destinations
Ashfield	44	8607	0.51	66	7973	0.83	50%
Botany Bay	271	34408	0.79	273	35941	0.76	0.7%
Burwood	54	11383	0.47	42	11707	0.36	- 22%
Canterbury	110	22813	0.48	105	22371	0.47	- 5%
Drummoyne	49	6016	0.81	43	6026	0.71	- 12%
Hunter's Hill	23	2433	0.95	26	2599	1.00	13%
Lane Cove	60	14090	0.43	104	15784	0.66	73%
Leichhardt	161	19686	0.82	238	19986	1.19	48%
Marrickville	163	22746	0.72	221	20700	1.07	36%
Mosman	61	6290	0.97	66	6293	1.05	8%
North Sydney	181	52587	0.34	397	55543	0.71	119%
Randwick	321	26343	1.22	394	28485	1.38	23%
Rockdale	94	17319	0.54	104	17026	0.61	11%
South Sydney♣	679	80293	0.85	1100	80822	1.36	62%
Sydney Inner¶	515	148884	0.35	1167	170946	0.68	127%
Sydney remainder Φ	244	49641	0.49	522	58910	0.89	114%
Waverley	101	12925	0.78	153	12925	1.18	51%
Willoughby	160	42769	0.37	294	45304	0.65	84%
Woollahra	103	14401	0.72	148	14449	1.02	44%
<b>TOTAL</b>	<b>3394</b>	<b>593634</b>	<b>0.57</b>	<b>5463</b>	<b>633790</b>	<b>0.86</b>	<b>61%</b>

\* Inner Sydney SLA defined as a SLA that is mostly within a 10km radius of Sydney Central Station.

♣ South Sydney SLA comprises suburbs and localities of Alexandria, Beaconsfield, Blackfriars, Broadway, Chippendale, Darlinghurst, Darlington, Elizabeth Bay, Erskineville, Erskineville South, Everleigh, Golden Grove, King George V Hospital, Kings Cross, Macdonaldtown, Missenden Road, Moore Park, Potts Point, Redfern, Rosebery, Rushcutters Bay, Sheas Creek, Strawberry Hills, Surry Hills, Sydney East, Sydney South, Sydney showground, Sydney University, Taylor Square, University of New South Wales, Victoria Barracks, Waterloo, Woolloomooloo, Zetland.

¶ Sydney Inner SLA comprises suburbs and localities of Australia Square, Chinatown, Church Hill, Circular Quay, Dawes Point, Garden Island, Millers Point, Parliament House, St James, Sydney City, The Rocks, Sydney Cove, Walsh Bay.

Φ Sydney remainder SLA comprises suburbs and localities of Brickfield Hill, Darling Harbour, Darling Island, Goats Island, Haymarket, Pyrmont, Railway Square, Ultimo.

## APPENDIX 10. Outer Sydney SLA destinations of people cycling to work reported on Census day in 1996 and 2001

Journey to work destinations in Outer Sydney SLAs**	Number of people cycling to outer Sydney work destinations 1996	Total trips to outer Sydney work destinations 1996	1996 Bicycle mode share %	Number of people cycling to outer Sydney work destinations 2001	Total trips to outer Sydney work destinations 2001	2001 Bicycle mode share %	% Change in number of people cycling to outer Sydney work destinations
Auburn	158	33309	0.47	171	33534	0.51	8%
Bankstown	377	56048	0.67	331	54429	0.61	- 12%
Baulkham Hills	104	27317	0.38	124	35343	0.35	19%
Blacktown $\psi$	337	52100	0.65	382	61673	0.62	13%
Camden	47	6110	0.77	56	8930	0.63	19%
Campbelltown	188	25994	0.72	203	30102	0.67	8%
Concord	49	10428	0.47	60	10056	0.60	22%
Fairfield	184	40599	0.45	192	42693	0.45	4%
Holroyd	177	26549	0.67	162	26612	0.61	- 8%
Hornsby	148	29901	0.49	146	31612	0.46	- 1%
Hurstville	113	17019	0.66	121	17056	0.71	7%
Kogarah	77	11423	0.67	71	12783	0.56	- 8%
Kuringgai	97	19219	0.50	96	20104	0.48	- 1%
Liverpool	359	36701	0.98	332	40245	0.82	- 8%
Manly	124	8257	1.50	132	8498	1.55	6%
Parramatta	350	74784	0.47	365	76369	0.48	4%
Penrith	378	36254	1.04	380	40640	0.94	0.5%
Pittwater	145	10730	1.35	157	11486	1.37	8%
Ryde	223	39105	0.57	300	45310	0.66	35%
Strathfield	76	14468	0.53	54	14629	0.37	- 29%
Sutherland $\beta$	444	38138	1.16	434	42313	1.03	- 2%
Warringah	388	35063	1.11	400	36174	1.11	3%
Wingecarri	90	9032	1.00	90	10276	0.88	0%
Wollondilly	48	5969	0.80	35	5796	0.60	- 27%
<b>TOTAL</b>	<b>4681</b>	<b>664517</b>	<b>0.70</b>	<b>4794</b>	<b>716663</b>	<b>0.67</b>	<b>2%</b>

\*\* Outer Sydney SLA defined as SLA for Sydney metropolitan area that is more than 10km from Sydney Central Station.

$\psi$  Blacktown: split into three SLAs for 2001 Census; Blacktown–North, Blacktown–South-East and Blacktown–South-West. For purpose of analysis data for Blacktown– North, Blacktown–South-East and Blacktown–South-West, for 2001, were combined into a summary measure.

$\beta$  Sutherland: split into two SLA's for 2001 Census; Sutherland Shire- East and Sutherland Shire– West. For purpose of analysis data for Sutherland Shire - East and Sutherland Shire– West, for 2001, were combined into a summary measure.

**APPENDIX 11. Greater Metropolitan Region (GMR) SLA destinations of people cycling to work reported on Census day in 1996 and 2001**

Journey to work destinations in the Greater Metropolitan Region SLAs	Number of people cycling to GMR work destinations 1996	Total trips to GMR work destinations 1996	1996 Bicycle mode share %	Number of people cycling to GMR work destinations 2001	Total trips to GMR work destinations 2001	2001 Bicycle mode share %	% Change in number of people cycling to GMR work destinations
Blue Mountains	94	10675	0.88	137	11809	1.16	46%
Cessnock	105	7974	1.32	82	9389	0.87	- 22%
Gosford	314	32682	0.96	278	36226	0.77	- 11%
Hawkesbury	306	14299	2.14	230	16147	1.42	- 25%
Kiama	13	2548	0.51	23	2944	0.78	77%
Lake Macquarie	358	33906	1.06	310	36032	0.86	- 13%
Maitland	107	10637	1.01	96	12329	0.78	- 10%
Newcastle Inner	251	13496	1.86	290	14363	2.02	16%
Newcastle Remainder	1007	49992	2.01	865	47307	1.83	- 14%
Port Stephens	263	11305	2.33	239	14251	1.68	- 9%
Shellharbour	93	7051	1.32	92	8487	1.08	- 1%
Shoalhaven Ω	327	16685	1.96	304	19495	1.56	- 7%
Wollongong	784	57274	1.37	774	55924	1.38	- 1%
Wyong	248	21434	1.16	219	24656	0.89	- 12%
<b>TOTAL</b>	<b>4270</b>	<b>289958</b>	<b>1.47</b>	<b>3939</b>	<b>309359</b>	<b>1.27</b>	<b>- 8%</b>

Ω Shoalhaven: split into 2 SLAs for 2001 Census: Shoalhaven– Part A and Shoalhaven– Part B. For purpose of analysis data for Shoalhaven– Part A and Shoalhaven– Part B, for 2001, were combined into summary measure.